

Stoke Therapeutics

NASDAQ: STOK

January 2024

This presentation has been prepared by Stoke Therapeutics, Inc. ("Stoke" or "us") for informational purposes only and not for any other purpose. Nothing contained in this presentation is, or should be construed as, a recommendation, promise or representation by the presenter or Stoke or any officer, director, employee, agent or advisor of Stoke. This presentation does not purport to be all-inclusive or to contain all of the information you may desire. Information provided in this presentation speaks only as of the date hereof. Stoke assumes no obligation to publicly update any information or forward-looking statement, whether written or oral, that may be made from time to time, whether as a result of new information, future developments, subsequent events, or circumstances after the date hereof, or to reflect the occurrence of unanticipated events.

This presentation contains forward-looking statements within the meaning of the "safe harbor" provisions of the Private Securities Litigation Reform Act of 1995, including, but not limited to, the ability of STK-001 to treat the underlying causes of Dravet syndrome and reduce seizures or show improvements in behavior or cognition at the indicated dosing levels or at all; the timing and expected progress of clinical trials, data readouts and presentations for STK-001 and STK-002; the timing of regulatory interactions or the outcomes thereof; our future operating results, financial position and cash runway; and our expectations, plans, aspirations and goals, including those related to the goals of our collaboration with Acadia. Statements including words such as "anticipate," "plan," "will," "continue," "expect," or "ongoing" and statements in the future tense are forward-looking statements. These forward-looking statements involve risks and uncertainties, as well as assumptions, which, if they prove incorrect or do not fully materialize, could cause our results to differ materially from those expressed or implied by such forward-looking statements, including, but not limited to, risks and uncertainties related to: Stoke's ability to advance, obtain regulatory approval of, and ultimately commercialize its produce candidates; the timing of data readouts and interim and final results of preclinical and clinical trials; positive results in a clinical trial may not be replicated in subsequent trials or successes in early stage clinical trials may not be predictive of results in later stage trials; preliminary interim data readouts of ongoing trials may show results that change when such trials are completed; Stoke's ability to fund development activities and achieve development goals into 2025; Stoke's ability to protect its intellectual property; global business, political and macroeconomic conditions, including inflation, interest rate volatility, cybersecurity events, uncertainty with respect to the federal budget, instability in the global banking system and volatile market conditions, and global events, including public health crises, and ongoing geopolitical conflicts, such as the conflicts in Ukraine and the Middle East; and other risks and uncertainties described under the heading "Risk Factors" in Stoke's Annual Report on Form 10-K for the year ended December 31, 2022, its quarterly reports on Form 10-Q and the other documentation Stoke files from time to time with the Securities and Exchange Commission. These forward-looking statements speak only as of the date of this presentation, and we undertake no obligation to revise or update any forward-looking statements to reflect events or circumstances after the date hereof.

By attending or receiving this presentation you acknowledge that you are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date such statements are made; you will be solely responsible for your own assessment of the market and our market position; and that you will conduct your own analysis and be solely responsible for forming your own view of the potential future performance of Stoke.

OUR GOAL:

Upregulate protein expression to treat the underlying cause of severe genetic diseases

Stoke's pipeline offers potential first-in-class disease modifying new medicines
for diseases caused by protein insufficiency

**STK-001 for
Dravet syndrome**

A severe and progressive
genetic epilepsy

**STK-002 for Autosomal
Dominant Optic Atrophy
(ADOA)**

The most common inherited
optic nerve disorder

**Rett syndrome,
Syngap1 syndrome**

Severe and rare genetic
neurodevelopmental diseases

And beyond...

~6,500 additional genes
with TANGO
target signatures

Advantages of Stoke's Approach vs. Other Genetic Approaches



Selectively boosts expression
only in tissues where the
protein is normally expressed



