

Bringing New Treatments to Life

Corporate Presentation | May 2026



Legal disclosure

FORWARD LOOKING STATEMENTS

This presentation contains forward-looking statements that involve substantial risks and uncertainties. All statements, other than statements of historical facts, contained in this presentation, including statements regarding the potential of TSHA-102, the durability and reproducibility of the clinical data from the REVEAL trials, the anticipated Part B trial design, our research, development and regulatory plans, and our strategy, future operations, communications with and feedback from the FDA and Health Canada on the regulatory pathway for TSHA-102, future financial position and cash runway, future revenues, projected costs, prospects, plans, objectives of management, and our ability to successfully commercialize our product candidates are forward-looking statements. The words “anticipate,” “believe,” “estimate,” “expect,” “intend,” “may,” “might,” “plan,” “predict,” “project,” “target,” “potential,” “will,” “would,” “could,” “should,” “continue,” and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. These forward-looking statements are subject to a number of risks, uncertainties and assumptions. Risks regarding our business are described in detail in our Securities and Exchange Commission filings, including in our Annual Report on Form 10-K for the year ended December 31, 2025, and our other filings with the SEC, which are available on the SEC’s website at www.sec.gov. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. The forward-looking statements contained in this presentation reflect our current views with respect to future events, and we assume no obligation to update any forward-looking statements except as required by applicable law.

This presentation includes statistical and other industry and market data that we obtained from industry publications and research, surveys and studies conducted by third parties as well as our own estimates of potential market opportunities. All of the market data used in this presentation involves a number of assumptions and limitations, and you are cautioned not to give undue weight to such data. Industry publications and third-party research, surveys and studies generally indicate that their information has been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. Our estimates of the potential market opportunities for our product candidates include several key assumptions based on our industry knowledge, industry publications, third-party research and other surveys, which may be based on a small sample size and may fail to accurately reflect market opportunities. While we believe that our internal assumptions are reasonable, no independent source has verified such assumptions.

Key investment highlights

TSHA-102: potential one-time treatment designed to address root cause of Rett syndrome, with a clear path to registration

High Unmet Need and Significant Market Opportunity

- No approved therapies address genetic root cause of Rett syndrome
- 15,000-20,000 patients (U.S., EU+U.K.); 1 of 10,000 female births worldwide¹

Differentiated Approach Designed to Support Commercial Uptake

- Clinically and commercially proven AAV9 capsid with well-established safety profile, based on third-party gene therapy studies
- Delivered intrathecally as a routine, minimally invasive procedure with outpatient potential, enabling broad, scalable access

Pivotal Trial Design Enabled by Natural History Data

- Patients aged ≥ 6 years are in developmental plateau, with a 0% to $< 6.7\%$ likelihood of achieving a developmental milestone²
- Single-arm, open label trial, enrolling 15 patients with patient serving as own control, assessing the % of patients aged 6 to < 22 years (developmental plateau population) who gain/regain ≥ 1 developmental milestone as the primary endpoint

Advancing with Clear Path Toward Registration

- Finalized FDA alignment on REVEAL pivotal trial protocol and SAP; 6-month interim may serve as basis for BLA submission
- Written FDA alignment on inclusion of ≥ 3 months of ASPIRE safety data (N=3, aged 2 to < 4 years) in BLA submission to support a broad ≥ 2 years label

Transformative Potential Supported by Part A Data³

- 100% response rate in REVEAL Part A for pivotal trial primary endpoint exceeds minimum threshold for success of 33%⁴
- No treatment-related SAEs or DLTs following low and high dose of TSHA-102
- FDA Breakthrough Therapy designation granted to TSHA-102

¹Amir, R E et al. "Rett syndrome is caused by mutations in X-linked MECP2, encoding methyl-CpG-binding protein 2." *Nature genetics* vol. 23,2 (1999): 185-8. doi:partners. 10.1038/13810. (estimated prevalence of 15,000-20,000 patients with typical Rett syndrome caused by a MECP2 mutation). ²Neul, Jeffrey L et al. "Trajectory of skill acquisition, loss, and regain in females with classic Rett syndrome." *Journal of neurodevelopmental disorders*, 10.1186/s11689-026-09680-6. 12 Mar. 2026, doi:10.1186/s11689-026-09680-6. ³Efficacy data based on May 19, 2025, data cutoff (N=10); Safety data based on May 2026 data cutoff (N=12). Study is ongoing and data is subject to change. ⁴Minimum threshold per REVEAL pivotal trial SAP. CNS=Central nervous system; SAP=Statistical analysis plan; BLA=Biologics license application; SAE=Serious adverse event; DLT=Dose-limiting toxicity

TSHA-102 Rett syndrome program strongly positioned for rapid execution toward BLA submission

Compelling Part A Clinical Data

supported FDA Breakthrough Therapy designation and indicates pivotal trial is well powered to establish efficacy

Initiated BLA-enabling PPQ Campaign

FDA alignment on PPQ and comparability strategy may enable pooling Phase 1/2 and pivotal data for BLA submission

Potential for Expedited Path to BLA Submission

FDA alignment that REVEAL pivotal trial 6-month interim analysis may serve as the basis for BLA submission

Potential for Broad Label Aged 2+ Years

FDA alignment on inclusion of ≥3 months of ASPIRE safety data in BLA submission to support a broad label

Next Steps

Completion of dosing in REVEAL pivotal trial and ASPIRE trial expected **Q2 2026**

Longer-term clinical data from Part A REVEAL Phase 1/2 trials expected **Q2 2026**

Completion of BLA-enabling PPQ campaign expected **Q4 2026**

Commercial readiness activities designed to position TSHA-102 for successful launch and adoption

Seasoned Commercial Leadership Team

Deep expertise across gene therapy commercialization, market development and market access

Blockbuster gene therapy launch experience (Zolgensma, AveXis)



Market Research Supports Potentially Strong Demand and Broad Adoption¹

High clinician intent to treat across all ages, with 90% of caregivers likely to pursue gene therapy upon approval

Strong preference for IT delivery over direct-to-brain due to familiarity, accessibility and scalability



Intrathecal Administration Enables Broad Access

Routine outpatient procedure enables scalable access beyond COEs to regional and local institutions

~75% of patients are managed outside large Rett COEs²



Rett syndrome: a devastating, rare and progressive X-linked neurodevelopmental disease



Primarily occurs in females



Caused by mutations in the X-linked gene encoding MeCP2 protein, which inhibits neuronal developments¹



Leads to impaired brain development and function, resulting in multisystem complications¹



Symptoms and severity vary due in part to random X-inactivation²



Hallmark characteristics of Rett syndrome appear across multiple clinical domains **impacting activities of daily living**

Results in **loss of functional abilities and developmental milestones** and the emergence of hallmark symptoms by 6 years that progress over time¹



Gross Motor Function

- Mobility issues
- Loss of movement and coordination abilities
- Gait disturbances
- Hypotonia
- Dystonia



Fine Motor Function

- Loss of hand function
- Loss of purposeful hand use
- Repetitive hand movements



Communication / Socialization

- Loss of speech / communication
- Social withdrawal
- Behavioral issues
- Intellectual disability



Autonomic Function / Seizures

- Epilepsy
- Sleep disturbances
- Breathing issues
- Gastrointestinal issues
- Cardiac dysfunction
- Vasomotor disturbances

There are no approved disease-modifying treatments that address the genetic root cause of Rett syndrome

High Unmet Medical Need



Current standard of care focused on symptom management¹



Patients typically require 24/7 care and lifelong assistance²

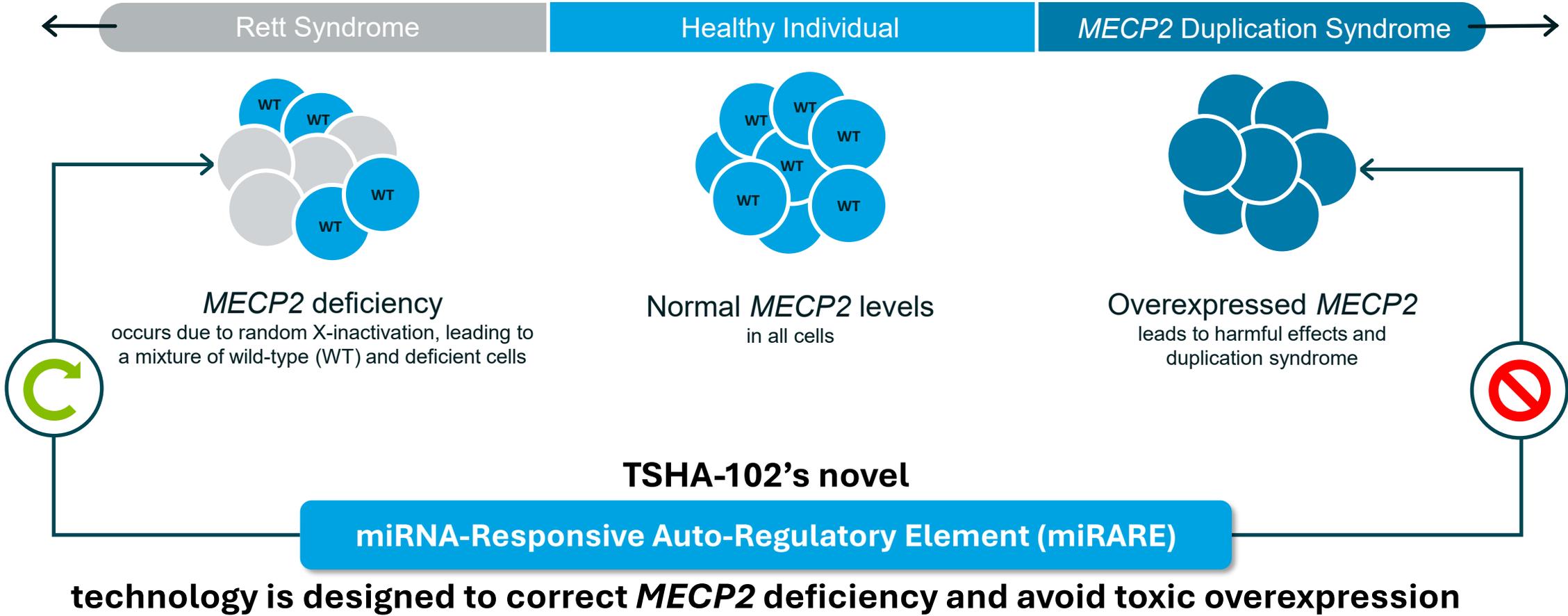


High caregiver burden with significant impact on quality of life and activities of daily living²

