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HARBOR™

Investor & Analyst Event Series – Volume 8

TRANSFORMING MYOTONIC DYSTROPHY

Global Phase 3 HARBOR Trial & Long-term MARINA-OLE™ Data

March 4, 2024

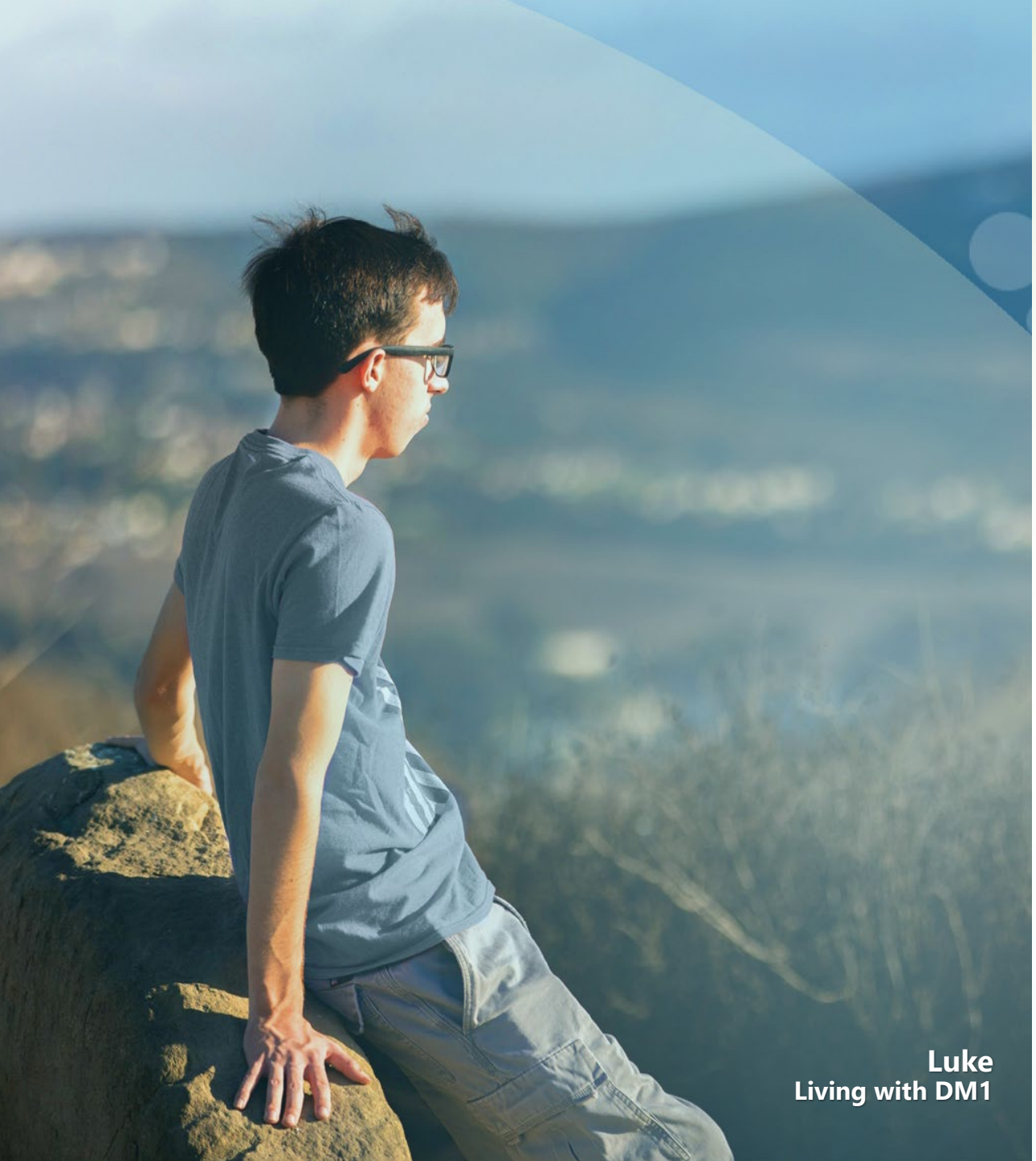
NASDAQ: RNA | avidity bio.com




Forward-Looking Statements

We caution the reader that this presentation contains forward-looking statements that involve substantial risks and uncertainties. All statements other than statements of historical fact contained in this presentation are forward-looking statements. Forward-looking statements include, but are not limited to, statements regarding: our future results of operations; our business strategy; the anticipated timing, design and conduct of our ongoing clinical trials; the timing of release of data from our ongoing clinical programs; the characterization of data and results from clinical trials, and conclusions drawn therefrom; research and development plans; plans and projected timelines for AOC 1001, AOC 1020 and AOC 1044; safety and tolerability profiles of our product candidates; the potential of the AOC platform; the ability of our product candidates to treat rare diseases; timing and likelihood of success; prospective products; product approvals; plans and objectives of management for future operations; and future results of anticipated product development efforts. In some cases, the reader can identify forward-looking statements by terms such as "may," "will," "should," "expect," "plan," "anticipate," "could," "intend," "target," "project," "contemplates," "believes," "estimates," "predicts," "potential" or "continue" or the negative of these terms or other similar expressions. The inclusion of forward-looking statements should not be regarded as a representation by Avidity that any of our plans will be achieved. Actual results may differ from those set forth in this presentation due to the risks and uncertainties inherent in our business and beyond our control, including, without limitation: we may not be able to fully resolve the partial clinical hold related to AOC 1001, which may result in delays in the clinical development of AOC 1001; additional requests for data in connection with the partial clinical hold or otherwise may result in significant additional expense and timing delays; data delivered to the FDA in connection with the partial clinical hold may not be satisfactory to the FDA; additional participant data related to AOC 1001 that continues to become available may be inconsistent with the data produced as of the most recent date cutoff, and further analysis of existing data and analysis of new data may lead to conclusions different from those established as of such date cutoff; unexpected adverse side effects or inadequate efficacy of our product candidates may delay or limit their development, regulatory approval and/or commercialization, or may result in additional clinical holds, recalls or product liability claims; we are early in our development efforts; our approach to the discovery and development of product candidates based on our AOC platform is unproven, and we do not know whether we will be able to develop any products of commercial value; the success of our preclinical studies and clinical trials for our product candidates; the results of early clinical trials are not necessarily predictive of future results; potential delays in the commencement, enrollment and completion of clinical trials; our dependence on third parties in connection with preclinical and clinical testing and product manufacturing; we may not realize the expected benefits of our collaborations with third parties, our existing collaborations may terminate earlier than expected or we may not be able to form new collaborations; regulatory developments in the United States and foreign countries, including acceptance of INDs and similar foreign regulatory submissions and our proposed design of future clinical trials; Fast Track Designation by the FDA may not lead to a faster development or regulatory review or approval process; our ability to obtain and maintain intellectual property protection for our product candidates and proprietary technologies; we may exhaust our capital resources sooner than we expect and fail to raise additional needed funds; and other risks described in our filings with the SEC, including under the heading "Risk Factors" in our Form 10-K for the year ended December 31, 2023, filed with the SEC on February 28, 2024, and in subsequent filings with the SEC. The reader is cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date hereof. Except as required by applicable law, we do not plan to publicly update or revise any forward-looking statements contained herein, whether as a result of any new information, future events, changed circumstances or otherwise. All forward-looking statements are qualified in their entirety by this cautionary statement, which is made under the safe harbor provisions of the Private Securities Litigation Reform Act of 1995.

This presentation also contains estimates and other statistical data made by independent parties and by us relating to market size and growth and other data about our industry. This data involves a number of assumptions and limitations, and the reader is cautioned not to give undue weight to such estimates. In addition, projections, assumptions, and estimates of our future performance and the future performance of the markets in which we operate are necessarily subject to a high degree of uncertainty and risk. These and other factors could cause results to differ materially from those expressed in the estimates made by the independent parties and by us. This presentation shall not constitute an offer to sell or the solicitation of an offer to buy securities, nor shall there be any sale of securities in any state or jurisdiction in which such offer, solicitation or sale would be unlawful prior to registration or qualification under the securities laws of any such state or jurisdiction.



