UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d)
of the Securities Exchange Act of 1934

Date of report (Date of earliest event reported): October 3, 2018

WAVE LIFE SCIENCES LTD.
(Exact name of registrant as specified in its charter)

Singapore	**001-37627**	**Not Applicable**
(State or other jurisdiction of incorporation)	**(Commission File Number)**	**(IRS Employer Identification No.)**

7 Straits View #12-00 Marina One East Tower Singapore 018936	**018936**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: +65 6236 3388

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions (see General Instruction A.2. below):

- ☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- ☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- ☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- ☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

Emerging growth company ☒

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☒

Item 7.01 Regulation FD Disclosure.

On October 3, 2018, Wave Life Sciences Ltd. (the "Company") held a presentation entitled "Stereochemical Control of Antisense Oligonucleotides Enhances Target Efficacy" at the 14th Annual Meeting of the Oligonucleotide Therapeutics Society ("OTS") in Seattle, Washington. The presentation contains data highlighting advances in the Company's novel chemistry platform and its ability to precisely design, optimize and manufacture stereopure oligonucleotides. A copy of the presentation is furnished as Exhibit 99.1 to this Current Report on Form 8-K.

The information in this report furnished pursuant to Item 7.01 shall not be deemed "filed" for the purposes of Section 18 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), or otherwise subject to the liabilities of that section. It may only be incorporated by reference in another filing under the Exchange Act or the Securities Act of 1933, as amended, if such subsequent filing specifically references the information furnished pursuant to Item 7.01 of this report.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits.

The following exhibit relating to Item 7.01 shall be deemed to be furnished, and not filed:

Exhibit No.	Document
99.1	Wave Life Sciences Ltd. Presentation at OTS on October 3, 2018

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

WAVE LIFE SCIENCES LTD.

Date: October 3, 2018

/s/ Keith C. Regnante
Keith C. Regnante
Chief Financial Officer

Exhibit 99.1

Stereochemical Control of Antisense Oligonucleotides Enhances Target Efficacy

Chandra Vargeese, PhD
SVP, Drug Discovery
Wave Life Sciences

October 3, 2018

Acknowledgements & Disclosures

- All Wave Life Sciences employees
- Prof. Gregory Verdine, co-founder & Director Wave Life Sciences
- Prof. Takeshi Wada, co-founder Wave Life Sciences
- Prof. Matthew Wood, Department of Physiology, Anatomy and Genetics, University of Oxford

- Chandra Vargeese is an employee of Wave Life Sciences

WAVE LIFE SCIENCES

Forward looking statements

This document contains forward-looking statements. All statements other than statements of historical facts contained in this document, including statements regarding possible or assumed future results of operations, preclinical and clinical studies, business strategies, research and development plans, collaborations and partnerships, regulatory activities and timing thereof, competitive position, potential growth opportunities, use of proceeds and the effects of competition are forward-looking statements. These statements involve known and unknown risks, uncertainties and other important factors that may cause the actual results, performance or achievements of Wave Life Sciences Ltd. (the "Company") to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. In some cases, you can identify forward-looking statements by terms such as "may," "will," "should," "expect," "plan," "aim," "anticipate," "could," "intend," "target," "project," "contemplate," "believe," "estimate," "predict," "potential" or "continue" or the negative of these terms or other similar expressions. The forward-looking statements in this presentation are only predictions. The Company has based these forward-looking statements largely on its current expectations and projections about future events and financial trends that it believes may affect the Company's business, financial condition and results of operations. These forward-looking statements speak only as of the date of this presentation and are subject to a number of risks, uncertainties and assumptions, including those listed under Risk Factors in the Company's Form 10-K and other filings with the SEC, some of which cannot be predicted or quantified and some of which are beyond the Company's control. The events and circumstances reflected in the Company's forward-looking statements may not be achieved or occur, and actual results could differ materially from those projected in the forward-looking statements. Moreover, the Company operates in a dynamic industry and economy. New risk factors and uncertainties may emerge from time to time, and it is not possible for management to predict all risk factors and uncertainties that the Company may face. Except as required by applicable law, the Company does 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.

Architects of transformation

Wave Life Sciences is a clinical-stage, genetic medicines company unlocking the potential of a proprietary chemistry platform that enables the precise design, optimization and production of stereopure nucleic acid therapies.

Wave's chemistry platform is built on a foundation of two core capabilities

PRECISION

Ability to design nucleic acid compounds that have **one defined and consistent profile**