No observed unwanted
off-target genetic effects



Utility across small and large
gene targets and mutations



Does not
alter DNA

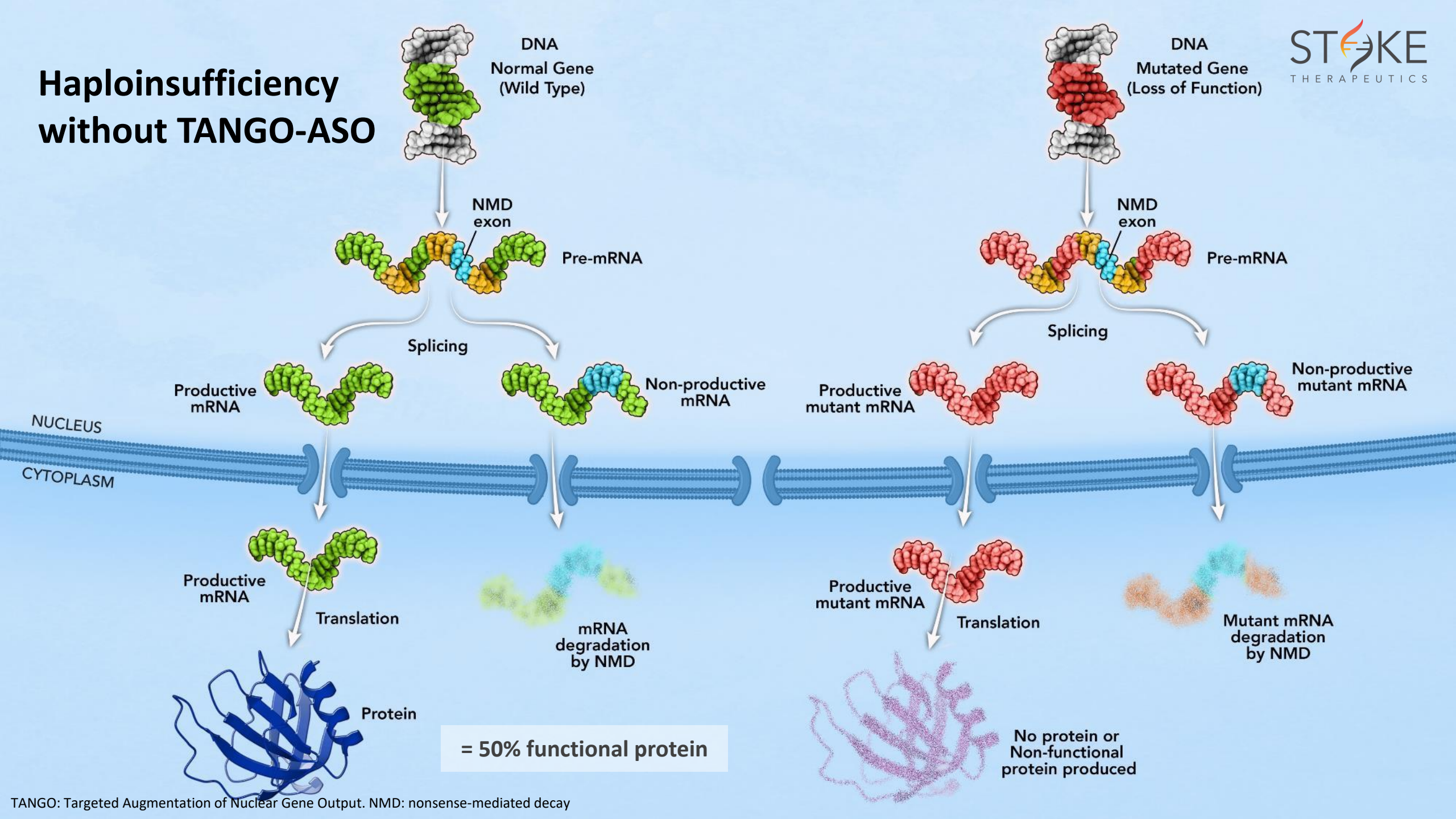


Ability to control dose level
and duration

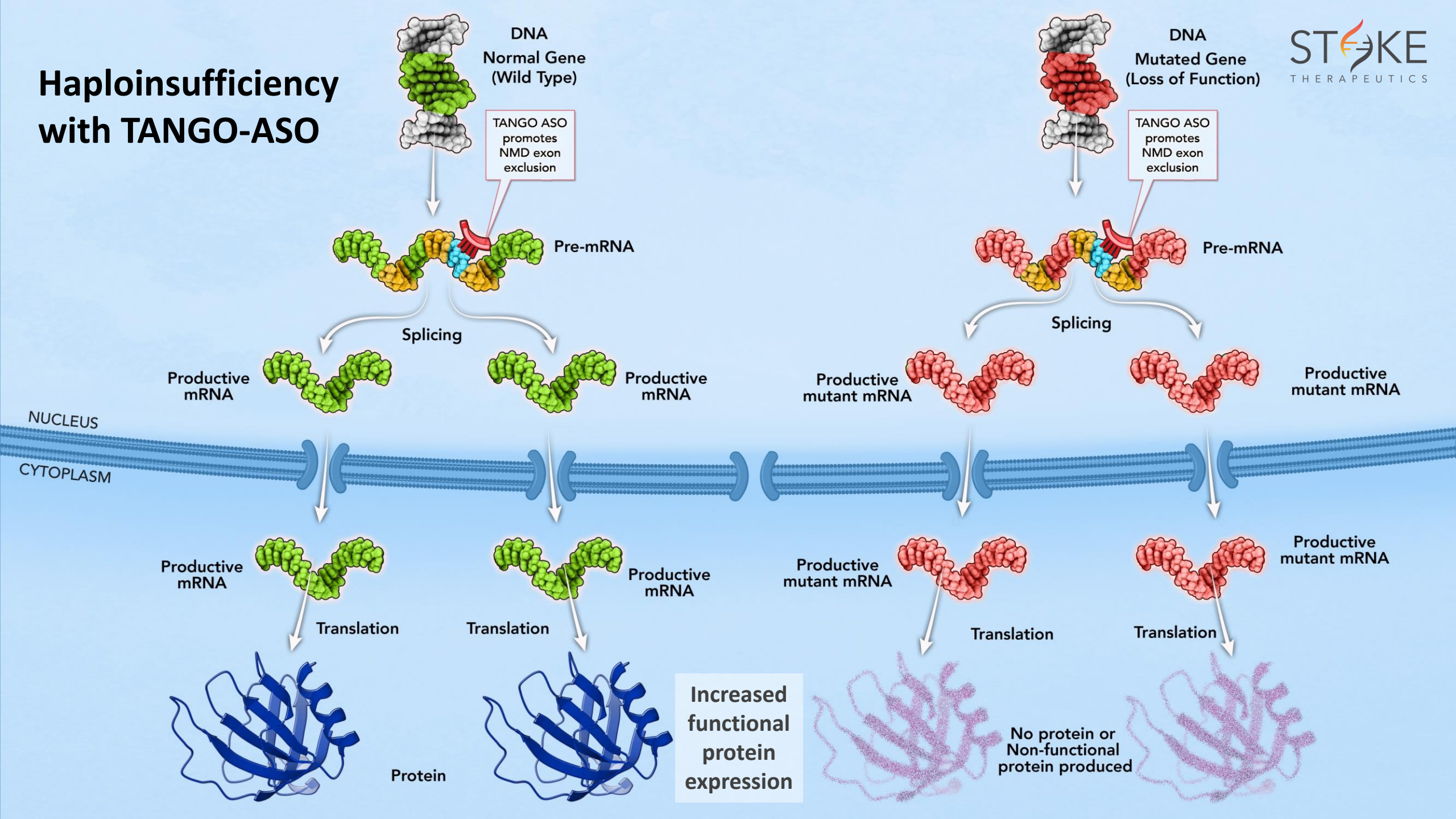


Simple and scalable
manufacturing

Haploinsufficiency without TANGO-ASO



Haploinsufficiency with TANGO-ASO



Dravet Syndrome: A Severe, Progressive Genetic Epilepsy

85%

of cases caused by a
HAPLOINSUFFICIENCY
of the *SCN1A* gene



RESULTING in



50%

Na_v1.1 protein
expression



1 out of 16,000

babies are born with Dravet syndrome

Up to 20%

of children and adolescents with Dravet syndrome die before adulthood, due to SUDEP¹, prolonged seizures, seizure-related accidents or infections



Seizures are not adequately controlled in
90% of people with
Dravet syndrome

~35,000

people affected in the U.S., Canada, Japan, Germany, France and the UK



Dravet syndrome is not concentrated in a particular geographic area or ethnic group

¹ Sudden Unexpected Death in Epilepsy

Sources: Symonds, J. et al., *Early childhood epilepsies: epidemiology, classification, aetiology, and socio-economic determinants*. Brain, 2021. 2018 Health Advances Report; Djémié et al., *Molecular Genetics & Genomic Medicine*, 2016; Lagae et al., *Developmental Medicine & Child Neurology*, 2017; Wu, Y. et al., *Incidence of Dravet Syndrome in a US Population*. Pediatrics, 2015. Nabbout et al., *Orphanet Journal of Rare Diseases*, 2013

The Effects of Dravet Go Beyond “Just Seizures”



Intellectual Disability & Developmental Delays

*“Over time, we have seen **slow, steady decline** in all areas, from speech, to mobility, endurance, loss of energy, tolerance for stimulation, stamina, etc.”*



Language & Speech Disturbances

*“At age 19, [our son] stopped talking, seemingly **losing his capacity for speech** overnight. Most days he is silent, and though he can understand simple conversation he is largely **unable to express himself.**”*



Movement & Balance

*“We're disappointed when [our son's] physical activity is limited and the short walk or visit that we plan with his grandmothers must now be changed to a longer **wheelchair ride.**”*

Sleep Abnormalities

*“Every single night, he has **seizures in his sleep.** In addition to all of the other comorbidities of DS, he's **robbed of the basic human necessity** of getting a good night's sleep. This impacts our entire family, as it is hard to function on **so little sleep day after day.**”*

STK-001 is on Track to be the First Disease-Modifying Treatment for Dravet Syndrome

Multiple medicines available for

Seizure management

Available medicines used to control seizures:

- Acetazolamide
- Benzodiazepines
- Brivaracetam
- Cannabidiol
- Carbamazepine
- Clobazam
- Ethosuximide
- Felbamate
- Fenfluramine
- Lamotrigine
- Levetiracetam
- Mesuximide
- Oxcarbazepine
- Phenytoin
- Rufinamide
- Stiripentol
- Topiramate
- Valproate products
- Zonisamide

Despite these treatments, seizures are not adequately controlled in 90% of patients with Dravet syndrome

No medicines available for

Syndrome management

STK-001

The first potential disease-modifying approach to address the genetic cause of Dravet syndrome



BUTTERFLY Natural History Data (patients 2-18 taking standard anti-seizure medicines)

- ✗ No meaningful improvement in seizure frequency
- ✗ Widening gap in cognition and behavior:
 - Expressive communication
 - Receptive communication
 - Gross motor skills



Data from Phase 1/2a and OLE Clinical Studies

- ✓ Substantial and sustained reductions in seizures with initial treatment (70mg)
 - Median reductions observed among all patients at 3 and at 6 months
 - Sustain reductions with ongoing treatment
- ✓ Substantial improvements in measures of cognition and behavior:
 - Expressive communication
 - Receptive communication
 - Gross motor skills



Safety

Generally well-tolerated in studies to date



PK data

Higher drug exposure in brain leads to greater reductions in seizure frequency

Preclinical Findings Support Clinical Development of STK-001

Single dose restores $\text{Na}_v1.1$ to near-normal levels for >3 months in DS mice



Significantly reduces mortality and seizure frequency in DS mice



Achieves broad distribution and increases $\text{Na}_v1.1$ protein expression in NHPs



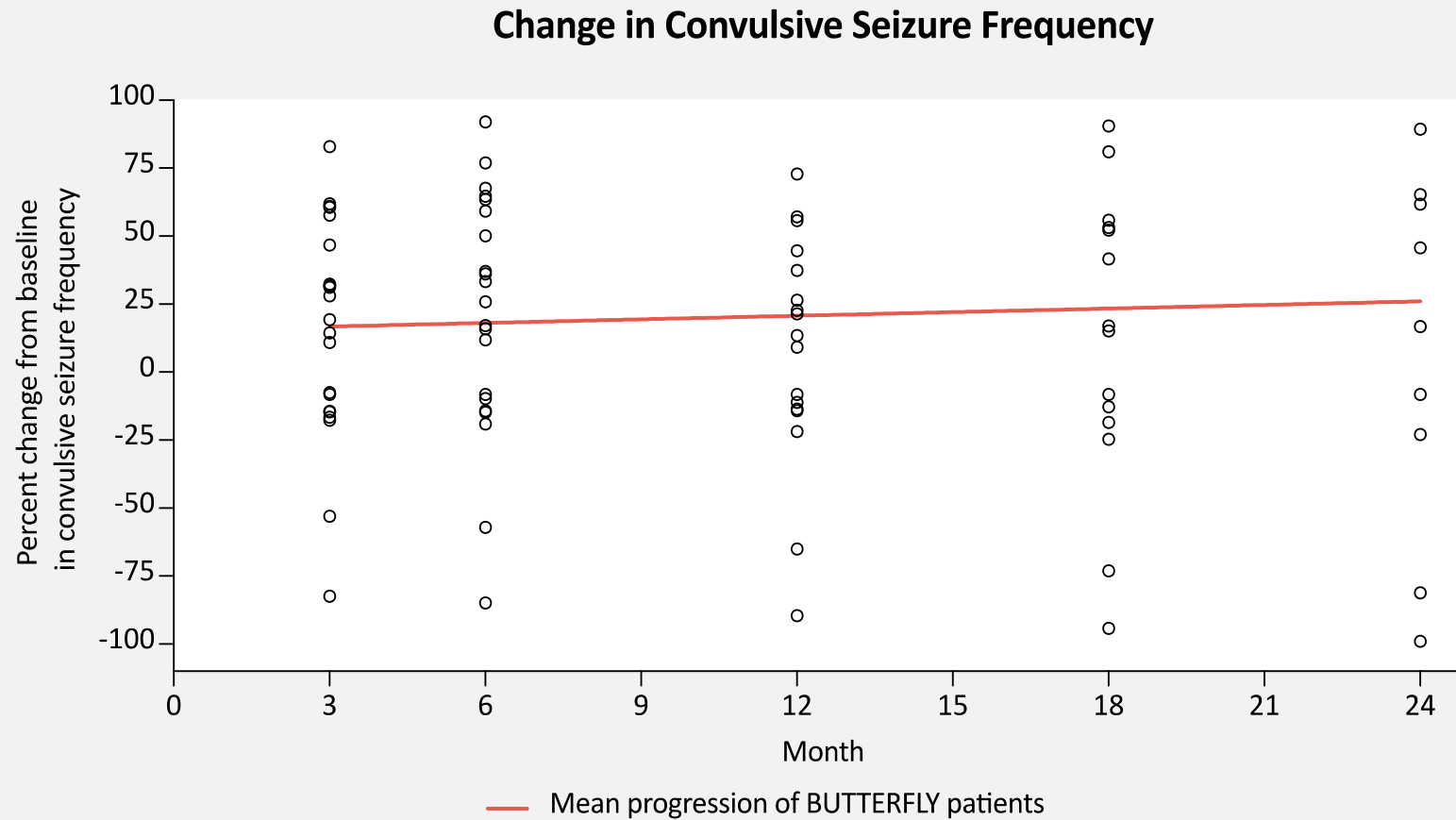
NHP toxicology studies support current clinical dosing