Significant Market Opportunity

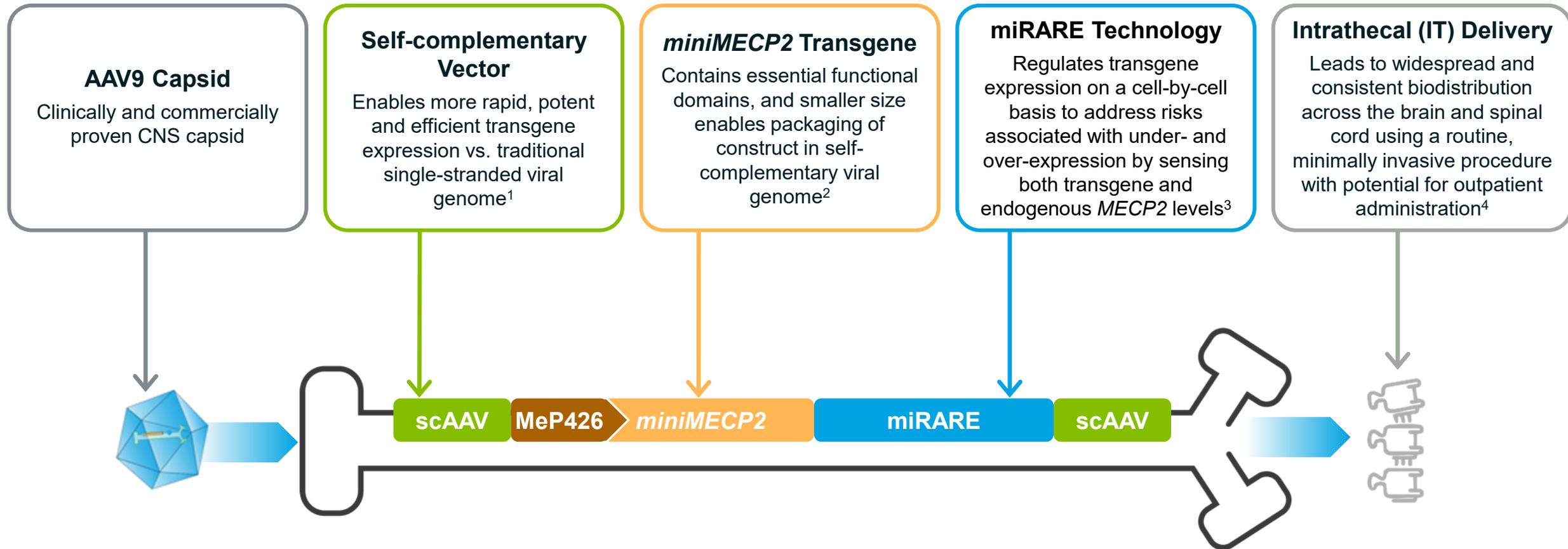
- Estimated **15,000 and 20,000 patients in major global markets (U.S., EU+U.K.)**³
- **1 of every 10,000 female births worldwide**³
- Commercial launch and uptake of DAYBUE highlights market demand⁴

Gene Therapy Treatment Challenge: too much or too little *MECP2* expression is harmful in Rett syndrome

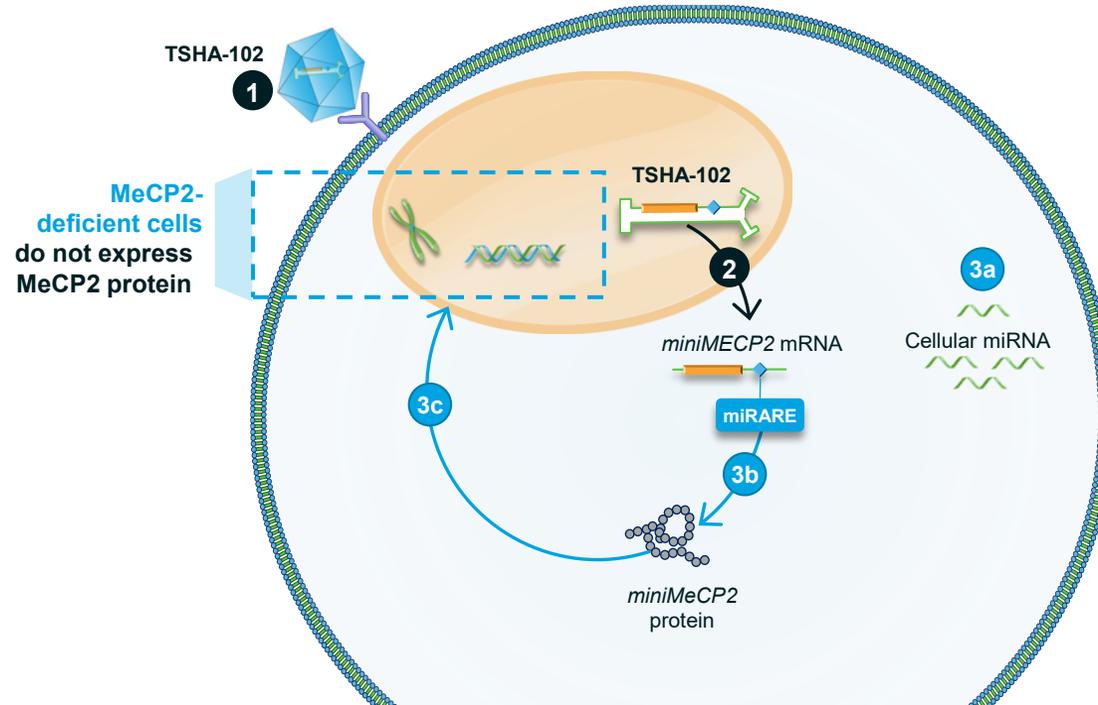
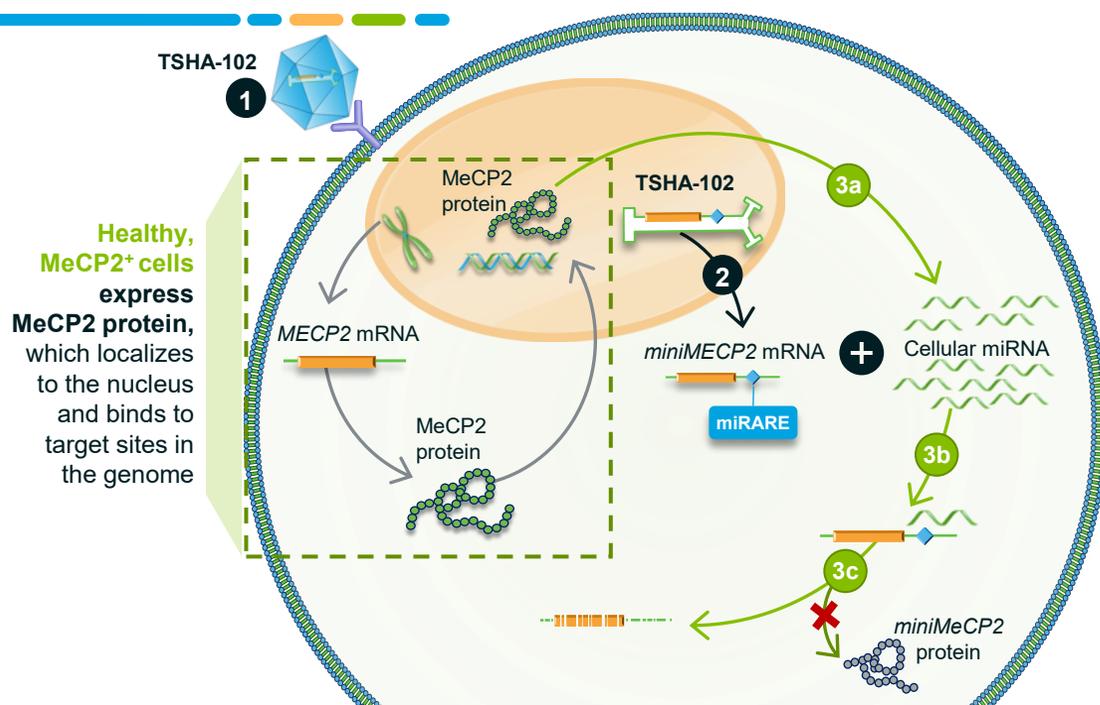


