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Any statements in this presentation about the future expectations, plans and prospects of Selecta Biosciences, Inc. (the "Company"), including without limitation, statements regarding the Company's cash runway, the unique proprietary technology platform of the Company, and the unique proprietary platform of its partners, the potential of ImmTOR to enable re-dosing of AAV gene therapy and to mitigate immunogenicity, the potential of ImmTOR and the Company's product pipeline to treat chronic refractory gout, MMA, IgAN, other autoimmune diseases, lysosomal storage disorders, or any other disease, the anticipated timing or the outcome of ongoing and planned clinical trials, studies and data readouts, the anticipated timing or the outcome of the FDA's review of the Company's regulatory filings, the Company's and its partners' ability to conduct its and their clinical trials and preclinical studies, the timing or making of any regulatory filings, the potential treatment applications of product candidates utilizing the ImmTOR platform in areas such as gene therapy, gout and autoimmune disease, the ability of the Company and its partners where applicable to develop gene therapy products using ImmTOR, the novelty of treatment paradigms that the Company is able to develop, whether the observations made in non-human study subjects will translate to studies performed with human beings, the potential of any therapies developed by the Company to fulfill unmet medical needs, the Company's plan to apply its ImmTOR technology platform to a range of biologics for rare and orphan genetic diseases, the potential of the Company's technology to enable repeat administration in gene therapy product candidates and products, the ability to re-dose patients and the potential of ImmTOR to allow for re-dosing, the potential to safely re-dose AAV, the ability to restore transgene expression, the potential of the ImmTOR technology platform generally and the Company's ability to grow its strategic partnerships, 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 proof of concept trials, including the 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 ability to predict results of studies performed on human beings based on results of studies performed on nonhuman subjects, 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, licenses or contractual relationships, its 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 Company's recurring losses from operations and negative cash flows, substantial fluctuation in the price of its common stock, risks related to geopolitical conflicts and pandemics and other important factors discussed in the "Risk Factors" section of the Company's most recent Annual Report on Form 10-K, 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 intention to update any forward-looking statements included in this presentation.



# Pioneering Precision Immune Tolerance

ImmTOR® and ImmTOR-IL™ immune tolerance platforms have potentially broad applicability to address the challenges of autoimmunity and immunogenicity

2

**Diversified pipeline** of novel therapeutic candidates; proof of concept in biologics and gene therapy, **expanding into autoimmune disease** 

3

**Topline Phase 3 data for SEL-212** in chronic refractory gout expected in **Q1 2023**, with additional value-generating milestones anticipated in 2023

4

Multiple strategic partnerships designed to validate platform and maximize its potential

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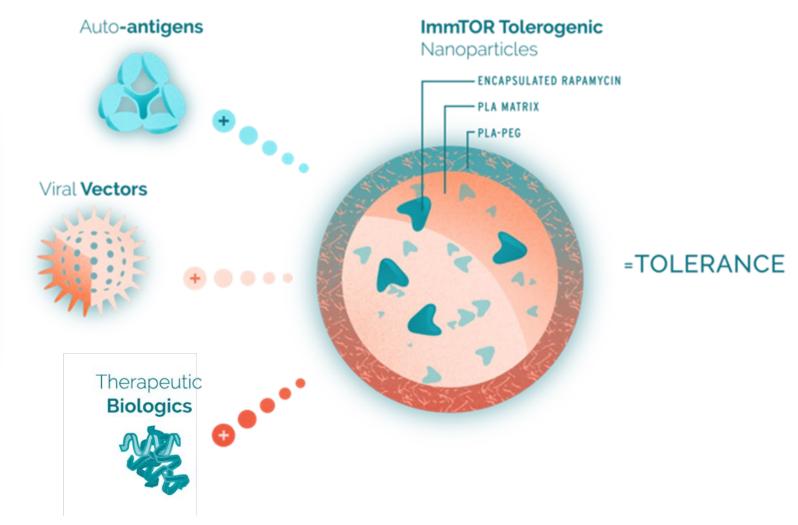
Strong balance sheet, positioned to reach multiple value inflection points with expected **runway into mid-2024** 

# Proprietary <u>precision immune tolerance</u> platform with potentially broad applicability

ImmTOR combines
nanoparticle technology
with an FDA approved
anti-inflammatory and
immunomodulatory drug

Designed to generate

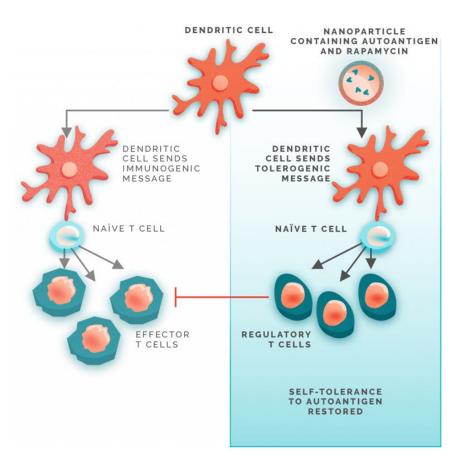
antigen-specific immune
tolerance when
combined with an antigen
of interest



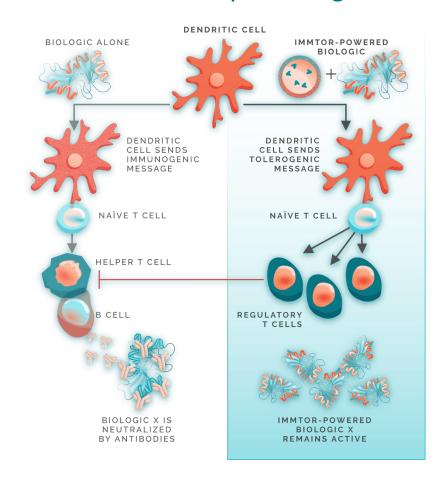


# ImmTOR aims to restore self tolerance in autoimmune disease and overcome immunogenicity of gene therapies and biologics