Sources: Targeted Augmentation of Nuclear Gene Output (TANGO) of SCN1A reduces seizures and rescues parvalbumin positive interneuron firing frequency in a mouse model of Dravet syndrome (AES 2020). Wengert ER, Wagley PK, Strohm SM, Reza N, Wenker IC, Gaykema RP, Christiansen A, Liao G, Patel MK. Targeted Augmentation of Nuclear Gene Output (TANGO) of Scn1a rescues parvalbumin interneuron excitability and reduces seizures in a mouse model of Dravet Syndrome. Brain Res. 2022;1775:147743. Stoke data. TANGO oligonucleotides for the treatment of Dravet Syndrome: Safety, biodistribution and pharmacology in the non-human primate (AES 2019)

No Improvement in Convulsive Seizure Frequency Despite Treatment with Standard Anti-Seizure Medicines Over 2 Years

BUTTERFLY natural history study of 2-18 years old patients with Dravet syndrome

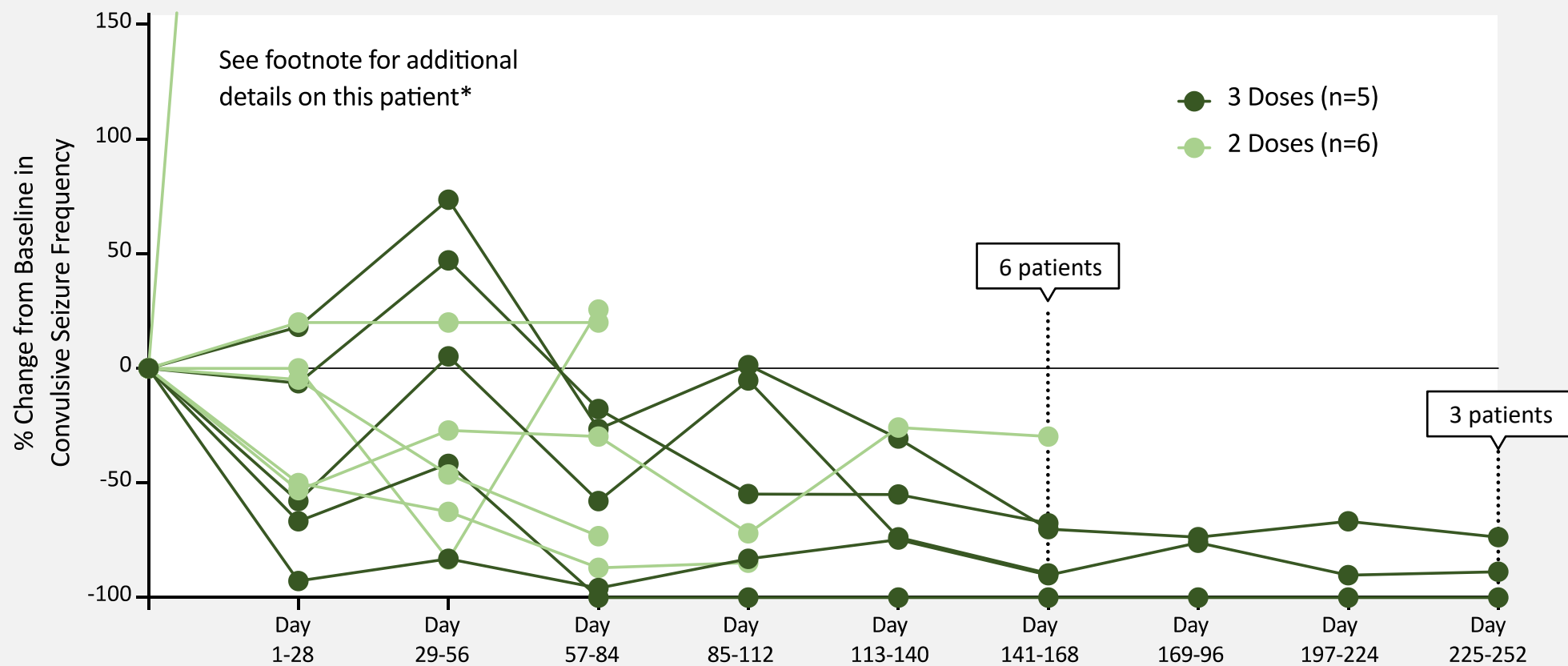


Patients were treated with the best available anti-seizure medicines	
Median baseline convulsive seizure frequency per 28 days (95% CI), n=26	
10.0 (5.50, 15.5)	
Most common ongoing anti-seizure medicines, n (%)	
Clobazam	25 (69.4%)
Fenfluramine	16 (44.4%)
Stiripentol	14 (38.9%)
Valproic Acid	14 (38.9%)
Cannabidiol	12 (33.3%)
Levetiracetam	8 (22.2%)

Substantial Reductions in Seizure Frequency Observed in Patients Treated with 2 or 3 Initial Doses of STK-001 (70mg)

Data as of July 2023. All patients have now completed the study. End of study data anticipated 1Q 2024.

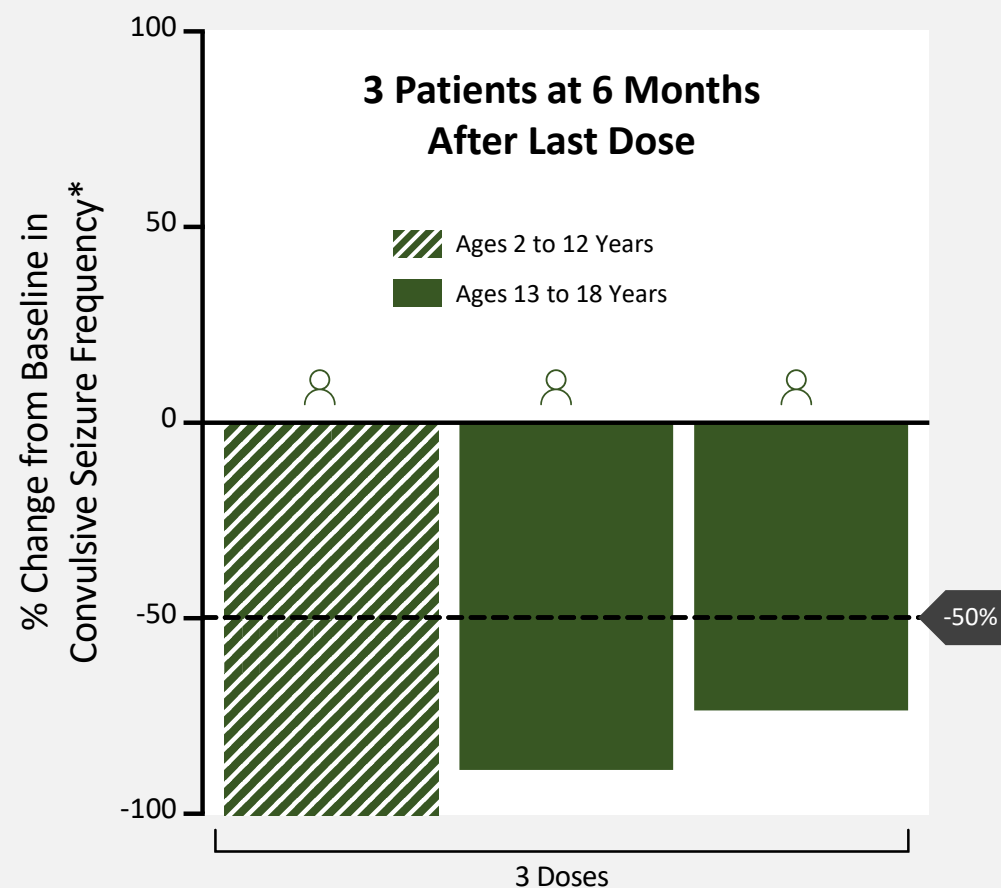
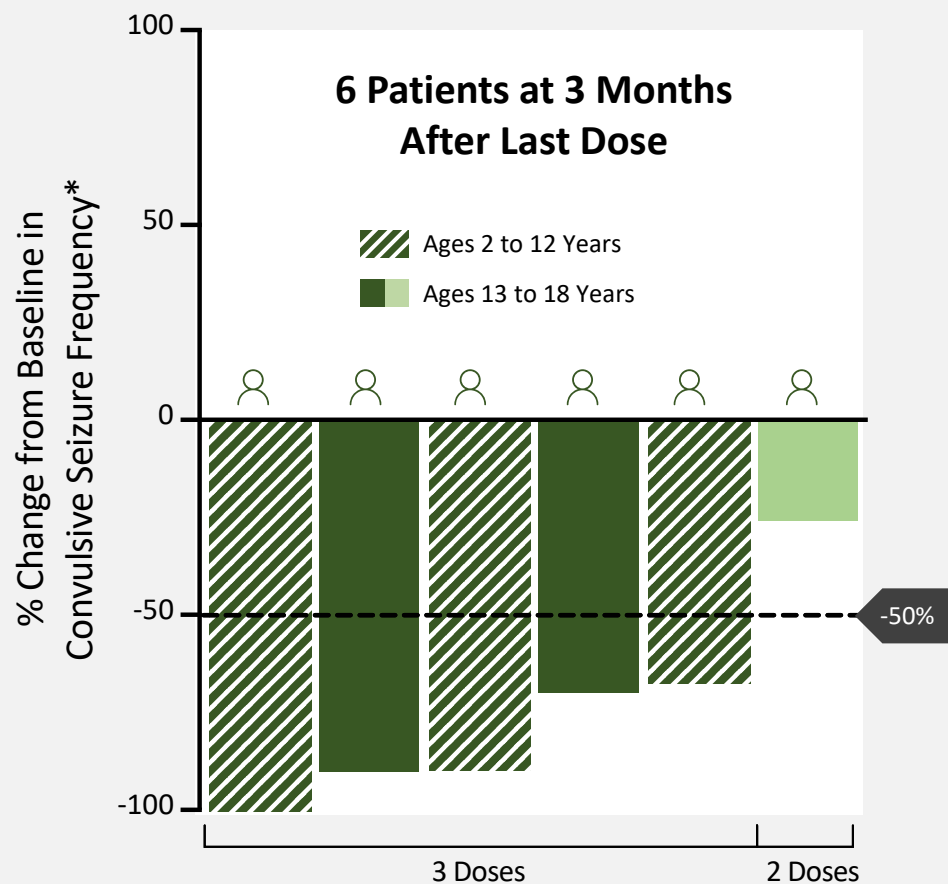
70 mg MAD (ADMIRAL)



