Solid Biosciences

22nd Annual Needham Healthcare Conference

April 20, 2023

Forward Looking Statement

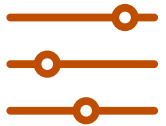
This presentation contains “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995, including statements regarding future expectations, plans and prospects for the company; the ability to successfully achieve and execute on the company’s priorities and achieve key clinical milestones; the benefits of the merger with AavantiBio; the cash runway of the company and the sufficiency of the company’s cash and investments to fund its operations; the company’s SGT-003 program, including expectations for filing an IND and initiating dosing, and the company’s future development of preclinical and capsid programs; the company’s attempt to build an innovation platform enabling the discovery and development of high-value genetic medicines for neuromuscular and cardiac diseases by integrating internal capabilities, including a vector core, validated animal models, optimized expression cassettes, novel capsids, and regulatory elements of target indications, and collaborations with leaders in related clinical and research fields; and other statements containing the words “anticipate,” “believe,” “continue,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “potential,” “predict,” “project,” “should,” “target,” “would,” “working” and similar expressions. Any forward-looking statements are based on management’s current expectations of future events and are subject to a number of risks and uncertainties that could cause actual results to differ materially and adversely from those set forth in, or implied by, such forward-looking statements. These risks and uncertainties include, but are not limited to, risks associated with the ability to recognize the anticipated benefits of Solid’s acquisition of AavantiBio; the company’s ability to advance SGT-003, AVB-202-TT, AVB-401 and other preclinical programs and capsid libraries on the timelines expected or at all; obtain and maintain necessary approvals from the FDA and other regulatory authorities; replicate in clinical trials positive results found in preclinical studies of the company’s product candidates; obtain, maintain or protect intellectual property rights related to its product candidates; compete successfully with other companies that are seeking to develop Duchenne and other neuromuscular and cardiac treatments and gene therapies; manage expenses; and raise the substantial additional capital needed, on the timeline necessary, to continue development of SGT-003, AVB-202-TT, AVB-401 and other candidates, achieve its other business objectives and continue as a going concern. For a discussion of other risks and uncertainties, and other important factors, any of which could cause the company’s actual results to differ from those contained in the forward-looking statements, see the “Risk Factors” section, as well as discussions of potential risks, uncertainties and other important factors, in the company’s most recent filings with the Securities and Exchange Commission. In addition, the forward-looking statements included in this press release represent the company’s views as of the date hereof and should not be relied upon as representing the company’s views as of any date subsequent to the date hereof. The company anticipates that subsequent events and developments will cause the company's views to change. However, while the company may elect to update these forward-looking statements at some point in the future, the company specifically disclaims any obligation to do so.

2023 Expected To Be a Year of Transformation and Meaningful Advancements for Solid

Strategic pipeline of programs continuing to evolve with anticipated key milestones in 2023-2024

PEOPLE
Led by experienced team with deep expertise in precision genetic medicine

PROCESS
Differentiated CMC expertise, building a robust, scalable manufacturing process utilizing transient transfection



PIPELINE
Opportunity to become a leading precision genetic medicines company within neuromuscular and cardiac genetic medicine

Solid has the people, process and pipeline to be a leader in precision genetic medicines for rare neuromuscular and cardiac diseases.

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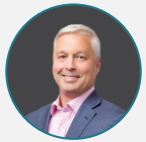
Led By Experienced Team With Deep Expertise in Precision Genetic Medicine



Bo Cumbo
President and CEO

AAVANTIBIO · SAREPTA THERAPEUTICS · VERTEX · GILEAD

Ty Howton, J.D.
Chief Administrative Officer

AAVANTIBIO · SAREPTA THERAPEUTICS · VERTEX · Genentech (A Member of the Roche Group)

Kevin Tan, M.B.A.
Chief Financial Officer

Selecta Biosciences · SAREPTA THERAPEUTICS · CPP Investments · MACQUARIE

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Roxana Donisa Dreghici, M.D.
Head of Clinical Development

Roche · santhera (THEIR FUTURE - OUR FOCUS)