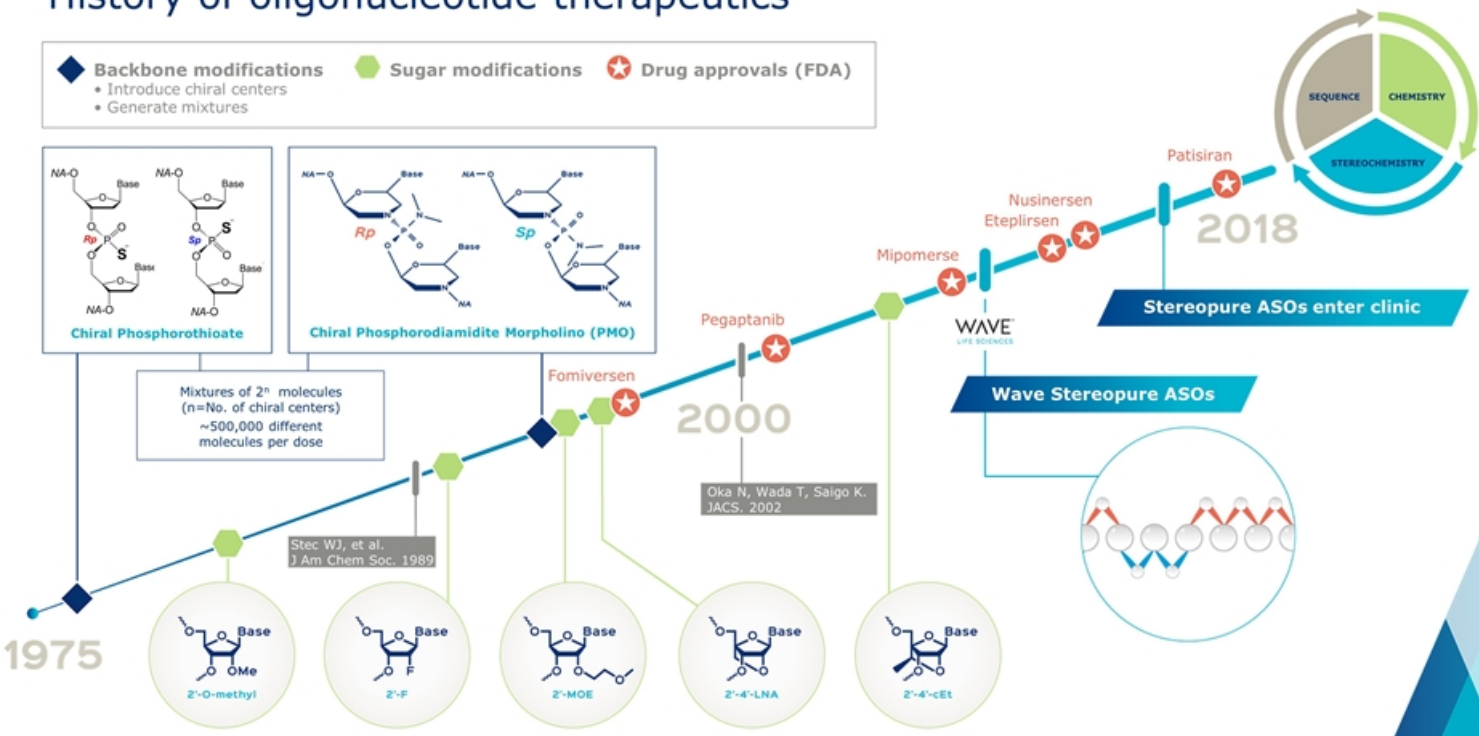
SCALE

Platform potential across **multiple modalities and tissues**

Internal expertise and capacity for **large-scale GMP manufacturing**

Wave has reinvented the design, synthesis and manufacture of nucleic acid therapies to potentially optimize potency, durability and safety

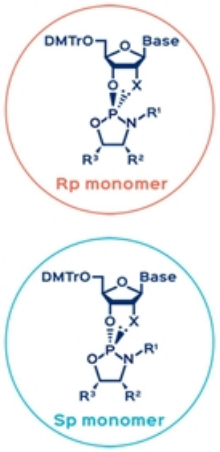
WAVE™
LIFE SCIENCES


History of oligonucleotide therapeutics
Backbone modifications
• Introduce chiral centers
• Generate mixtures
Sugar modifications
Drug approvals (FDA)
SEQUENCE
CHEMISTRY
STEREOCHEMISTRY
Chiral Phosphorothioate
Chiral Phosphorodiamidite Morpholino (PMO)
Mixtures of 2ⁿ molecules
(n=No. of chiral centers)
~500,000 different
molecules per dose
Stec WJ, et al.
J Am Chem Soc. 1989
Fomiversen
Pegaptanib
2000
Oka N, Wada T, Saigo K.
JACS. 2002
Mipomerse
WAVE
Nusinersen
Eteplirsen
Patisiran
2018
Stereopure ASOs enter clinic
Wave Stereopure ASOs
1975
2'-O-methyl
2'-F
2'-MOE
2'-4'-LNA
2'-4'-cEt

Advances in stereopure oligonucleotide synthesis and manufacturing

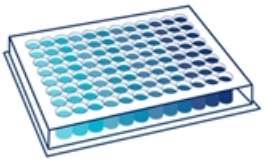
Versatility in Chemistry

- Improved synthetic capabilities
- Custom building blocks
  - Tunable 'R' groups
  - Various 2'-modifications



