



A Global Phase 3 Trial Assessing the Efficacy and Safety of Z-basivarsen in Myotonic Dystrophy Type 1

Douglas Kerr^{1*}, Soma Ray¹, Shuli Yu¹, Sowmya Chary¹

*Presenting author.
¹Dyne Therapeutics, Inc., Waltham, MA, USA.



BACKGROUND

- Myotonic dystrophy type 1 (DM1) is a rare, progressive, genetic, neuromuscular disorder in which a spliceopathy caused by CTG repeat expansions in the myotonic dystrophy protein kinase (*DMPK*) gene drives heterogeneous multisystemic manifestations (muscular, central nervous system [CNS] and non-muscular) resulting in substantial disease burden and early mortality¹⁻⁵
- No disease-modifying therapies are currently available, limiting treatment to symptom management^{6,7}
- High unmet need exists for a treatment that addresses the underlying cause of DM1 in systems where patients report the most impact, including muscle and CNS⁴
- ACHIEVE (NCT05481879) is an ongoing global, randomized, placebo-controlled, Phase 1/2 clinical trial evaluating the safety and efficacy of zeleciment basivarsen (z-basivarsen, also known as DYNE-101) in adults aged 18–65 years with DM1⁸
 - ACHIEVE consists of a multiple ascending dose (MAD) period (24 weeks [completed]), followed by an open-label extension (OLE) period (24 weeks), and long-term extension (LTE) period (96 weeks)^{8,9}
 - Data from the MAD portion of ACHIEVE demonstrated that z-basivarsen leads to functional improvement across diverse clinical measures, including myotonia, muscle strength and function, and patient-reported outcomes⁹
 - Based on a favorable benefit–risk profile observed in the MAD portion of ACHIEVE, the selected dose regimen of 6.8 mg/kg Q8W is currently being evaluated in the registrational expansion cohort (REC), with change from baseline in hand myotonia and function as measured by video hand opening time (vHOT) at 6 months versus placebo being assessed as the primary endpoint¹⁰
 - As of April 23, 2025, the 6.8 mg/kg dose of z-basivarsen administered Q8W showed a favorable safety profile with no serious related TEAEs,¹¹ based on approximately 93 patient-years of follow-up
- HARMONIA is a global, randomized, double-blind, placebo-controlled, Phase 3 study designed to detect multisystemic functional improvement and evaluate the efficacy, safety, and tolerability of z-basivarsen 6.8 mg/kg Q8W in individuals with DM1 aged ≥16 years

DM1 PATHOPHYSIOLOGY AND Z-BASIVARSEN MECHANISM OF ACTION

- DM1 is caused by CTG repeat expansion in the *DMPK* gene, ultimately leading to multisystemic spliceopathy¹²
- Mutant *DMPK* messenger RNA (mRNA) forms a hairpin structure that aggregates into toxic nuclear foci in multiple cell types (including those in muscle and brain), sequestering members of the muscleblind-like (MBNL) family of splicing factors within the nucleus and leading to splicing dysregulation (spliceopathy), which is the molecular hallmark of DM1¹²
- Z-basivarsen is an investigational therapeutic that consists of a transferrin receptor 1 (TfR1)-binding antigen-binding fragment (Fab) conjugated to an antisense oligonucleotide (ASO) that targets mutant nuclear *DMPK* RNA for degradation with the goal of correcting the underlying spliceopathy that causes disease manifestations (Figure 1)¹³⁻¹⁶
 - TfR1 is highly expressed on the surface of muscle cells and brain capillary endothelial cells that form the blood–brain barrier, enabling broad delivery to cells within both muscle and the CNS^{13,17}