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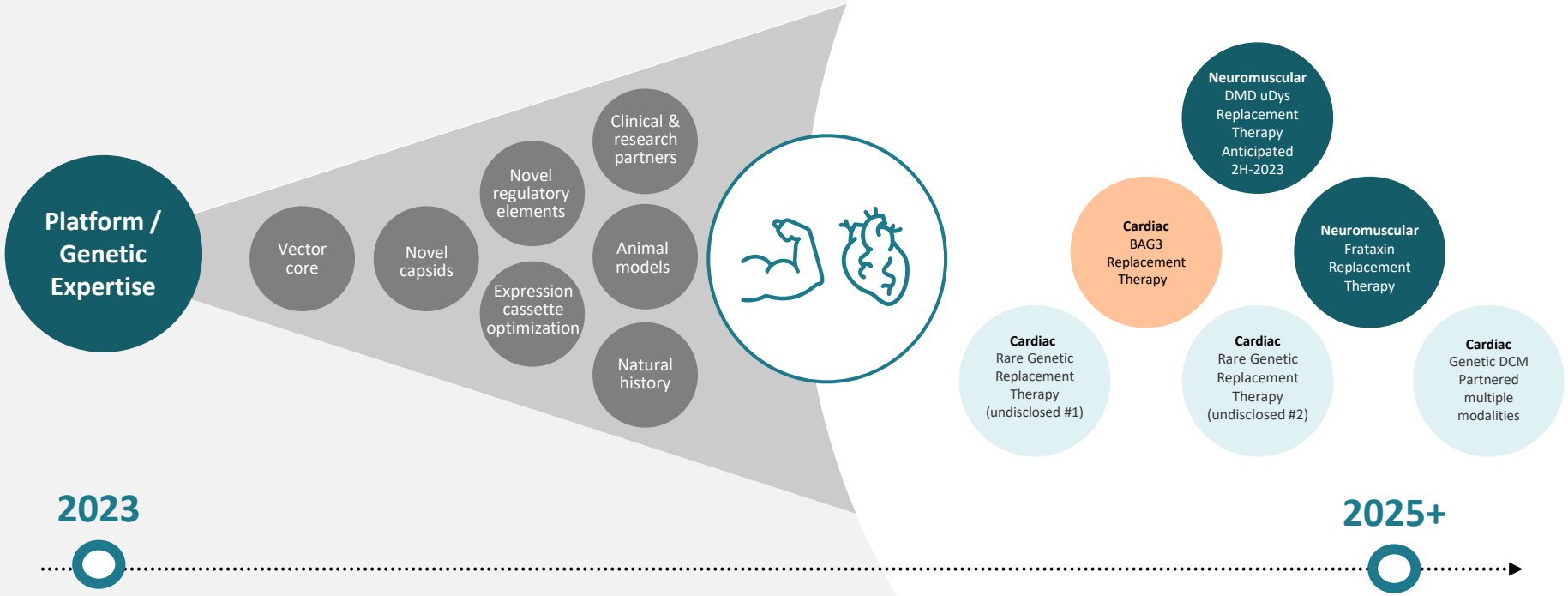
Merger Solidifies Solid as a Gene Therapy Platform Technology Company



Solid is Well-Positioned to Execute on Multiple Programs in the Coming Years

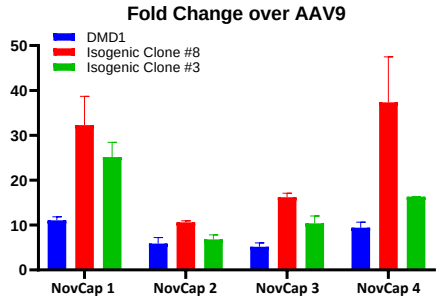
Next Generation Therapies Start With Delivery Through Innovative Capsids

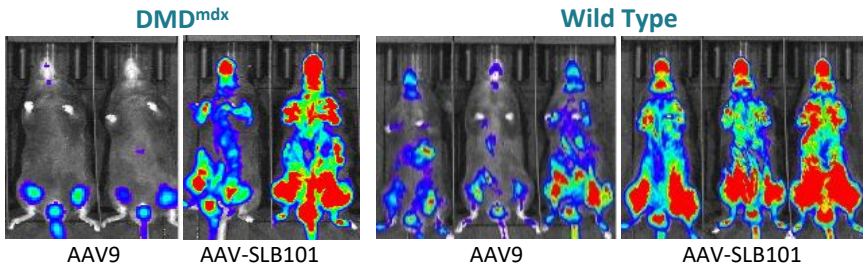
AAV CARDIAC capsids enhance select cardiac tissue tropism and reduce liver targeting

- Utilization of human (primary cells) and primate (Cyno macaques) as selection models
- Multiple libraries with unique barcodes (ability to test replicate libraries in tandem)
- Library generated with two different muscle- and cardiac-specific promoters
- Relies on combination of rational design and directed evolution
- Employs RNA for positive cardiac selection and DNA for negative liver selection
- Enhancement of RNA pool using Magnetic Instant Capture (MagIC Beads) technology

Rational, Hand-Crafted Design approach used to internally engineer capsid candidates with the goal of improving SKELETAL & CARDIAC MUSCLE tropism

Human Duchenne Cell Microdystrophin Expression





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Combined Company Strengthens Process/Analytical Development & CMC Regulatory Team Capabilities