### **Autoimmune Disease**



### **Gene Therapies/Biologics**

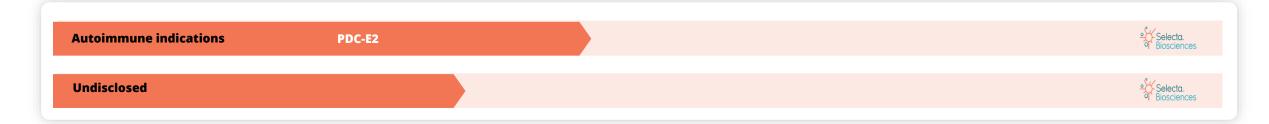




### A diversified and growing wholly-owned pipeline

**Recent and Expected Upcoming Milestones Indication Preclinical** Phase 1 Phase 2 Phase 3 **Antigen** 

### **TOLEROGENIC THERAPIES**



### **GENE THERAPIES**

Methylmalonic acidemia (MMA) **AAV** (serotype undisclosed) **SEL-302** Phase 1 start Q4 2022

### **BIOLOGIC THERAPIES**



# Unlocking the potential of our platform through collaborations

**Upcoming** Commercial Indication **Antigen Preclinical** Phase 1 Phase 2 Phase 3 Milestones **Rights BIOLOGIC THERAPIES** DISSOLVE I & II Topline Data Q1 2023 [ SO | **Chronic Refractory Gout** Pegadricase **SEL-212** 

### **GENE THERAPIES**

| Pompe disease                         | lgG protease (Xork)     | SEL-018 | ≯a | stellas |
|---------------------------------------|-------------------------|---------|----|---------|
| Duchenne muscular dystrophy (DMD)     | Undisclosed             |         |    | SAREPTA |
| Limb-girdle muscular dystrophy (LGM   | ID) Undisclosed         |         | §  | SAREPTA |
| Two indications for lysosomal storage | e disorders Undisclosed |         |    | Takeda  |



Restoring Self-Tolerance in Autoimmune Disease

### Striving to restore self-tolerance in autoimmune diseases

ImmTOR + IL-2 has the potential to be a best-in-class approach



Roughly **80 autoimmune conditions** affect as much as **4.5% of the world's population\***; **24M+ individuals in the US** alone are affected by autoimmune diseases\*\*

The current standard of care is broad immunosuppression, which is associated with side effects and leaves patients vulnerable to serious infection and malignancies

There is a significant need for **antigen-specific** therapies that can induce immune tolerance to pathogenic autoantigens without the need for chronic and systemic immune suppression



>> Approach: restore **natural self-tolerance by administering ImmTOR with nanoparticle-encapsulated self-antigens** and avoid the need for chronic and systemic immune suppression

Aiming to expand antigen-specific Tregs and enhance durability of tolerance by developing a proprietary Tregselective IL-2 to combine with ImmTOR and autoantigens

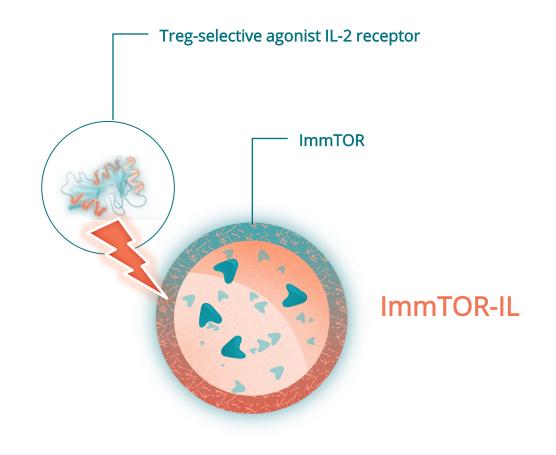


### ImmTOR-IL: ImmTOR plus IL-2 receptor agonist

### Evolution of the ImmTOR Platform

- Synergistic mechanism of ImmTOR and a Treg-selective IL-2
- Identified an interleukin-2 (IL-2) cytokine with plans to advance it through the next stage of development
- Observed to greatly increase the magnitude and durability of antigen-specific Treg expansion when compared to either ImmTOR or IL-2 alone
- Proof of concept human data in which we observed ImmTOR alone and IL-2 alone lowers the translational risk and provides further confidence in the clinical utility of this potentially synergistic approach
- Potential to enable lower and fewer doses of ImmTOR

|                       | IL-2 mutein                         | ImmTOR  | ImmTOR-IL  |
|-----------------------|-------------------------------------|---|--|
| Induce Treg           | ×                                   | <b>✓</b>                                      | <b>~</b>   |
| Expand existing Tregs | <b>~</b>                            | ×   | <b>✓</b>   |
| Antigen-specific      | X                                   | <b>✓</b>                                      | <b>✓</b>   |
|                       | Expansion of all pre-existing Tregs | Induction of target<br>antigen-specific Tregs | Induction and<br>expansion of antigen-<br>specific Tregs |



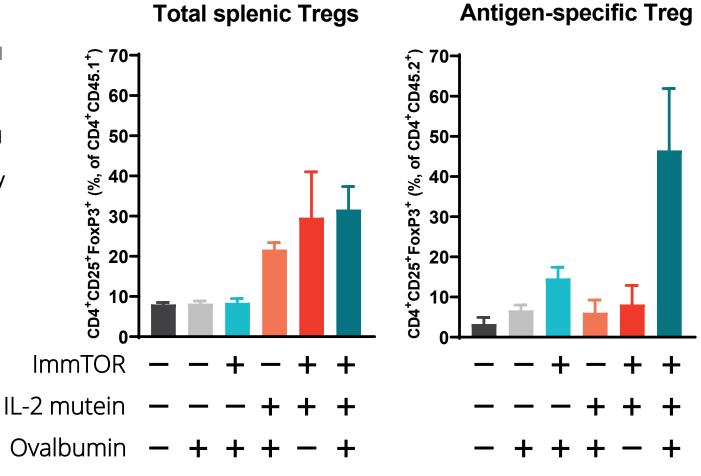


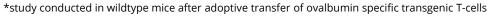
# Induction and expansion of antigen-specific Treg

Observed a significant expansion of <u>antigen-specific Treg\*</u> with a single dose of ImmTOR in combination with an IL-2 mutein + antigen

With superior expansion and durability of total Tregs, Selecta potentially **has a best-in-class IL-2 therapy** 

Data believed to show an approximately 3-fold increase in antigen-specific Tregs, and an opportunity to enable a "first in class" therapy for autoimmune disorders