Figure 1. Z-basivarsen addresses the central pathobiology of DM1

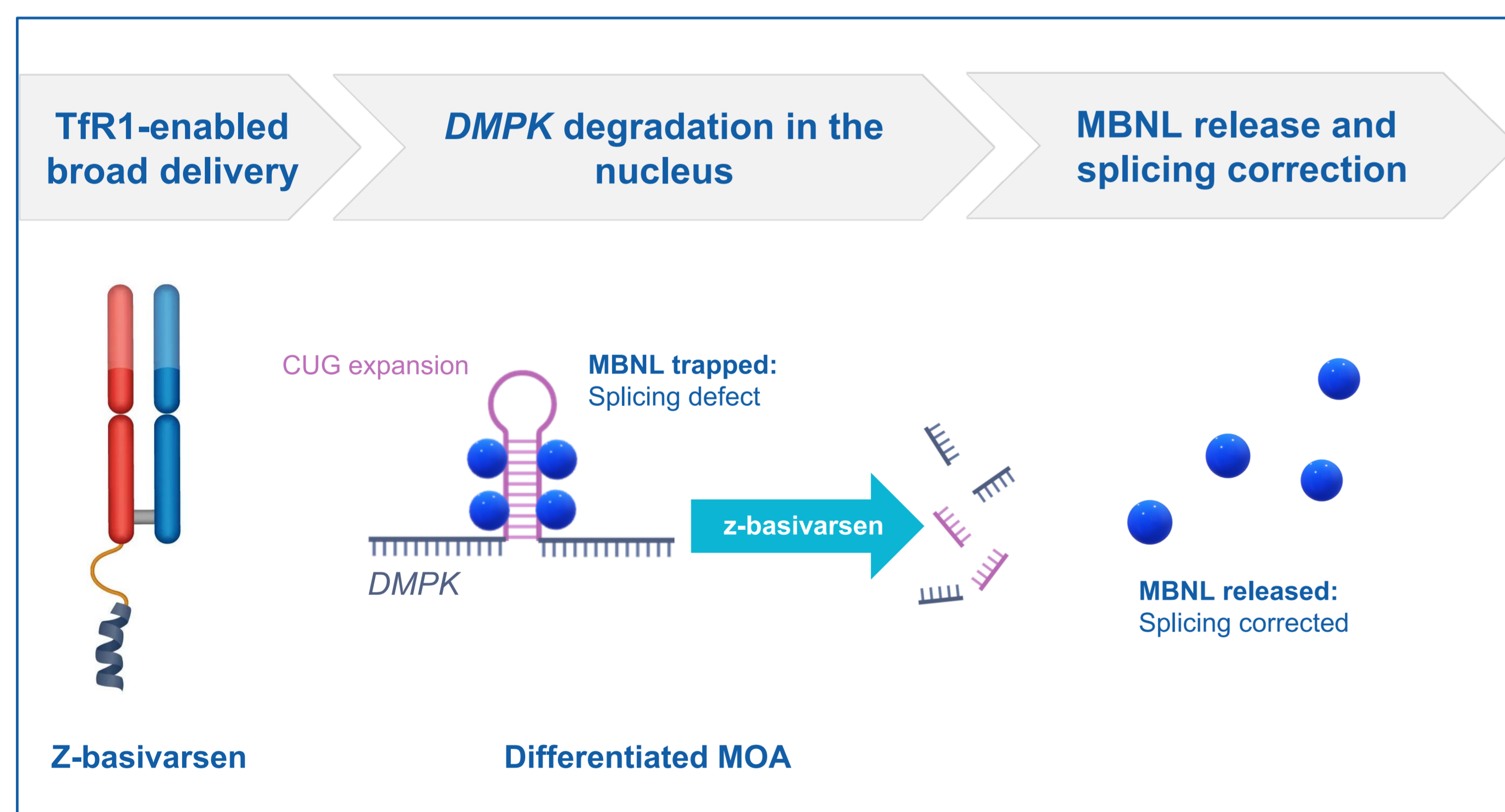


Image depicts proposed z-basivarsen mechanism of action.
DM1, myotonic dystrophy type 1; DMPK, dystrophin myotonia protein kinase; Fab, antigen-binding fragment; MBNL, muscleblind-like; MOA, mechanism of action; TfR1, transferrin receptor 1.