*D1-D28: +825%, D29-D56: +626%, D57-D84: +1125%, D85-D112: +717%

Source: MONARCH and ADMIRAL: Phase 1/2a Studies in US and UK Investigating Safety and Drug Exposure of STK-001, an Antisense Oligonucleotide (ASO), in Children and Adolescents with Dravet Syndrome (DS), AES 2023.

Median Reductions in Convulsive Seizure Frequency Observed Among All Patients with 2 or 3 Doses of 70mg at 3 and at 6 Months



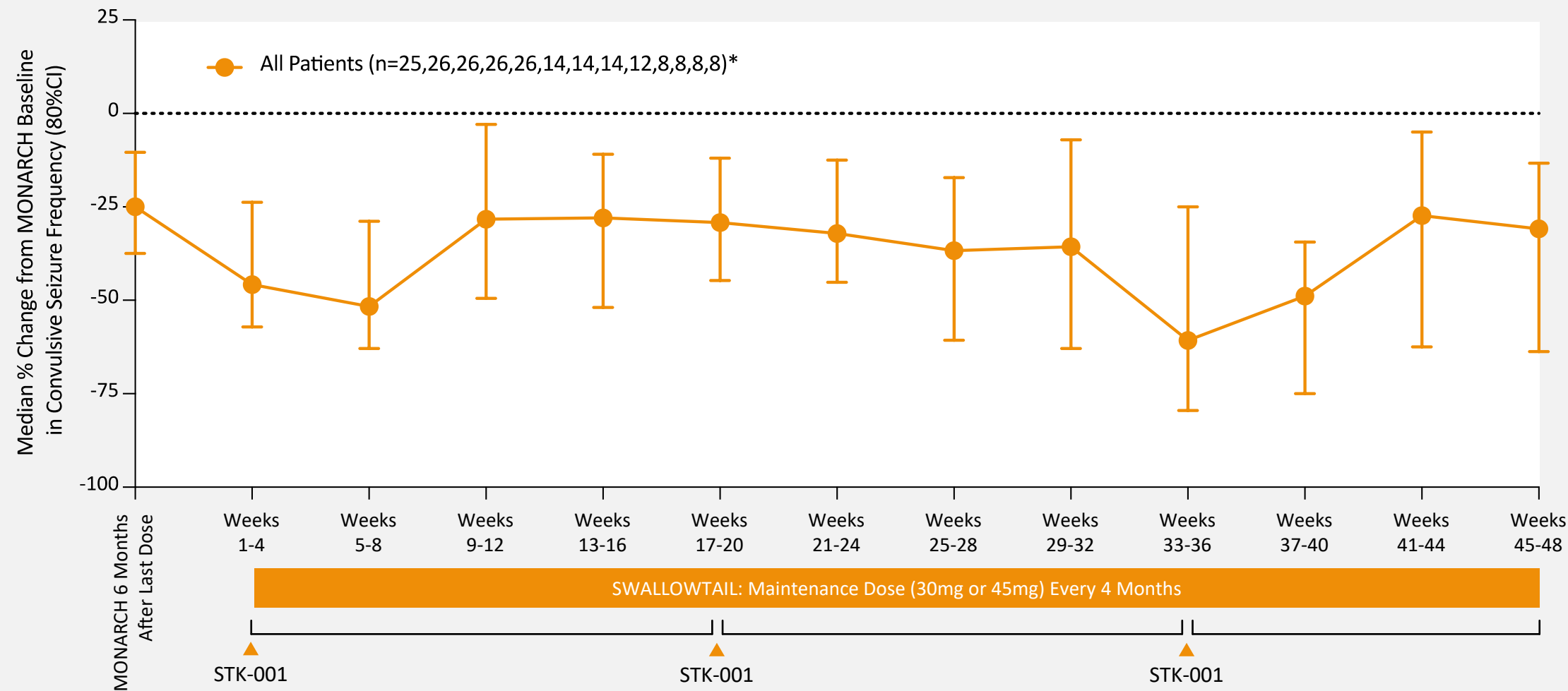
*28-day interval prior to 3 months or 6 months After Last Dose for all patients. 1 patient in 70 mg cohort received Dose 3 late; therefore, interval does not extend fully to 3 and 6 months

After Last Dose for this patient. Data cutoff dates: MONARCH 13APR2023; ADMIRAL 12APR2023 and 21JUN2023

Source: MONARCH and ADMIRAL: Phase 1/2a Studies in US and UK Investigating Safety and Drug Exposure of STK-001, an Antisense Oligonucleotide (ASO), in Children and Adolescents with Dravet Syndrome (DS), AES 2023.

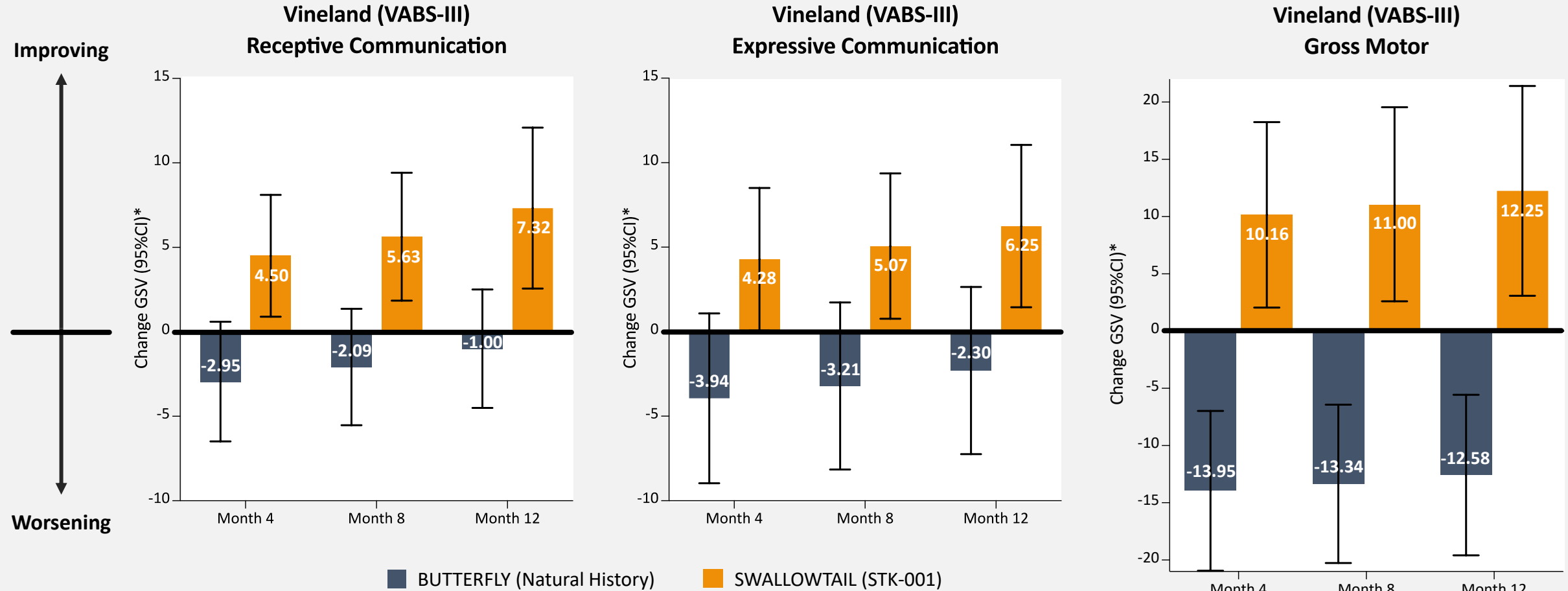
OLE Data: Sustained Reductions in Convulsive Seizure Frequency

Effects observed with ongoing treatment with STK-001 at 30mg, 45mg



*No exclusion for AED modification in MONARCH or SWALLOWTAIL. Data cutoff dates: MONARCH 13APR2023; SWALLOWTAIL 24MAR2023
Source: SWALLOWTAIL and LONGWING: Open-Label Extension (OLE) Studies for Children and Adolescents with Dravet Syndrome (DS) who Previously Participated in a Study of Antisense Oligonucleotide (ASO) STK-001, AES 2023.