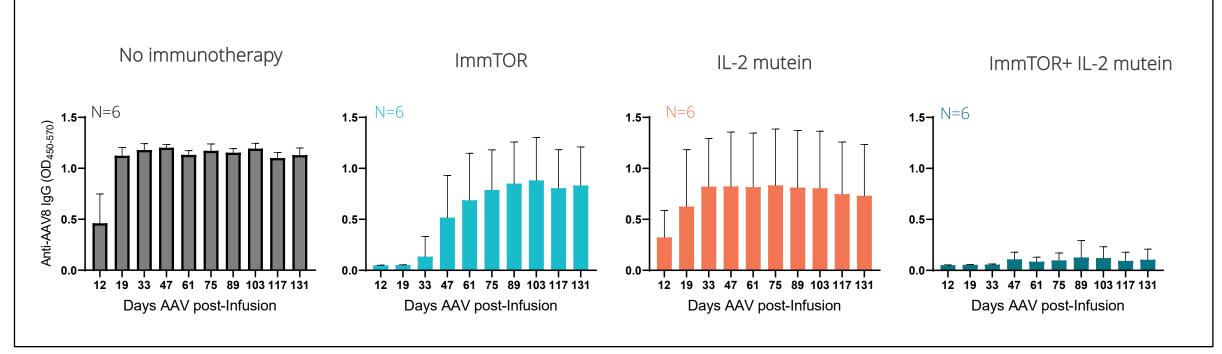




# ImmTOR-IL mitigates immunogenicity of high vector dose AAV gene therapy

ImmTOR + 4 monthly doses of IL-2 mutein inhibits anti-AAV antibodies at 5E13 vg/kg dose



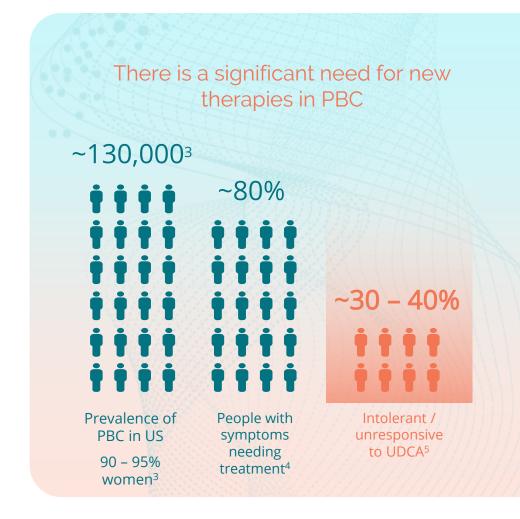




# Initial autoimmune disease focus: Primary Biliary Cholangitis (PBC)

ImmTOR + PDC-E2 antigen has the potential to address underlying autoimmune disease

- PBC is a rare T-cell mediated autoimmune liver disease
  - It is driven by a well-defined pathogenic antigen: **PDC-E2**
  - Leads to bile duct damage, progressive inflammation, scarring (cirrhosis) and eventually, liver failure
- Current therapies do not address underlying disease or key symptoms
  - 30 40% of patients are intolerant / unresponsive to current SoC (UDCA<sup>1</sup>), and OCA<sup>2</sup> is marred by high AE rates and black box warnings
- Our approach has the potential to directly address underlying disease
  - In preclinical studies ImmTOR induced a **strong tolerogenic environment** and showed hepatoprotective properties in liver injury models
  - Co-administration of ImmTOR with PDC-E2 has the potential to restore immune tolerance in the liver

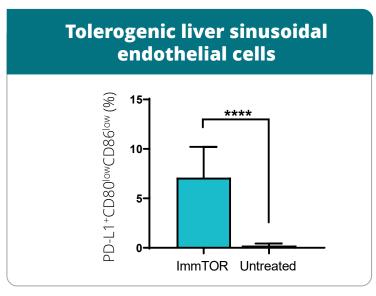


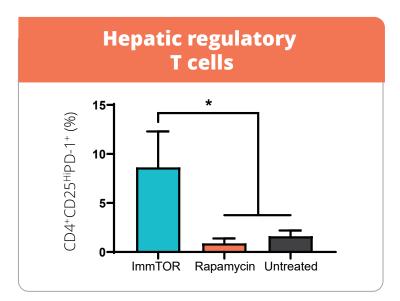


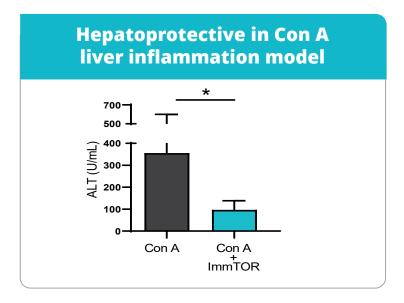
# An ImmTOR-based approach to treating primary biliary cholangitis (PBC)

Selecta intends to co-administer ImmTOR with PDC-E2, the autoantigen implicated in PBC

### We believe ImmTOR is ideally suited to address the root cause of PBC







PBC is a T-cell mediated disease driven by a well-defined antigen, ImmTOR designed to biodistribute to the liver and induce a tolerogenic environment, ImmTOR observed to exhibit hepatoprotective properties in liver injury models<sup>1</sup>

<sup>\*</sup> P=0.05, \*\*\*\*P=0.0001



### AAV gene therapies are coming of age but still have challenges

Selecta has platform technologies to potentially address many key challenges facing the modality



- >> While most gene therapy trials use AAV vectors, the formation of neutralizing antibodies (NAbs) after AAV vector administration prevents redosing
  - Adverse patient events related to high vector doses is inextricably linked to immunogenicity\*
  - Pre-existing immunity to AAV vectors excludes significant numbers of patients



- ImmTOR and Xork offer independent value creation opportunities with existing and new partners
  - ImmTOR Human proof of concept shows the possibility for ImmTOR to inhibit the formation of NAbs to AAV vectors. Extensive preclinical work shows the potential for improved and more durable transgene expression upon the first dose and potential hepatoprotective benefits
  - Xork Cleaves human IgG specifically, efficiently and shows low cross reactivity to human sera potentially opening a potential treatment window for those with pre-existing immunity to AAV vectors