TSHA-102: an investigational one-time gene therapy that is designed to regulate *MECP2*

Strategically designed to enable optimal and controlled transgene expression across the CNS



miRARE: potential best-in-class approach to regulating *MECP2* expression using RNA interference and binding sites for endogenous microRNA responsive to MeCP2¹



miRARE is designed to **SILENCE** *miniMECP2* transgene expression in healthy, MeCP2⁺ cells

miRARE is designed to **ENABLE** *miniMECP2* transgene expression in MeCP2-deficient cells

In cells with normal MeCP2 function in the nucleus:

In cells lacking normal MeCP2 function:

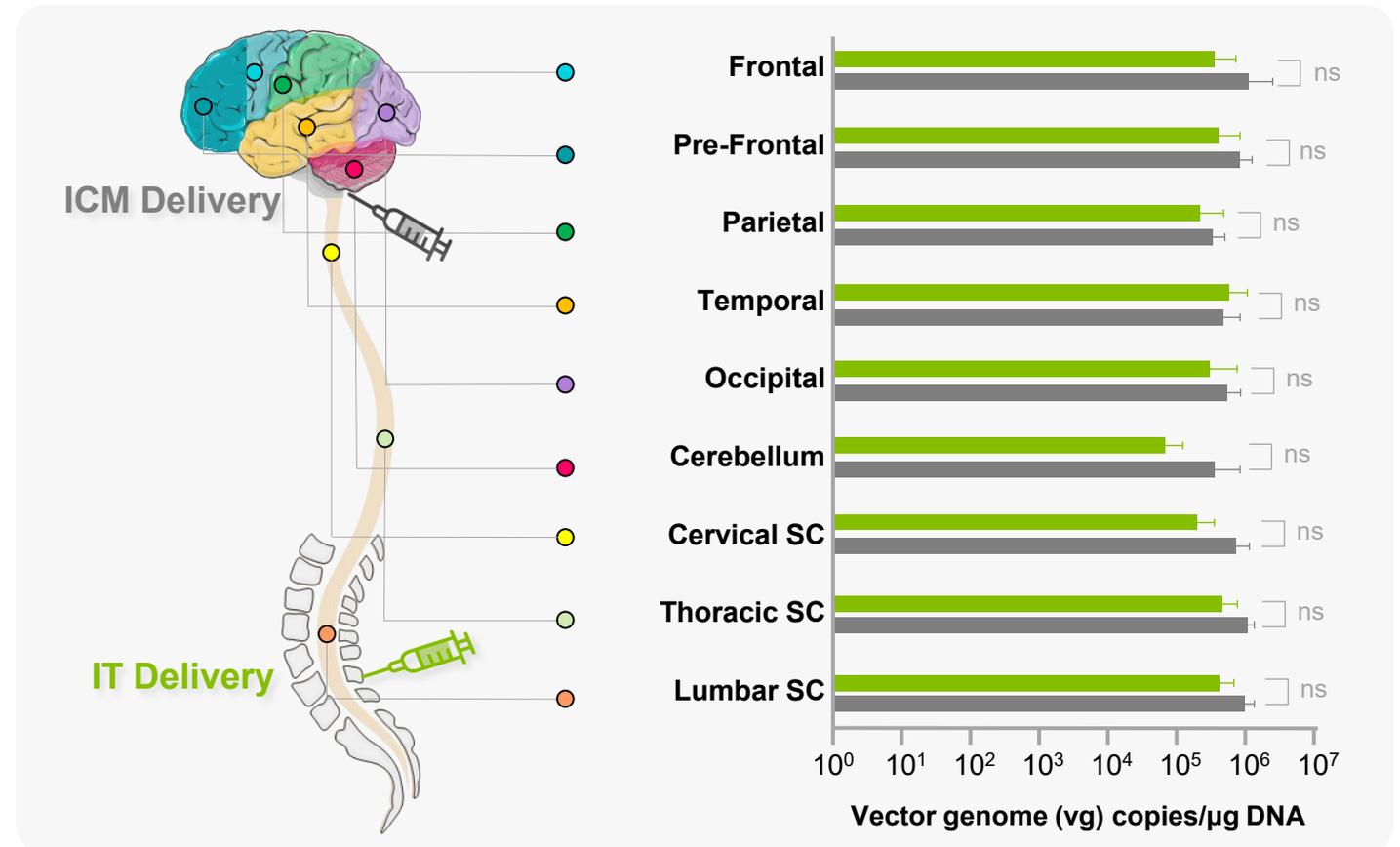
- 3a** Cellular miRNAs are produced abundantly
- 3b** miRNAs interact with miRARE in the *miniMECP2* mRNA
- 3c** This interaction signals the cell to degrade the mRNA and/or to **suppress synthesis of the miniMeCP2 protein**

- 3a** Fewer cellular miRNAs are produced
- 3b** Therefore, the transgene mRNA is translated to produce miniMeCP2 protein
- 3c** The miniMeCP2 protein is imported into the nucleus, **restoring MeCP2 function**

Intrathecal (IT) Administration: a potentially effective, safe and minimally invasive delivery approach for broad targeting of the CNS¹

- IT and ICM administration achieved **comparable, consistent and broad biodistribution** in the brain and spinal cord
- Supports TSHA-102 clinical development approach **leveraging the minimally invasive IT administration** with potential for **outpatient administration**
- IT administration **minimizes systemic exposure**, potentially reducing risk of immune responses and systemic toxicities

Biodistribution data comparing IT vs. ICM delivery using the same dose and volume in NHPs¹



TSHA-102 (ICM): 2x10¹⁵ total vg HED, TSHA-105 (IT): 2x10¹⁵ total vg HED

FDA aligned pathway to potential registration for TSHA-102

PART A: REVEAL Phase 1/2 Trials

Adolescent and Adult (females ≥ 12 years)

Cohort 1
 5.7×10^{14} total vg
N=2

Cohort 2
 1×10^{15} total vg
N=4

Pediatric (females 5-8 years)

Cohort 1
 5.7×10^{14} total vg
N=2

Cohort 2
 1×10^{15} total vg
N=4

Dosing complete (N=12 females, 6-21 years)

PART B: REVEAL Pivotal Trial

Developmental Plateau Population

(females 6 to < 22 years)

- Evaluate efficacy and safety of TSHA-102

N=15
 1×10^{15} total vg

ASPIRE Trial

Pre-developmental Plateau Population

(females 2 to < 4 years)

- Evaluate safety and preliminary efficacy of TSHA-102; efficacy data to be extrapolated from REVEAL pivotal trial

N=3
 1×10^{15} total vg¹

Potential Registrational Path

Patients with Rett syndrome Age 2+

Written FDA alignment on:

- REVEAL 6-month interim analysis may serve as basis for BLA submission
- Inclusion of ≥ 3 months of ASPIRE safety data in BLA submission to support a broad label in patients aged ≥ 2 years

Ongoing REVEAL Pivotal Trial for TSHA-102

Finalized FDA alignment on study protocol and SAP

Study Overview

- **Study Design:** Single-arm, open-label trial, using each patient as own control
- **Dose:** 1×10^{15} total vg (high dose), administered intrathecally
- **Sample Size:** Enrolling 15 females with Rett syndrome aged 6 to <22 years (developmental plateau population)¹
- **Primary Endpoint:** Response rate, defined as the percentage of patients who gain or regain \geq one developmental milestone from a list of 28
 - Video-based determination of milestone gain/regain will be performed by independent, blinded central raters
- **SAP:** Response rate of 33% (5 out of 15 patients) is the minimum threshold for success sufficient to reject the null hypothesis of 6.7%²
 - 12-month primary analysis, with 6-month interim analysis that may serve as the basis for BLA submission
- **Key Secondary Endpoints:** Average number of total developmental milestones gained/regained per patient and clinician-assessed outcome measures, including R-MBA and CGI-I

Company Believes REVEAL Part A Data Support Pivotal Trial is Well Powered to Establish Efficacy



**Response rate = 100%
(N = 10) across all patients
treated with TSHA-102
post-treatment³**

Primary endpoint: milestone gain is an objective, clinically meaningful and inherently individualized assessment of function in the developmental plateau population

~0% probability of milestone gain/regain after age 6 in the untreated population¹

Supported by cumulative incidence models from longitudinal natural history study developmental milestone data

Fine motor, gross motor, and communication
developmental milestones captured as binary (yes/no) measures

Gain or regain of \geq one of 28 defined developmental milestones post-TSHA-102

- ✓ Represent meaningful functional improvement based on caregiver research²
- ✓ Directly reflects activities of daily living
- ✓ Inherently individualized to show improvements in a heterogeneous disease
- ✓ FDA-endorsed primary endpoint

28 developmental milestones from the natural history dataset included in the primary endpoint