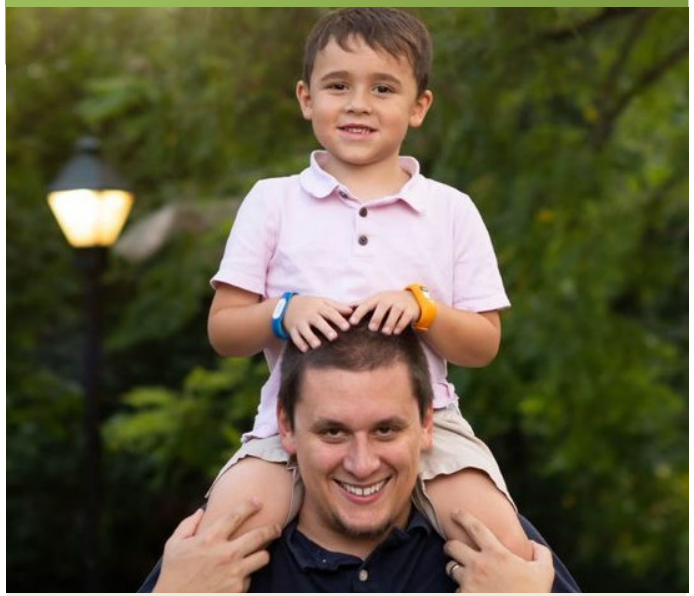
OUR VISION

To profoundly improve people's lives by revolutionizing the delivery of RNA therapeutics

Delivering in 2024: 3 Data Readouts in 3 Clinical Programs in 3 Rare Diseases

AOC 1044 in **DMD44**

~900 patients in U.S.



Anticipate Phase 1/2 EXPLORE44 patient data in 2H 2024

AOC 1020 in **FSHD**

~16,000-38,000 patients in U.S.

Anticipate Phase 1/2 FORTITUDE preliminary data in ~half of participants in Q2 2024

AOC 1001 in **DM1**

>40,000 patients in U.S.

MARINA-OLE™ data in Q1 2024

On track for initiation of global Phase 3 HARBOR trial Q2 2024

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Goals for the Day

Share global Phase 3 HARBOR™ trial design

- Regulatory agreement on study design
- On-track to initiate in Q2 2024

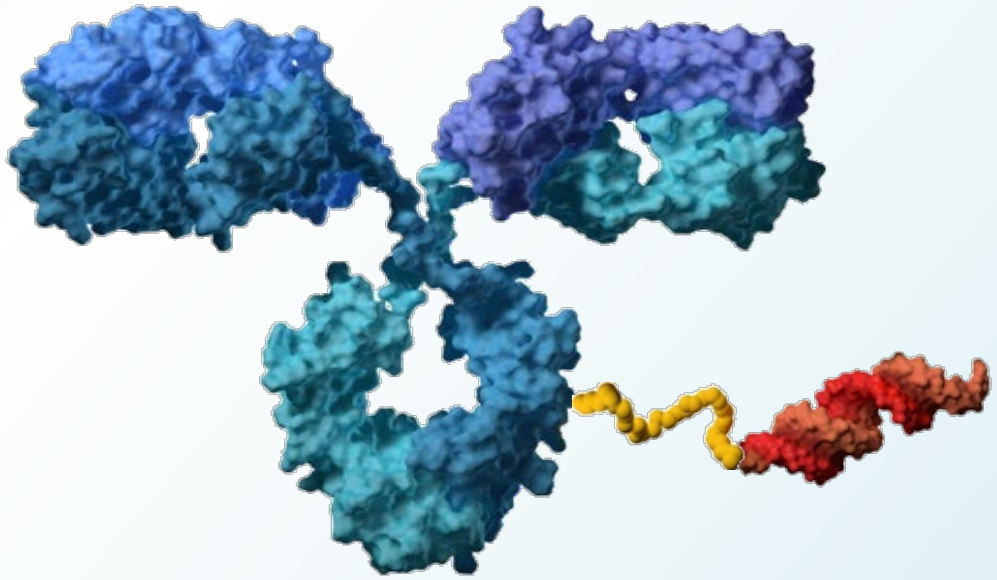
Present long-term data from MARINA-OLE™

- Consistent and durable improvement in multiple measures, including vHOT, hand grip, muscle strength and activities of daily living
- Favorable long-term safety and tolerability

Debut data from END-DM1 natural history study

Demonstrate reversal of disease progression compared to natural history

delpacibart etedesiran
abbreviation: *del-desiran*
(formerly known as AOC 1001)



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Sarah Boyce
President & CEO

Steve Hughes, M.D.
Chief Medical Officer

W. Michael Flanagan, Ph.D.
Chief Scientific &
Technical Officer

Geoff Grande
VP, Investor Relations &
Corporate Communications

Avidity Management Team

MARINAOLE™

MARINA™

John W. Day, M.D., Ph.D.,
Professor of Neurology and Pediatrics, and Director, Division of Neuromuscular Medicine,
Stanford University School of Medicine
GUEST SPEAKER

Transforming Myotonic Dystrophy

Agenda/Outline

Revolutionizing the Delivery of RNA	**Sarah Boyce**, President & CEO
Advancing to Phase 3: HARBOR™ Trial	**Steve Hughes, M.D.**, CMO
• **MARINA-OLE™ Long-term Efficacy and Safety Data**	**John W. Day, MD, PhD,** Professor of Neurology and Pediatrics and Director, Division of Neuromuscular Medicine, Stanford University School of Medicine
• **Delivering For People Living With DM1**	**Steve Hughes, M.D.**, CMO
Closing Remarks	**Sarah Boyce**, President & CEO
Q&A Session	**Avidity Management & Dr. Day**, Stanford Moderator: **Geoff Grande**, VP of IR/CC

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DM1: Significant Patient Burden and Unmet Need

>40,000
PEOPLE WITH DM1 IN THE US

0
APPROVED THERAPIES

- Underrecognized, progressive & often fatal neuromuscular disease that primarily affects skeletal, cardiac & smooth muscle
- Increases in severity from generation to generation
- Significant impact on quality of life
- *Del-desiran* is designed to address root cause of DM1


Loraine, Kristl & Zen
Living with DM1

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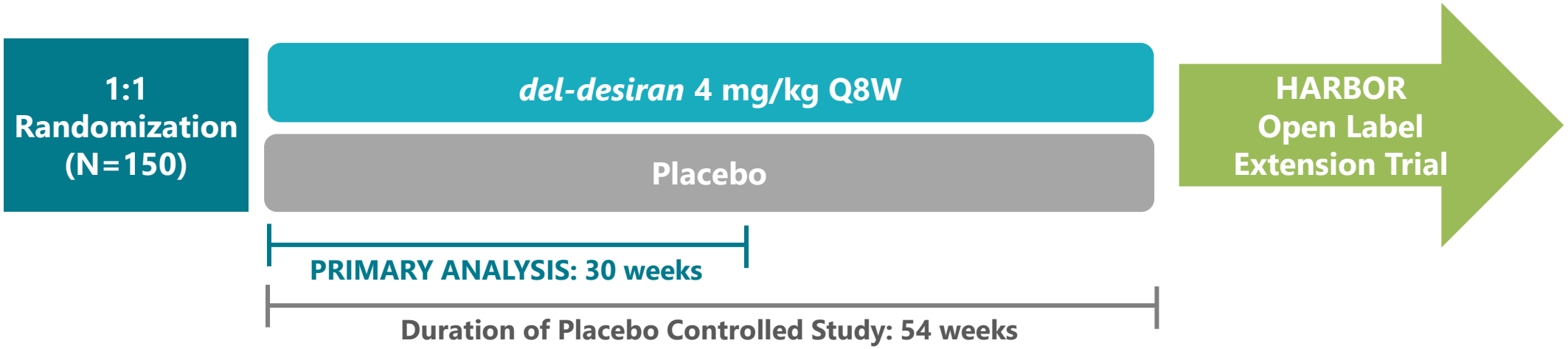
HARBOR™ Initiating Global Phase 3 Study

- Regulatory agreement on study design
- HARBOR™ study designed for efficiency and speed of execution
- On track to initiate in Q2 2024



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HARBOR™ Phase 3 Trial: Design & Objectives

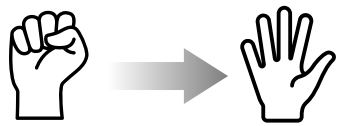
Optimized for efficiency and speed of execution