# Aiming to have the leading toolkit to power AAV gene therapies



"Gene therapy is a one time only treatment"

The ImmTOR platform has shown the ability to mitigate the formation neutralizing antibodies (NAbs) to empty capsids in humans

Preventing the formation of NAbs could enable redosing of gene therapies



"Patient eligibility is limited"

Xork can cleave IgG potentially opening a therapeutic window for gene therapy treatment and **enable redosing** 

Increasing patients eligible for gene therapies can bring hope to those without treatment alternatives and make programs more commercially viable



"High doses are needed to ensure therapeutic benefit"

Low transduction efficiency and lack of organ specificity requires higher doses to ensure therapeutic benefit

Selecta has partnered with a leading synthetic biology company to engineer next generation capsids with improved transduction and organ specificity



### ImmTOR could enable safer, more efficacious gene therapy treatments

ImmTOR is designed to be dose sparing - a key safety consideration and manufacturing benefit

Day 0 5e11 vg/kg AAV-SEAP 5e11 vg/kg AAV-SEAP + ImmTOR 25e11 vg/kg AAV-SEAP

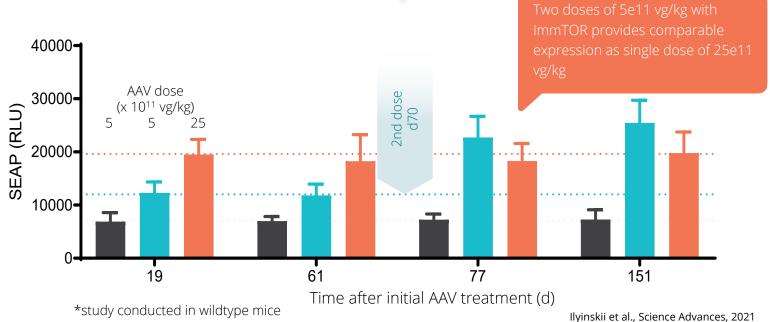
Day 70 5e11 vg/kg AAV-SEAP

5e11 vg/kg AAAV-SEAP + ImmTOR

25e11 vg/kg AAV-SEAP

ImmTOR has been observed to enhance transgene expression after first and second doses of AAV

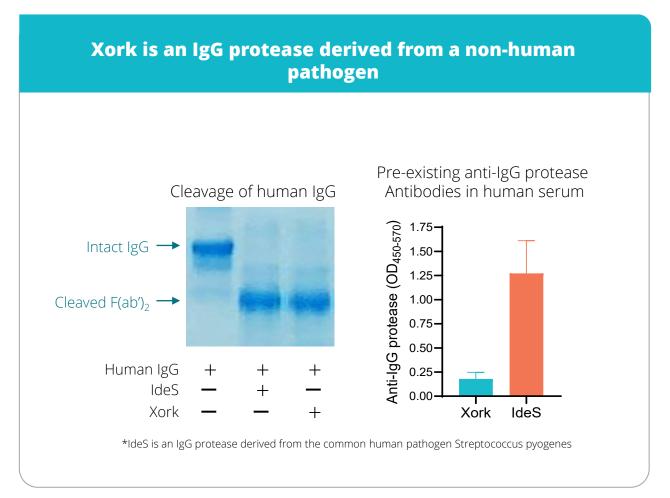
Repeat dosing enabled by ImmTOR is dose sparing





# Aiming to simultaneously address two key challenges in AAV gene therapy

The combination of ImmTOR and Xork could make gene therapy both accessible and re-dosable





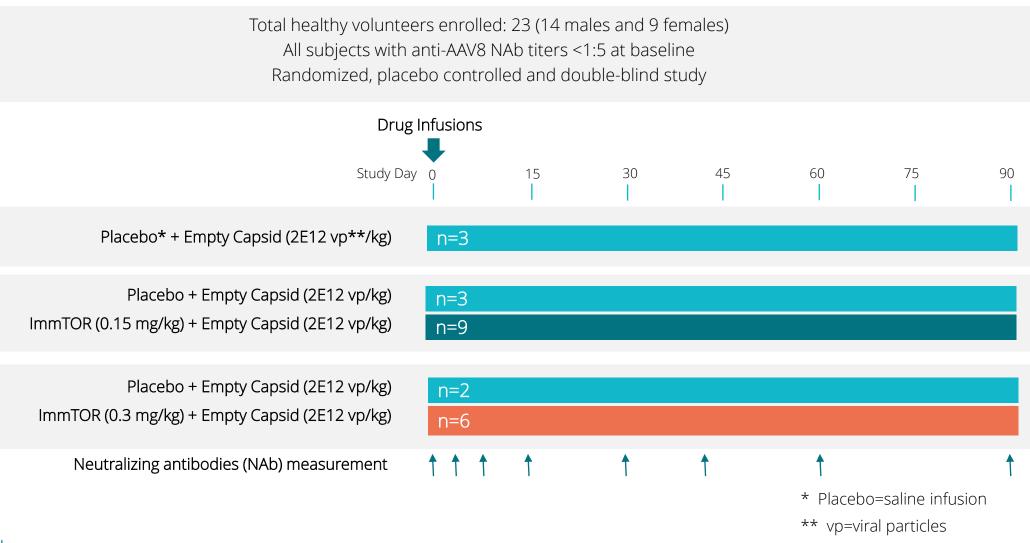
- Mitigate NAb formation
- Address re-dosing issues
- Enhance expression

Cleave pre-existing IgG



Potential to make gene therapy both accessible & re-dosable

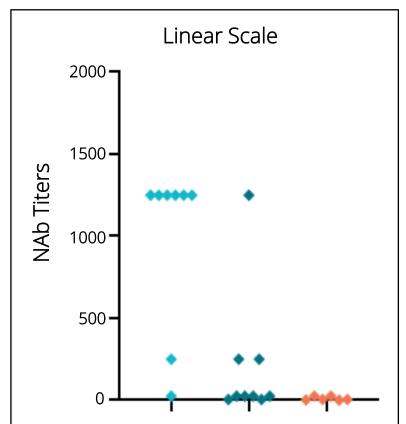
# SEL-399 (empty-AAV8 capsid) Phase 1 dose-escalation study

