

Apitegromab: Potential to Advance the Standard of Care for Patients with Spinal Muscular Atrophy (SMA)

Virtual Investor Event – KOL Discussion July 12, 2023



Forward-Looking Statements

Various statements in this presentation concerning the future expectations, plans and prospects of Scholar Rock, Inc. ("Scholar Rock"), including without limitation, Scholar Rock's expectations regarding its strategy, its product candidate selection and development timing, including timing for the initiation of and reporting results from its clinical trials for apitegromab, SRK-181, and other product candidates and indication selection and development timing, its cash runway, the ability of any product candidate to perform in humans in a manner consistent with earlier nonclinical, preclinical or clinical trial data, and the potential of its product candidates and proprietary platform. The use of words such as "may," "could," "might," "will," "should," "expect," "plan," "anticipate," "believe," "estimate," "project," "intend," "future," "potential," or "continue," and other similar expressions are intended to identify such forward-looking statements for the purposes of the safe harbor provisions under The Private Securities Litigation Reform Act of 1995. All such 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, without limitation, that preclinical and clinical data, including the results from the Phase 2 trial of apitegromab or Part A of the Phase 1 trial of SRK-181, are not predictive of, may be inconsistent with, or more favorable than, data generated from future clinical trials of the same product candidate, including the Phase 3 clinical trial of apitegromab in SMA and Part B of the Phase 1 clinical trial of SRK-181, respectively, Scholar Rock's ability to provide the financial support, resources and expertise necessary to identify and develop product candidates on the expected timeline, the data generated from Scholar Rock's nonclinical and preclinical studies and clinical trials, information provided or decisions made by regulatory authorities, competition from third parties that are developing products for similar uses, Scholar Rock's ability to obtain, maintain and protect its intellectual property, the success of Scholar Rock's current and potential future collaborations, Scholar Rock's dependence on third parties for development and manufacture of product candidates including, without limitation, to supply any clinical trials, Scholar Rock's ability to manage expenses and to obtain additional funding when needed to support its business activities and establish and maintain strategic business alliances and new business initiatives, and the impacts of current macroeconomic and geopolitical events, hostilities in Ukraine, increasing rates of inflation and rising interest rates, on business operations and expectations, as well as those risks more fully discussed in the section entitled "Risk Factors" in Scholar Rock's Quarterly Report on Form 10-Q for the guarter ended March 31, 2023, as well as discussions of potential risks, uncertainties, and other important factors in Scholar Rock's subsequent filings with the Securities and Exchange Commission. Any forward-looking statements represent Scholar Rock's views only as of today and should not be relied upon as representing its views as of any subsequent date. All information in this press release is as of the date of the release, and Scholar Rock undertakes no duty to update this information unless required by law.

Apitegromab and SRK-181 are investigational drug candidates under evaluation. Apitegromab and SRK-181 have not been approved for any use by the FDA or any other regulatory agency and the safety and efficacy of apitegromab and SRK-181 have not been established.



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Welcome & Scholar Rock Overview

Jay Backstrom, President & CEO





Esteemed Presenters



Thomas Crawford, MD

Co-Director, Muscular Dystrophy Association Clinic and Professor of Neurology and Pediatrics, Johns Hopkins Medicine Lead TOPAZ and SAPPHIRE Principal Investigator

- Member of Department of Neurology at Johns Hopkins since 1987
- Practice involves general child neurology with a principal interest in caring for children with neuromuscular, neuromotor, and ataxic disorders
- On the Medical and Scientific Advisory Boards of Families of Spinal Muscular Atrophy, and the Medical Advisory Committee for the Muscular Dystrophy Association



Basil Darras, MD

Associate Neurologist-in-Chief, Boston Children's Hospital and Professor of Neurology, Harvard Medical School **TOPAZ and SAPPHIRE Principal Investigator**

- Chief of the division of clinical neurology in the Department of Neurology at Boston Children's Hospital
- Director of Neuromuscular Center and Spinal Muscular Atrophy program
- Special focus in the care of children with neuromuscular conditions originating from inherited or acquired conditions of the motor unit



Laurent Servais, MD, PhD

Professor of Paediatric Neuromuscular Diseases, MD UK Oxford Neuromuscular Centre and Invited Professor of Child Neurology at Liège University SAPPHIRE Principal Investigator

- Joined MD UK Oxford Neuromuscular Center and the University of Oxford in September 2019 Director of Neuromuscular Center and Spinal Muscular Atrophy program
- Leader of the newborn screening program for SMA in southern Belgium
- Main research focus expertise covers the development of innovative outcome measures, including connected devices for real-life patients' evaluation.



Jackie Glascock, PhD

Vice President, Research, Cure SMA

- Joined Cure SMA in 2016, overseeing the organization's research programs
- Cure SMA is a non-profit organization which has funded and directed over \$82 million for SMA research
- The organization also advocates for and provides practical support programs for the SMA community