Pivotal Study Design

- 4 mg/kg every 8 weeks; first dose of 2 mg/kg
- N=150; Ages 16+
- 1:1 randomization
- Primary analysis at Week 30; Placebo-control out to week 54
- Participants eligible to roll-over into an open label extension
- ~40 global sites

Primary Endpoint

Video Hand Opening Time (vHOT)



MYOTONIA

Key Secondary Endpoints

Hand Grip

STRENGTH

Quantitative Muscle Testing

DM1-Activ

ACTIVITIES OF DAILY LIVING

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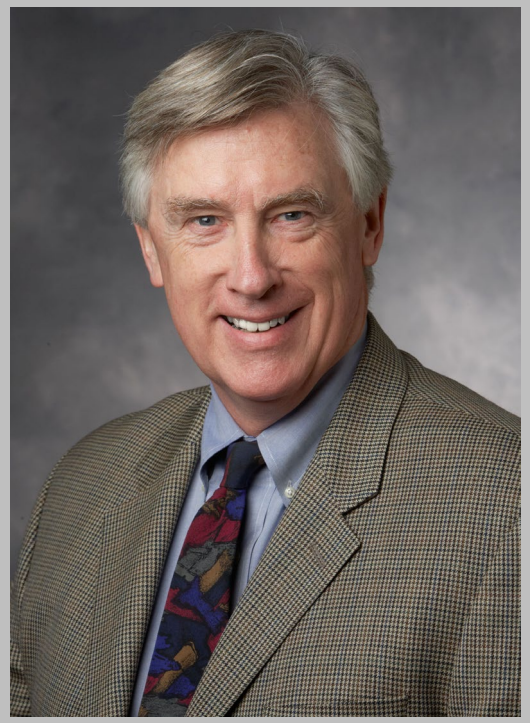
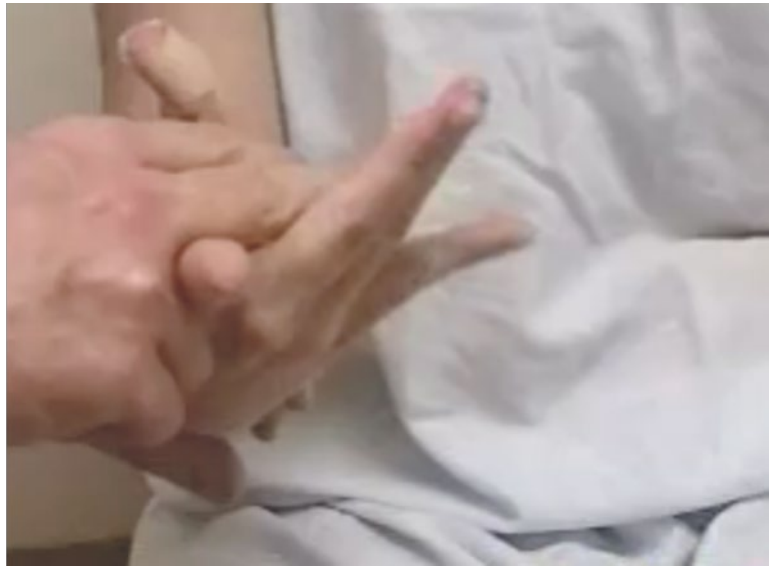
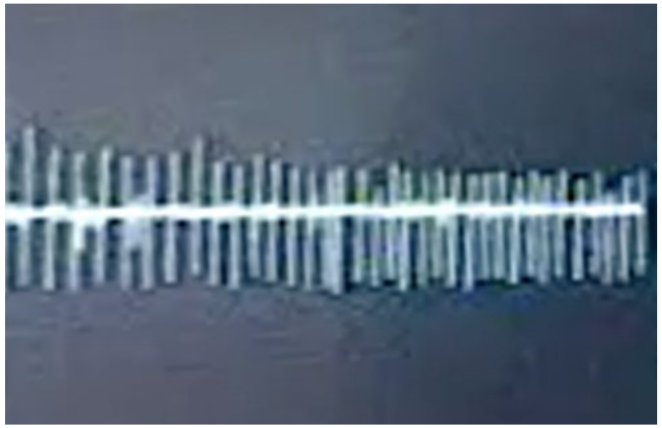


John W. Day, M.D., Ph.D., Stanford University School of Medicine
Professor of Neurology, Pediatrics (Genetics) and Pathology, and Director of the Division of Neuromuscular Medicine

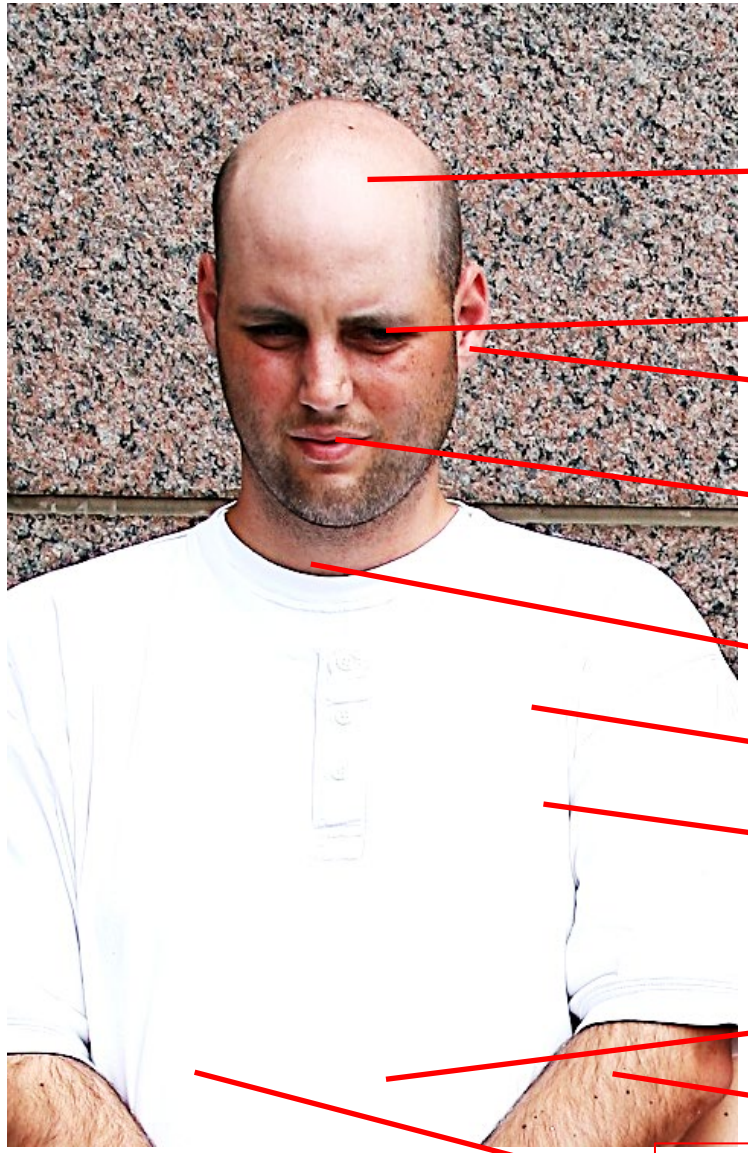
John W. Day is Professor of Neurology, Pediatrics (Genetics) and Pathology, and Director of the Division of Neuromuscular Medicine at Stanford University. Dr. Day received his MD from the University of Minnesota, and PhD in Neuroscience from Albert Einstein College of Medicine, where he studied synaptic physiology and plasticity. After completing his neurology and neuromuscular training at UCSF he was recruited to the University of Minnesota, where, as Professor of Neurology, Pediatrics and Genetics, he founded and directed the Paul and Sheila Wellstone Muscular Dystrophy Center. In 2011 he was recruited to Stanford to establish a comprehensive Division of Neuromuscular Medicine. Dr. Day has investigated the genetic causes and multisystemic effects of neuromuscular disorders and has more than 30 years of experience designing and directing clinical trials of novel therapeutics including antisense oligonucleotides and gene replacement therapies.