Communication

- Pointed for something they wanted
- Waved “Bye-Bye”
- Followed a command with a gesture
- Identified body parts (pointed with eyes or fingers)
- Followed a command without a gesture
- Used word(s) with meaning
- Spoke in phrases (2 words or more) with meaning



Fine Motor

- Reached for toy
- Holds bottle unpropped
- Used raking grasp to retrieve an object
- Used pincer grasp (refined or modified)
- Transferred an object from one hand to another
- Finger fed
- Drank from a cup held without assistance
- Used a fork or spoon to eat with assistance
- Used a fork or spoon to eat without assistance



Gross Motor

- Come to sitting
- Sat without support
- Stood while holding on
- Pulled to standing
- Stood independently
- Walked with support
- Walked independently
- Climbed up stairs with help
- Climbed down stairs with help
- Climbed up stairs without help
- Climbed down stairs without help
- Ran 10 feet without falling

Selection criteria:

- ✓ Meaningful functional gains based on caregiver research
- ✓ Represent activities of daily living
- ✓ 0% to <6.7% likelihood gained/regained in patients age ≥ 6 years with untreated Rett syndrome¹

Key findings that supported alignment with FDA on the REVEAL pivotal trial

1 Rett Syndrome Caregiver Research

achievement of a developmental milestone would be a meaningful therapeutic outcome

2 Rett Syndrome Natural History Data Analysis

by age ≥ 6 years, there is $\sim 0\%$ likelihood of gaining or regaining developmental milestones¹

3 Part A Clinical Data

100% of patients gained/regained \geq one developmental milestone post-TSHA-102²

Rett syndrome caregiver research indicates improved function or achievement of developmental milestones would significantly improve quality of life



Communication

Gained or improved communication of basic needs—through eye gaze, gestures, or words—would enable self-advocacy and strengthen social connections

- Ex: follow a command without a gesture, pointed for something they wanted, use word(s) with meaning, identify body parts (pointed with eyes or fingers)



Fine Motor Function

Gained or improved hand function would restore a sense of control and purpose, and enable play and social engagement

- Ex: finger feed, use fork or spoon to eat without assistance, reached for a toy, drank from a cup held without assistance



Gross Motor Function

Gained or improved gross motor function would foster independence and reduce the physical burden of caregiving

- Ex: walked independently or with support, stood while holding on, sat without support, climbed up stairs without help

“If she can actually tell me what she wants, or make a choice between two things, even if it’s just looking at something purposefully...because now I don’t know what’s going on.”
– Caregiver of 20-year-old

“Feeding herself, entertaining herself...being able to flip pages or purposefully hold a book, change the channel on a remote...would be a game changer for us.”
– Caregiver of 8-year-old

“If we got a safe and secure sitting position from her, that would be a win. We would be able to have her sitting and not have to be right next to her. We could have her at the dining table with us.”
– Caregiver of 5-year-old

Longitudinal natural history data informed key elements of TSHA-102 pivotal trial design

Natural History Study (NHS) Dataset¹

- N = ~1100 females with confirmed Rett syndrome diagnosis; up to 14 years follow-up
- Captures longitudinal data on the functional gain, loss and regain of **developmental milestones** across core domains of Rett syndrome:



Communication

Ex: Pointed for something they wanted | Used word(s) with meaning



Fine Motor Function

Ex: Finger feed | Drank from a cup held without assistance



Gross Motor Function

Ex: Sat without support | Walked with support

- These functional skills and activities of daily living are highly important to caregivers

Developed Age- and Time-Based Models of Developmental Milestone NHS Data¹

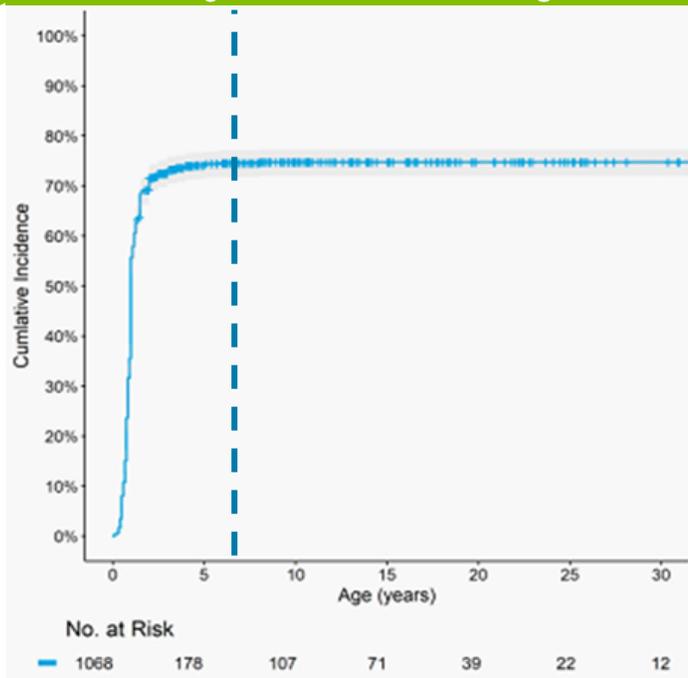
- Cumulative incidence models demonstrated **distinct trends in developmental milestone acquisition** that:
 - ✓ Strengthened understanding of longitudinal disease progression in Rett syndrome
 - ✓ Contextualized and substantiated disease-modifying potential of TSHA-102
 - ✓ Informed our discussions with the FDA on proposed pivotal trial design for TSHA-102

NHS cumulative incidence models showed that the likelihood of gaining/regaining 28 defined developmental milestones is **predictable in the age ≥ 6 population**¹



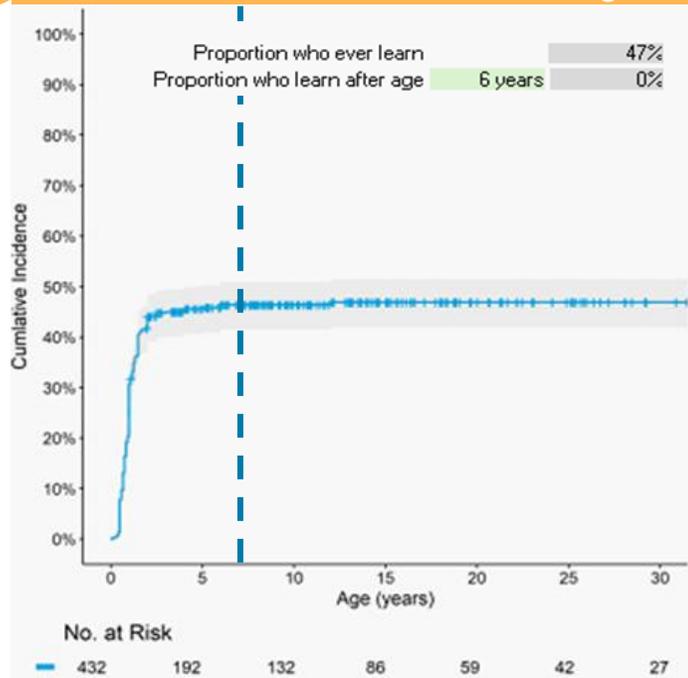
Communication Milestones

Ex: of patients who learn to use word(s) with meaning, ~0% ever learn after age 6



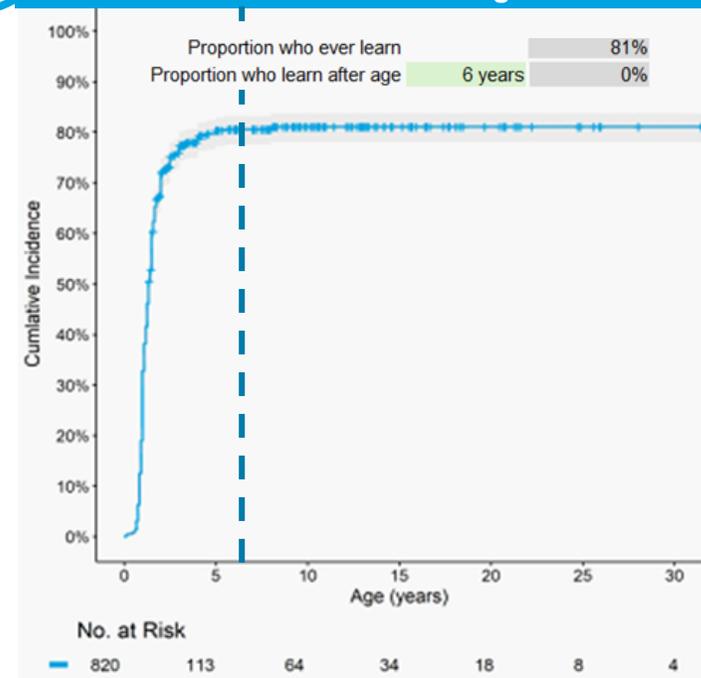
Fine Motor Milestones

Ex: of patients who learn to drink from a cup held without assistance, ~0% ever learn after age 6