REFERENCES

- Liao Q, et al. *Neuroepidemiology*. 2022;56(3):163–73;
- Mathieu J, et al. *Neurology*. 1999;52(8):1658–62;
- De Antonio M, et al. *Rev Neurol (Paris)*. 2016;172(10):572–80;
- Hagerman KA, et al. *Muscle Nerve*. 2019;59(4):457–64;
- Weninger S, et al. *Front Neurol*. 2018;9:303;
- Pascual-Gilbert M, et al. *Drug Discov Today*. 2023;28(3):103489;
- Hartman JM, et al. *Annals Clin Transl Neurol*. 2024;11(12):3175–91;
- ClinicalTrials.gov. NCT05481879. <https://clinicaltrials.gov/study/NCT05481879>. Accessed February 18, 2026;
- Lilleker JB, et al. MDA Clinical and Scientific Conference 2025; Poster O44;
- Dyne Therapeutics, Inc. 2025. <https://investors.dyne-tx.com/static-files/e05f7874-d149-4f83-8d0c-b0bb686f9aa7>. Accessed February 18, 2026;
- Sansone V, et al. WMS Annual Congress 2025; Poster 380P;
- López-Martínez A, et al. *Genes*. 2020;11(9):1109;
- Weeden T, et al. *Commun Med*. 2025;5(1):22;
- Zanotti S, et al. *Mol Ther*. 2021;29(4 Suppl 1):127;
- Zanotti S, et al. *Mol Ther*. 2022(a);30(4 Suppl 1):9;
- Zanotti S, et al. MDA Clinical and Scientific Conference 2022(b) abstract for poster number 144;
- Shen X, et al. *Int J Mol Sci*. 2025;26(23):9793;
- Wheeler TM, et al. *Nature*. 2012;488(7412):111–5;
- Tanner MK, et al. *Nucleic Acids Res*. 2021;49(4):2240–54;
- Goldberg A. *Arch Gerontol Geriatr*. 2012;54(3):434–8
- Muñoz-Bermejo L, et al. *Biology (Basel)*. 2021;10(6):510;
- Lusardi MM, Fritz S, Middleton A, et al. *J Geriatr Phys Ther*. 2017;40(1):1–36.

DISCLOSURE INFORMATION

Douglas Kerr, Soma Ray, Shuli Yu, and Sowmya Chary are employees of Dyne Therapeutics and may hold stock in the company.

ACKNOWLEDGMENTS

This study was funded by Dyne Therapeutics. Medical writing and editorial support was provided by Anisha Desai and Ben Holtom of Obsidian Healthcare Group Ltd, UK. This support was funded by Dyne Therapeutics. The authors wish to thank the clinical trial investigators and site coordinators and, most importantly, all the participants, families, and caregivers for their willingness to participate in this clinical trial, which was sponsored by Dyne Therapeutics.

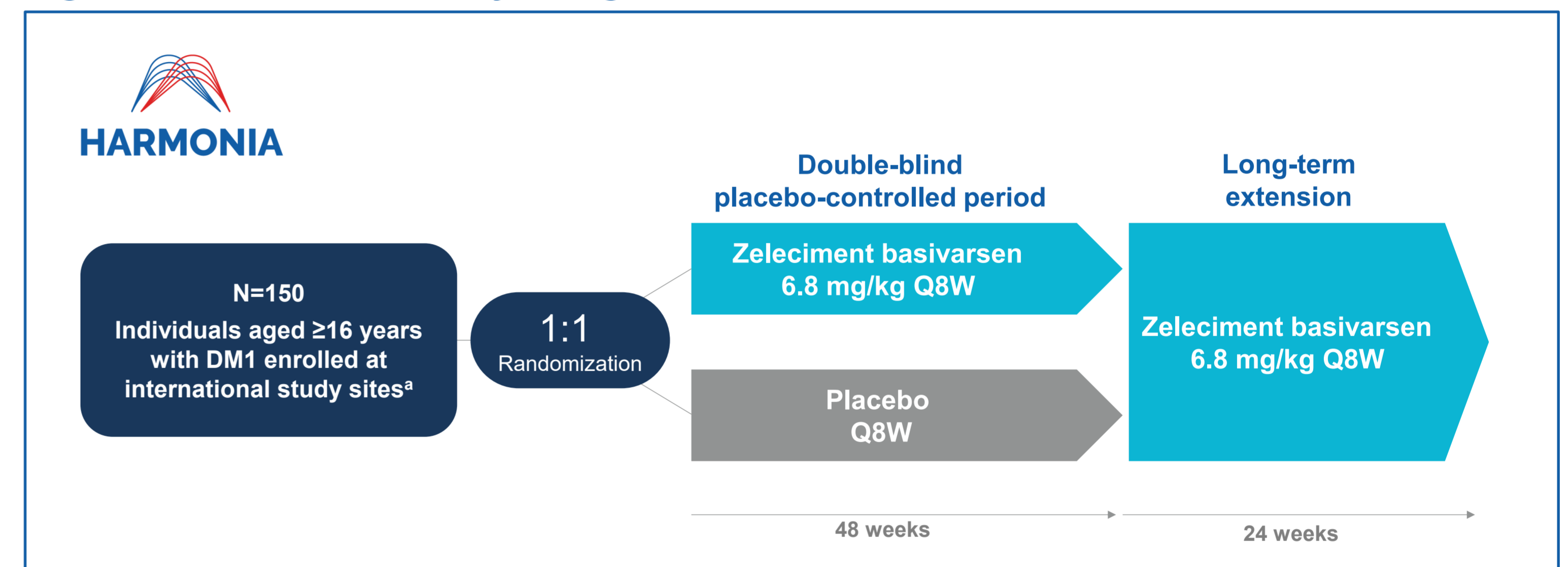
OVERALL STUDY AIM

- HARMONIA is a Phase 3, placebo-controlled, randomized, double-blind study powered to detect the multisystemic efficacy, safety, and tolerability of z-basivarsen administered intravenously to individuals with DM1 aged ≥16 years