Recognizing the spectrum of DM1





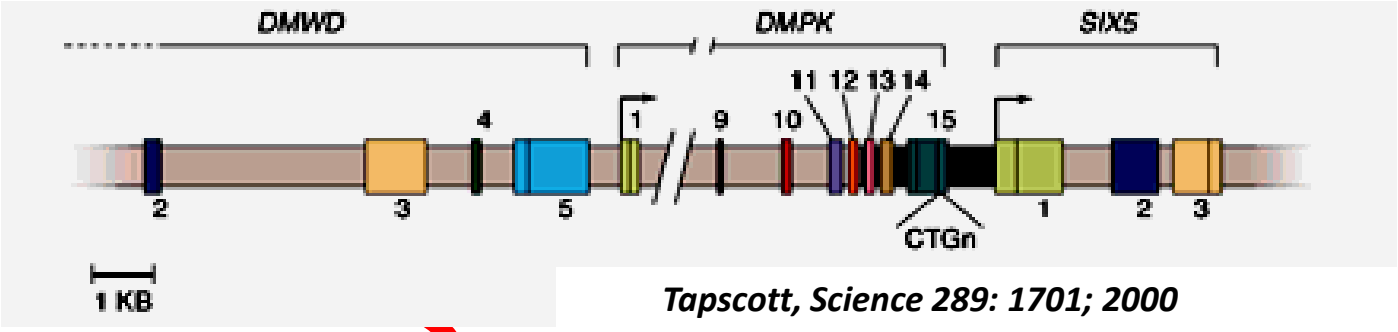
Myotonic Dystrophy Affects Multiple Systems



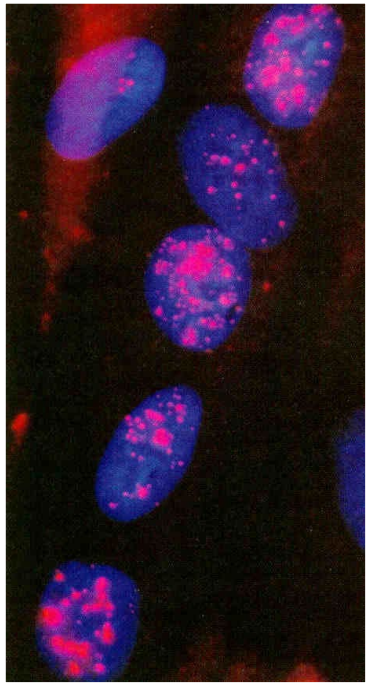
- Skin and Hair
- Eye & Eyelids
- Hearing
- Mouth & Speech
- Throat, Voice, Swallow
- Breathing, coughing
- Heart function & rhythm
- Stomach, Bowel
- Liver and Bile
- Muscle: Stiff, Fatigue, Pain, Weakness, Atrophy, Dystrophy

- CNS Abnormalities
- Sleep Abnormalities
- Blood Abnormalities
- Hormone Abnormalities

How does a non-coding CTG expansion cause DM?



Tapscott, Science 289: 1701; 2000

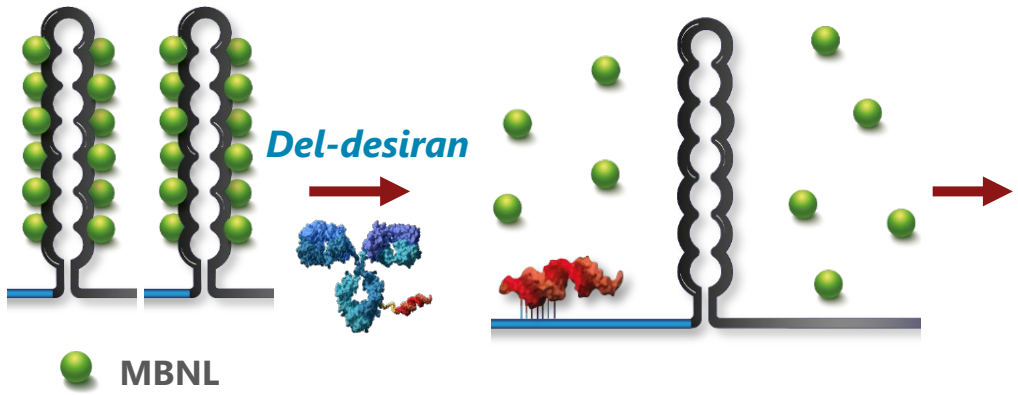


Taneja, et al.,JCB 1995

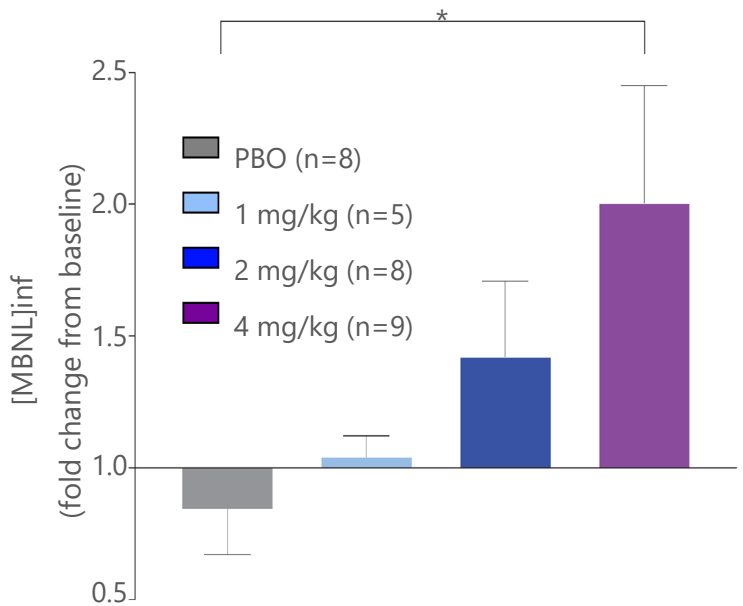
RNA **MBNL** **Co-Local**

Mankodi, et. al., HMG 10:2165; 2001

Del-desiran Designed to Address Underlying Cause of Myotonic Dystrophy by Liberating Free MBNL



MBNL sequestered by CUG repeats of mutant DMPK



Del-desiran (AOC 1001) treatment Reduced mutant DMPK

Del-desiran (AOC 1001) Leads to Dose-dependent increase in MBNL

MARINA®
MARINA OLE™

Video Hand Opening Time (vHOT)

MYOTONIA

Hand Grip

Quantitative Muscle Testing

STRENGTH

DM1-Activ

ACTIVITIES OF DAILY LIVING

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#Data shown as mean and standard error. Fold change is calculated per subject as post-treatment relative to baseline;
*P<0.05, unpaired t-test
Wagner, SD, et al. *PLOS Genet.* 2016;12(9):e1006316

Long-term Safety & Efficacy Data from MARINA-OLE™ Trial in Patients with DM1

Del-desiran: Favorable Long-term Safety and Tolerability

Over 265 infusions of del-desiran totaling 61.1 patient-years of exposure

MARINA-OLE™	Number (%) with AE N=37
Subjects with ≥ 1 AE	
Any AE	35 (94.6%)
AE related to study drug	9 (24.3%)
Unrelated serious AE (SAE)	4 (10.8)
SAE related to study drug	0
AE leading to treatment discontinuation	0
AE leading to death	0

- **All 37 participants enrolled remain on study**
- **All related AEs were mild or moderate**
  - Most common related AEs reported in 2 or more participants:
    - Nausea
    - Headache
  - No discontinuations
  - No study drug related SAEs; unrelated SAEs are consistent with DM1

As of January 2024, data from MARINA-OLE™

SAEs considered unrelated to treatment included nausea/vomiting, worsening of atrial fibrillation, and chest pain; and one participant had acute cholelithiasis and biliary pancreatitis.