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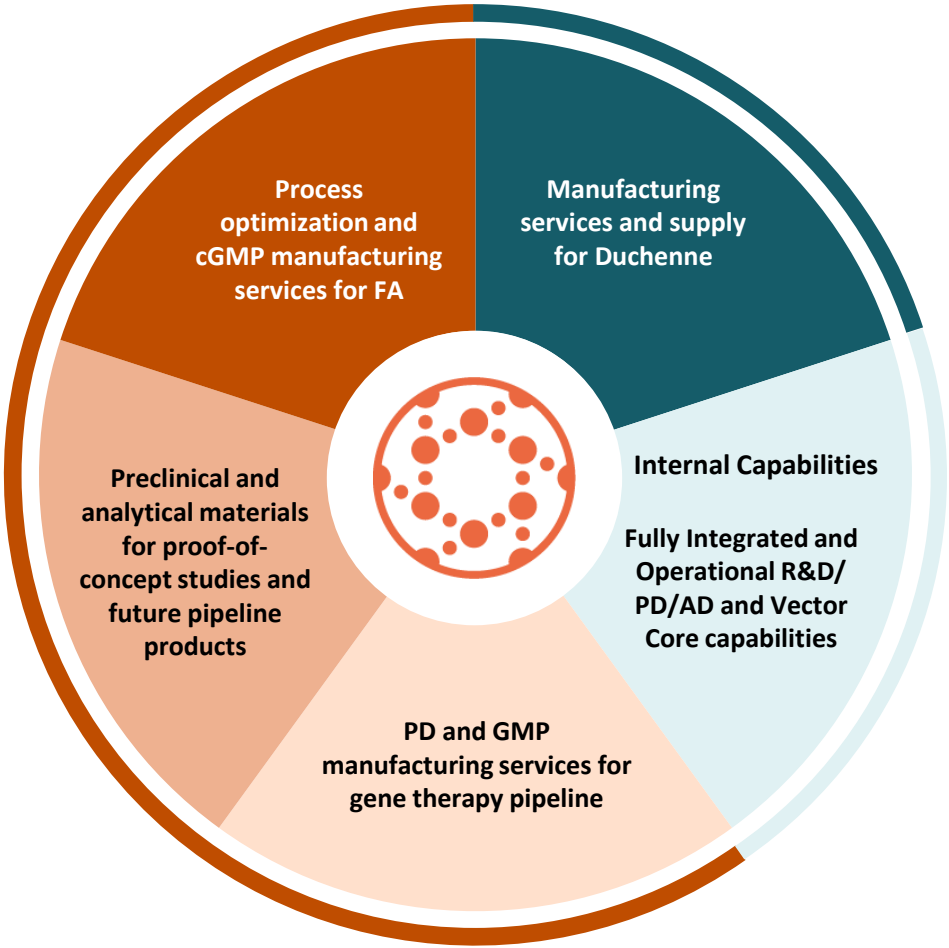
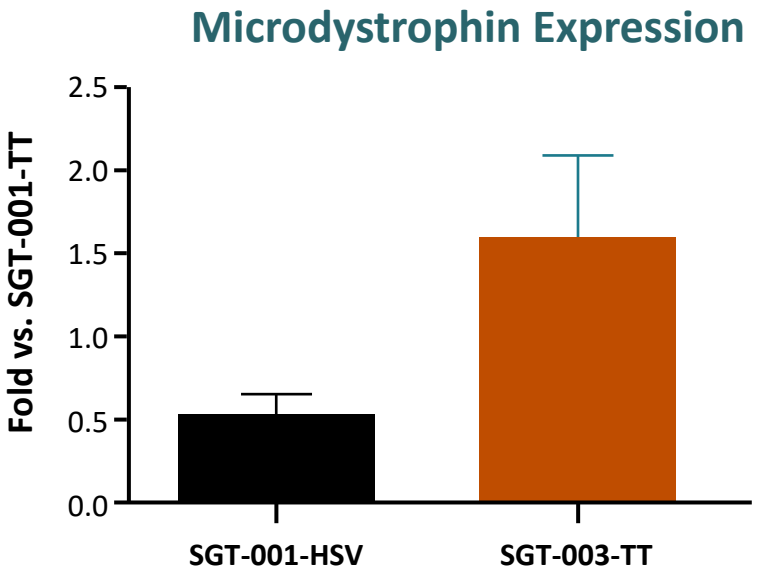
Robust network of CDMO partners along with our internal MS&T expertise and dedicated resources support advancement of Solid's pre-clinical and early-stage pipeline programs



Transition to Transient Transfection Manufacturing and Use of the AAV-SLB101 Capsid Yielded Additive Improvements in Expression



28-day in vivo mdx mouse study. Microdystrophin expression measured in the quadriceps muscle using Western Blot (WB). Mean data are shown +/- SD relative a Reference of SGT-001 produced by the HSV process. n=5 per group.