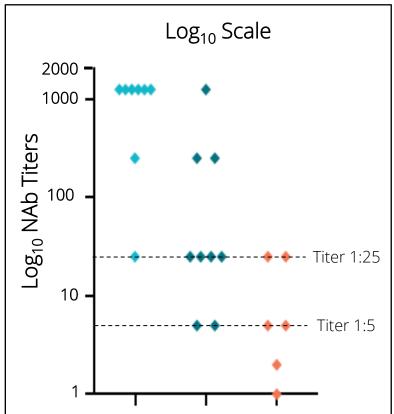


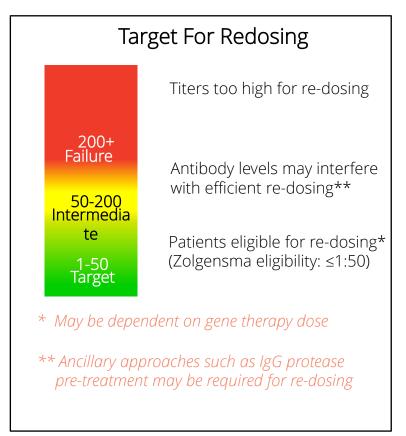


### Single dose ImmTOR observed to inhibit anti-AAV8 NAb formation at day 30

100% of subjects dosed with 0.3 mg/kg ImmTOR had NAb titers ≤1:25 at Day 30 67% of subjects dosed with 0.3 mg/kg ImmTOR had NAb titers ≤1:5 at Day 30







- Empty Capsid (n=8)
- Empty Capsid + 0.15 mg/kg ImmTOR (n=9)
- Empty Capsid + 0.3 mg/kg ImmTOR (n=6)



### Summary and conclusions

- We observed AAV8 empty capsids eliciting a strong immune response with peak median anti-AAV8 NAb titers of 1:6875
- We observed ImmTOR inhibiting the formation of anti-AAV8 NAb in a dose-dependent manner at Day 30

| ImmTOR Dose | Subjects ≤ 1:5 NAb titer | Subjects ≤ 1:25 NAb titer | Median titers | Fold difference from control |  |
|-------------|--------------------------|---------------------------|---------------|------------------------------|--|
| 0.15 mg/kg  | 22%                      | 67%                       | 1:25          | 50                           |  |
| 0.30 mg/kg  | 67%                      | 100%                      | 1:5           | 250                          |  |

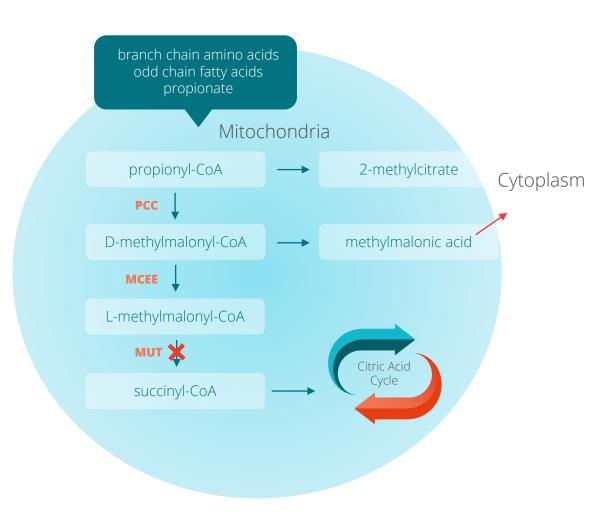
- After Day 30, 2 of 6 subjects treated with 0.3 mg/kg ImmTOR maintained NAb titers ≤25, while remaining ImmTOR-treated subjects showed delayed formation of NAb reaching control levels by Day 90
- Animal studies suggest that if NAb are inhibited at Day 30, administration of two additional monthly doses of ImmTOR may maintain control of NAb beyond 90 days
- Safety findings included AEs previously observed with ImmTOR (Stomatitis & Rash). Asymptomatic and transient laboratory changes in subjects receiving ImmTOR were seen in 2 subjects with mild to moderate thrombocytopenia and 1 subject with grade 3 hypertriglyceridemia
- This promising study in healthy volunteers **provides support for the potential use of ImmTOR for the inhibition of NAbs to AAV8 in gene** therapy clinical trials



### SEL-302 - Gene therapy program for the treatment of MMA

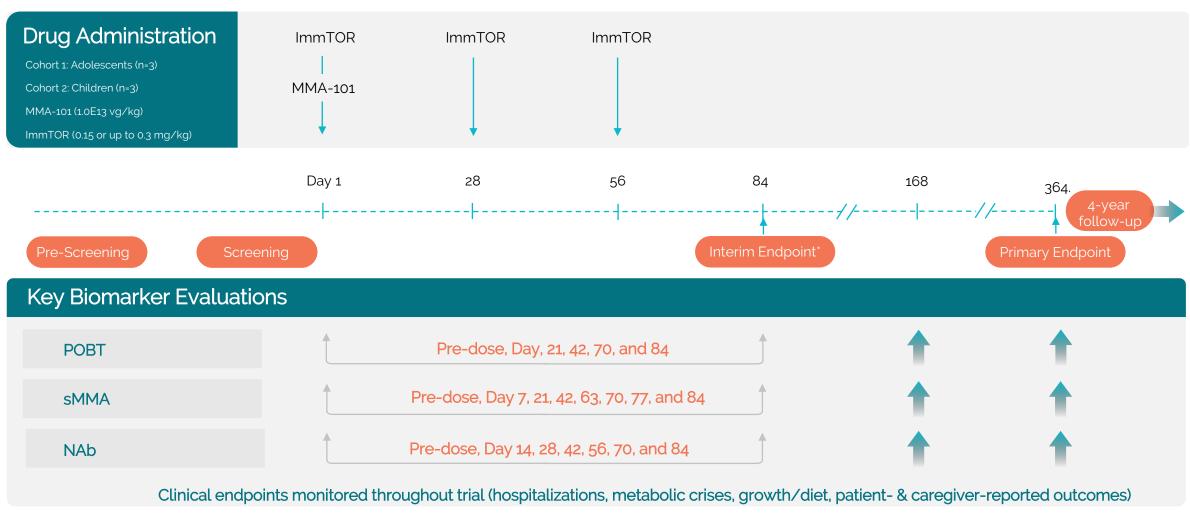
### Phase 1 start expected in Q4 2022

- Methylmalonic acidemia (MMA) is a rare monogenic metabolic disease with a potential live birth incidence of between 1:25,000 and 1:48,000<sup>1</sup>
- Majority of patients have mutations in the mitochondrial methylmalonyl-CoA mutase (MUT) gene
- Metabolic instability, particularly in the liver, can cause hyperammonemia and production of other toxic metabolites
- Metabolic crisis can cause irreversible neurocognitive damage, stunted growth, chronic kidney disease and premature death
- Only effective treatment is liver transplantation at an early age
- Selecta is developing an AAV gene therapy combined with ImmTOR for the treatment of MMA (SEL-302)