Event Agenda



SAPPHIRE

Welcome & Scholar Rock Overview

> Bas TOP

SMA Overview & Current Treatment Landscape

Patient Perspective: Unmet Medical Needs in SMA

TOPAZ Data through 36 Months & SAPPHIRE Overview

Patient Journey

Q&A

Jay Backstrom, MD, MPH President & CEO, Scholar Rock

Basil Darras, MD TOPAZ and SAPPHIRE Principal Investigator

Laurent Servais, MD, PhD SAPPHIRE Principal Investigator

Jackie Glascock, PhD VP of Research, Cure SMA

Jing Marantz, MD, PhD Chief Medical Officer, Scholar Rock

Thomas Crawford, MD Lead TOPAZ and SAPPHIRE Principal Investigator



Scholar Rock: Transforming Patient Lives, Addressing High Unmet Medical Need



Revolutionary Platform

Neuromuscular

and Beyond

- Global leader in TGFβ superfamily biology
- Targeting the latent forms of growth factors
- Exquisite selectivity to deliver differentiated therapies
- Rich preclinical pipeline focused on high unmet patient needs
- Phase 3 SAPPHIRE study underway, enrollment completion expected in Q3 2023; data readout expected in 2024
- Phase 1 proof-of-concept DRAGON study underway in immuno-oncology
- Compelling proof-of-concept TOPAZ data informed Phase 3 SAPPHIRE study design
- Seasoned leadership team with track record of clinical and commercial success
- Anticipated cash runway into 2025



- Commercial planning underway for apitegromab (SMA) in US and Europe
- Broad platform, including promising early-stage assets, provides opportunities to advance alone or in partnership





Positioned for Success

Strategic

Optionality

Revolutionary Approach to Regulating TGFβ Superfamily Implicated in Devastating Diseases

• Scholar Rock's Target Latent Growth Factor



Traditional Target "Mature" Growth Factor



TGFβ Superfamily: Highly Sought After Targets

Recognized by the industry as important targets given their fundamental roles in regulating a variety of biological processes Dysregulation plays a role in devastating diseases that have a high unmet need, including:

- Neuromuscular disorders
- Fibrosis
- Oncology

Scholar Rock's R&D Platform Transforming Medical Practice

- Selectively target the latent form of growth factors in the microenvironment of cells and tissues with uniquely designed antibodies
- Overcome the challenges that plague traditional approaches that target the "mature" growth factor or its receptors, which are difficult to differentiate and lead to unintended negative effects



Robust Pipeline of Novel Product Candidates

	DISCOVERY/ PRECLINICAL	PHASE 1	PHASE 2	PHASE 3	ANTICIPATED 2023 MILESTONES
SPINAL MUSCULAR ATROPHY Apitegromab (selective anti- pro and latent myostatin)			TOPAZ	SAPPHIRE	36-month TOPAZ data SAPPHIRE: last patient enrolled expected in Q3
IMMUNO-ONCOLOGY SRK-181 (selective context-independent, anti-latent TGFβ-1)		DRACON			Rolling clinical data updates
ANEMIA Selective anti-RGMc					IND-enabling studies
FIBROSIS Selective context-dependent (LTBP1 & LTBP3) anti-latent TGFβ-1					IND-enabling studies

Potential to transform the lives of people living with a wide range of serious diseases, including neuromuscular disorders, oncology, and fibrosis



Leadership Team: Experienced in Drug Development and Commercialization



Jay Backstrom, MD, MPH President & CEO

30 years of clinical R&D experience leading multiple successful regulatory approvals

Celgene



Ted Myles, MBA Chief Operating Officer & CFO

25 years of progressive experience in clinical and commercial-stage companies



CATA THERAPEUTICS



Jing Marantz, MD, PhD Chief Medical Officer

20 years of development and medical leadership experience across neurology, hematology/oncology, and rare diseases



Tracey Sacco Chief Commercial Officer

20 years of commercial leadership experience, including product launch and global commercial strategy





Mo Qatanani, PhD SVP, Research

15 years of industry experience in the strategic and operational sides of research & development





Caryn Parlavecchio Chief Human Resources Officer

25 years of experience leading HR, culture transformation, leadership development, DEI, and talent management

HolyName 💥 🔥 NOVARTIS



Junlin Ho, JD General Counsel & Corporate Secretary

15 years of experience leading and advising life sciences companies in areas of legal and compliance







Executing on the Promise: Apitegromab SMA Trials



ScholarRock 10

SMA=Spinal Muscular Atrophy *Subject to regulatory approval



SMA Overview and Current Treatment Landscape

Basil Darras, MD Boston Children's Hospital

Laurent Servais, MD, PhD Oxford Neuromuscular Centre





Spinal Muscular Atrophy

Basil T. Darras, M.D.

Neuromuscular Center and SMA Program Boston Children's Hospital Harvard Medical School Boston, MA, USA



Spinal Muscular Atrophy (SMA) or...

 5q "classic" SMA is a genetic disorder, characterized by degeneration and loss of motor neurons in the anterior horns of the spinal cord and brain stem, leading to muscular atrophy and weakness



5q Proximal SMA Is...

- An autosomal recessive disorder caused by loss or mutation of the SMN1 gene and retention of the SMN2 gene
- SMN1 and SMN2 genes encode the "<u>survival (of) motor neuron</u> (SMN)" protein

SMA is caused by decreased levels rather than complete loss of the SMN protein,

leading to selective dysfunction of motor neurons in the spinal cord and brain stem

Spinal Muscular Atrophy Timeline: Classification (1991): 100 years



Classification of SMA: Continuum of Severity—Phenotypic Spectrum

Functional Classification	ONSET	COURSE	SURVIVAL
SMA, Type I	Birth to	Never sit	< 2 years without aggressive treatment
(severe, "non-sitters")	6 months	unsupported	
SMA, Type II	< 18 months	Never stand or walk	~98% to age 5 years,
(intermediate, "sitters")	(7-18 months)	but sit at some time	~70% to age 25 years
SMA, Type III	> 18 months	Able to stand and	Almost normal
(mild, "walkers")	(Illa < 3 years, Illb > 3 years)	walk at some time	life span

Spinal Muscular Atrophy (Type I) (Werdnig-Hoffmann Disease, non-sitters)







Darras BT, Markowitz JA, Monani UR, et al. *Spinal muscular atrophies.* Chapter 8. In: Darras BT, Jones HR Jr, Ryan MM, De Vivo DC (editors). *Neuromuscular Disorders of Infancy, Childhood and Adolescence: A Clinician's Approach.* 2nd edition. San Diego: Academic Press, 2015. pp. 117-45.