END-DM1 Natural History Study: Understanding DM1 Disease Progression

- Non-interventional NHS aimed to advance the understanding of disease progression in DM1 patients
- Focuses on clinical outcome assessments to support development of therapies for DM1
- 700 patient, 2 year study, ~ 20 centers
- Designed and run by the Myotonic Dystrophy Clinical Research Network (DMCRN)
- Supported by FDA, MDA, MDF; Avidity is one of several sponsoring organizations

END-DM1 Data Informed Design of the MARINA® & Phase 3 HARBOR™ Trials

Presenting one-year data for the first time today

Same endpoints measured

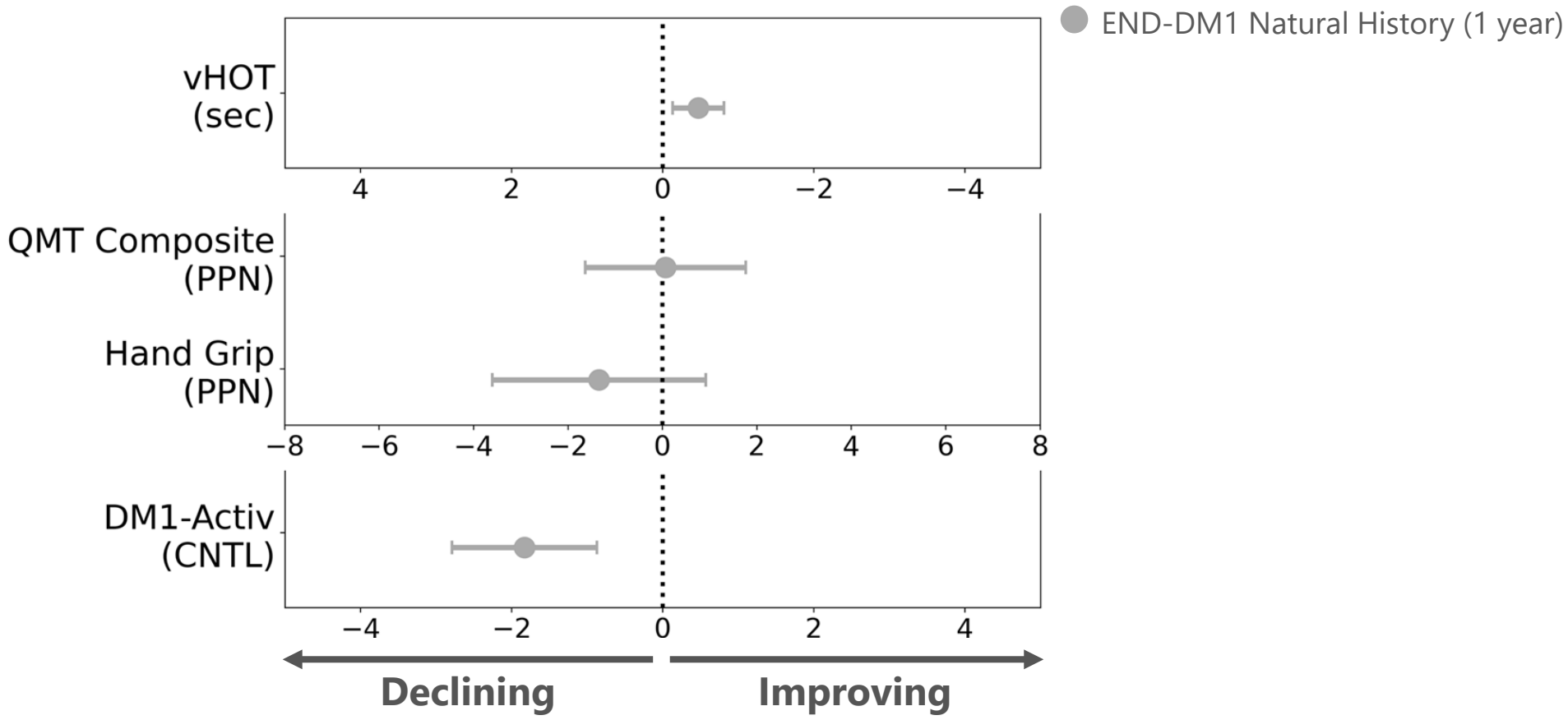
Clinical trial sites overlap with MARINA® & HARBOR

Contemporary data set based upon standard of care

Hundreds of patients with at least one-year of follow-up in END-DM1 natural history study

END-DM1: Disease Progression in Key Measures

DM1 endpoints: reliable and relevant to myotonic dystrophy



Thanks to END-DM1 physicians for reviewing and approving use of this Avidity analysis; END-DM1 subpopulation based on MARINA® (n ~ 60)

PPN = Percent predicted normal
CNTL= percentile
Error bars = SEM (standard error of the mean)

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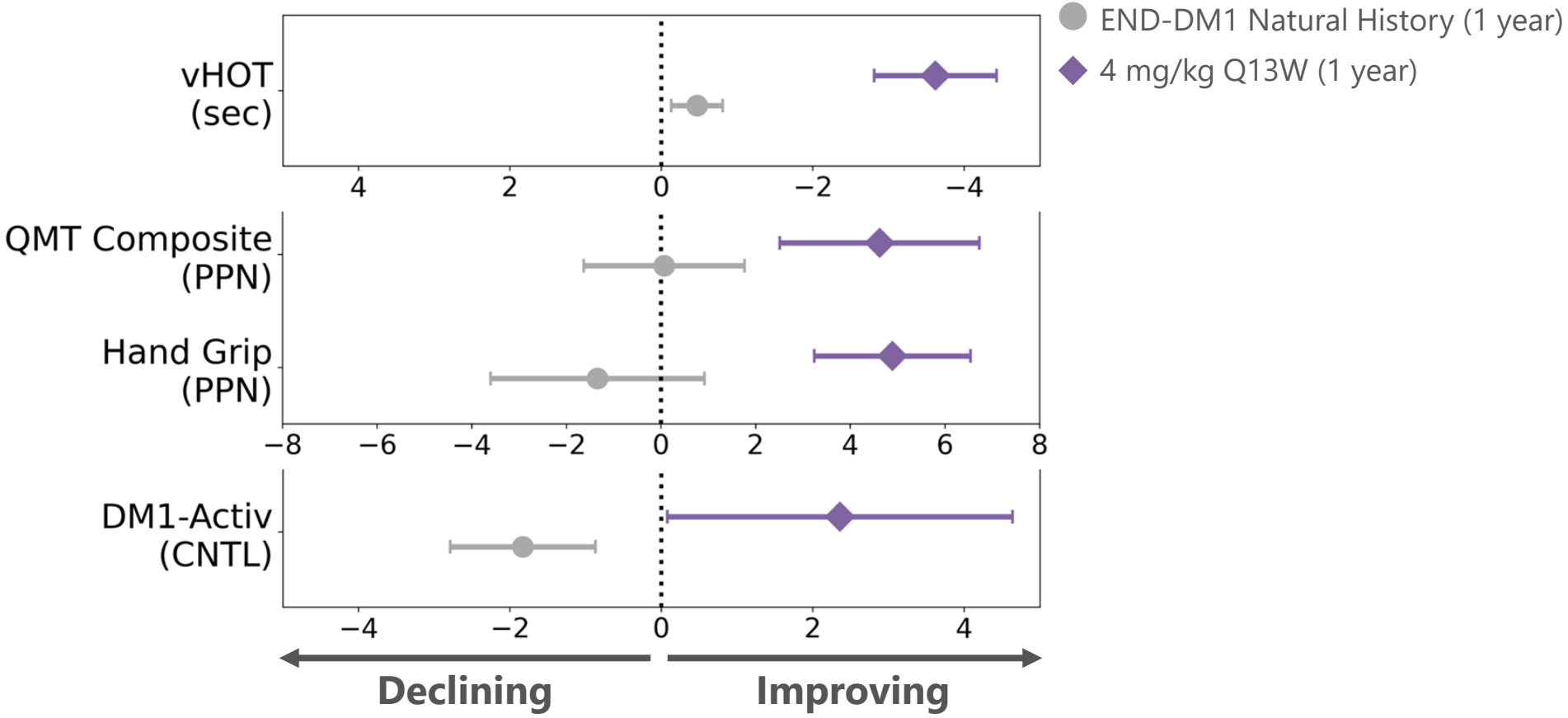
Del-desiran: Reversal of Disease Progression in MARINA-OLE™ vs. Natural History

Key endpoints to be used in pivotal HARBOR study



Thanks to END-DM1 physicians for reviewing and approving use of this Avidity analysis; END-DM1 subpopulation matched to MARINA® (n ~ 60)

In MARINA-OLE™ data 4 mg/kg, n=12 for vHOT, QMT composite, hand grip; n=11 for DM1-Activ

PPN = Percent predicted normal
CNTL= percentile
Error bars = SEM (standard error of the mean)