Process change (HSV to TT) and AAV-SLB101 capsid combined to increase µDys by 2.3x vs SGT-001 HSV

- Product with desired quality attributes supported by analytical data with TT process
- Product demonstrated high levels of in vitro and in vivo transgene expression vs HSV material
  - In vivo expression increased by 1.4-2.0x in multiple mdx studies

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Diversified Pipeline with Multiple Programs at Different Stages

Indications With High Unmet Need and Significant Market Opportunities

Program	Indication	Research / Discovery	Preclinical	IND submission (Anticipated)
NEUROMUSCULAR				
SGT-003 (AAV-SLB101)	Duchenne			2H 2023
AVB-202 - TT (cardiac and neuromuscular manifestations)	Friedreich's Ataxia			
CARDIAC				
AVB-401 (Dilated Cardiomyopathy (DCM))	BAG3-Mediated DCM			
AVB-501 (Dilated Cardiomyopathy (DCM))	Undisclosed			
AVB-601 (Hypertrophic Cardiomyopathy)	Undisclosed			

Notes: In 2020, Solid entered into a collaboration agreement with Ultragenyx for the development of UX810, a next generation Duchenne construct comprised of Solid's proprietary nNOS microdystrophin and Ultragenyx's HeLa PCL manufacturing platform for use with AAV8 and Clade E variants thereof. Solid has the option to co-fund collaboration programs in return for a profit share or increased royalty payments at proof-of-concept

Duchenne Muscular Dystrophy and Next Generation SGT-003

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Duchenne Represents A Large Global Market Opportunity With Significant Unmet Need

Next Generation and Potential For Best-In-Class With SGT-003

Disease Overview

- Caused by mutations in the dystrophin gene, which leads to the absence of the dystrophin protein
- Due to progressive and irreversible muscle loss, patients typically lose the ability to walk by their early-teens and succumb to respiratory or heart failure in their 30's

Epidemiology

- Most common life-limiting genetic disorder diagnosed in childhood
- Estimated 5,000 to 15,000 cases in the U.S.
- 1:3500-5000 newborn males affected
- Diagnosed between three and five years of age due to pronounced muscle weakness

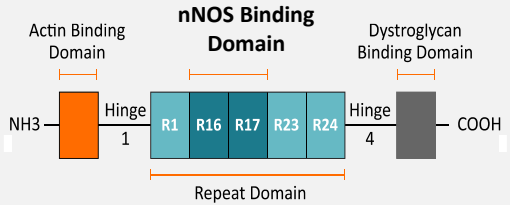
Planned Approach

- Drive functional microdystrophin expression in patients' muscles and improve the course of the disease
- Deliver best-in-class microdystrophin transgene containing the nNOS binding domain via a novel, muscle-tropic capsid
- Utilize a transient transfection manufacturing process

Next-Generation Therapies Utilize Optimized Transgene, Capsid, and Manufacturing Process

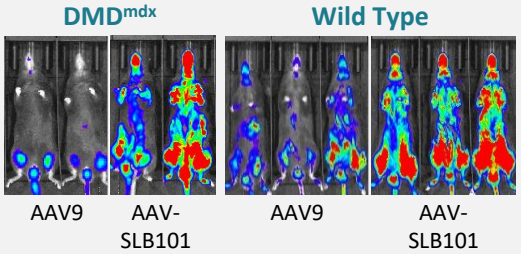
Transgene

nNOS Microdystrophin uniquely includes the nNOS binding domain, important for prevention of activity-induced ischemia and associated muscle injury



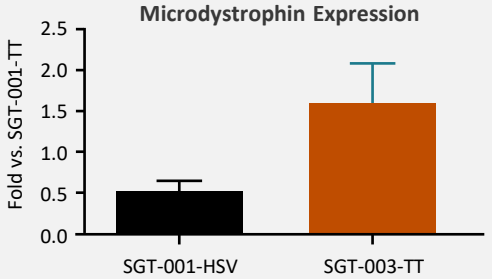
Capsid

Rational design approach used to engineer capsid candidates with the goal of improving skeletal muscle tropism



Manufacturing Process

Process change from HSV to TT-based manufacturing has yielded a greater than two-fold increase in microdystrophin expression in mice for SGT-003 (TT) compared with SGT-001 (HSV)

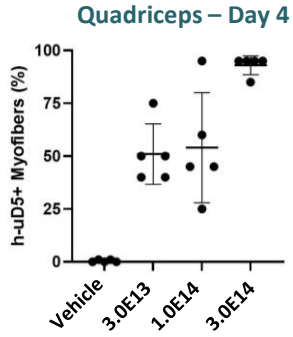


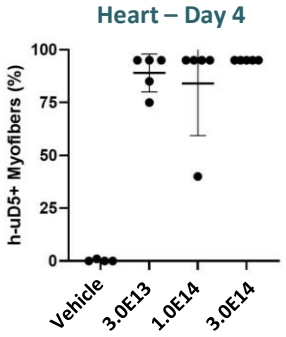
Next-Generation Construct Has Shown Promising Results in Preclinical Testing