Gross Motor Milestones

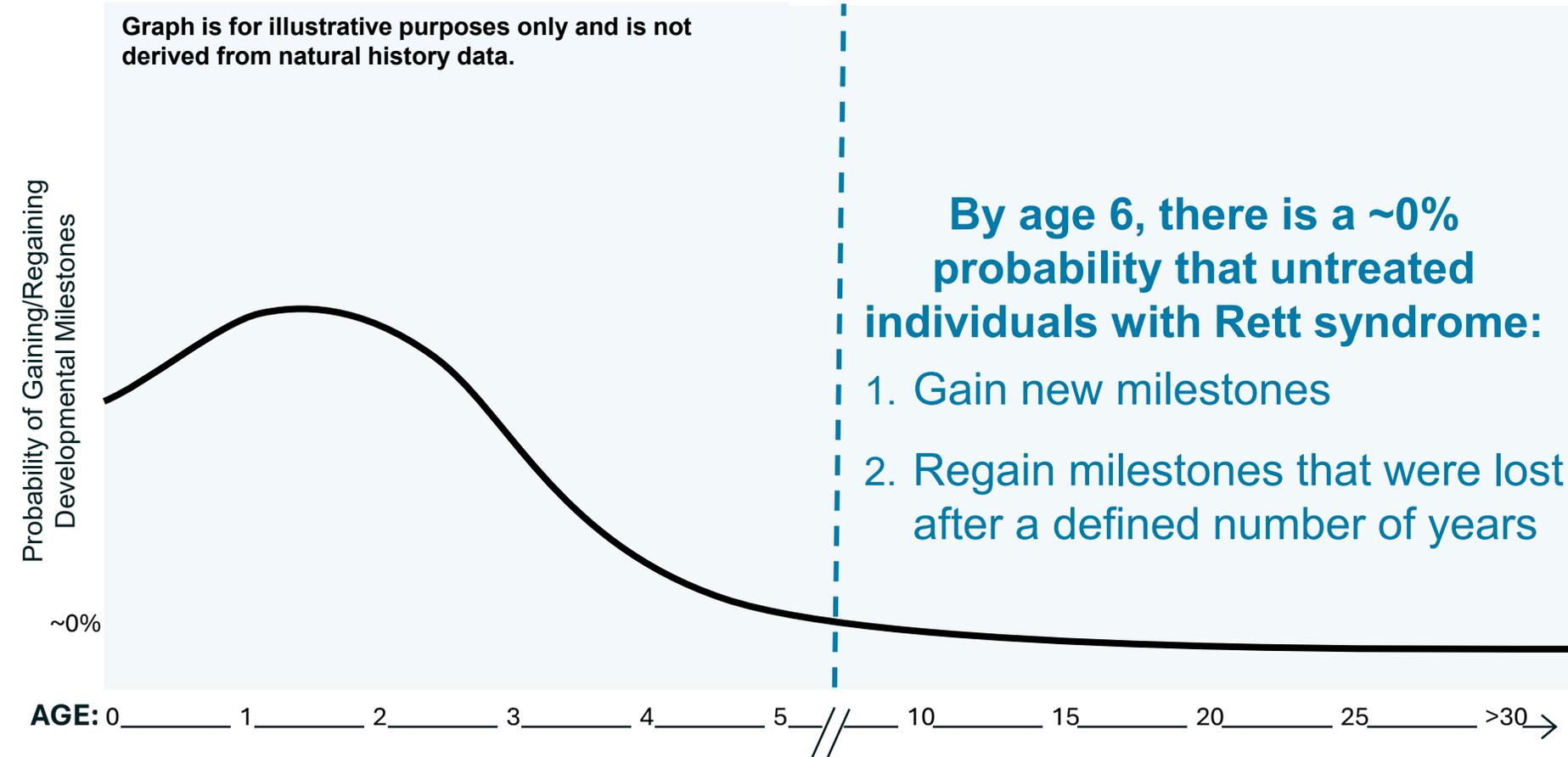
Ex: of patients who learn to walk with support, ~0% ever learn after age 6



We leveraged these findings to establish the **“Developmental Plateau Population”**

Rett syndrome NHS data analysis demonstrated that **after 6 years of age, there is ~0% likelihood of gaining or regaining developmental milestones**¹

Graph is for illustrative purposes only and is not derived from natural history data.



Pre-Developmental Plateau Population (age 0-6 years):
demonstrate ongoing development

Developmental Plateau Population (age ≥6 years):
gain or regain of developmental milestones is unexpected

NHS data analysis supports a minimum inclusion age of 6 years in a well-controlled, single-arm interventional trial evaluating gain and regain of developmental milestones

REVEAL Part A data supports encouraging safety profile and disease-modifying potential of TSHA-102¹

Underscores the potential to improve function and enable developmental milestone achievements

Generally Well-tolerated

no treatment-related SAEs or DLTs in all patients treated to date

Developmental Milestone Achievement

in 100% of patients, which is not expected based on natural history, with a pattern of early sustained gains and new gains/regains over time

Additional Skills and Improvements

in 100% of patients, with multiple skill gains/improvements outside the natural history defined developmental milestones across the core domains of Rett syndrome

Dose-dependent Improvements

high dose consistently outperforming low dose, and effects deepening over time across measures (e.g., developmental milestones, R-MBA, CGI-I)

Part A of REVEAL Phase 1/2 trials of TSHA-102

Dosing complete (N=12, aged 6-21 years)

Study overview:

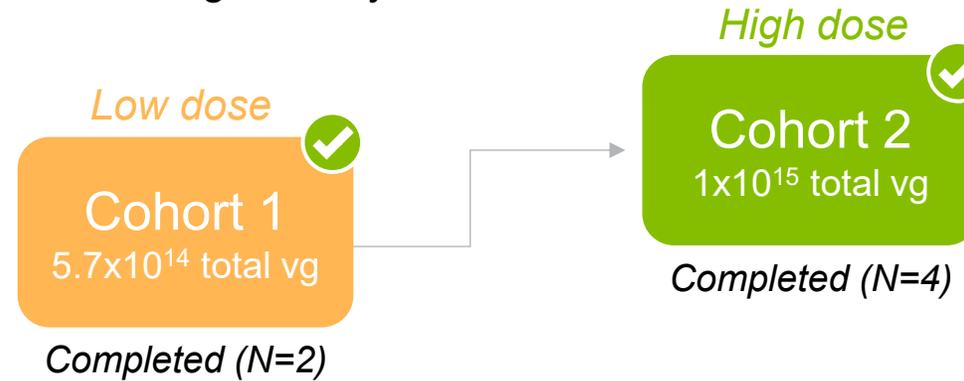
- Open-label, dose-escalation and dose-expansion trial in the U.S. and Canada
- Safety and preliminary efficacy of TSHA-102
- Evaluates two dose levels; if possible, establishes MAD or MTD

Key clinical assessments:

- R-MBA
- CGI-I
- CGI-S

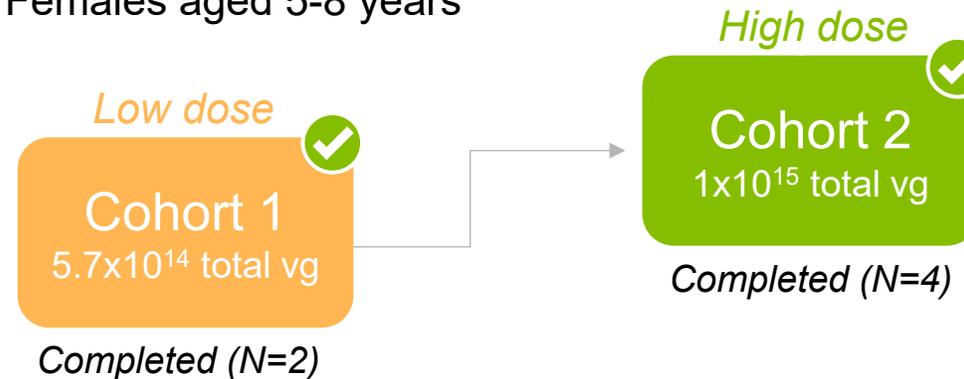
Adolescent and Adult Trial

Females aged ≥12 years



Pediatric Trial

Females aged 5-8 years



Rigorous developmental milestone evaluation criteria applied to Part A data enabled reliable, objective assessment of TSHA-102 efficacy

Developmental milestones data was captured via videos, COAs, caregiver assessments and clinician notes in Part A

Developmental milestone evaluation criteria:

- ✓ **Baseline:** Milestone either never gained or lost sufficiently long ago, such that the likelihood of spontaneous gain/regain is <6.7%, based on review of patient medical history and available baseline video data
- ✓ **Post-treatment evidence:** Video documentation of milestone demonstration
- ✓ **Evaluation method:** Milestone gain/regain determined by multiple independent central raters based on prespecified definitions of achievement for each milestone outlined in the pivotal trial protocol

Reliable Part A data supporting TSHA-102's impact on developmental milestone achievement indicate the pivotal trial is well powered to establish efficacy of TSHA-102

100% of patients (N=10) gained/regained \geq one defined developmental milestone post-TSHA-102

with a ~0% likelihood of being achieved without treatment based on NHS data¹

| | Cohort 1: Low Dose 5.7x10 ¹⁴ total vg | | | | Cohort 2: High Dose 1x10 ¹⁵ total vg | | | | | |
|---------------------------|--|--|--|--|--|--|--|--|--|--|
| |  LD:P1 |  LD:P2 |  LD:P3 |  LD:P4 |  HD:P1 |  HD:P2 |  HD:P3 |  HD:P4 |  HD:P5 |  HD:P6 |
| AGE AT DOSING (years): | 20 | 21 | 6 | 7 | 15 | 21 | 16 | 8 | 6 | 7 |
| POST-TREATMENT FOLLOW UP: | 18 mos. | 18 mos. | 12 mos. | 12 mos. | 9 mos. | 9 mos. | 6 mos. | 6 mos. | 6 mos. | 3 mos. |
| | Developmental Milestone Gained Post-TSHA-102 | | | | Developmental Milestone Gained Post-TSHA-102 | | | | | |
| |  |  |  |  |  |  |  |  |  |  |

Developmental milestone gains and regains were assessed by multiple independent central raters, who evaluated functional skills through video evidence at baseline and post-treatment, applying predefined binary criteria.