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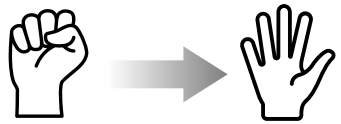
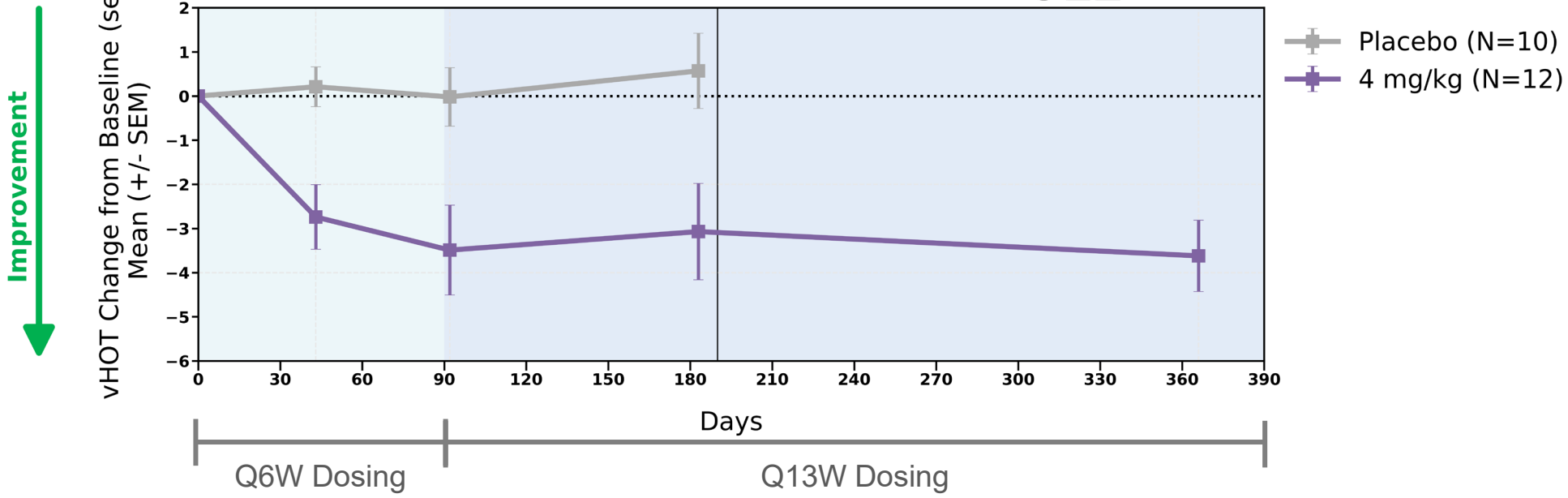
Del-desiran: Long-term Improvement in Myotonia

Measured by video hand opening time (vHOT) in MARINA® and MARINA-OLE™

Video Hand Opening Time (vHOT)



Independently adjudicated



MARINA® data statistically significant at all assessment time points*

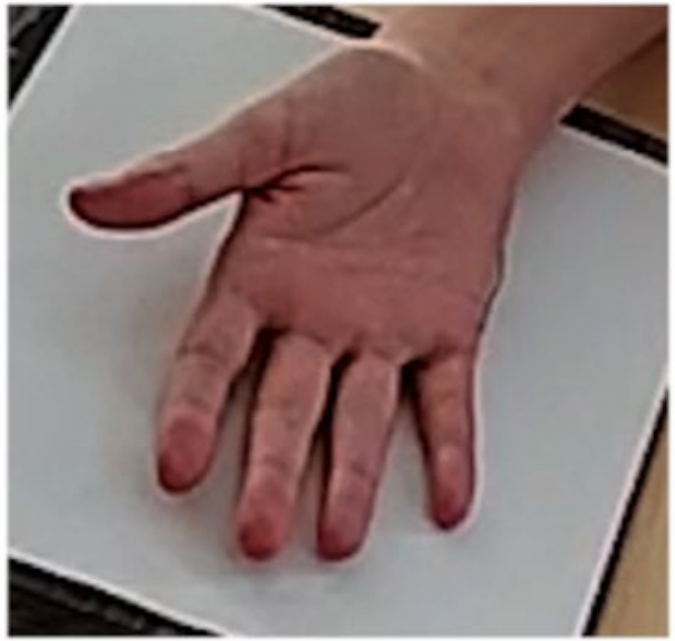
SEM=standard error of the mean
*Based on a post-hoc analysis

Del-desiran: Long-term Improvement in Myotonia

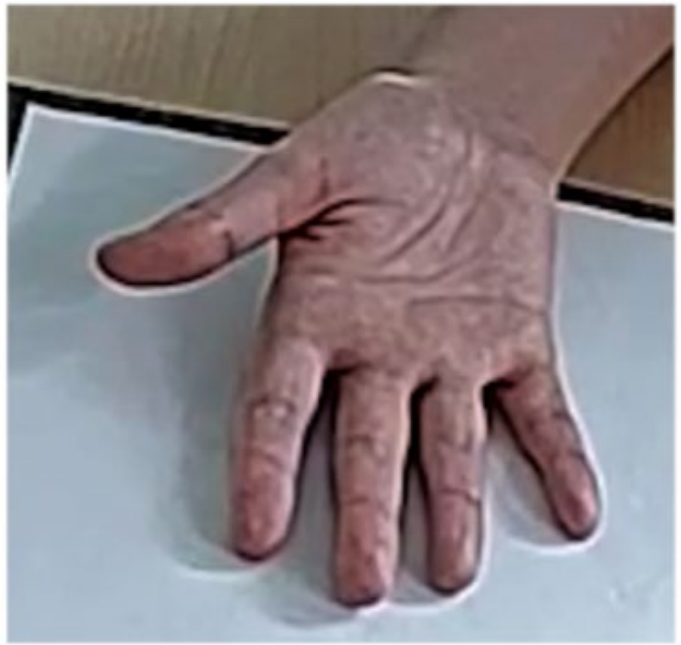
Measured by video hand opening time (vHOT) in MARINA® and MARINA-OLE™

Participant from *del-desiran* 4 mg/kg

Baseline vHOT



MARINA-OLE™ (1 year of 4 mg/kg)



Timepoint at Day 183 in MARINA-OLE™

Del-desiran: Long-term Improvement in Muscle Strength

Measured by Hand Grip and Quantitative Muscle Testing in MARINA® and MARINA-OLE™

Hand Grip Strength

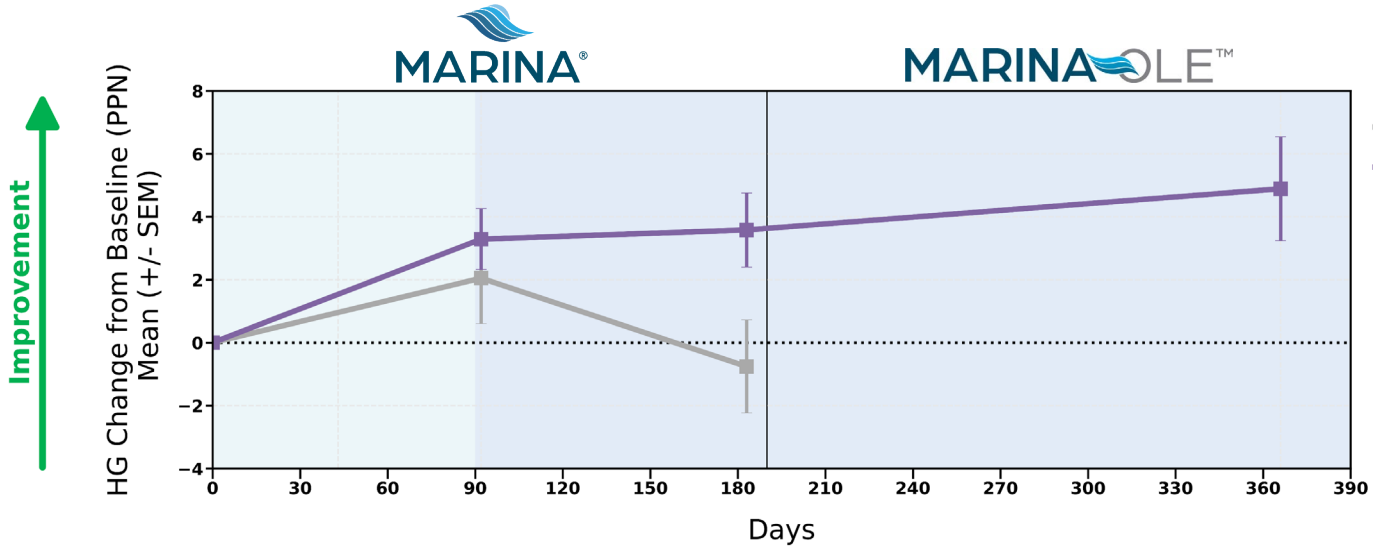
Quantitative Muscle Testing (QMT)