Intermediate Severity Spinal Muscular Atrophy, Type II, (sitters), Type III, (walkers)





SMA Incidence and Prevalence in Pre-treatment Era

The introduction of DMTs is expected to alter the prevalence of SMA



DMT, disease modifying therapy; SMA, spinal muscular atrophy

1. Spinal Muscular Atrophy Overview. SMA Foundation. Available at: http://www.smafoundation.org/wp-content/uploads/2012/03/SMA-Overview.pdf (Accessed January 2019)

2. Ogino S, et al. *Eur J Hum Genet.* 2004;12:1015–1023.

3. SMA Foundation estimate

Spinal Muscular Atrophy Timeline



Goal of SMA Therapeutics

- Goal of most drug trials has been to increase the full-length SMN protein production from the "back-up" *SMN2* gene or replace the *SMN1* gene
- Unique "translational" disease
 - Genetic defect same in all patients
 - Clear targets

Hammersmith Functional Motor Scale Expanded (HFMSE)



- HFMSE is a scale used to investigate the patient's ability to perform various activities and is used in later-onset (Type 2 or Type 3) SMA¹
- The scale has 33 items, with each item scored with a 0, 1, or 2. The maximum score is 66¹
- While a 3-point change has been shown to be clinically meaningful, a 1 point improvement on HFMSE is considered meaningful to patients and caregivers²

Significance of HFMSE Validated Measure Assessing the Physical Abilities of Patients with Types 2/3 SMA

ltem	Lowest item grade (0)	Highest item grade (2)
1. Sitting on a chair	Unable or needs two hands to support balance	Able to sit without support for a count of 3 or more
10. Sitting to lying	Unable or falls over	Able to lie down in a controlled fashion through side-lying or using clothes
29. Able to Jump	Unable to initiate jump with both feet simultaneously	Jumps at least 12 inches with both feet simultaneously

Examples of HFMSE items:

Motor Function Measure MFM 32

HFMSE

Assesses the physical abilities of patients with Types 2/3 SMA

ABLE TO:

Touch Head Above Ear Level

whilst maintaining stable trunk and head



Roll From Supine to Prone

over the right side without pulling/ pushing on hands



Revised Upper Limb Module (RULM)

REVISED UPPER LIMB MODULE FOR SPINAL MUSCULAR ATROPHY: DEVELOPMENT OF A NEW MODULE

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 ⁸ Department of Clinical and Experimental Medicine and Nemo Sud Clinical Centre, University of Messina, Italy
 Accepted 3 October 2016

- RULM is a scale specifically designed to assess limb function in a wide range of patients with SMA types 2 and 3¹
- The scale has 19 items, with each item scored with a 0, 1, or 2. The maximum score is 37 because one item is scored on a can/cannot score¹
- A 2-point improvement is generally considered clinically meaningful¹

Significance of the Revised Upper Limb Module (RULM)

Examples of RULM items:

Item	Lowest score (0)	Highest score (2)
Bring hands from lap to table	Unable to bring one hand to table	Brings two hands completely to table
Raise cup with 200 g to mouth	Unable to get cup to mouth	Cup with 200 g to mouth with one hand
Four-point kneeling	Unable	Achieves four-point kneeling; head up for a count of three

RULM

Evaluates Motor Performance in Upper Limbs

ABLE TO:

Bring Token to Cup placed vertically at

shoulder height

↓ Bring Weight at Eye Level using two hands





Therapeutic Strategies for SMA



Three Disease-modifying Treatments



Three Disease-modifying Treatments

	Nusinersen (Spinraza)	AVXS-101 (Zolgensma)	Risdiplam (Evrysdi)
Compound	18-mer antisense oligonucleotide	Adeno associated virus 9 with human coding <i>SMN1</i>	Small molecule
Mechanism of action	Increases amount of full-length SMN protein from <i>SMN2</i>	Gene replacement therapy. Production of SMN protein from <i>SMN1</i>	Increases amount of full-length SMN protein from <i>SMN2</i>
Pivotal clinical trials	ENDEAR, CHERISH, NURTURE	AVXS 101, STR1VE, SPRINT	FIREFISH, SUNFISH, RAINBOWFISH
Approval	All SMA types: FDA 2016, EMA 2017	Age < 2 years: FDA 2019. Type 1 up to 3 <i>SMN2</i> copies: EMA 2020	All SMA types: FDA 2020. EMA-All SMA types :1-4 copies < 2 months: FDA 2022

Spinal Muscular Atrophy: 130 Years Later, Three Approved Treatments

What Determines Efficacy? Number of Surviving Motor Neurons in Spinal Cord





"Time is motor neurons"

Improving and Sustaining Muscle Function Remains an Unmet Need



Mean improvement in HFMSE experienced by patients with nonambulatory Types 2/3 SMA in nusinersen Phase 3 CHERISH trial¹

HFMSE=Hammersmith Functional Motor Scale-Expanded

*Percentages represent percent of patients who named these unmet needs when asked "What are your most significant current unmet needs that you hope new therapies would address"?