Versatility in Scale

Candidate Optimization and Selection

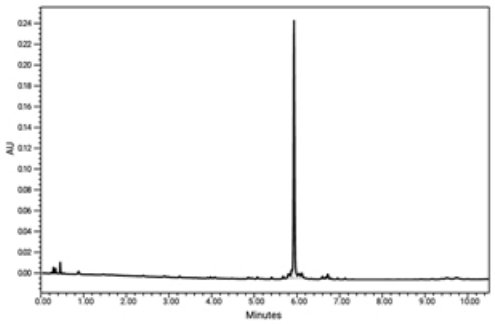


High-throughput scale

GMP Quality

Manufacturing scale

High Crude Purity



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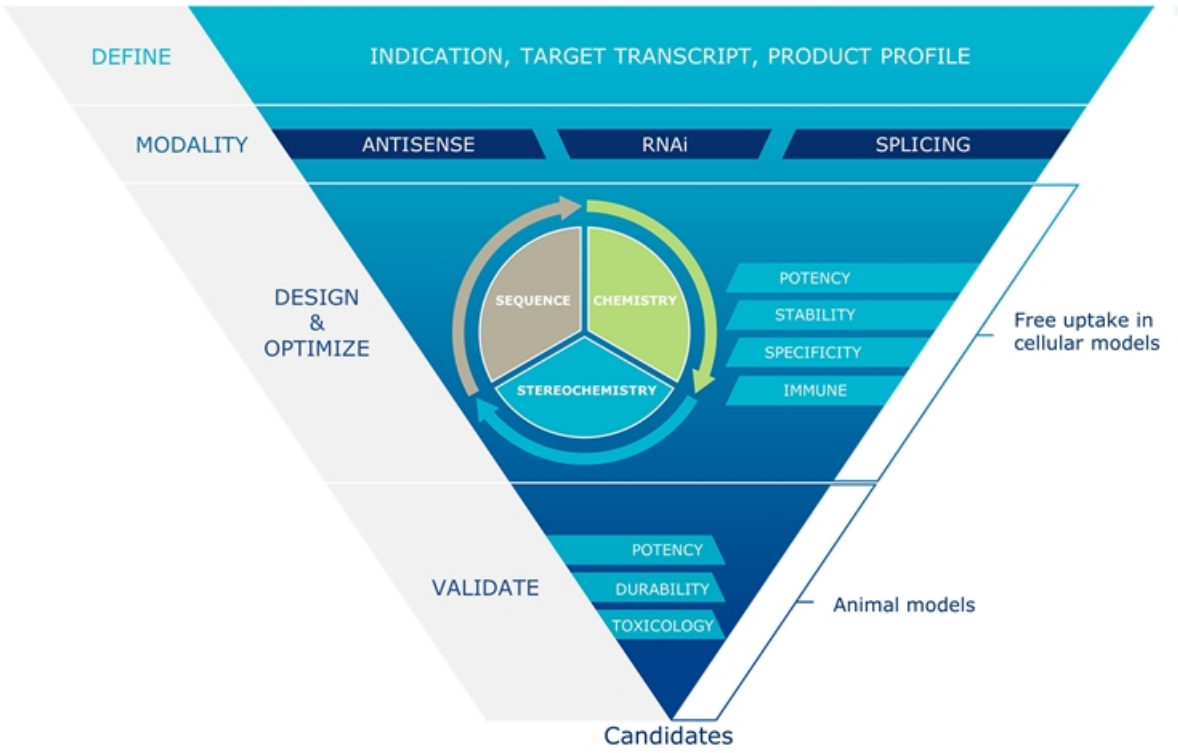
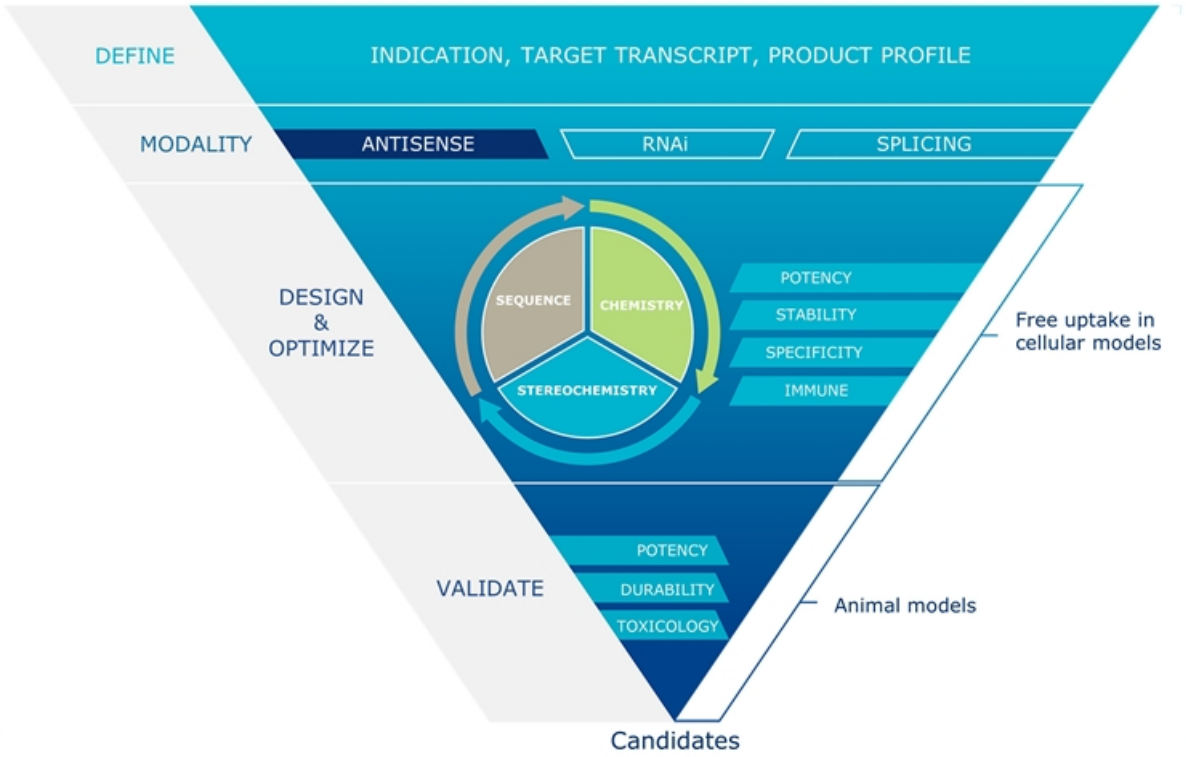
Wave's chemistry platform