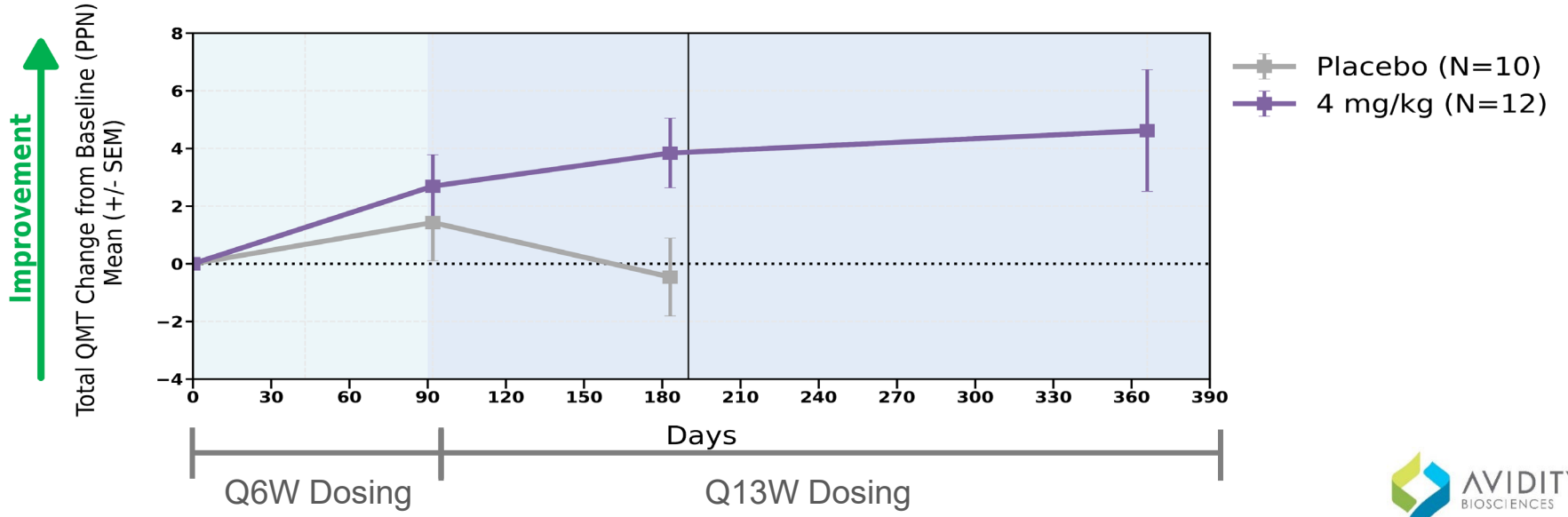
Hand Grip

Elbow Extension & Elbow Flexion

Knee Extension & Knee Flexion

Ankle Dorsiflexion





HG=hand grip; PPN=percent predicted normal; SEM=standard error of the mean

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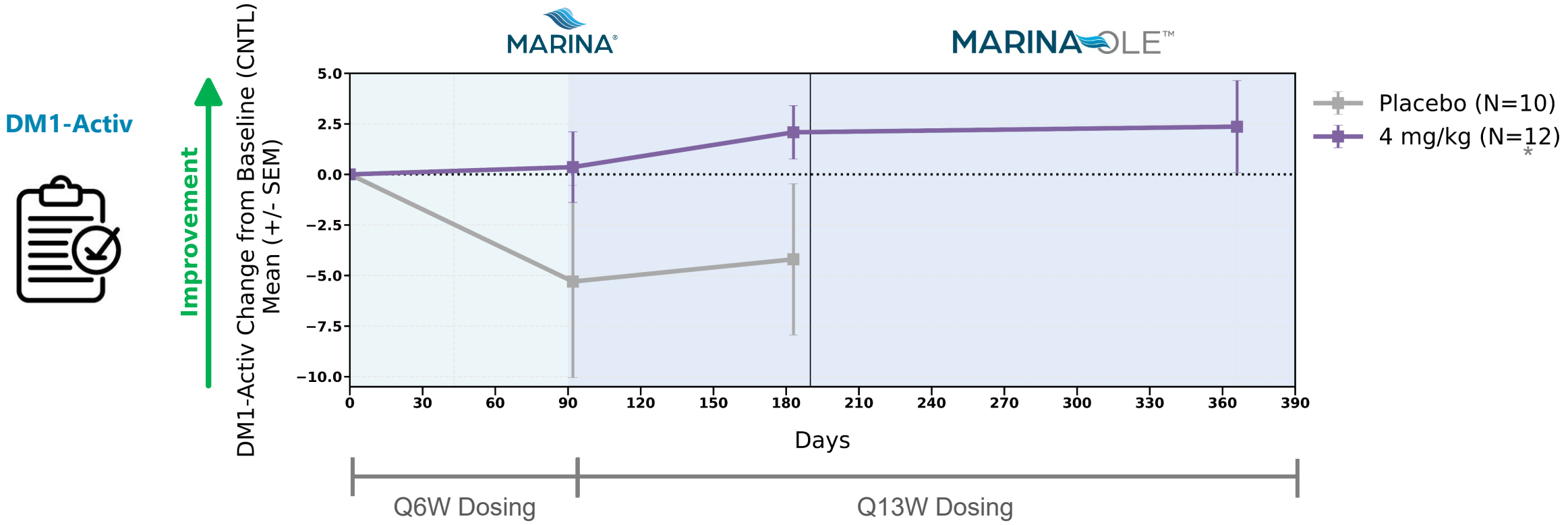
Del-desiran: Long-term Improvement in Activities of Daily Living

Measured by DM1-Activ Patient Reported Outcomes in MARINA® and MARINA-OLE™



*Day 360 excludes one participant who experienced an injury impairing their ability to perform mobility measures.
CNTL= percentile
SEM = standard error of the mean

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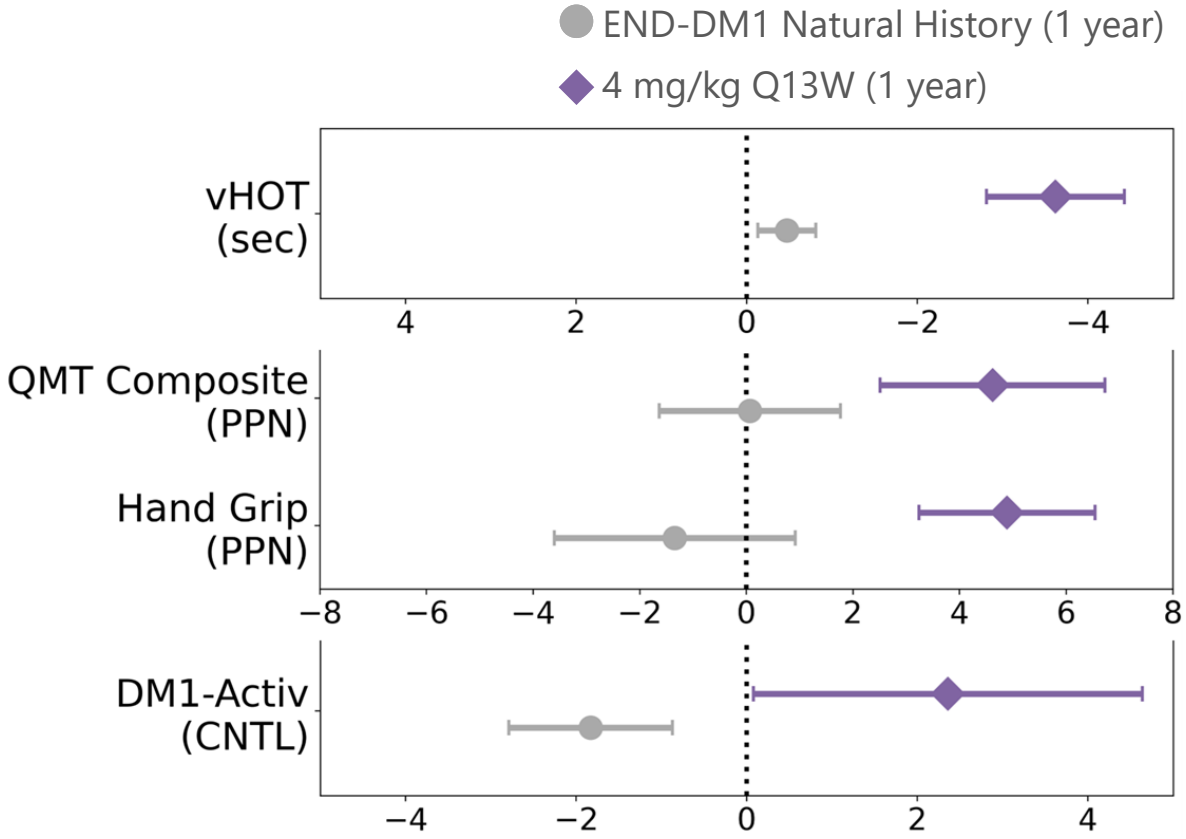
MARINA-OLE™ Data Summary