1. Mercuri E et al.: N Engl J Med 2018; 378:625-635; DOI: 10.1056/NEJMoa1710504: cherish trial results. 2. 2022 Community Update Survey, Cure SMA.

This third-party information is provided for background only and is not intended to convey or imply a comparison to the TOPAZ clinical trial results.

Reduce

fatigue

83%

Other Strategies to Treat SMA

SPLICING MODIFICATION



Modification of *SMN2* mRNA splicing to increase production of functional SMN protein (nusinersen, RG7916, LMI070)

GENE REPLACEMENT



Replacement of faulty *SMN1* gene using viral-vector-based gene therapy (AVXS-101)

MUSCLE ACTIVATION



Improvement of muscle forcefrequency response in skeletal muscle via **activation of fast skeletal muscle troponin** (CK-2127107)

Myostatin Inhibition TOPAZ, SAPPHIRE studies





Thank you



Reasonable Expectations and Unmet Need in Patients Treated with SMN-Directed DMT

Laurent Servais MD, PhD

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Disclosure

Coordinating investigator of trials :

- Endear, Cherish, Shine (Biogen)
- Sunfish, Firefish, Manatee (Roche)
- Nathis SMA (co-funding by Roche)
- AVXS 101 (Avexis)
- AVXS 304 (Avexis)
- SAPPHIRE (Scholar Rock)

Member of SAB of Biogen, Avexis, Scholar Rock, Cytokinetics, Roche and SMA Europe. Gave consultancy for Zentech, BioHaven, Illumina, Sysnav

Research funded by Roche, Biogen and Novartis



Treated patients with SMA present with a very significant unmet need.

They may improve very significantly, then reach a plateau.

Effect of Nusinersen on HFMSE and RULM Over 4 years SHINE Type 2/3 SMA



Effect of Risdiplam on HFMSE, RULM, and MFM32 Over 4 Years





Underlying Muscle Atrophy and Associated Muscle Weakness Is Not Addressed with Current SMA Therapies



SMA, spinal muscular atrophy; SMN, survival motor neuron. **1.** Long KK, et al. *Hum Mol Genet*. 2019;28(7):1077-1088. 2. Hua Y, et al. *Nature*. 2011;478(7367):123-126. **3.** Figure adapted from: SMA Foundation Overview. Accessed June 07, 2023. http://www.smafoundation.org/wp-content/uploads/2012/03/SMA-Overview.pdf.



Patient Video





After two months, I felt more strength in the hands. I was able to drink a cup of tea with more inside, not just a small quantity, like before treatment

I felt more stable and more straight in my wheelchair

I stopped having my choking episodes (previously 1-2 per month). I could eat again things like meat or uncooked vegetables

I became able to eat alone in the evening (I was previously too tired)

I could start writing for hours rather than for a couple of minutes: **It changed my life**

But the main change to my quality of life was being able to sew or to handwork in the evening after my day at the university



Patient Video

Targeting Muscle in SMA to Overcome Plateau



* Based on Animal Model Data.

1. Long KK, et al. *Hum Mol Genet*. 2019;28(7):1077-1088; 2. Pirruccello-Straub M, et al. *Sci Reports*. 2018;8(1):2292. doi:10.1038/s41598-018-20524-9 3. Figure adapted from: SMA Foundation Overview. Accessed June 07, 2023. http://www.smafoundation.org/wp-content/uploads/2012/03/SMA-Overview.pdf.

Patient Perspective: Unmet Medical Needs in SMA

Jackie Glascock, PhD Cure SMA



Changes in Key Outcomes for Children Ages 5-7 Since the Advent of the SMA Treatment Era

	Total Neuromuscular Module Subscale Scores for Children Ages 5 – 7, 2017 – 2021					ores for	
	Aį	ge 5	A	ge 6	Age 7		
Year	n	Score	n	Score	n	Score	
2017	21	49.9	15	52.4	21	53.1	
2019	20	55.8	13	68.0	11	48.0	
2021	14	58.2	12	52.0	17	58.0	
*2018 omitted due to small number of observations (14): PedsOL not in 2020 CUS							

Key Takeaways:

- Overall scores show a positive trend
- Higher scores indicate better health-related quality of life

*Sourced from the Cure SMA Community Update Survey



Parent Reported Unmet Needs in Children with SMA



"It is hard for my child to use his or her hands"



*Sourced from the Cure SMA Community Update Survey



Self Reported Unmet Needs in Adults with SMA

"What are the most significant current unmet needs that you hope new therapies would address?" (Check all that apply)*

	2019		2020		2021		2022	
	n	%	n	%	n	%	n	%
Reducing Fatigue			368		226		200	
Yes			298	81	189	83	165	83
No			61	17	37	16	30	15
Don't know			9	2	0	1	5	3
Improving fatigue	208							
Yes	142	68						
No	60	29						
Don't know	6	3						
Improving respiratory (breathing) function	208		361		224		198	
Yes	89	43	228	63	131	58	124	63
No	113	54	119	33	80	36	63	32
Don't know	6	3	14	4	13	6	11	6
Improving swallowing	208		360		226		196	
Yes	68	33	197	55	106	47	95	48
No	134	64	135	38	109	48	89	45
Don't know	6	3	28	8	11	5	12	6
Gaining muscle strength	208		372		230		204	
Yes	192	92	356	96	225	97	198	97
No	10	5	11	3	5	2	4	2
Don't know	6	3	5	1	0	0	2	.1