Patients gained/regained developmental milestones across the core functional domains of Rett syndrome post-TSHA-102

A total of 22 developmental milestones were achieved across 10 patients treated with TSHA-102



Communication

- ✓ Spoke in phrases (2 words or more) with meaning
- ✓ Used word(s) with meaning
- ✓ Followed a command without a gesture
- ✓ Followed a command with a gesture
- ✓ Pointed for something they wanted
- ✓ Identified body parts

Enable **expression of needs**, preferences, emotions, and foster **social connections**



Fine Motor

- ✓ Holds bottle unpropped
- ✓ Finger fed
- ✓ Reached for a toy
- ✓ Transferred an object from one hand to another

Reflect self-care skills and purposeful hand use that **enable independence**



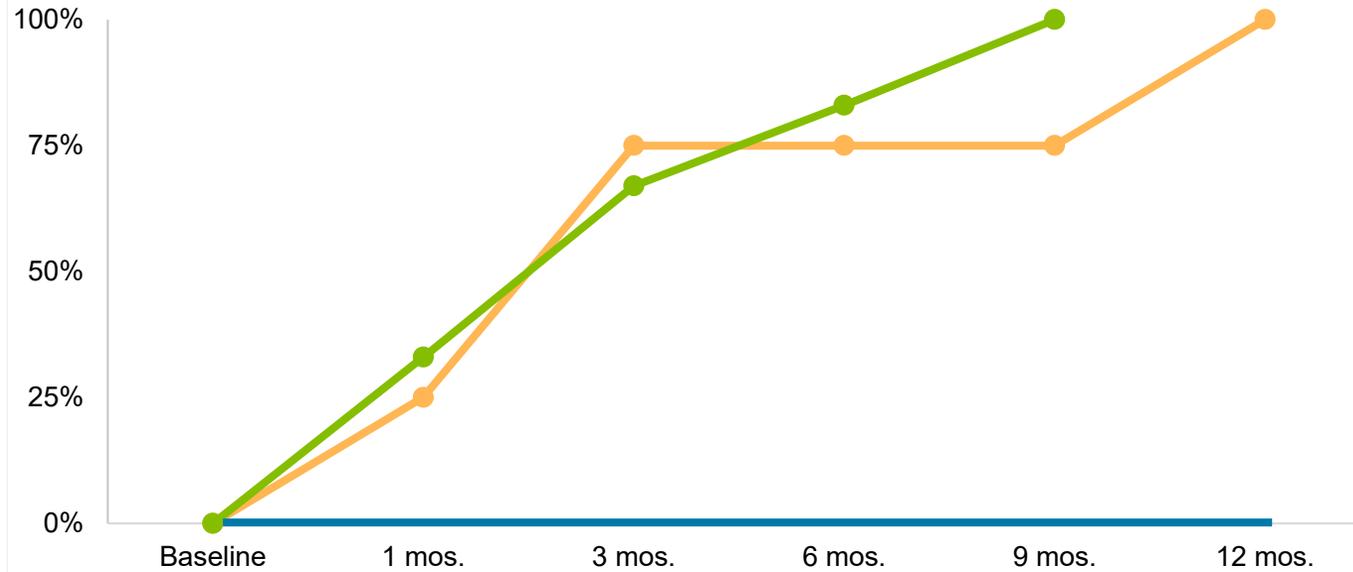
Gross Motor

- ✓ Walked with support
- ✓ Stood while holding on
- ✓ Pulled to standing
- ✓ Sat without support

Enhance mobility and independence, and **reduce the physical burden of caregiving**

High dose TSHA-102 achieved 100% responder result at a 25% faster rate compared to low dose TSHA-102

Responder Rate: Time to Response



| | | | | | |
|---------------------------|-----|-----|-----|------|------|
| Low Dose TSHA-102 | 25% | 75% | 75% | 75% | 100% |
| High Dose TSHA-102 | 33% | 67% | 83% | 100% | |

- **Accelerated functional benefit seen with high dose TSHA-102**
- Early clinical response may increase the likelihood of reversing the disease trajectory and may be predictive of long-term clinical outcomes in Rett syndrome
- Consistent pattern of early gains that are sustained, with new achievements continuing to emerge over time following TSHA-102

Natural History (Developmental Plateau Population)¹ = ~0%

REVEAL caregiver testimonials post-TSHA-102 highlight the impact of functional **developmental milestone gains** on quality of life

“All of our days are better. Her improvements are much beyond anything we had expected or hoped for.”

“She’s **gained multiple words** – ‘no,’ ‘yeah,’ ‘mom,’ ‘dad’ – makes consistent sounds with meaning – and even **says some phrases** – ‘ok, bye’ and ‘no more.’”

“She’s a lot easier to care for. She can **point a lot more deliberately to make choices and show us what she wants**, and she will keep gesturing until we get it for her. And she pushes away what she doesn’t want.”

“**[Standing while holding on]** has been a godsend when it comes to toileting while out in the community because now, I can have her stand and hang on to my arm to toilet or wipe her... and the consistency of keeping her hand down [without constant stereotypes] allows us to practice more with a walker, which has been huge.”

“Her hands are more relaxed, and she tries to grab everything with a **raking grasp**. She can **follow directions** in a snap, like if we say, ‘let’s go,’ she gets up, heads to the door. She’s babbling now, which she didn’t do before, and is definitely trying to tell us something.”

Systematic evaluation criteria in Part A demonstrated a broad functional impact of TSHA-102

Primary Evidence of Efficacy

Developmental Milestones (DM)

Functional gain of \geq one of the **28 DMs defined in the natural history study** assessed via rigorous video-evidenced evaluation

Evaluation Criteria:

- ✓ **Baseline:** Video data/medical history confirming milestone was either never gained or lost sufficiently long ago, such that the likelihood of spontaneous gain/regain is $<6.7\%$ ¹
- ✓ **Post-treatment:** Video documentation of milestone demonstration
- ✓ **Evaluation method:** Determined by multiple independent central raters based on prespecified definitions of achievement for each milestone

Supportive Evidence of Functional Gain

Additional Skills and Improvements

Functional gain or improvement in a core disease characteristic **outside of the 28 natural history defined DMs** measured by validated, structured scales

| Rett-validated Scale: | Purpose: | Data Collection and Evaluation Method: |
|---|--|---|
| Adapted Mullen Scales of Early Learning (MSEL-A) | Assesses expressive and receptive language skills | <ul style="list-style-type: none"> ✓ Video-recorded evaluation conducted in clinic ✓ Centrally rated by multiple independent raters ✓ N=5 patients with available data |
| Revised Motor Behavior Assessment (R-MBA) | Assesses frequency, severity or independence of Rett characteristics | <ul style="list-style-type: none"> ✓ Video-recorded evaluation conducted in clinic ✓ Clinician-reported ✓ N=10 patients with available data |
| Observer-Reported Communication Ability (ORCA) | Assesses communication skills | <ul style="list-style-type: none"> ✓ Structured evaluation conducted in home ✓ Caregiver-reported ✓ N=5 patients with available data |

All reported skills/improvements required: **(a)** baseline data, **(b)** documented gain or improvement for individual item that was sustained through latest assessment

100% of patients (N=10) achieved multiple skills/improvements outside the natural history defined developmental milestones post-TSHA-102

Reinforce broad, consistent functional gains across the core domains impacting activities of daily living

A Total of 165 Additional Skills and Improvements Achieved Across Core Disease Characteristics¹

| MSEL-A = 34 total gains | ORCA = 59 total gains | R-MBA = 72 total improvements |
|--|--|--|
| <ul style="list-style-type: none"> ⊕ Played with sounds ⊕ Vocalized two-syllable sounds ⊕ Recognized body parts (one or more) ⊕ Identified objects ⊕ Understood action words ⊕ Identified the function of objects ⊕ Identified colors (one or more) ⊕ Understood size/length concepts ⊕ Understood comparative concepts ⊕ Followed directions ⊕ Followed two related commands ⊕ Followed three unrelated commands ⊕ Differentiated between objects with increasing levels of abstraction and complexity | <ul style="list-style-type: none"> ⊕ Used gesture to communicate (e.g. point, eye gaze) ⊕ Understood mood (based on facial expression/tone of voice) ⊕ Anticipated a game/activity in response to verbal cue ⊕ Responded when told “no” or “stop” ⊕ Expressed refusal by saying “no” ⊕ Used gesture to say “hello” and “goodbye” ⊕ Used gesture/word to identify a person by name ⊕ Responded to yes/no and open-ended questions ⊕ Took turns during game/activity ⊕ Used AAC device to communicate ⊕ Followed two-step directions part of daily routine ⊕ Expressed frustration when misunderstood ⊕ Communication understood by known individuals | <p>Improved:</p> <ul style="list-style-type: none"> ⊕ Motor skills ⊕ Purposeful hand use ⊕ Frequency of reach for objects/people ⊕ Chewing function ⊕ Speech and verbal communication ⊕ Response to spoken words ⊕ Ability to make choices ⊕ Sustained social interest and eye contact <p>Reduced or Absent:</p> <ul style="list-style-type: none"> ⊕ Hand stereotypies ⊕ Breath holding and hyperventilation ⊕ Seizure episodes ⊕ Choking/gagging episodes ⊕ Dystonia and hypertonia/rigidity ⊕ Bradykinesia ⊕ Truncal rocking ⊕ Bruxism ⊕ Aberrant behavior (e.g. self harming) |