# MMA Clinical Trial Design: Schedule of Events for Individual Subjects



POBT=1-13C -sodium propionate oxidative capacity using breath tesevaluationt; sMMA= serum methylmalonic acid levels; NAb=neutralizing anti-AAV8 antibodies \*Interim Endpoint= Data cutoff for Data Safety Monitoring Board





### ImmTOR designed to enhance biologic therapies

Unlocking their full potential by potentially ameliorating unwanted immune responses



Many biologics can be highly immunogenic resulting in suboptimal responses to the standard of care due to the development of anti-drug antibodies (ADAs) after multiple treatments

Patients that develop an immune response to the current standard of care may be forced to discontinue treatment or experience adverse reactions



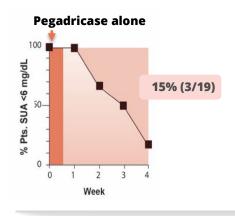
ImmTOR, co-administered with immunogenic therapeutic enzymes, has the potential to ameliorate an immune response to the biologic treatment **allowing patients to stay on therapy longer** 

Extensive human data and significant safety database across multiple biologics demonstrates broad potential applicability and a promising approach to minimize the healthcare and economic burden of ADAs



# SEL-212 is a late-stage enzyme therapy program in chronic refractory gout

ImmTOR markedly improved patient response to the enzyme pegadricase in a Phase 2 trial

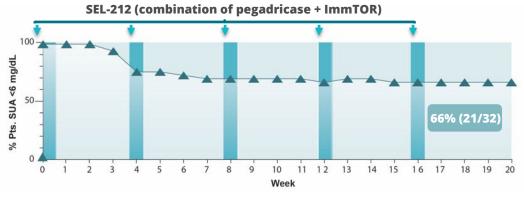


### **Pegadricase alone\*\***

Pegadricase 0.2 or 0.4 mg/kg

Only 15% of patients treated with pegadricase alone maintain control of serum uric acid (SUA) after four weeks of therapy

Pegadricase is a highly immunogenic enzyme with most patients treated with pegadricase alone developing anti-drug antibodies within 2 weeks after a single treatment



### 5 monthly doses SEL-212\*

Pegadricase 0.2 mg/kg ImmTOR 0.1 or 0.15 mg/kg ImmTOR was observed to ameliorate the immune response to pegadricase and was generally well-tolerated resulting in sustained control of serum uric acid (SUA)

<sup>\*\*</sup>Data from pegadricase alone cohorts from the SEL-037/101, SEL-212/101, and SEL-212/201 trials



<sup>\*</sup> Data from 5 monthly dosing cohorts of the SEL-212/201 trial

### Patients most in need reaped greater benefits with SEL-212

Observed a delta of 19% points for SEL-212 versus pegloticase for patients with visible tophi at baseline

### Patients with tophi at baseline:

- Represent the most severely affected population of gout patients
- Are less likely to achieve target SUA levels on conventional oral lowering therapies and have increased gout-related emergency room visits, hospitalizations, gout-related surgeries, and co-morbidities
- Have increased prevalence of swollen and tender joints and chronic kidney disease
- Have increased risk of mortality

| Evaluation Period | Data Set | SEL-212 |                   | pegloticase |                   | Treatment Difference² |
|-------------------|----------|---------|-------------------|-------------|-------------------|-----------------------|
| (Month)           |          | n¹      | Responder Percent | n¹          | Responder Percent | Percentage pts        |
| Month 3 and 6     | PP       | 26      | 58%               | 26          | 39%               | 19                    |
| combined          | ITT      | 35      | 57%               | 34          | 42%               | 16                    |

<sup>1.</sup> Number of patients with tophi with Responder Assessment

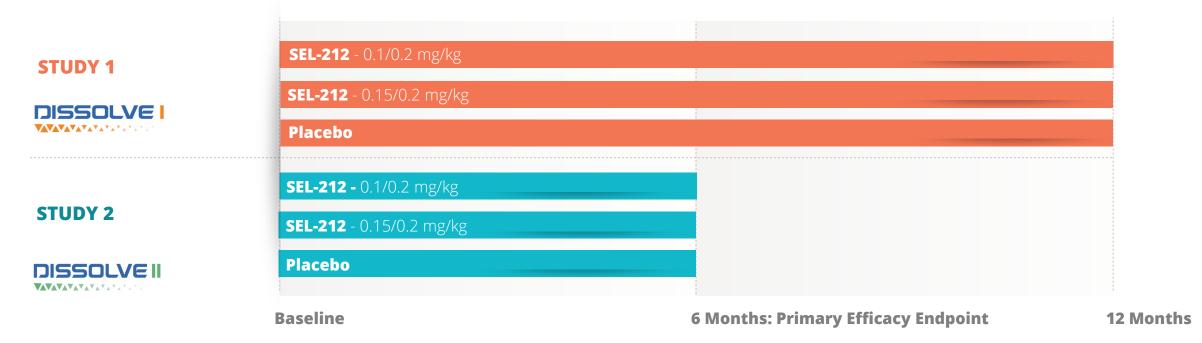


Treatment difference = SEL-212 percent responder - pegloticase percent responder. Rounded to nearest integer