	2019		2020		2021		2022	
	n	%	n	%	n	%		%
Achieving new motor function	208		368		226		201	
Yes	133	64	325	88	196	87	178	89
No	69	33	35	10	25	11	18	9
Don't know	6	3	8	2	5	2	5	2
Stabilize motor function					224		200	
Yes					203	89	181	91
No					21	9	16	8
Don't know					0	1	3	2
Improving communication through speech and/or technology	208		355		220		194	
Yes	22	11	89	25	64	29	62	32
No	180	87	239	67	142	65	116	60
Don't know	6	3	27	8	14	6	16	8
Improving activities of daily living			366		225		202	
Yes			332	91	201	89	186	92
No			32	9	21	9	13	6
Don't know			2	1	3	1	3	1
Improving daily functioning	208							
Yes	160	77						
No	42	20						
Don't know	60	3						

KEY TAKEAWAYS

In 2022, participant hopes for therapy included the following priorities, which ranked over 80%:

- Reduction of fatigue: 83%
- Gaining muscle strength:
 97%
- Achieving new motor function: 89%
- Stabilize motor function: 91%
- Improving activities of daily living (ADLs): 92%
 - ADLs include feeding, dressing, or going to the bathroom by yourself, using a wheelchair, combing your hair

*Sourced from the Cure SMA Community Update Survey. Total numbers of answers for each question in header rows.



Remaining Unmet Needs in Adults with SMA

"What are the most significant current unmet needs that you hope new therapies would address?" (Check all that apply)*



*Sourced from the Cure SMA Community Update Survey



2022 FDA Patient-Led Listening Session on Remaining Unmet Need

"I am going into my junior year of high school. I am a co-captain of my robotics team. However, I often have to choose between taking a shower and doing homework because I don't have the energy to do both. I have robotics multiple days a week which often takes the rest of my energy for the day."

– Teen affected by SMA

"Small tasks are huge success in my life. If I could lift that 1L bottle of water at work instead of having to find a graduate student to move it for me or lift a ½ gal of milk in and out of the fridge to cook with instead of calling for someone to come help. If I could reach my arms up, to put my hair in a ponytail. These things don't take a ton more muscle, but they are all muscle I still don't have." "To us, the development of add-on, non-SMN targeted therapies so that there are additional options to treat future needs as they arise is critically important. This would provide our family a great deal of peace of mind about what the future holds for our son and our family.

 Mother of infant treated before symptom onset

"If you compare my three children, you will see a huge improvement of motor function however, each of them could still benefit from another drug or dual drugs to fully increase the ability for them to be comparable to 'typical children'."

- Mother of 3 children affected by SMA

IN CLOSING, IF YOU TAKE AWAY ONE THING FROM MY STORY, I HOPE IT IS THIS:

What may seem like minimal gains in strength actually translate to exponential gains in functional abilities.

To illustrate this, I invite you to try a little experiment. The next time you are eating a bowl of soup, cereal, or something of the sort, try this: First, straighten your back and neck, and don't let yourself bend them at all, because you have rods in your back to correct your scoliosis. Next, keep your elbows on the armrests of your chair and never lift them up because you don't have the strength in your arms. Now, try spooning your food into your mouth. I bet you'll have a pretty difficult time. Once you've gotten used to that, allow yourself to lift your elbows off your armrests just two inches or so and try eating again. It may not sound like much, but you'll see that those two inches are life-changing."

- Adult affected by SMA

– Adult affected by SMA

Quotes from patient advocates who participated in 2022 Cure SMA FDA Patient-Led Listening Session. Summary from FDA website at https://www.fda.gov/media/162961/download





Apitegromab Phase 2 TOPAZ Data Through 36 months

Jing Marantz, MD, PhD Chief Medical Officer





Apitegromab Offers Significant Potential to Address Unmet Needs



Myostatin is a negative modulator of muscle growth

Strong preclinical evidence indicates upstream targeting of structurally differentiated pro- and latent myostatin avoids undesirable off-target effects

Apitegromab selectively inhibits myostatin and has the potential to build muscle and strength to improve certain patient outcomes







Phase 2 Trial Design^{1,2}



All SMA Types 2/3, cohorts defined by age and present ambulatory status at time of enrollment. HFMSE, Hammersmith Functional Motor Scale Expanded; IV, intravenous; q4w, every 4 weeks; SMA, spinal muscular atrophy; SMN, survival motor neuron.

1. Place A, et al. Eu J Neurol. 2021;28(Suppl1):207-334 (EPR-184). 2. Crawford T, et al. TOPAZ Extension: 24-month Efficacy and Safety of Apitegromab in Patients With Later-onset SMA (Type 2 and Type 3 SMA). Presented at CureSMA Annual Conference; June 16-19, 2022.