WAVE LIFE SCIENCES

Wave's chemistry platform: Antisense



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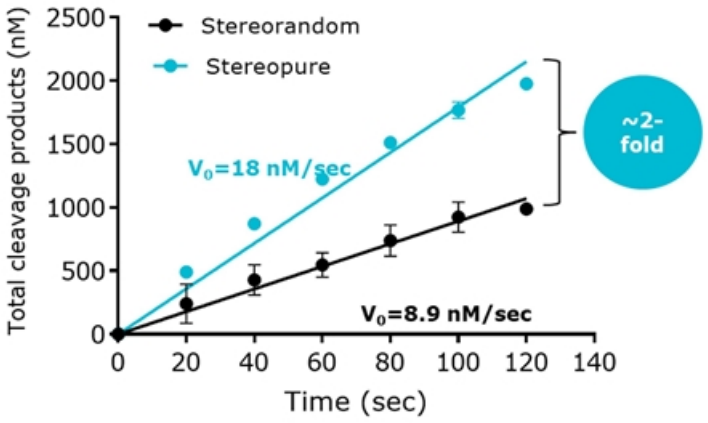
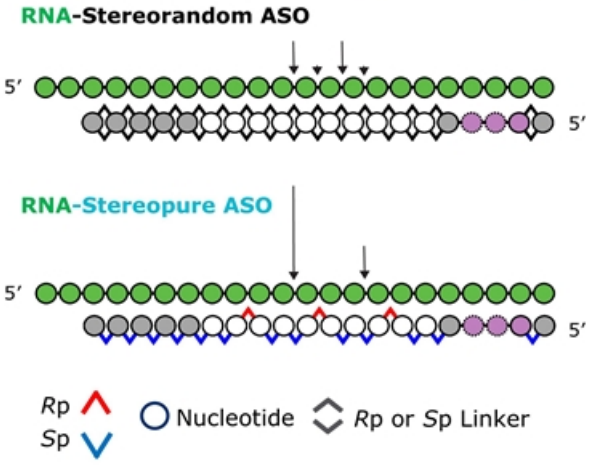
Precision RNase H-mediated RNA degradation

Initial Velocity (V_0)



Cleavage Activity



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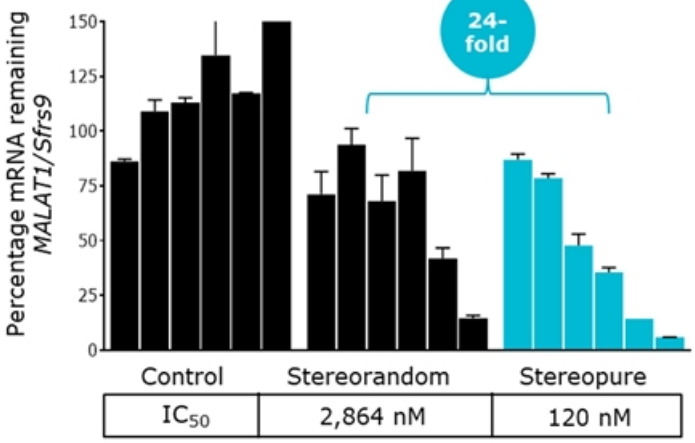
In RNase H1 assay, ASOs were pre-annealed to surrogate *MALAT1* mRNA (1:1, Cf=5 μM). RNase H (250:1, E:S) was added and quenched with EDTA at the indicated times. Products were quantified, and V_0 was calculated from the best-fit line (n=3 per time point).

Potency of stereopure oligonucleotides under *in vitro* free-uptake conditions translates *in vivo*

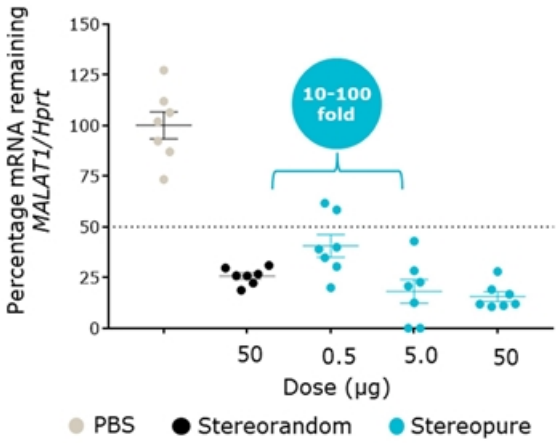
In Vitro

MALAT1 Knockdown in iCell Neurons



In Vivo

MALAT1 Knockdown in Posterior Mouse Eye at 1 Week



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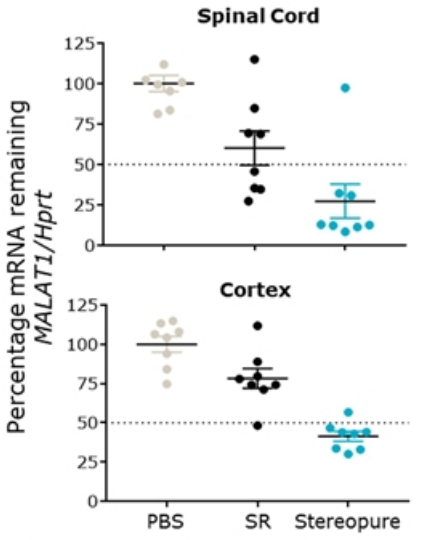
In vitro: In iCell neurons, 10, 30, 100, 300, 1,000 or 3,000 nM ASO was added to iCell neurons under free-uptake conditions. 4-days post-treatment, RNA was harvested and processed. *MALAT1* mRNA expression was determined by qPCR (n=2 per concentration). *In vivo*: Mice received a single IVT injection. 1 week post injection, tissues were frozen and processed for RNA. *MALAT1* mRNA expression was determined by qPCR (n=7).