### SEL-212 phase 3 DISSOLVE program design

### Evaluating SEL-212 in a pivotal phase 3 program vs. placebo, joint topline data expected in Q1 2023

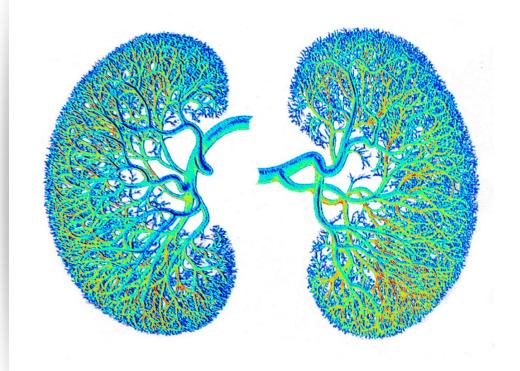
- 2 double blinded placebo-controlled trials of SEL-212 (0.1 mg/kg & 0.15 mg/kg ImmTOR)
  - Both studies have a 6-month primary endpoint of serum uric acid (SUA) < 6 mg/dL at month 6, and DISSOLVE I has a 6-month safety extension; secondary endpoints include tender and swollen joint counts, tophus burden, patient reported outcomes of activity limitation and quality of life and gout flare incidence
- Randomized 1:1:1 against placebo with 265 treated subjects across both studies





# Opportunity to address unmet medical needs for the treatment of IgAN

- Immunoglobulin A nephropathy (IgAN) is a leading cause of chronic kidney disease (CKD) and renal failure with 30-40% of patients reaching end-stage renal disease; approximately **100,000 patients in the U.S. and only one approved therapy**
- Caused by deposits of the protein immunoglobulin A (IgA) inside the filters (glomeruli) in the kidney
- Current treatments fail to address the root cause of the disease and are focused on protecting the kidney from further damage
- Selecta is **developing an entirely new class of IgA protease** from a commensal bacteria in collaboration with IGAN Biosciences for the treatment of IgAN
- Combining ImmTOR with an IgA protease has the potential to mitigate the formation of new ADAs and address the underlying pathophysiology of the disease

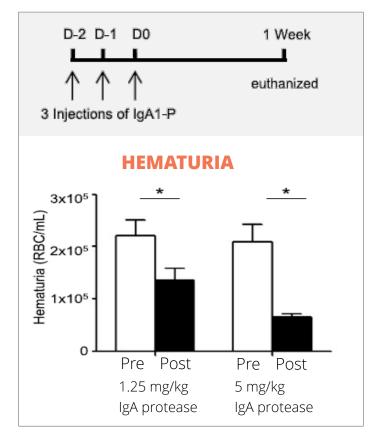




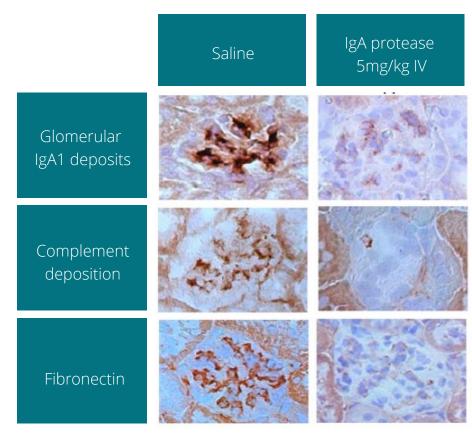
### Combining ImmTOR with IgA protease for the treatment of IgAN

Building on the clinical data from the SEL-212 program and strong preclinical data in IgA

- IND enabling studies underway for next generation Immunoglobulin A (IgA) protease to address IgA nephropathy
- Mice expressing human IgA1 and sCD89 develop spontaneous IgA nephropathy
- Treatment with IgA protease clears glomerular IgA1 deposits and associated inflammation and hematuria



Adapted from Lechner et al., J Am Soc Nephrol, 2016.







### Experienced management team positions Selecta for success















**Carsten Brunn, Ph.D.**President and CEO

**Blaine Davis**Chief Financial Officer

**Lloyd Johnston, Ph.D.**Chief Operations Officer

**Kei Kishimoto, Ph.D.**Chief Scientific Officer

**Peter G. Traber, M.D.**Chief Medical Officer

**Kristen Baldwin**Chief People Officer

**Matthew Bartholomae**General Counsel





































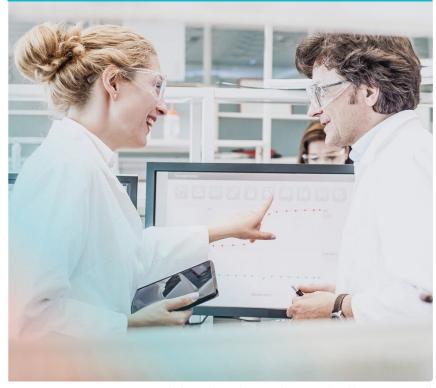




# Positioned for growth in 2023

### ~\$136.2 MILLION

Cash on hand as of December 31, 2022<sup>(1)</sup>



Current funding expected to extend into mid 2024 and is expected to support anticipated development across pipeline programs including:

### Key 2023 milestones:

- ✓ Licensed next-generation IgG protease candidate, Xork, for development with AT845, Astellas Gene Therapies' investigational product for the treatment of Pompe Disease
- Report top-line data from Phase 3 DISSOLVE I & II programs of SEL-212 in chronic refractory gout in Q1 2023
- ☐ Preliminary Phase 1 SEL-302 data in gene therapy for MMA
- ☐ Initiate IND enabling studies with the selected IL-2 candidate to further advance and expand the immune tolerance platform in autoimmune disease
- ☐ Initiate IND enabling studies with the selected IgA protease candidate from IGAN Biosciences

<sup>1.</sup> Includes cash, cash equivalents, marketable securities and restricted cash.