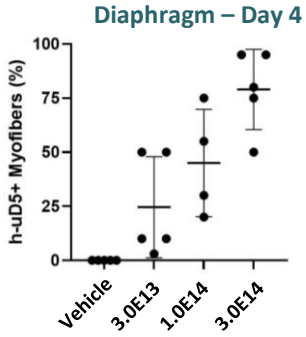
Expression Achieved Early (Day 4) and Optimized by Day 29

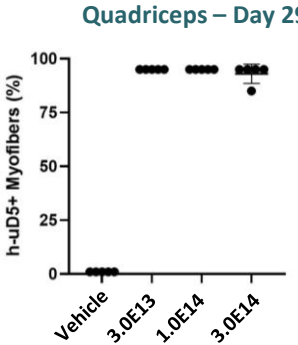
Observations:

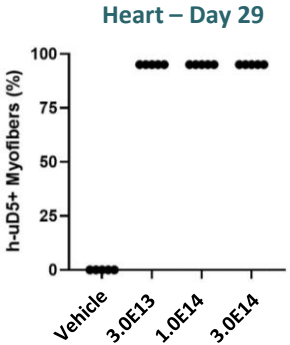
- Dose-Dependent Expression
- Expression Localized to Functional Membrane
- All tissues reached 100% expression at all doses by day 29
- Quantitative MS analysis will be performed to evaluate the full dynamic range of expression

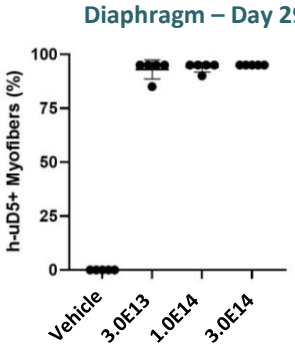












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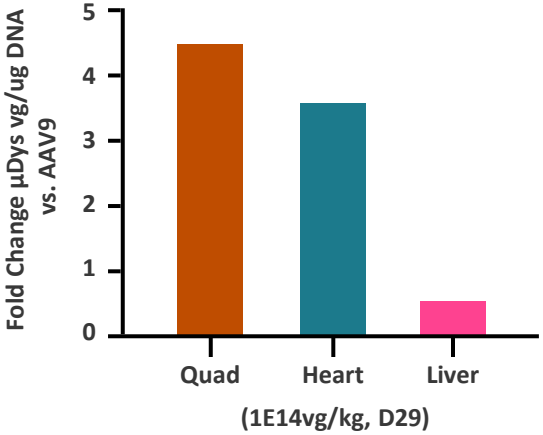
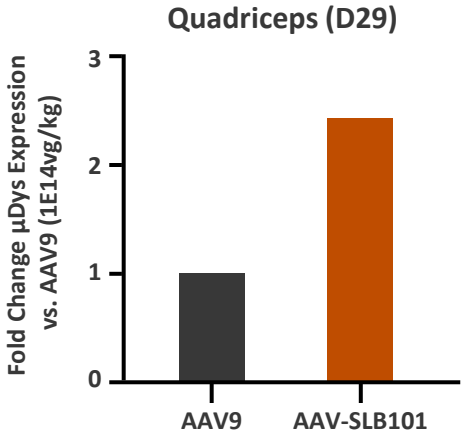
SGT-003 with SLB101 Capsid Demonstrated Superior Tropism to AAV9

Positive biodistribution and expression data has the potential to translate into better efficacy

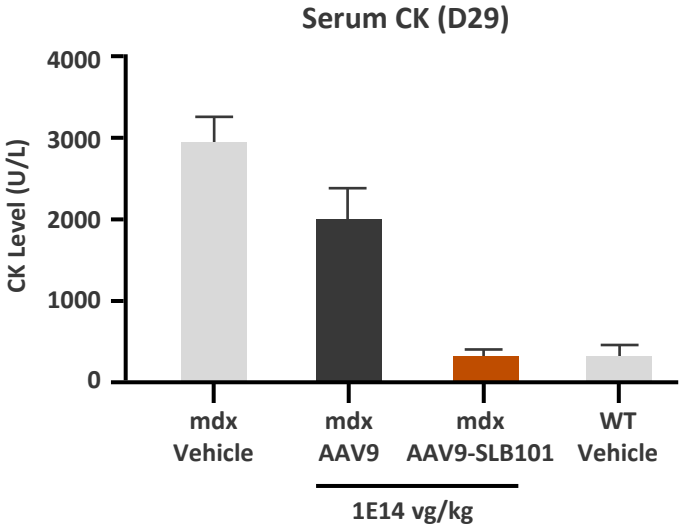
Tissue Specific Biodistribution and Liver De-targeting in mdx Mouse