TOPAZ Age 2-12 Analysis* in Pooled Nonambulatory Cohorts (20mg/kg) at 12 Months Mean Increase of Motor Function Outcomes by HFMSE was Significant



Mean HFMSE Increase OF 4.4 POINTS

with majority experiencing \geq 3-point increases on top of background SMN therapy

HFMSE Gains Also Notable in subset of individuals in this analysis who had started background nusinersen at age ≥ 5:

- 75% (6/8) with \geq 1-point increase
- 50% (4/8) with \geq 3-point increase

Nonambulatory Types 2/3 SMA (Apitegromab 20 mg/kg; Intent-to-Treat Population)	Age 2-12 years (n=16 [†])
Mean HFMSE change from baseline, (95% CI)	+4.4 (1.3, 7.4)
Patients with \geq 1-pt increase in HFMSE, n (%)	13 (81%)
Patients with \geq 3-pt increase in HFMSE, n (%)	9 (56%)

TOPAZ results showed HFMSE improvement from baseline or RHS stabilization across all three pre-specified cohorts.¹

No safety signals for apitegromab were identified through month 12 of TOPAZ; the five most frequently reported treatment-emergent adverse events were headache, pyrexia, upper respiratory tract infection, cough, and nasopharyngitis

*Exploratory, post hoc analysis. †For 12-month endpoint, if participants skipped three consecutive doses due to site restrictions caused by COVID-19, records after dose skipping were excluded from analysis. The last observation carried forward was used for other missing data.

1. Crawford T et al.. Presented at Muscular Dystrophy Association, 2023 Clinical & Scientific Conference, March 22, 2023. Cl, confidence interval; HFMSE, Hammersmith functional motor scale expanded; SMA, spinal muscular atrophy. Apitegromab is an investigational drug candidate being evaluated for the treatment of spinal muscular atrophy. Apitegromab has not been approved for any use by the US FDA or any other health authority, and its safety and efficacy have not been established.



Motor Function With SMN Therapies as Assessed by HFMSE HFMSE Appears to Plateau After Initial Gains

Change in HFMSE Over Four Years with Nusinersen¹ Overall population age 2-12 Change in HFMSE* Over Four Years with Risdiplam² Overall population age 2-25

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1. Mercuri E, et al. Presented at: World Muscle Society Congress 2020, P. 257

2. Oskoui M, et al. Presented at: 2021 Muscular Dystrophy Association Clinical & Scientific Conference; March 15-18, 2021. Poster 80.

HFMSE, Hammersmith Functional Motor Scale-Expanded; SE, standard error.

*MFM was primary efficacy endpoint of SUNFISH. HFMSE was a secondary endpoint. This third-party information is provided for background only and is

not intended to convey or imply a comparison to the TOPAZ clinical trial results.

TOPAZ 12-Month HFMSE Changes and Duration of Prior Nusinersen



- Patients enrolled were already in the chronic maintenance phase of nusinersen
- Lack of clear correlation between 12month HFMSE & duration of prior nusinersen exposure in patients aged 2 – 21 suggests motor function improvement mainly attributable to apitegromab

Post hoc analysis: Scatter plot of prior nusinersen treatment duration vs change in HFMSE from baseline; in nonambulatory Types 2 and 3 participants in TOPAZ, there was no clear relationship between duration of nusinersen treatment and change in motor function. Patients skipped 3 or more doses due to COVID-site restrictions excluded; apitegromab is an investigational product candidate under development. HFMSE, Hammersmith Functional Motor Scale–Expanded



TOPAZ Patient Disposition Over 36 Months



a. Patients stratified based on previous treatment with approved SMN therapy.

b. Patients randomized to receive 2 or 20 mg/kg apitegromab.

*Includes patients who crossed over from 2 mg/kg to 20mg/kg starting week 68 through week 104

** Excludes patients on monotherapy

SMN Rx=SMN therapy.

TOPAZ patient retention

PRIMARY TREATMENT:

58 ENROLLED

57 completed primary treatment period and enrolled in the extension study

• 1 withdrew consent due to fatigue & weight gain

EXTENSION: 57 ENROLLED

7 discontinued

- 2 due to concerns with COVID-19
- 5 on monotherapy due to lack of benefit
- >90% of patients on combination therapy remained in study**



Motor Function Outcomes by HFMSE Over 36 Months Improvements Were Substantial and Sustained

Pooled Nonambulatory Patients

Age 2-21 Years All Doses (N=35) Baseline mean age=7.3 |Time on SMN Rx=24.1m

Age 2-12 Years All Doses (N=29) Baseline mean age=5.5 | Time on SMN Rx=24.6m



For the 36-month evaluation, an observed case analysis was conducted, which pooled all the nonambulatory patients (Cohorts 2 and 3) and was based upon the available data for given timepoints. This analysis population included patients receiving either low dose (2 mg/kg) or high dose (20 mg/kg) apitegromab (inclusive of patients in Cohort 3 who switched from 2 mg/kg to 20 mg/kg in Year 2). This analysis excludes data post scoliosis surgery from seven patients. One patient did not conduct HFMSE at time of database lock for 24 months, however, this patient had an unscheduled HFMSE score one month prior to their scheduled visit. In the most recent analysis, this result was included in the 24-month analysis. Error bars represent SE. CI represents confidence interval. SMN Rx=SMN therapy. In the age 2-21 group, 18/28 patients achieved ≥ 1-pt gains, and 11/28 patients ≥ 3-pt gains at 36 months. Data cutoff date as of March 13, 2023. Apitegromab is an investigational drug candidate being evaluated for the treatment of spinal muscular atrophy. Apitegromab has not been approved for any use by the US FDA or any other health authority, and its safety and efficacy have not been established.