Examples of multi-domain functional gains and improvements impacting activities of daily living observed post-TSHA-102

Based on developmental milestone gains and additional skills/improvements among the 10 treated patients¹



Communication Improvements

Enable **expression of needs**, preferences, emotions, and foster **social connections**

| PRE-TREATMENT | POST-TREATMENT |
|--|---|
| Non-verbal | Uses phrases/sentences with meaning |
| Understood simple words | Complex ideas and engaging in conversations |
| Made choices <10% of time using eye gaze | Makes choices 100% of time by pointing |



Fine Motor Improvements

Reflect self-care skills and purposeful hand use that **enable independence**

| PRE-TREATMENT | POST-TREATMENT |
|-------------------------------------|---|
| Stereotypies 76-100% of time | Stereotypies 1-25% of time |
| No purposeful hand use | Plays with toys and transfers intentionally |
| Required caregiver-assisted feeding | Finger feeds and holds a bottle unpropped |



Gross Motor Improvements

Enhance mobility and independence, and **reduce the physical burden of caregiving**

| PRE-TREATMENT | POST-TREATMENT |
|--|---|
| Most severe dystonia (fixed positional deformity) | No dystonia |
| Non-ambulatory | Walks with support |
| Required caregiver support for positional transfers and to stand | Pulls self to standing position and stands while holding on |



Autonomic / Other Improvements

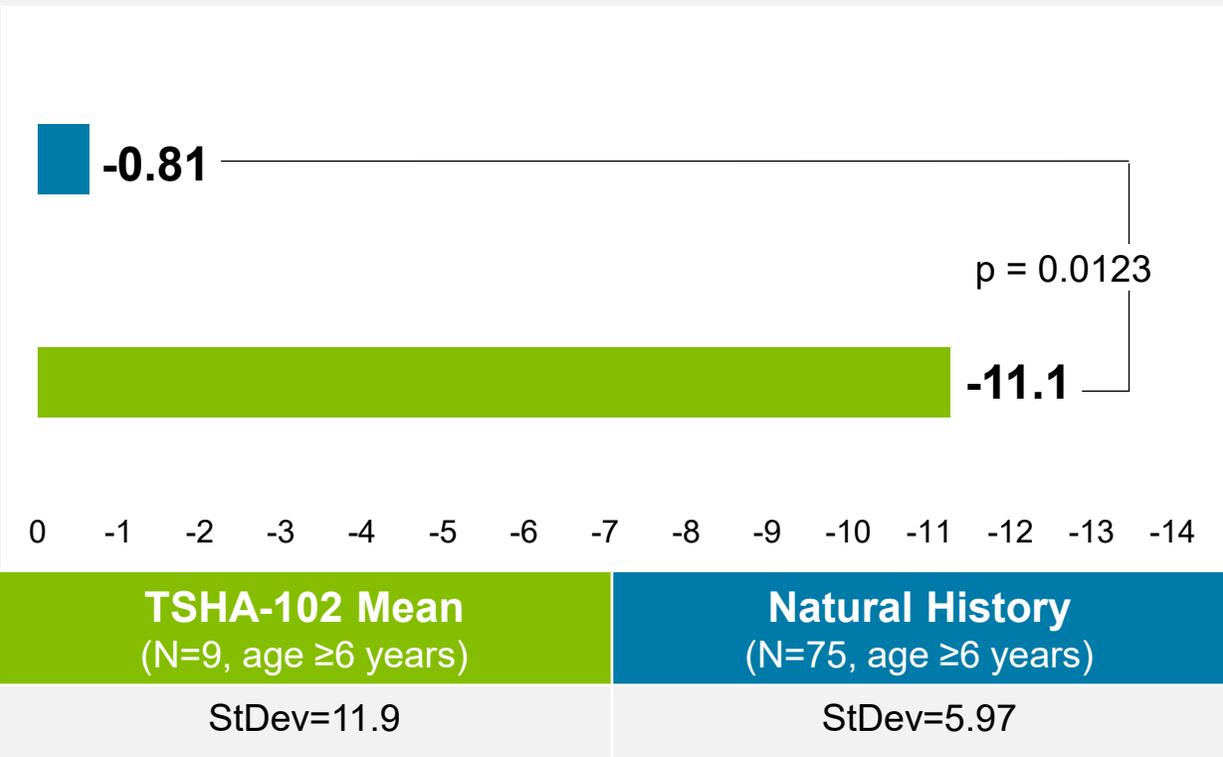
Improve core features of Rett syndrome that have a **meaningful impact on quality of life**

| PRE-TREATMENT | POST-TREATMENT |
|--|---|
| Hyperventilating/breath holding 26-50% of time | Absent or reduced hyperventilating/breath holding |
| Weekly-monthly seizure episodes | Seizure-free ≥6 months |
| Required a g-tube for feeding | Oral feeds |

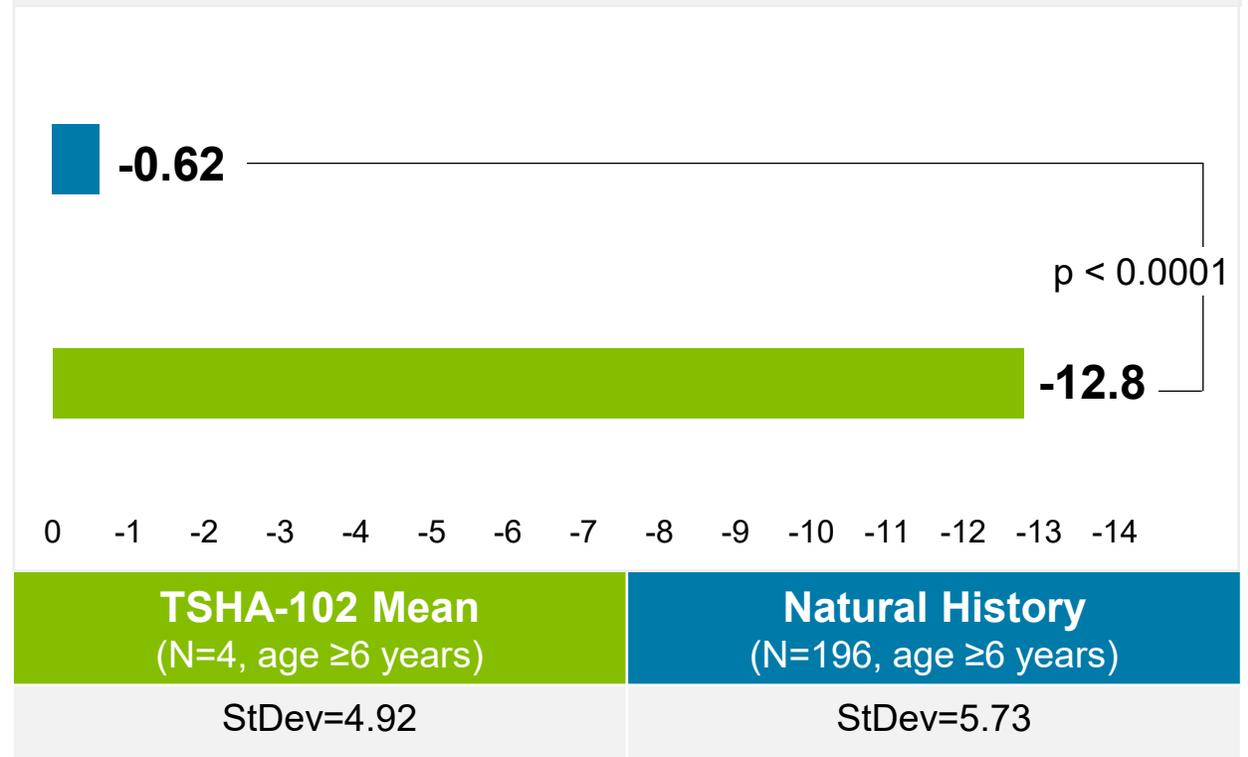
TSHA-102 demonstrated a statistically significant mean R-MBA score improvement compared to natural history at both 6 and 12 months

Lower score = improvement; R-MBA assessed in Rett syndrome NHS at ~6 months and ~12 months¹

R-MBA Score Mean Change From Baseline: 6 Months



R-MBA Score Mean Change From Baseline: 12 Months



TSHA-102 demonstrated early global improvement, with dose-dependent effects deepening over time in CGI-I