Robust µDys Expression in mdx Mouse

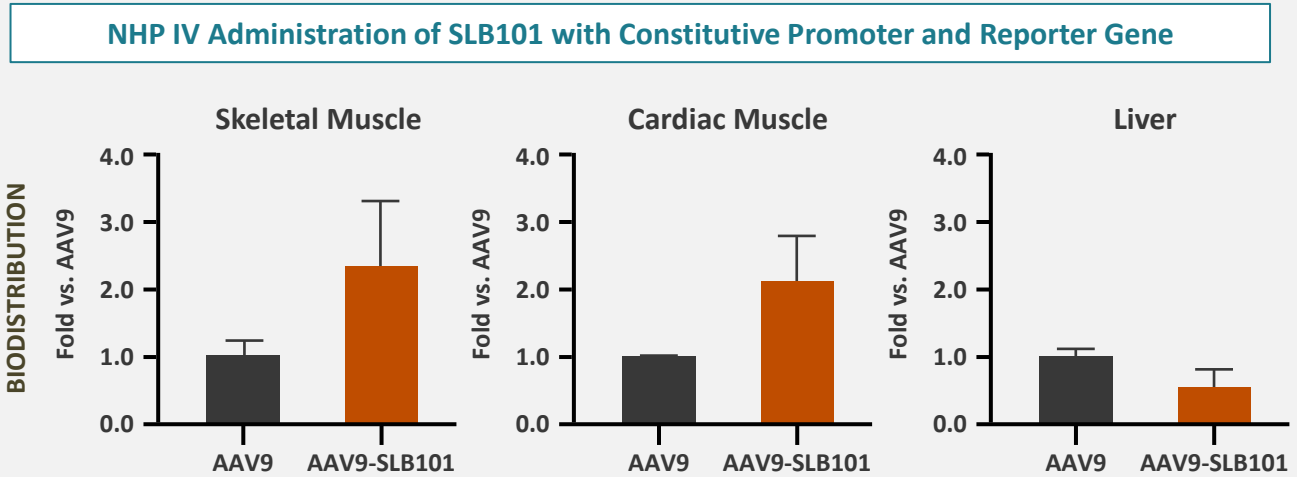


Reduced CK levels in Vivo in mdx Mouse



NHP Data Utilizing AAV-SLB101 Showed Improved Biodistribution in Cardiac and Skeletal Muscle with Decreased Hepatic Transduction vs AAV9

- ✓ **Increased biodistribution to skeletal & cardiac muscle** resulted in increased transgene expression at lower doses*
- ✓ **Reduced biodistribution in liver** suggests tissue de-targeting and improved safety profile*



* Average fold differences calculated from the five skeletal muscle tissues sampled, three cardiac muscles sampled, and the single liver sample

Friedreich's Ataxia and AVB-202-TT

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Friedreich's Ataxia Represents a Large Market Opportunity With Significant Unmet Need and No Approved Therapies

AVB-202-TT's dual route of administration is differentiated to treat the primary manifestations of morbidity and mortality.

Disease Overview

- Monogenic disease caused by loss of frataxin with both neurological and cardiac manifestations affecting muscle control and coordination with possible loss of vision and hearing, and slurred speech
- Cardiac complications are the primary cause of death.
- Substantial unmet need with no disease-modifying standard of care for the broad population.[1]

Epidemiology

- 1 in every 40,000 to 50,000 people[2,3]
- Carrier rate between 1:60 and 1:100
- Average age of diagnosis is in the early-teens which leads to many undiagnosed patients[1]

Planned Approach

- Aim to address neurological and cardiac manifestations via dual IV and IT routes of administration
- Drug candidate selection and transition manufacturing process to transient transfection

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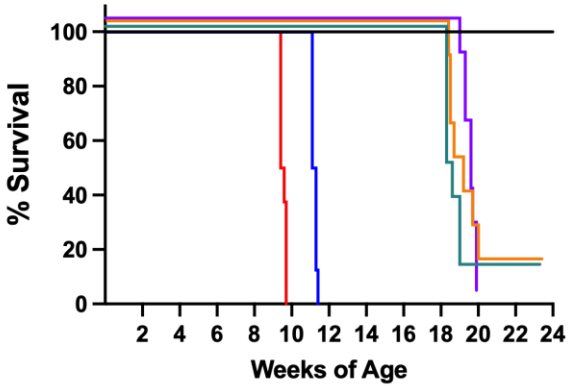
1. FARA. **2.** Durr et al, 1996. **3.** NORD

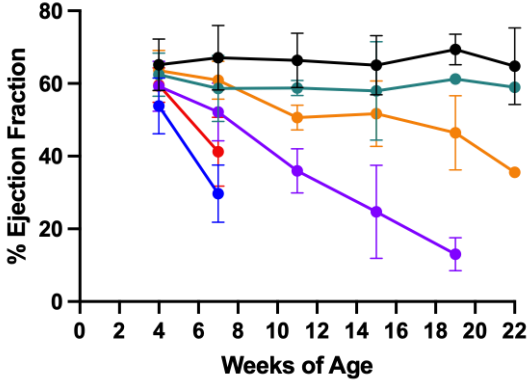
AVB-202-TT Rescued Cardiac Function and Extended Survival in Cardiac FA Mouse

Robust frataxin expression levels suggest efficacy may be achieved at low doses.