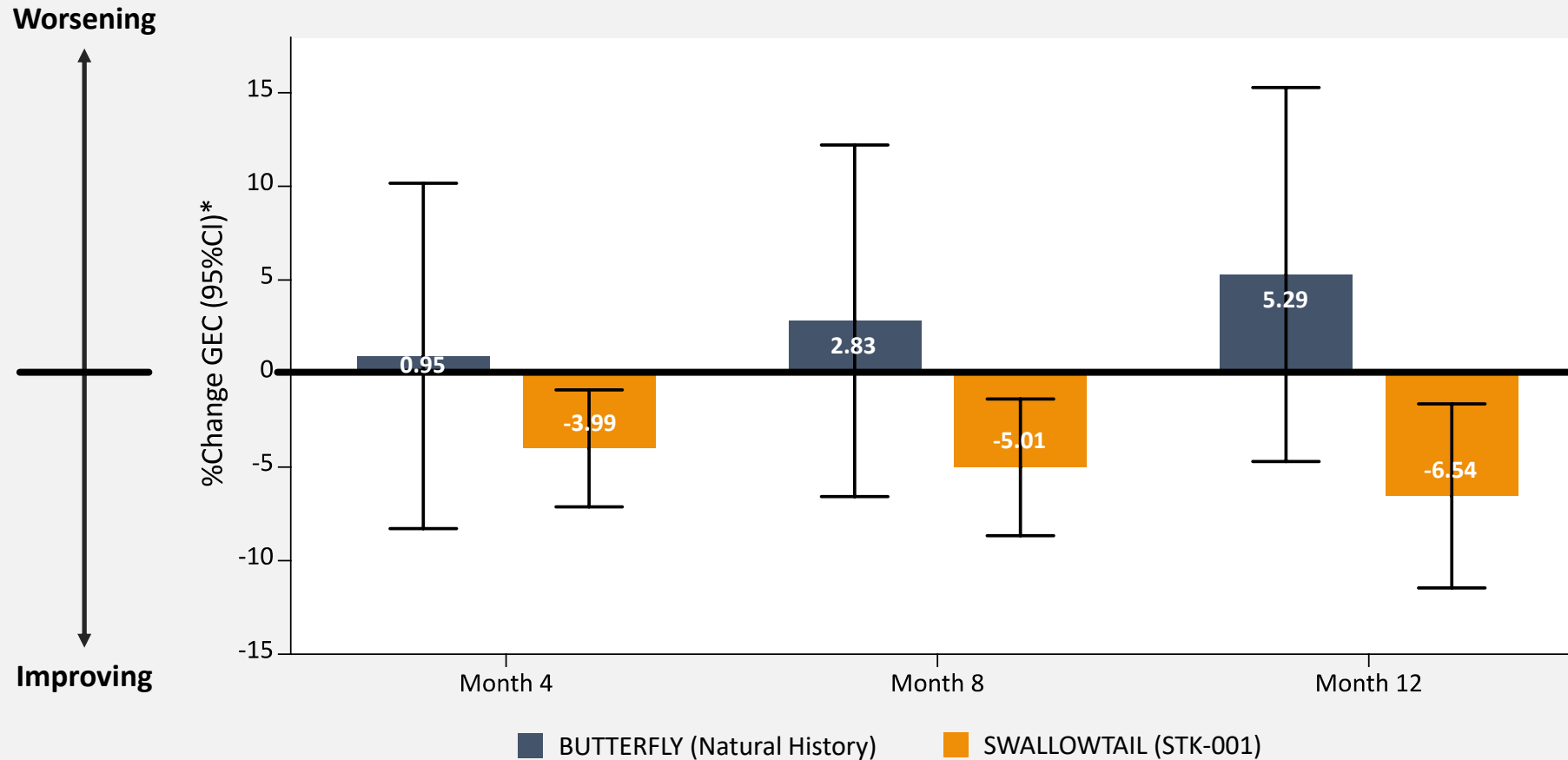
OLE Data (30mg, 45mg): Substantial Improvements in Communication and Gross Motor Skills with Ongoing Treatment



*Mixed model repeated measures with AR(1) covariance structure. Baseline covariates in BUTTERFLY matched to SWALLOWTAIL. Analysis includes patients who received 30 or 45 mg for all doses in SWALLOWTAIL; BUTTERFLY sample size: n=36 at screen, n=27 at Month 12; SWALLOWTAIL sample size: n=24 at screen, n=9 at Week 48 and n=5 at Week 64. GSV = Growth Scale Value. Source: SWALLOWTAIL and LONGWING: Open-Label Extension (OLE) Studies for Children and Adolescents with Dravet Syndrome (DS) who Previously Participated in a Study of Antisense Oligonucleotide (ASO) STK-001, AES 2023.

OLE Data (30mg, 45mg): Substantial Improvements in Executive Function with Ongoing Treatment

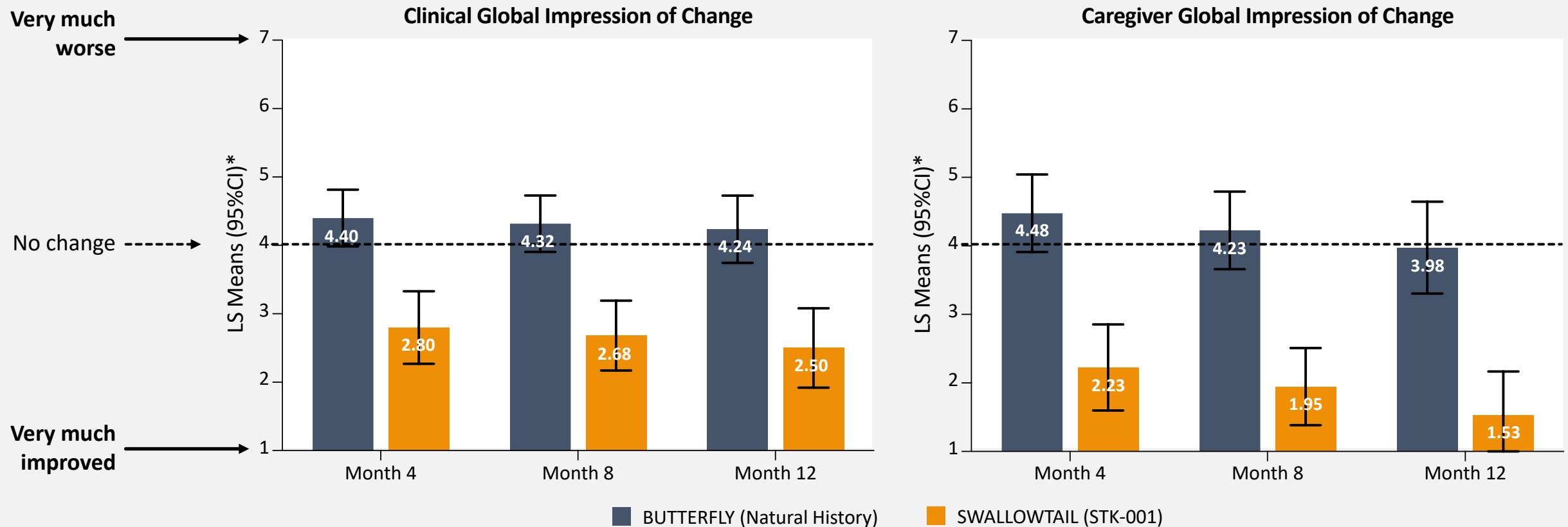
BRIEF-P Global Executive Composite (GEC)



*Mixed model repeated measures with AR(1) covariance structure. Baseline covariates in BUTTERFLY matched to SWALLOWTAIL. Analysis includes all patients who received 30 or 45 mg for all doses in SWALLOWTAIL; BUTTERFLY sample size: n=36 at screen, n=30 at Month 12; SWALLOWTAIL sample size: n=25 at screen, n=9 at Week 48 and n=5 at Week 64. BRIEF-P measures executive function in children, such as the ability to organize thoughts and have working memory. Source: SWALLOWTAIL and LONGWING: Open-Label Extension (OLE) Studies for Children and Adolescents with Dravet Syndrome (DS) who Previously Participated in a Study of Antisense Oligonucleotide (ASO) STK-001, AES 2023.