# Pioneering Precision Immune Tolerance

ImmTOR® and ImmTOR-IL™ immune tolerance platforms have potentially broad applicability to address the challenges of autoimmunity and immunogenicity

Diversified pipeline of novel therapeutic candidates; proof of concept in biologics and gene therapy, expanding into autoimmune disease

Topline Phase 3 data for SEL-212 in chronic refractory gout expected in Q1 2023, with additional value-generating milestones anticipated in 2023

Multiple strategic partnerships designed to validate platform and maximize its potential

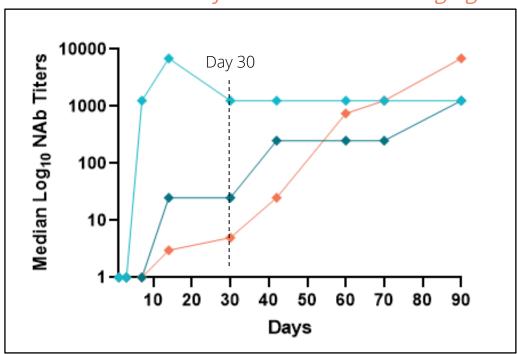
Strong balance sheet, positioned to reach multiple value inflection points with expected **runway into mid-2024** 

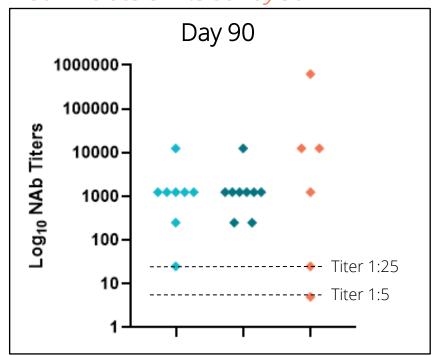


# Subjects treated with a single dose of ImmTOR developed delayed NAb formation by day 90

Additional doses of ImmTOR may be required to maintain control beyond Day

2 of 6 subjects dosed with 0.3 mg/kg ImmTOR had NAb titers ≤1:25 at Day 90 1 of 6 subjects dosed with 0.3 mg/kg ImmTOR had NAb titers ≤1:5 at Day 90



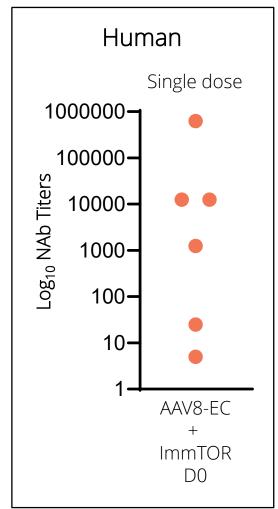


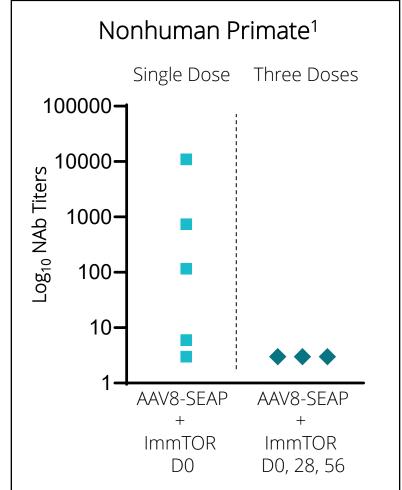
- Empty Capsid (n=8)
- ◆ Empty Capsid + 0.15 mg/kg ImmTOR (n=9)
- Empty Capsid + 0.3 mg/kg ImmTOR (n=6)

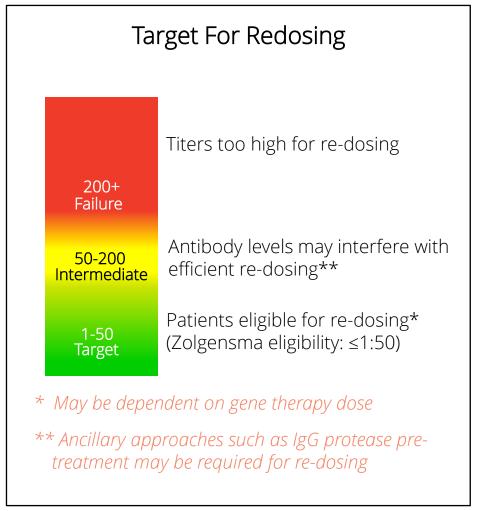


# Empty capsid data in-line with single dose ImmTOR NHP data at day 90

Three monthly doses of ImmTOR provide inhibition of NAbs in NHP



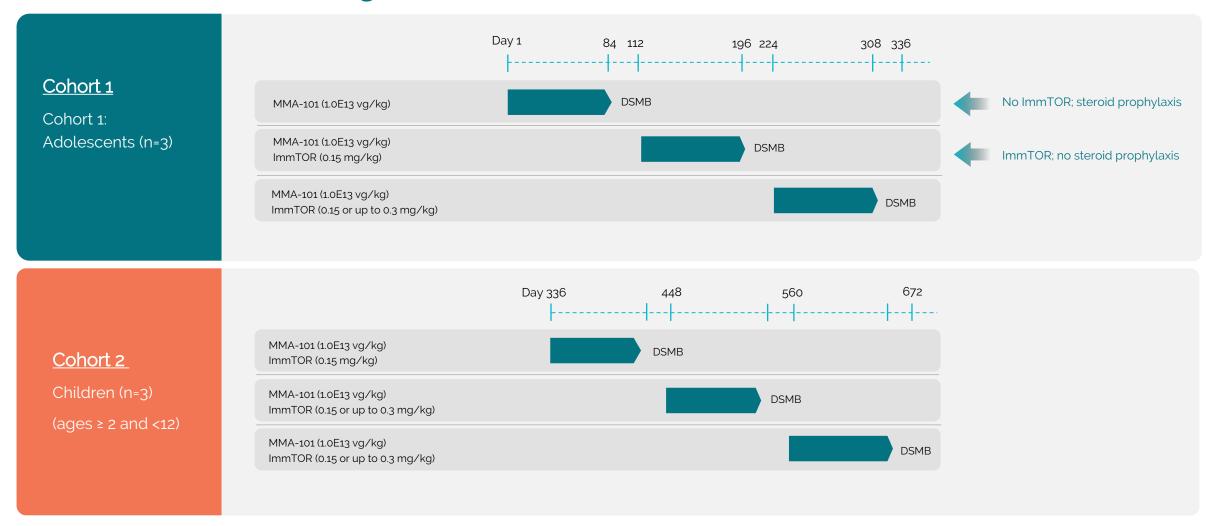




1. ESGCT 2021 Poster 003



# MMA Clinical Trial Design: Schedule of Events



Assumes 1 month (28 days) between Day 84 cutoff and subsequent participant enrollment to allow for DSMB report generation and review.