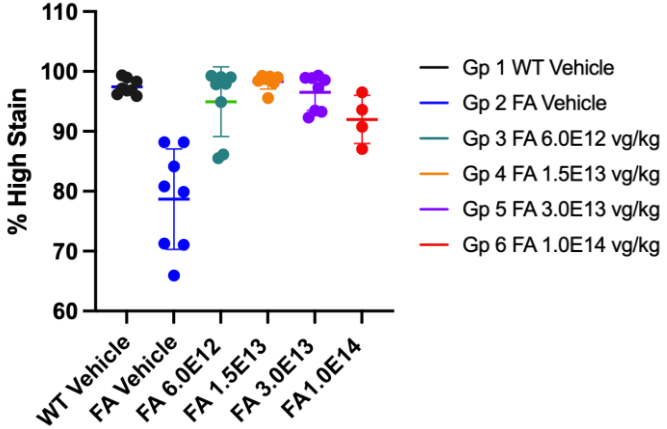
Survival



Ejection Fraction



SDH Activity



- SDH activity via histochemical stain on heart tissue sections. The percentage of tissue with high stain is quantified by image analysis software.
- All groups analyzed 15-16 wks after dosing except for early euthanasia groups (FA vehicle = 11 wks; FA 1.0E14 vg/kg= 9.5 wks)

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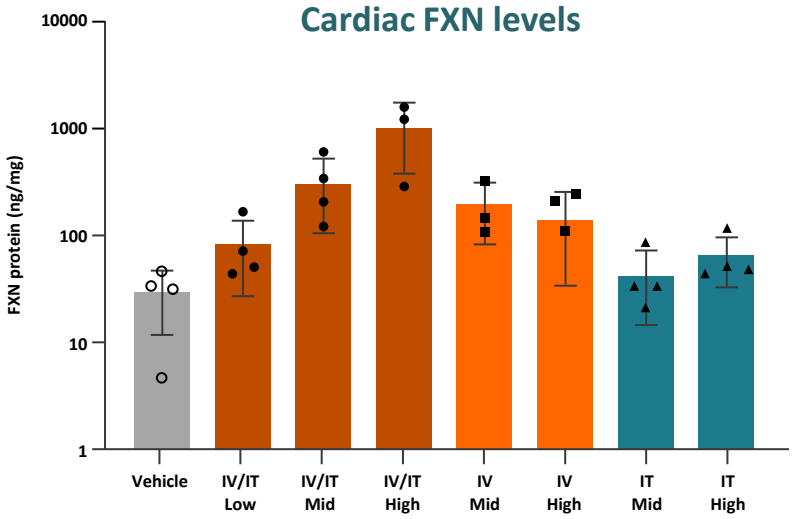
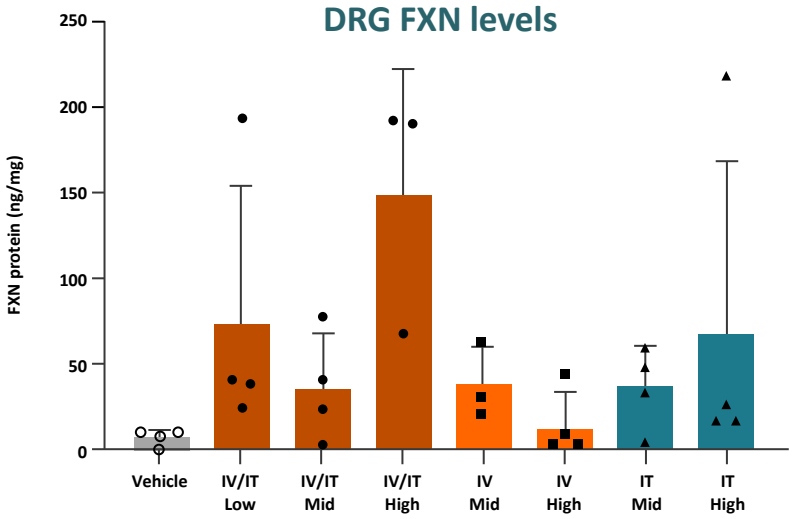
6 Month NHP Study: Favorable Safety Profile and Utility of Dual Route of Administration

Using a dual route of administration allows for optimized expression at lower dose vs IT or IV alone