OLE Data (30mg, 45mg): Substantial Improvements in Overall Condition Compared to BUTTERFLY Natural History Results

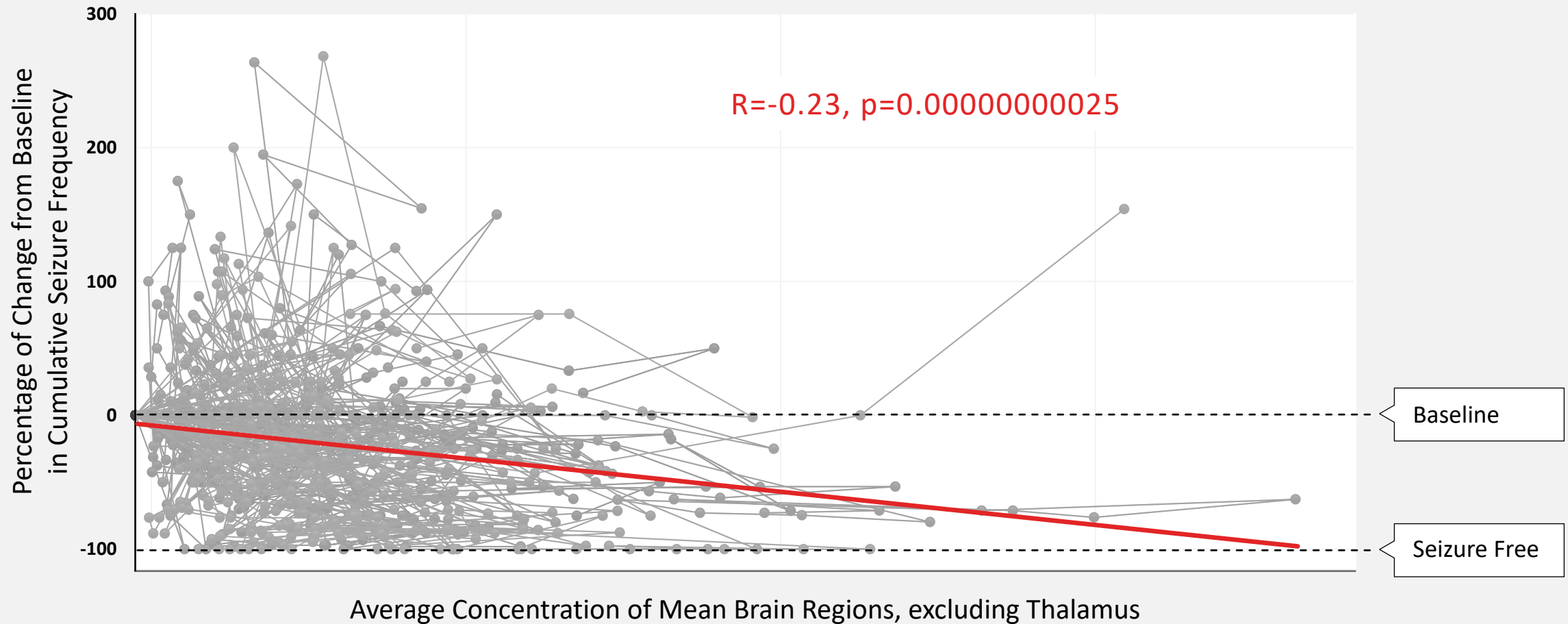
Consistent responses across caregiver and clinician ratings



*Mixed model repeated measures with AR(1) covariance structure. Baseline covariates in BUTTERFLY matched to SWALLOWTAIL. Analysis includes all patients who received 30 or 45 mg for all doses in SWALLOWTAIL. For CGI-C, BUTTERFLY sample size: n=32 at Month 3, n=29 at Month 12; and for CaGI-C, BUTTERFLY sample size: n=27 at Month 3, n=24 at Month 12. For both CGI-C and CaGI-C, SWALLOWTAIL sample size: n=25 at Week 16, n=9 at Week 48 and n=5 at Week 64. CGI and CaGI in BUTTERFLY were adapted for cognition. CGI-C=Clinical Global Impression of Change and CaGI-C=Caregiver Global Impression of Change. Sources: SWALLOWTAIL and LONGWING: Open-Label Extension (OLE) Studies for Children and Adolescents with Dravet Syndrome (DS) who Previously Participated in a Study of Antisense Oligonucleotide (ASO) STK-001, AES 2023.

Higher Brain Exposure Leads to Greater Seizure Reduction

PK Modeling of exposure-seizure relationship



Single & Multiple Doses up to 70mg Were Generally Well Tolerated

MONARCH and ADMIRAL (n=74)

32% (24/74) of patients experienced a treatment-emergent adverse event (TEAE) related to study drug

Most common TEAEs related to study drug were CSF protein elevations, vomiting, and irritability

20% (15/74) had a treatment-emergent serious adverse event (TESAE). The TESAEs experienced by 14 of 15 patients were not considered related to study drug.

- 1 patient experienced Suspected Unexpected Serious Adverse Reactions (SUSARs) that the investigator attributed to STK-001. The patient completed the study.
- An amendment to the ADMIRAL study protocol allowed investigators to decide whether to administer 2 or 3 doses of STK-001 (70mg)

SWALLOWTAIL (n=44) A greater incidence of CSF protein elevations was observed compared to MONARCH & ADMIRAL

CSF protein values >50 mg/dL have been observed after dosing without any associated clinical manifestations

- 35% (26/74) of patients in MONARCH & ADMIRAL
- 64% (28/44) of patients in SWALLOWTAIL: 1 patient discontinued study treatment; 1 patient missed 1 dose

STK-001 Has Potential to Address the Genetic Cause of Dravet Syndrome

Summary of Key Clinical Data from Ongoing Studies

- ✓ Single and multiple doses of 10mg to 70mg were generally well-tolerated
- ✓ Patients treated with 2 or 3 doses of 70mg experience substantial and sustained reductions in convulsive seizures
- ✓ Reductions in seizure frequency were maintained with ongoing treatment at lower doses (30mg, 45mg)
- ✓ Improvements in assessments of cognition and behavior as measured by VABS-III* & BRIEF-P**

*Vineland Adaptive Behavior Scale (VABS-III), an assessment of adaptive behavior which refers to an individual's ability to undertake daily activities appropriate for their age group.

**Behavior Rating Inventory of Executive Function–Preschool Version, an assessment of pediatric executive function.

Autosomal Dominant Optic Atrophy (ADOA): A Severe, Progressive Optic Nerve Disorder

65-90%

of cases caused by mutations in one allele of the *OPA1* gene, most of which lead to a **HAPLOINSUFFICIENCY**



RESULTING in



50%

OPA1 protein expression and disease manifestation

1 out of 30,000

people are affected globally with a higher incidence of ~1 out of 10,000 in Denmark due to a founder effect



Up to

46%

of patients are registered legally blind

80%

of patients are symptomatic by age 10

~18,000

people affected in the U.S., Canada, Japan, Germany, France and the UK



>400

Different *OPA1* mutations reported in ADOA patients

No Approved Disease-Modifying Therapies for ADOA

Healthy Vision



Simulation of Optic Neuropathy



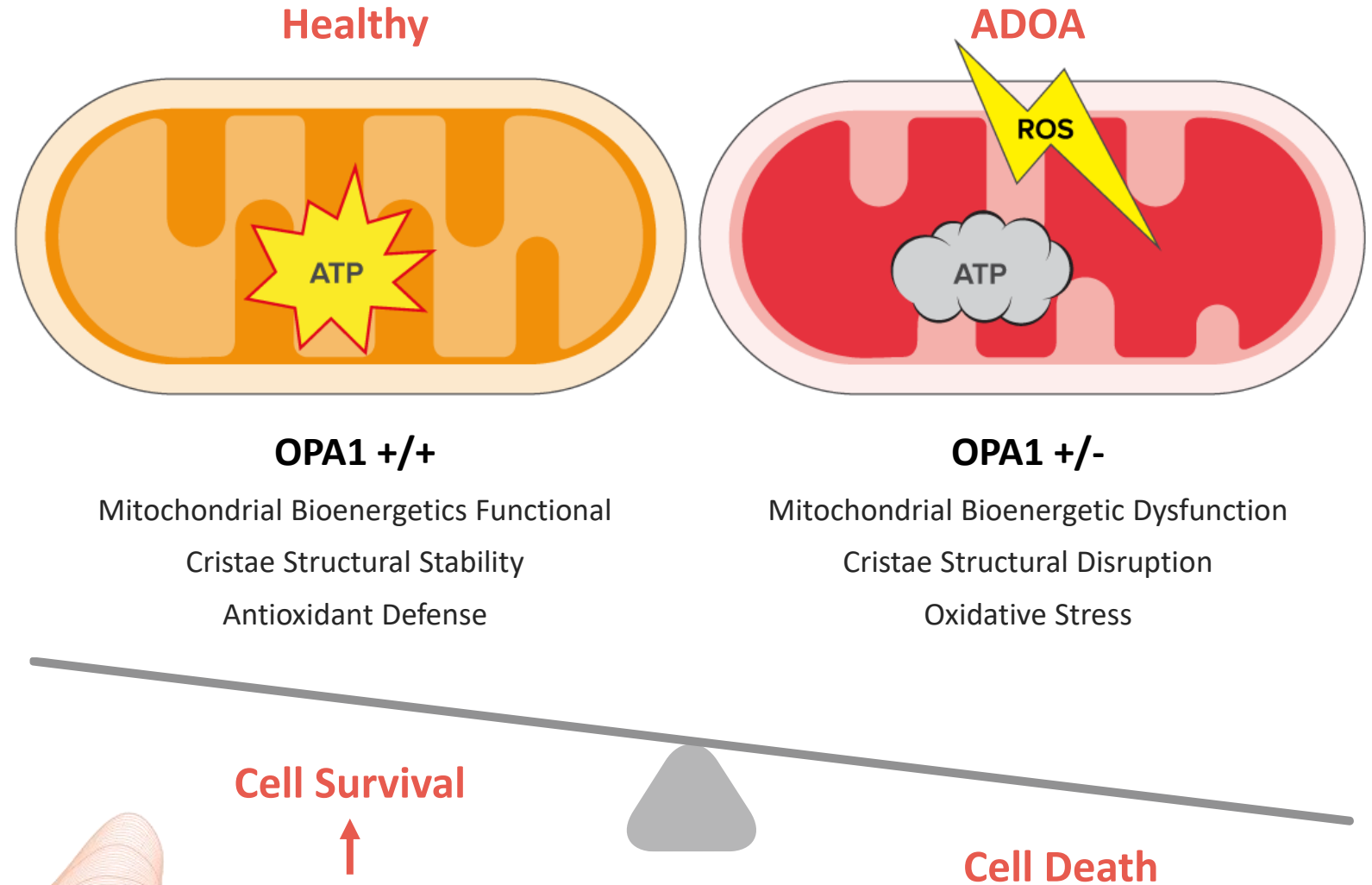
- Most common inherited optic nerve disorder
- Leads to central field defects and reduced color vision in both eyes
- Severity can vary; rate of vision loss difficult to predict
- Supportive services and low-vision aids are offered for patients