Stereopure oligonucleotides enhance potency across tissues *in vivo*

Antisense

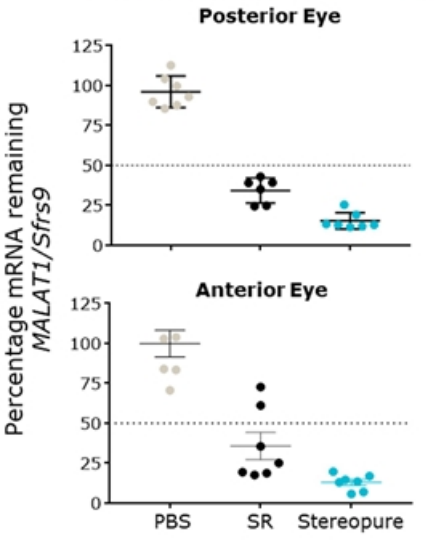
CNS

Single ICV injection in Mice (50 µg)



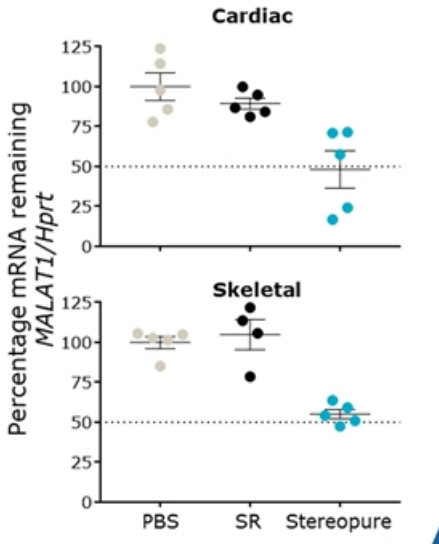
Eye

Single IVT injection in Mice (50 µg)



Muscle

Single SC injection in Mice (25 mg/kg)



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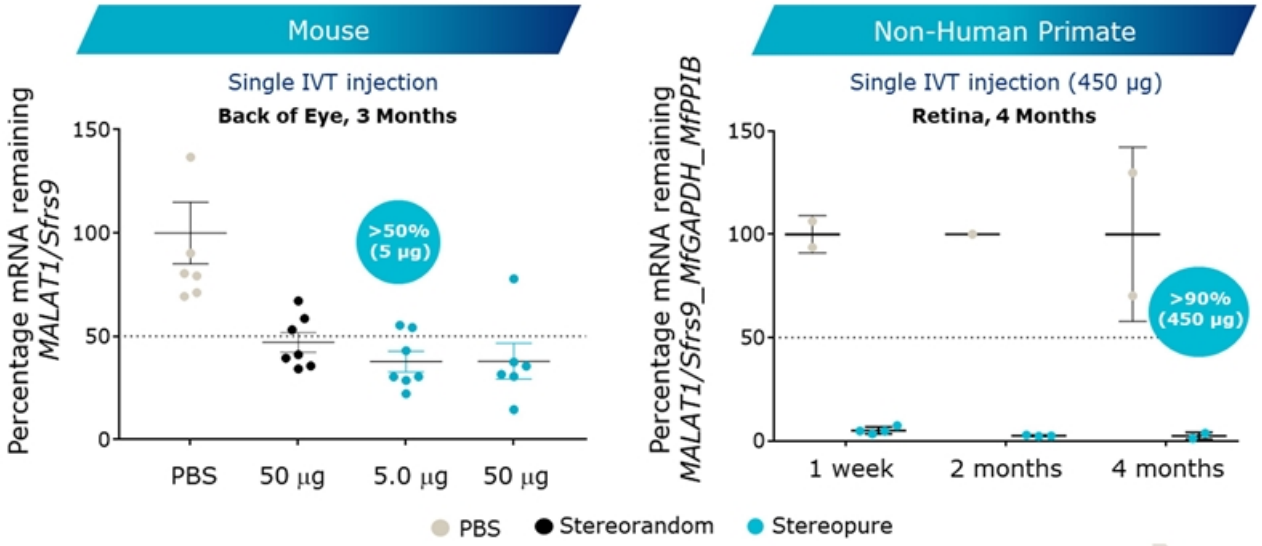
Tissues were harvested 1 week post-dose and processed for RNA. mRNAs were quantified by qPCR. Plots show relative fold change or percentage mRNA remaining with respect to control mRNA. Each symbol represents one animal. SR = Stereorandom

Stereopure oligonucleotides induce potent and durable activity in the eye

(OTS poster #030)