Dose Group	IV Dose (vg/kg)	IT Dose (vg/brain wt)
IV/IT Low	6.0E+12	6.00E+13
IV/IT Mid	1.5E+13	1.50E+14
IV/IT High	3.0E+13	3.00E+14
IV Mid	1.5E+13	-
IV High	3.0E+13	-
IT Mid	-	1.50E+14
IT High	-	3.00E+14

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BAG3 Mediated Dilated Cardiomyopathy

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Dilated Cardiomyopathy (BAG3) is the First Program from Our Cardiac Pipeline

Attractive Indication with Clear Mechanistic Rationale, High Unmet Need, and Significant Market Opportunity

Key Disease Highlights

- The BAG3 gene codes for the BCL-2-associated athanogene 3 protein
- Sufficient levels of functional BAG3 are required for healthy cardiac function
- BAG3 mutations lead to reduced BAG3 levels and dilated cardiomyopathy (DCM)
- Postulated mechanism: Decreased BAG3 leads to heat shock protein dysfunction and a build-up of dysfunctional proteins in the sarcomere, causing myofilament damage, poor contraction, and heart failure.

Epidemiology

- ~29,000 active patients in the US[1, 2, 3]
- Most common presentation is dyspnea but can range from dyspnea to sudden death.
- Activities of daily life are severely impacted.
- Eventually, heart failure sets in, and death ensues.
- Once patients are symptomatic, mortality is approximately 25% at one year and approximately 50% at five years[5]
- No approved therapies address the underlying cause of disease. Symptomatic treatment is the standard of care[4]

Planned Approach

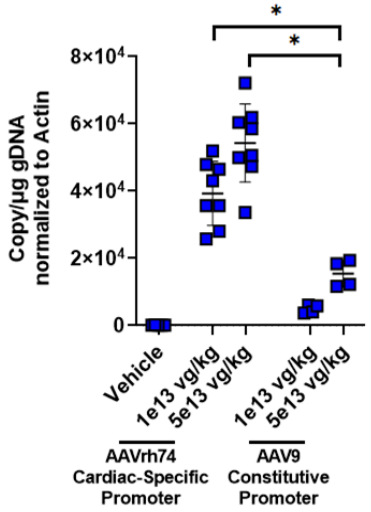
- AAV-delivered optimized BAG3 transgene with cardiac-specific promoter for safe and specific expression
- Additional studies to evaluate the potential of using AAV-SLB101 to develop a genetic medicine for BAG3-mediated DCM
- Optimized transient transfection manufacturing process

1. Dominguez et al, 2018. **2.** Virani et al, 2021. **3.** Clearview Analysis. **4.** Shaw et al, 2018. **5.** Bozkurt et al, 2007

Data Illustrate Superior Cardiac Biodistribution and Transgene Expression Compared to AAV9

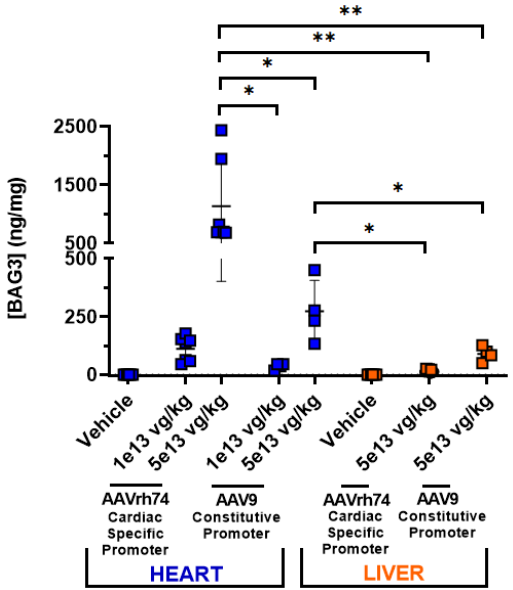
Data support Solid's targeted approach to genetic cardiomyopathies: BAG3

Cardiac Biodistribution



AAV+cardiac specific promotor showed better BD in the heart over AAV9 with a constitutive promotor.

hBAG3 Expression



AAV-cardiac specific promotor combination showed increased cardiac expression, and decreased liver expression.

BAG3 DCM
Reducing liver expression while optimizing cardiac expression allows for a more targeted, lower dose AAV therapeutic.

Driving the Future

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2023 Anticipated Milestones

Complete SGT-003 GLP tox for next-generation Duchenne therapy
1H 2023

Cardiac Capsid Library Complete Multiple Rounds of NHP Studies
2023

IND Submission for SGT-003
2H 2023

Initiation of Patient Dosing for SGT-003
Late-2023

Drug candidate selection and initiation of IND-enabling studies for AVB-202-TT

Continue to diversify pipeline through BD transactions

$213.7 million in cash and investments as of December 31, 2022, expected to enable Solid to advance key strategic priorities into 2025

Thank You

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