Motor Function Outcomes by RULM Over 36 Months Improvements Were Substantial and Sustained

Pooled Nonambulatory Patients



For the 36-month evaluation, an observed case analysis was conducted, which pooled all the nonambulatory patients (Cohorts 2 and 3) and was based upon the available data for given timepoints. This analysis population included patients receiving either low dose (2 mg/kg) or high dose (20 mg/kg) apitegromab (inclusive of patients in Cohort 3 who switched from 2 mg/kg to 20 mg/kg in Year 2). This analysis excludes data post scoliosis surgery from seven patients. One patient did not conduct RULM at month 24, however, had an unscheduled RULM score one month prior to their scheduled visit. In the most recent analysis, this result was included in the 24-month analysis. Error bars represent standard error (SE). Cl represents confidence interval. SMN Rx=SMN therapy. In the age 2-21 group, 18/27 patients achieved ≥ 1-pt gains, and 15/27 patients ≥ 2-pt gains at 36 months. Data cutoff date as of March 13, 2023. Apitegromab is an investigational drug candidate being evaluated for the treatment of spinal muscular atrophy. Apitegromab has not been approved for any use by the US FDA or any other health authority, and its safety and efficacy have not been established.



Pooled Nonambulatory Patients New WHO Development Milestones Achieved Over 36 Months

		WHO MILESTONE						
	Age (years)	Hands & knees crawling	Standing with assistance	Walking with assistance	Standing alone	Walking alone		
	8		$\bigcirc \heartsuit \bigcirc \bigotimes $					
SMN Rx (≥ age 5)	9	$\times \checkmark \times \times$	$(X) \bigvee (X) (X)$					
	19			$\times \checkmark \checkmark \times$				
	2*				🛛 🗸 🏹 🗸	\times \times \checkmark \checkmark		
	4*	\times \times \checkmark \times						
	5*	🚿 🍼 🗶 🍼						
SMN Rx (< age 5)	2	🗵 🔮 🗳 🗳	× 🗸 🗸 🗸	× 🗸 🗸 🗸	\times \times \times \checkmark			
(********	2	\times \bigcirc \checkmark \checkmark						
	4	\times \times \bigcirc \checkmark						
	5					🛞 🍼 🗳 🟹		
Proportion of patients gaining new milestones in TOPAZ BL 12M 24M 36M								

No record

Key Takeaways

- Patients receiving nusinersen
 ≥ age 5 mostly maintained
 WHO milestones
- Patients receiving nusinersen
 < age 5 improved overall: 6
 out of 20 gained new
 milestones over 36 months



Cohort 3 (all doses): BL (0%,) 12m (24%), 24m (26%), 36m (30%) Cohort 3: Randomized to 20mg/kg dose: 12m (25%), 24m (33%), 36m (40%) *Includes patients who crossed over from 2 mg/kg to 20mg/kg starting week 68 through week 104. SMN Rx=SMN therapy. Data cutoff date as of March 13, 2023. Apitegromab is an investigational drug candidate being evaluated for the treatment of spinal muscular atrophy. Apitegromab has not been approved for any use by the US FDA or any other health authority, and its safety and efficacy have not been established.

Pooled Nonambulatory Patients | Age 2 – 21 | All Doses | Over 36 Months Improvements in PRO Measures Were Consistent with Motor Function



N = 35; Baseline mean age=7.3 |Time on SMN Rx=24.1m

HFMSE=Hammersmith Functional Motor Scale Expanded; OC=observed case; PEDI-CAT=Pediatric Evaluation of Disability Inventory Computer Adaptive Test; PROMIS=Patient Reported Outcome Measurement Information System; RULM=Revised upper limb module; SE=standard error of the mean. SMN Rx=SMN therapy. Data on File. Scholar Rock, Inc. Cambridge, MA. Data cutoff date as of March 13, 2023. The updated PEDI-CAT analysis included additional records (2 at 12 months and 1 at 24 months) that were not available at the time of previous analysis. Apitegromab is an investigational drug candidate being evaluated for the treatment of spinal muscular atrophy. Apitegromab has not been approved for any use by the US FDA or any other health authority, and its safety and efficacy have not been established.



Treatment-Emergent Adverse Events (TEAEs)*	2 mg/kg dose (N=10) n (%)	20 mg/kg dose (N=48) n (%)	Total (N=58) n (%)
Any TEAE	10 (100)	46 (95.8)	56 (96.6)
Any serious TEAE	5 (50)	16 (33.3)	21 (36.2)
Any TEAE leading to study drug discontinuation	0	1 (2.1)	1 (1.7)
Any Grade 3 (severe) or higher TEAE	4 (40)	16 (33.3)	20 (34.5)

- TEAEs were consistent with previous reports with no new findings after 198 patient years of exposure
 - Most frequently reported TEAEs^{*}: headache (38%), pyrexia (38%), COVID-19 (36%), nasopharyngitis (36%), & upper respiratory tract infection (33%)
 - TEAEs were mostly mild to moderate in severity and generally consistent with the underlying patient population and nusinersen therapy
- No deaths or suspected unexpected serious adverse reactions or hypersensitivity reactions to apitegromab were reported
- No patients displayed positive titers for apitegromab antibodies (ADA)

*Defined as AEs that start after the first dose of study drug or start prior to the administration of study drug and worsen in severity/grade or relationship to investigational medication after the administration of study drug. % = 100 x n/N; % at 12 month. AE, adverse event; TEAE, treatment emergent adverse events. Data cutoff date as of March 13, 2023. Apitegromab is an investigational drug candidate being evaluated for the treatment of spinal muscular atrophy. Apitegromab has not been approved for any use by the US FDA or any other health authority, and its safety and efficacy have not been established.