TRIAL DESIGN

- The ACHIEVE registrational expansion cohort utilizes vHOT for the primary endpoint, as a direct measure of myotonia and function and an early indicator of multisystemic functional improvement due to correction of underlying spliceopathy^{8-11,18,19}
- Designed with patient and physician input, HARMONIA aims to capture the broader, multisystemic impact of treatment, and utilizes the five times sit-to-stand test (5xSTS) for the primary endpoint, reflecting a functionally meaningful measure that is highly relevant to individuals with DM1
 - 5xSTS is a reliable and responsive measure of the ability to perform sit-to-stand transfers and reflects functions highly meaningful to individuals with DM1, including lower extremity strength, balance control, mobility, stamina, and trunk muscle engagement^{20,21}
 - Additionally, 5xSTS has been shown to be an independent predictor of falls²² and provides important clinical information related to the ability to perform activities of daily living²¹
- In addition to 5xSTS, HARMONIA will include a broad set of secondary and exploratory endpoints designed to capture the multisystemic impact of z-basivarsen, including effects on the CNS

Figure 2. HARMONIA study design



a. Additional eligibility criteria apply as per protocol.
Q8W, every 8 weeks.

INCLUSION AND EXCLUSION CRITERIA

Inclusion criteria^a

- Age ≥16 years
- DM1 confirmed by molecular genetics with trinucleotide repeat size >100
- Able to complete the following independently:^b
 - Walk 10 meters
 - 5xSTS
 - BMI <35 kg/m²

Exclusion criteria^a

- Known diagnosis of congenital DM1
- History of major surgical procedure within 12 weeks of start of screening (exception: pacemaker or defibrillator)
- Use of GLP-1 agonist/incretin medications within a period of 5 half-lives prior to screening assessments

a. Additional eligibility apply; b. Inserts or supports that do not extend above the ankle are permitted.
5xSTS, five times sit-to-stand; BMI, body mass index; DM1, myotonic dystrophy type 1; GLP-1, glucagon-like peptide 1.

TRIAL ENDPOINTS

Primary endpoint	Selected secondary endpoints		
Change from baseline in 5xSTS at Week 49	Change from baseline in muscle function tests at Week 49	Patient and clinician reported outcomes	Safety
<ul style="list-style-type: none"> vHOT (middle finger) QMT total 10MWR 9-hole peg test 	<ul style="list-style-type: none"> MDHI^a DM1-ACTIV^c total score^a PGI-C and CGI-C PGI-S and CGI-S 	<ul style="list-style-type: none"> Safety and tolerability 	

A suite of exploratory endpoints will assess multiple domains of CNS impact in DM1, including use of clinical outcome assessments, patient-reported outcomes, and actigraphy

a. MDHI and DM1-ACTIV^c endpoints measured as change from baseline at Week 49.
5xSTS, five times sit-to-stand; 10MWR, 10-meter walk/run test; CGI-C, Clinician Global Impression of Change; CGI-S, Clinician Global Impression of Severity; CNS, central nervous system; DM1, myotonic dystrophy type 1; DM1-ACTIV^c, DM1 Activity and Participation scale for clinical use; MDHI, Myotonic Dystrophy Health Index; PGI-C, Patient Global Impression of Change; PGI-S, Patient Global Impression of Severity; QMT, Quantitative Muscle Testing; vHOT, video hand opening time.

CONCLUSIONS

- HARMONIA has been designed alongside the DM1 community and leading physicians, and is intended to be a field-defining Phase 3 study
- The primary endpoint is the 5xSTS test, a reliable, responsive, functionally meaningful endpoint that is relevant to activities of daily living
- A broad set of secondary and exploratory endpoints will evaluate the impact of z-basivarsen on multisystemic functional improvement, including the CNS
- Clinical study sites for HARMONIA are now being initiated at international locations

Zeleciment basivarsen (z-basivarsen, also known as DYNE-101) is investigational or otherwise in development and has not been approved as safe or effective by the US FDA, EMA, or any other regulatory authority.