Sources: Yu-Wai-Man P et al. *Ophthalmology*, 2010; Yu-Wai-Man P, Chinnery PF. *Ophthalmology*, 2013; Lenaers G, Hamel C, Delettre C, et al. *Orphanet J Rare Dis*, 2012; Chun BY and Rizzo JF III. *Curr Opin Ophthalmol*, 2016
Image of child sourced from ICR, Ophthalmology Center Barcelona. Accessed Jan. 8, 2021 from <https://icrcat.com/en/eye-conditions/leber-hereditary-optic-neuropathy/>
Credit: Lhon Eye Society Sweden. Image shown depicts Leber Hereditary Optic Neuropathy, which presents visual effects similar to ADOA.

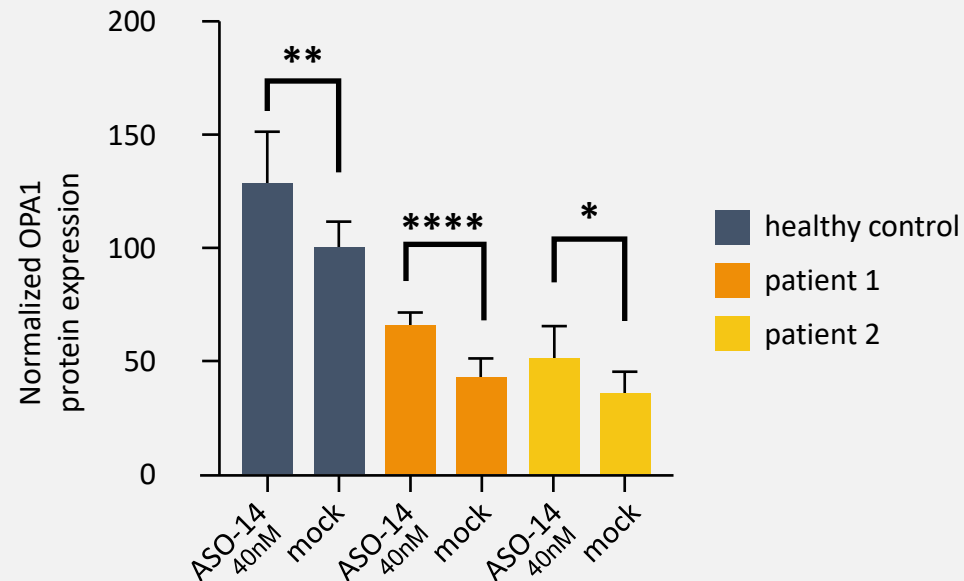
OPA1 is Critical for Normal Mitochondrial Function and Cellular Metabolism

- Retinal ganglion cells have very high energy (ATP) requirements
- Impaired mitochondrial function leads to cell death
- OPA1 is critical for mitochondrial function and energy production

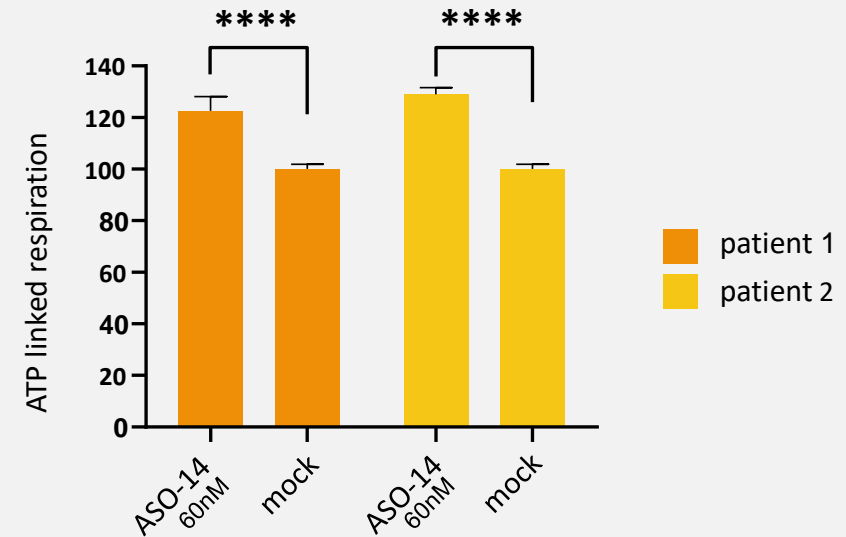


TANGO ASO Increases OPA1 Protein and ATP Linked Mitochondrial Respiration in ADOA Patient Cells

ASO treatment increased OPA1 protein levels in OPA1 deficient ADOA patient cells



ASO treatment increased ATP linked respiration in OPA1 deficient ADOA patient cells

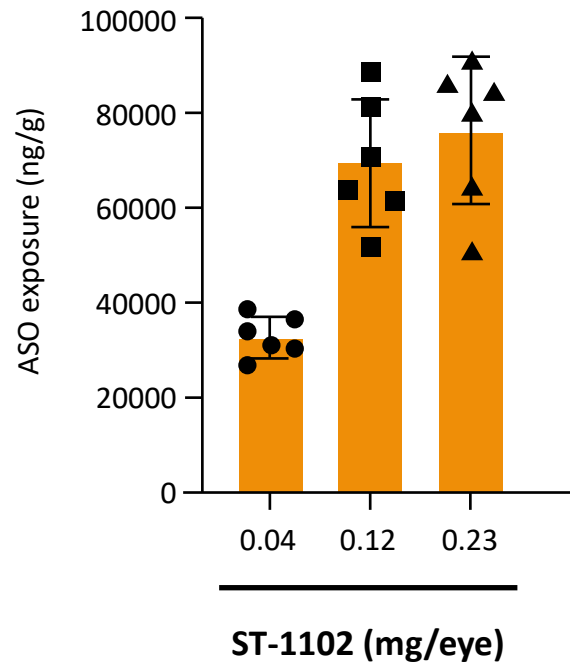


Source (left graph): Stoke data

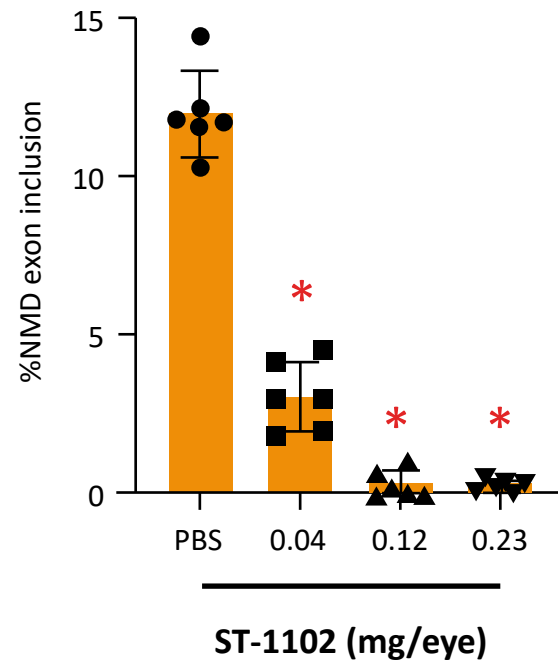
Source (right graph): Venkatesh A, et al. Antisense oligonucleotide mediated increase in OPA1 improves mitochondrial function in fibroblasts derived from patients with autosomal dominant optic atrophy (ADOA). Presented at The Association for Research in Vision and Ophthalmology; May 1-7, 2021.