Average CGI-I score of **1.0** (*very much improved*) in high dose cohort vs. average CGI-I score of **2.8** in low dose cohort at ≥9 months post-TSHA-102

| | | | | | |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|
| Low Dose: Average CGI-I Score | 3.0 (N=4) | 2.3 (N=4) | 3.0 (N=2) | 3.3 (N=4) | 2.0 (N=2) |
| High Dose: Average CGI-I Score | 2.7 (N=6) | 2.0 (N=5) | 1.0 (N=2) | | |
| Time Post TSHA-102: | 3 months | 6 months | 9 months | 12 months | 18 months |

Consistent dose response observed across key measures at 6 months post-TSHA-102, with the separation between dose cohorts increasing over time

| Endpoint | | Low Dose Cohort | High Dose Cohort | Dose-Dependent Response? |
|--------------------------|---|------------------------------|-----------------------------|--------------------------|
| Developmental Milestones | Responder Rate (%) | 100% by 12 months | 100% by 9 months | ✓ |
| | Responder Rate at 6 Months (%) | 75% | 83% | |
| R-MBA ¹ | Patients with R-MBA Improvement (%) at latest visit | 100% | 100% | ✓ |
| | Mean Score Improvement at 6 Months | -9.8 | -12.2 | |
| | Mean Score Improvement at ≥9 Months | -11.5 | -18.0 | |
| CGI-I | Patients with CGI-I Improvement (%) at latest visit | 75% | 100% | ✓ |
| | Mean CGI-I Score at 6 Months | 2.3 | 2.0 | |
| | Mean CGI-I Score at ≥9 Months | 2.8 | 1.0 | |
| CGI-S | Patients with CGI-S Improvement (%) at latest visit | 25% | 33% | ✓ |

TSHA-102 was generally well tolerated at the low and high dose with no treatment-related SAEs or DLTs

Number of Events Across 12 Pediatric, Adolescent and Adult Patients Dosed in Part A of REVEAL Phase 1/2 Trials

| | Low Dose 5.7x10 ¹⁴ vg (N=4) | | High Dose 1x10 ¹⁵ vg (N=8) | | Total (N=12) | |
|--|--|------|---|------|-----------------|------|
| | N | E | N | E | N | E |
| TEAE Related to TSHA-102: | 4 | [10] | 5 | [14] | 9 | [24] |
| Serious TEAE Unrelated to TSHA-102: | 2 | [7] | 4 | [6] | 6 | [13] |
| Serious TEAE Related to TSHA-102: | 0 | 0 | 0 | 0 | 0 | 0 |

- All TEAEs related to TSHA-102 were mild-moderate in severity, with the most common being elevated liver enzymes* (N=4, 33%), pyrexia (N=3, 25%), lethargy (N=2, 17%), and elevated levels of NfL in CSF (clinically insignificant) (N=2, 17%)
- Expected transaminase elevations observed
 - Majority experience mild elevations <2x ULN
 - Acute excursions (>5x ULN) less common, clinically asymptomatic and steroid treatment-responsive
- Seizures have generally been well controlled following TSHA-102

*Includes the following: hepatic enzyme increased, hypertransaminasemia, transaminases increased-and liver function test increased

Anticipated TSHA-102 program milestones

| | |
|----------------|--|
| Q2 2026 | Complete dosing in REVEAL pivotal trial |
| Q2 2026 | Complete dosing in ASPIRE trial |
| Q2 2026 | Report longer-term safety and efficacy data from Part A of the two REVEAL Phase 1/2 trials |
| Q4 2026 | Complete BLA-enabling PPQ campaign for TSHA-102 |

Well-capitalized through key milestones:

- Cash and cash equivalents of \$276.6 million as of March 31, 2026
- Cash runway expected to fund operating expenses and capital requirements **into 2028**

Appendix



Overview of Clinical Global Impression-Improvement (CGI-I) rating with Rett syndrome-specific anchors¹

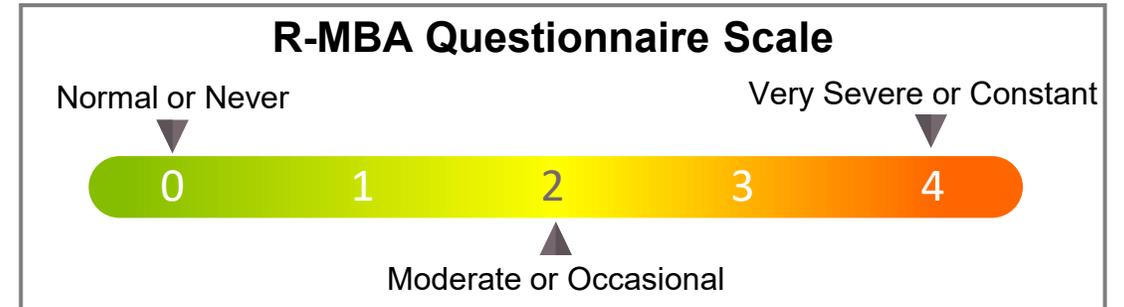
CGI-I: Clinician-rated scale assessing improvement from baseline

- Designed as a global clinical assessment
- Factors considered to determine change included duration, onset, durability of change and the context of sign/symptom change across the Rett syndrome specific domains of the CGI

| Score | CGI-I |
|-------|--------------------|
| 1 | Very much improved |
| 2 | Much improved |
| 3 | Minimally improved |
| 4 | No change |
| 5 | Minimally worse |
| 6 | Much worse |
| 7 | Very much worse |

Overview of Revised Motor Behavior Assessment (R-MBA)

- Clinician-reported assessment that measures the onset of disease regression, growth, motor and communication skills, and disease behaviors for individuals with Rett syndrome¹
- **Associated with developmental milestone acquisition and function impacting quality of life**
- Measures the severity or frequency of a diverse set of symptoms to capture phenotypic variability
- Assessed in Rett syndrome natural history study²



24-item questionnaire across five domains:

1. Motor Dysfunction
2. Functional Skills
3. Social Skills
4. Aberrant Behavior
5. Rett-specific Behavior (i.e. Respiratory)

Compelling preclinical safety, pharmacology, toxicology & biodistribution data supported clinical advancement of TSHA-102 in a broad age range of patients

TSHA-102 improved survival, body weight, motor function and respiratory health across all ages evaluated

in KO mouse models of Rett syndrome, and demonstrated a favorable safety profile in KO and WT mice



TSHA-102 was well tolerated up to 2×10^{15} vg in NHPs and rats



Broad biodistribution to brain and spinal cord
demonstrated in NHPs, rats and mice



WT animals treated with TSHA-102 and vehicle demonstrated similar levels of *MECP2*, supporting the mechanism of miRARE

by minimizing transgene expression in the presence of endogenous *MECP2*



miRARE downregulated *MECP2* transgene and protein expression in response to cellular levels of MeCP2
in human and mouse cell lines



Robust preclinical data for TSHA-102 demonstrated across age ranges

| Species | Animal Model | Age | Study Size | HED (vg/participant) | Route of Administration | Findings: |
|----------------------------|--|-------------------|------------|--|------------------------------------|--|
| Mouse | Wild-type and <i>Mecp2</i> ^{-Y} | Neonates (P2) | n=45 | 2.9x10 ¹⁴ | ICV | <ul style="list-style-type: none"> Improvement in survival rate, overall neurobehavioral function and growth in neonatal KO Rett mice No impact on WT treated mice |
| Mouse | Wild-type and <i>Mecp2</i> ^{-Y} | P7, P14, P28 | n=252 | 2.9x10 ¹⁴ 7.1x10 ¹⁴ 1.4 x 10 ¹⁵ 2.9x10 ¹⁵ | IT | <ul style="list-style-type: none"> Significant improvement in survival, body weight, motor function and respiratory health across treatment ages in KO Rett mice No signs of overexpression in WT treated mice |
| Mouse | Wild-type and <i>Mecp2</i> ^{-Y} | P28 - P35 | n=137 | 2.9x10 ¹⁵ | IT | <ul style="list-style-type: none"> TSHA-102 vector DNA and transgene distribution demonstrated in the brain and spinal cord miniMECP2 RNA detected in brain and spinal cord |
| Rat | Wild-type | 3.4 - 6.1 weeks | n=160 | 2.5x10 ¹⁴ 5.0x10 ¹⁴ 2.0x10 ¹⁵ | IT | <ul style="list-style-type: none"> Favorable safety profile of TSHA-102 Nerve conduction metrics within functional physiological ranges for all groups at all timepoints |
| Non-human primate | Wild-type | Juvenile (~2 yrs) | n=24 | 2.5x10 ¹⁴ 5.0x10 ¹⁴ 2.0x10 ¹⁵ | IT | <ul style="list-style-type: none"> TSHA-102 was well-tolerated with no toxicity observed Biodistribution demonstrated in brain and spinal cord, with low miniMECP2 mRNA expression in the CNS, indicating miRARE mediated transgene expression in the presence of endogenous MECP2 |
| Human and mouse cell lines | 2v6.11, SH-SY5Y, and Neuro-2a | NA | NA | NA | Cell transfection and transduction | <ul style="list-style-type: none"> Evidence that miRARE can control miniMECP2 transgene and protein expression in cell culture models miniMeCP2 protein expression induced by absence of cellular MeCP2 |