9-fold greater eye volume

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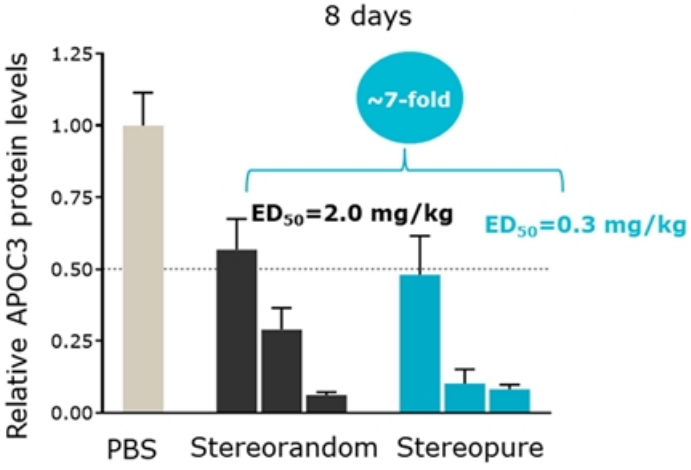
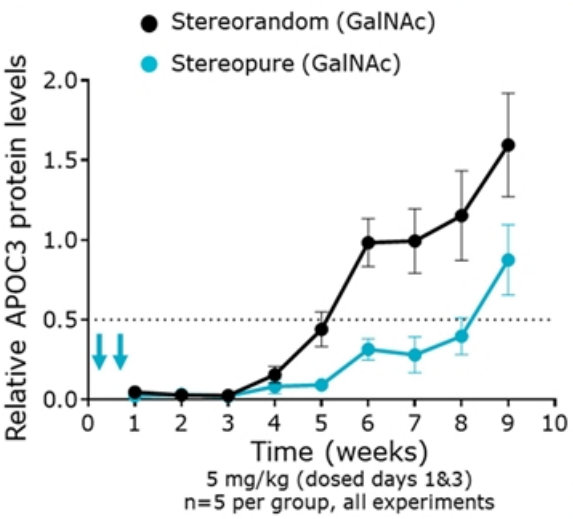
Tissues were harvested at the indicated time points, post-dose and processed for RNA. mRNAs were quantified by qPCR. Plots show percentage mRNA remaining with respect to control mRNA. Each symbol represents one animal.

Stereopurity improves potency and durability of GalNAc-conjugated oligonucleotides

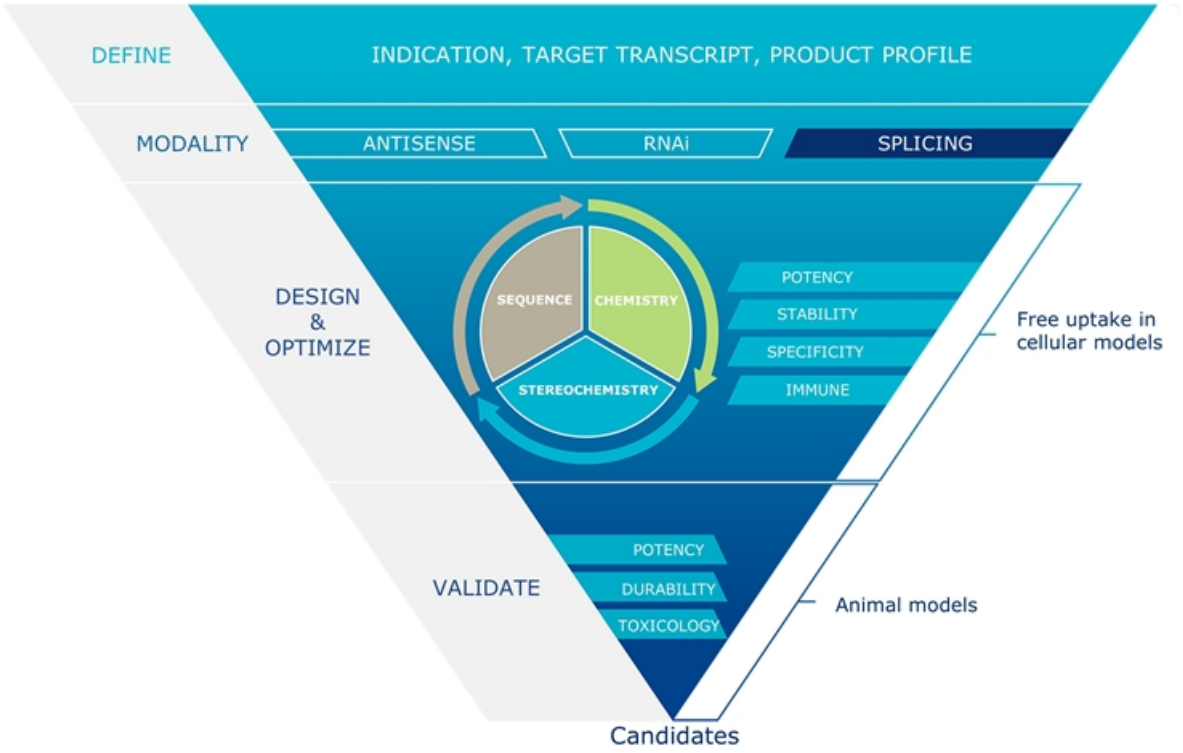
Stereopure ASO yields potency comparable to state-of-the-art GalNAc-dsRNAi