Potential of *del-desiran* to be a transformational therapy for DM1 patients

Del-desiran 4 mg/kg

- Demonstrated favorable long-term safety and tolerability
- Showed reversal of disease progression in MARINA® and MARINA-OLE™ compared to END-DM1 natural history data
- Provided consistent and durable improvements in multiple clinical endpoints

Global HARBOR™ trial initiation Q2 2024



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Patient Experience: Impact of *del-desiran* on their life

MARINA OLE™

"I started this drug in June and like, two weeks after I took the first infusion, I went to open up a pop bottle, which I never would've been able to do. It **was a twist pop bottle**…**and it opened right up**.

My **strength was better, my outlook was better**, **my hands were working**. I had more strength, and I could stretch them out. I could **open things and I could turn door knobs** and all these things that were harder.

Like, my **upper arm strength was better**. I could **walk better**.

I didn't need to wear my neck brace all the time and **everything just improved a lot**."

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Patient Experience: Impact of *del-desiran* on their life

MARINA OLE™

> Before the study I couldn't stand on my toes and since I've been **going back to working out, I can actually stand on my toes again.** So hopefully **building up some strength.**
>
> The myotonia, if I would make a fist, I wouldn't be able to open my hand…I was able to squeeze my fist and **open my hand with no problems.**
>
> My **tongue would cramp up when I would speak**, and I have not had any signs of that happening since the very first dose.

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Patient Experience: Impact of *del-desiran* on their life

MARINA OLE™

"I've noticed a really big difference in the fact that I used to be a really active person before I got more symptomatic. After a few rounds of the infusion, I've actually been able to **get back to the gym and start working out**, working with a trainer. That's all because **my mobility has definitely increased.** My **range of motion has also increased.**

I think that it's amazing that when I was diagnosed, I was told there's no treatment, no cure. The study has **given me a lot of hope**. I would love for that to be able to be shared with other people in the community who have DM1."

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Revolutionizing the Delivery of RNA	**Sarah Boyce**, President & CEO
Advancing to Phase 3: HARBOR™ Trial	**Steve Hughes, M.D.**, CMO
• **MARINA-OLE™ Long-term Efficacy and Safety Data**	**John W. Day, MD, PhD,** Professor of Neurology and Pediatrics and Director, Division of Neuromuscular Medicine, Stanford University School of Medicine
• **Delivering For People Living With DM1**	**Steve Hughes, M.D.**, CMO
Closing Remarks	**Sarah Boyce**, President & CEO
Q&A Session	**Avidity Management & Dr. Day**, Stanford Moderator: **Geoff Grande**, VP of IR/CC

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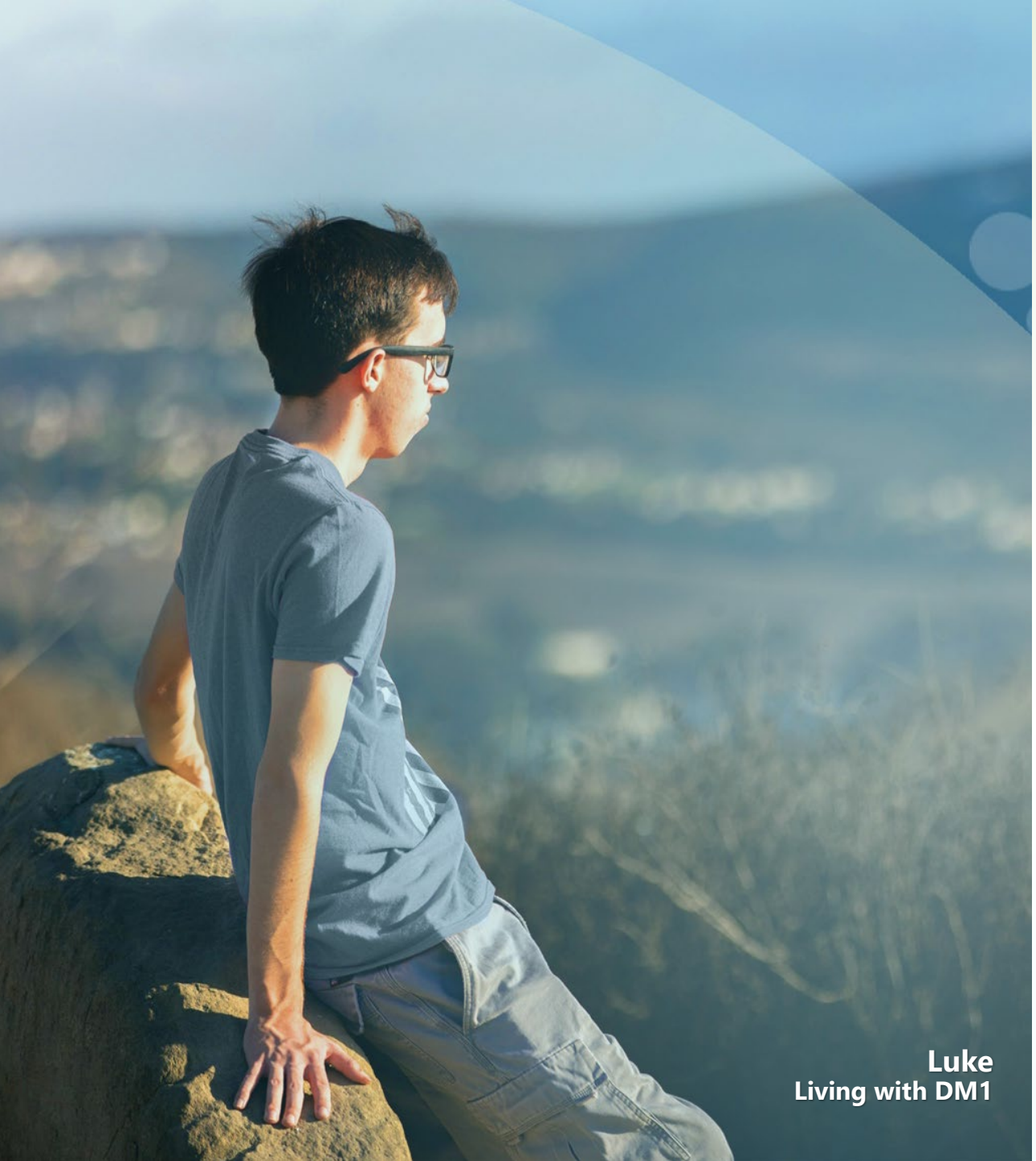

OUR VISION

To profoundly improve people's lives by revolutionizing the delivery of RNA therapeutics

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HARBOR™

Investor & Analyst Event Series – Volume 8

TRANSFORMING MYOTONIC DYSTROPHY

Global Phase 3 HARBOR Trial & Long-term MARINA-OLE™ Data

Q&A

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