TANGO ASO Demonstrates Dose-Dependent OPA1 Protein Increases in Rabbit Retina

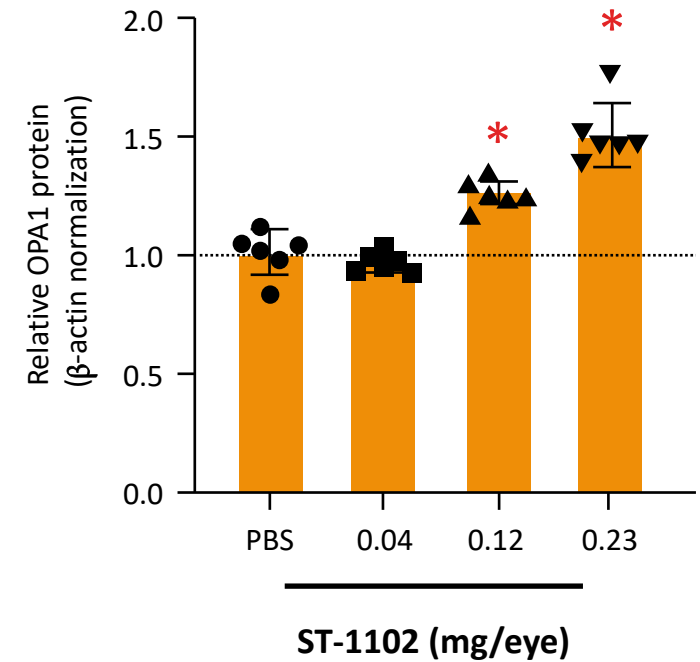
ASO exposure in retina
Day 29



Target engagement
Day 29

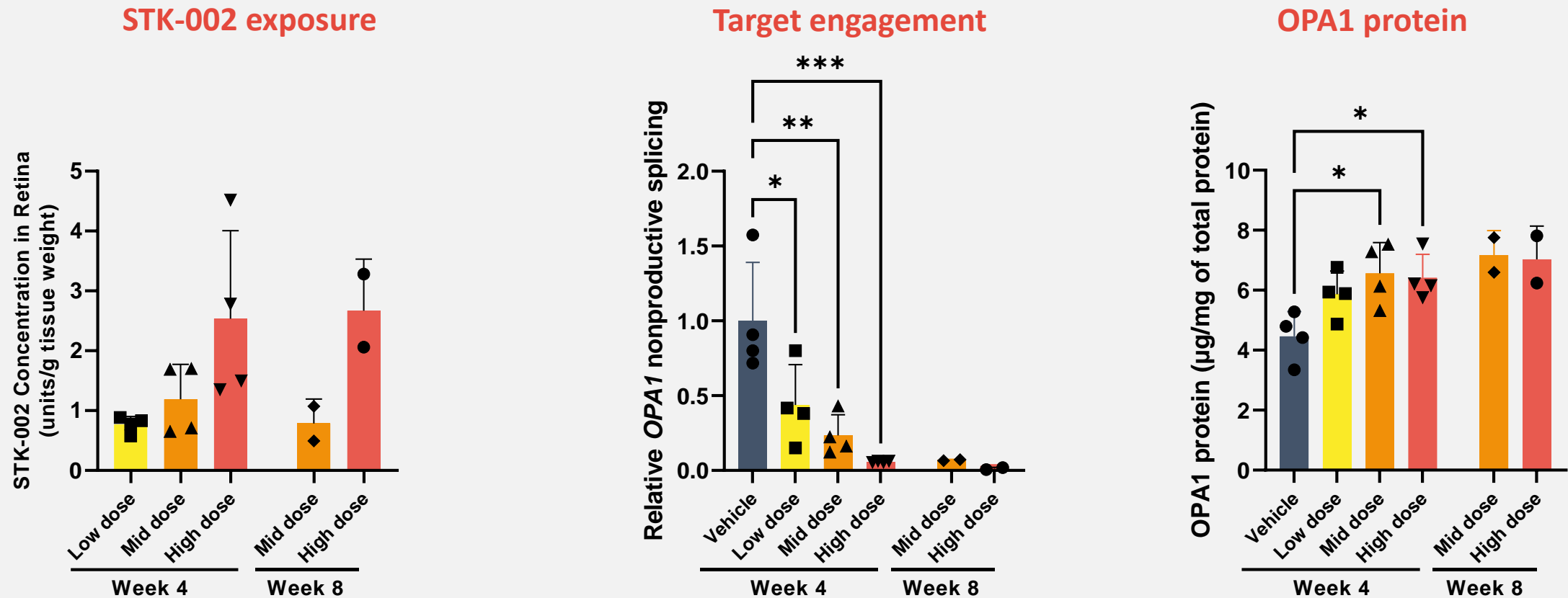


OPA1 protein
Day 29



* $P < 0.0005$ by one-way ANOVA compared to PBS group

Dose-Related Target Engagement and OPA1 Protein Upregulation in Retinal Tissue of NHPs following IVT Administration of STK-002



NHP: Non-human primates

IVT: Intravitreal

Source: Venkatesh A, et al. STK-002, an Antisense Oligonucleotide (ASO) for the Treatment of Autosomal Dominant Optic Atrophy (ADOA), is Taken Up by Retinal Ganglion Cells (RGC) and Upregulates OPA-1 Protein Expression After Intravitreal Administration to Non-human Primates (NHPs). ASGCT; May 16-19, 2022.

Preclinical Findings Support Clinical Development of STK-002

Summary of Key Preclinical Data

Increase OPA1 protein and ATP linked respiration in ADOA patient cells



Result in dose-dependent increases in OPA1 protein expression in rabbit retina



Were well tolerated for up to 29 days after intravitreal injection in rabbit



Dose-related increase in OPA1 protein expression was observed in NHP RGCs



Phase 1 study (OSPNEY) of STK-002 in the UK expected to start in 2024

OSPNEY is a study of children and adults ages 6 to 55 who have an established diagnosis of ADOA and have evidence of a genetic mutation in the *OPA1* gene

Our Pipeline of First-in-Class Disease Modifying Potential Medicines



PROGRAM	TARGET	DISCOVERY & PRECLINICAL	PHASE 1/2	PHASE 3	PARTNER
Central Nervous System					
Dravet Syndrome	SCN1A	STK-001			100% Stoke Global
SYNGAP1 Syndrome	SYNGAP1				Stoke : Acadia 50:50
Rett Syndrome	MECP2				Acadia Worldwide License
Undisclosed	Undisclosed				Acadia Worldwide License
Ophthalmology					
ADOA	OPA1	STK-002			100% Stoke Global

ADOA: Autosomal dominant optic atrophy

Rett Syndrome: A Severe, Debilitating Neurological Disorder

~33%

of cases caused
by hypomorphic
mutations of the *MECP2*
gene¹

RESULTING in



Partial loss of
function of the
MeCP2 protein



1 out of **10,000** to **15,000** females are born with Rett syndrome²

Period of rapid
decline typically
begins between

6 to 18
months⁴

Symptoms include³:

- **Loss of purposeful hand use**
- **Involuntary hand movements such as handwringing**
- **Loss of speech**
- **Loss of mobility or gait disturbances**



60-80% of patients have **epilepsy**⁴

Note: All seizure types have been reported in Rett syndrome. Complex partial and generalized tonic-clonic are the most common
Sources: ¹ RettBase (<http://mecp2.chw.edu.au/>); GnomAD (<https://gnomad.broadinstitute.org/>); NOMAD; ² National Institutes of Health – National Institute of Neurological Disorders and Stroke; ³ International Rett Syndrome Foundation; ⁴ Operta et al., Brain Behav 2019

SYNGAP1: A Severe Intellectual Disability / Developmental and Epileptic Encephalopathy (ID/DEE)

>80%

of cases caused by a
HAPLOINSUFFICIENCY
of the *SYNGAP1* gene¹

RESULTING in

50%

SynGAP protein
expression



1-2 out of **100,000** children are born with SYNGAP1-ID/DEE



1-2%

of all **intellectual disability**
cases²

100%

of patients have **developmental delay**
or **intellectual disability**³



84%

of patients have
generalized epilepsy³

~50%

of patients have **autism and other**
behavioral abnormalities³

Sources: ¹ Parker et al., *American Journal of Medical Genetics*, 2015; Jimenez-Gomez et al., *Journal of Neurodevelopmental Disorders*, 2019; ² SYNGAP1 Resource Guide, Second Edition; An Overview of SYNGAP1 Basic Biology and Clinical Description. Bridge the Gap SYNGAP (now SYNGAP1 Foundation); SynGAP Research Fund; ³ SYNGAP1-Related Intellectual Disability: https://www.ncbi.nlm.nih.gov/books/NBK537721/#_syngap1-id_Clinical_Characteristics_

2024 Summary of Priorities



Advance STK-001 for Dravet Syndrome to Pivotal

- Q1 Data Readout
- Pending data, request Phase 3 planning meetings with regulators



Advance STK-002 for ADOA

- Initiate Phase 1 study (OSPREGY) in 2024



Develop & Expand Pipeline

- Execute on collaboration with Acadia to advance 3 neurodevelopmental programs including Rett syndrome and Syngap1 programs
- Expand TANGO ASOs as a first-in-class disease-modifying approach for additional genetic diseases

Current Liquidity Anticipated to Fund Operations to the End of 2025

\$214.7M in Cash, Cash Equivalents, and Marketable Securities as of 9/30/23



Copyright Stoke Therapeutics, Inc.
Not for publication or distribution