Stereopure ASO yields durable effect in transgenic mice



Wave's chemistry platform: Splicing



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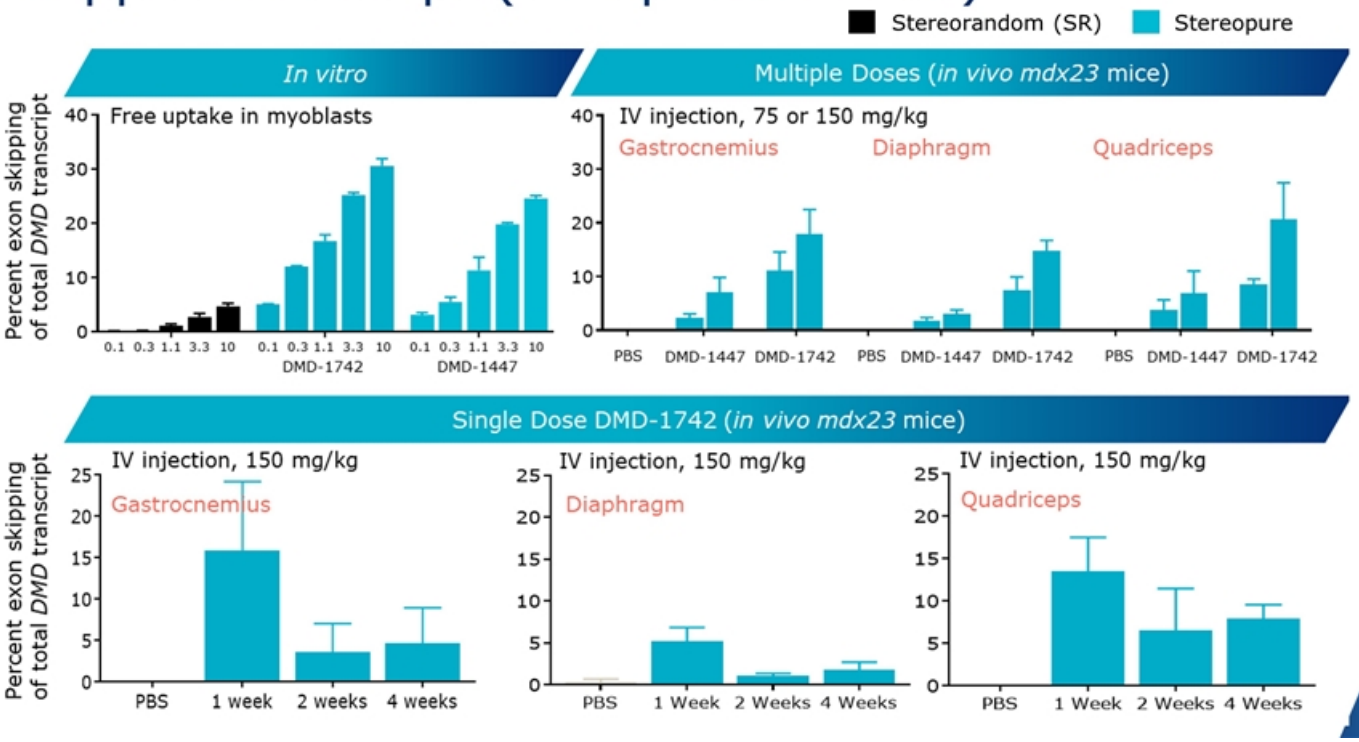
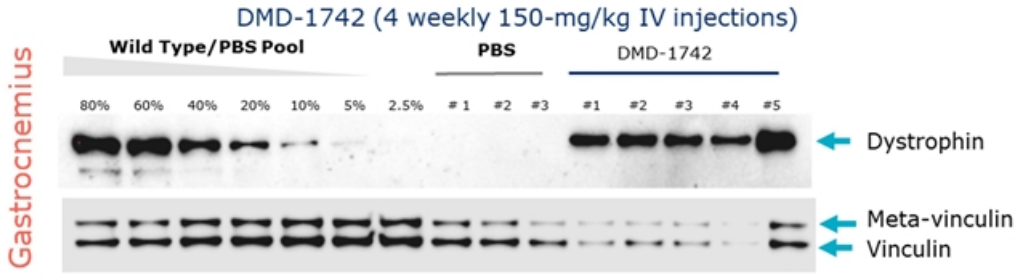
Stereopure oligonucleotides induce exon 23 skipped transcript (OTS poster #119)



Stereopure oligonucleotide induces dystrophin protein restoration and reduces elevated serum enzymes

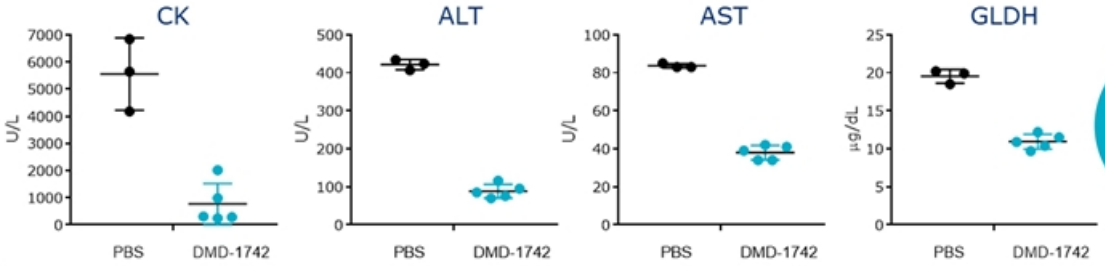
Multiple Doses (*in vivo mdx23* mice)