Summary of TOPAZ Data

Substantial and Sustained Improvement Over 36 MONTHS





Data to date has shown substantial clinical benefit that is dose-dependent

Benefit continued to improve or was sustained over 36 months Consistency across functional scales and patient-reported outcomes



Well tolerated profile and low discontinuation rate supports durability of treatment

TOPAZ data suggest that apitegromab has the potential to transform care in SMA by directly addressing progressive muscle weakness





Phase 3 SAPPHIRE Pivotal Trial Overview





SAPPHIRE Phase 3 Design is Optimized by Insights from TOPAZ



TOPAZ Learnings

Substantial HFMSE gains observed in the nonambulatory Type 2/3 SMA cohorts

Exploratory age 2-12 analysis in nonambulatory Type 2/3 showed transformative potential

HFMSE gains substantial by 12 months of treatment

Dose response seen (greater effect observed with 20 mg/kg over 2 mg/kg)



SAPPHIRE Design Elements

- Study population: nonambulatory Type 2/3 SMA
- Primary efficacy endpoint: HFMSE





- 20 mg/kg apitegromab dose
- Also evaluating 10 mg/kg arm (to explore potential that dose between 2 and 20 mg/kg may be comparable to 20 mg/kg)





Ongoing SAPPHIRE Phase 3 Trial Overview



Randomized, double-blind, placebo-controlled, parallel arm design (n=204) Enrolling patients who are on SMN-directed therapy (nusinersen or risdiplam) Anticipate completing enrollment in 3Q 2023

SCREENING	TREATMENT (52 weeks)
MAIN POPULATION (n=156) Ages 2-12 With nonambulatory Types 2 and 3 SMA	N=52 \rightarrow Apitegromab (20 mg/kg IV q4w) + SMN-directed therapy
Stratified randomization to ensure balanced allocation:	R → N=52 → Apitegromab (10 mg/kg IV q4w) + SMN-directed therapy
 Age at SMN therapy initiation (age < 5 vs age ≥ 5) 	N=52 → Placebo (IV q4w) + SMN-directed therapy
2. SMN therapy (nusinersen vs. risdiplam)	

ENDPOINTS

Primary Efficacy: Mean HFMSE change from baseline at 12 months

Additional Efficacy Measures: RULM, WHO, other outcome measures

Safety, PK/PD, ADA

Additional Data Opportunities

Exploratory population (age 13-21), in patients using SMN therapy

Focused upon safety & exploratory efficacy (n=48; 2:1 randomization between apitegromab 20 mg/kg vs placebo)

Separate open-label extension study (after patients complete 12-month treatment period) Focused upon safety & exploratory long-term efficacy





Patient Journey

Thomas Crawford, MD John Hopkins Medicine





Patient Journey

Thomas Crawford, M.D.

Co-Director, MDA Clinic and Professor of Neurology and Pediatrics, Johns Hopkins Medicine



Summary Experience at Johns Hopkins University Site

			Baseline Characteristics				Change from Baseline								
Patient	Dose Received	Age	Gender	HFMSE	RULM	Prior Nusinersen	Scoliosis	Contracture	12m HFMSE	12m RULM	24m HFMSE	24m RULM	36m HFMSE	36m RULM	WHO Milestone Gained
Patient #1	20mg/kg	11	F	33	34	17 months	Yes	Yes	-1	0	-19*	-3	-16**	-3	_
Patient #2	20mg/kg	5	М	40	29	24 months	No	No	11	5	11	4	14	5	Walking Alone
Patient #3	2mg/kg***	5	М	21	25	32 months	No	Yes	6	2	4	3	5	5	Crawling
Patient #4	20mg/kg	4	М	17	23	30 months	No	Yes	1†	0†	0	0	2	3	_

*, HFMSE score at 24 months is following scoliosis surgery and was not included in reported analyses at 24 months and 36 months; **, HFMSE was obtained at 31 months and not obtained at 36 months,

***, patient 3 initially randomized to 2 mg/kg prior to switching to 20 mg/kg during extension phase, †, HFMSE and RULM were obtained at Week 40.

BL, baseline; HFMSE, Hammersmith Functional Motor Scale-Expanded; NA, not available; RULM, Revised Upper Limb Module; WHO, World Health Organization.

Patient Story 4-year-old boy (nonambulatory at baseline)





Before Treatment Initiation

HFMSE: Baseline 17 Nusinersen treatment: 30 months

Contracture

WHO MILESTONES: able to sit; unable to crawl, stand or walk

After Treatment Initiation

	12 MONTHS	24 MONTHS	36 MONTHS		
HFMSE	+1 pt	0	+2 pts		
RULM	0	0	+3 pts		
	WHO MILEST	ONES: no change			

Patient Story 5-year-old boy (nonambulatory at baseline)





Before Treatment Initiation

HFMSE: Baseline 33 Nusinersen treatment: 24 months

No scoliosis or contracture

WHO MILESTONES: able to sit, crawl, and stand; unable to walk

After Treatment Initiation

	12 MONTHS	24 MONTHS	36 MONTHS
HFMSE	+11 pts	+11 pts	+14 pts
RULM	+5 pts	+4 pts	+5 pts
	WHO MILESTON	NES: walking alone	2

Q&A





Q&A Participants



Jay Backstrom, MD, MPH



Thomas Crawford, MD



Basil Darras, MD



Jing Marantz, MD, PhD



Ted Myles



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