Dystrophin Protein Restoration



70-90% of natural dystrophin restoration

Serum Enzyme Levels



87% reduction in creatine kinase levels

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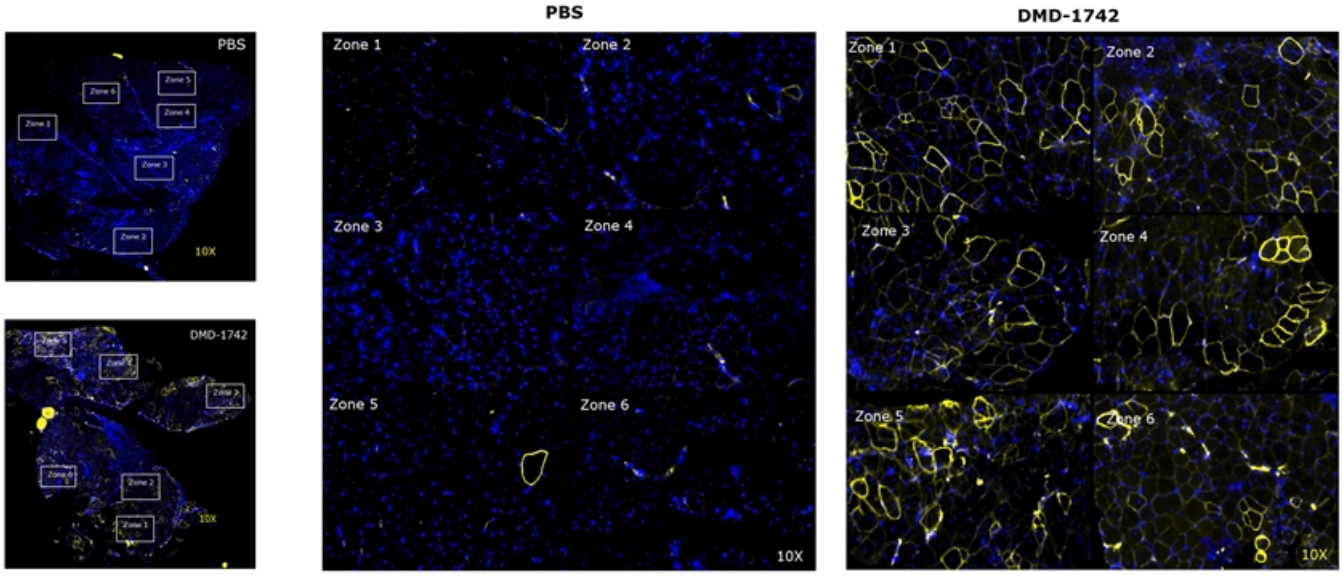
ALT=alanine aminotransferase; AST=aspartate aminotransferase; CK=creatine kinase; GLDH=glutamate dehydrogenase.
Serum and plasma clinical chemistry were measured with an Olympus AU640 (Olympus America) and the manufacturer's reagents and procedures.

Stereopure surrogate restores dystrophin in muscle fibers after single dose

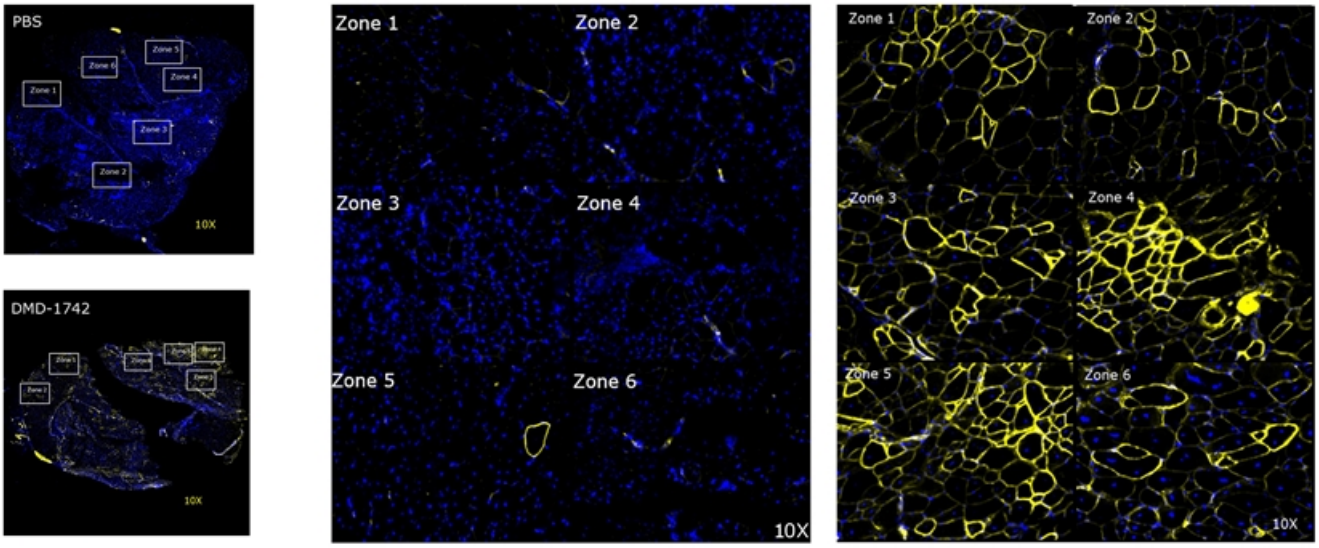
Immunohistochemistry of dystrophin in gastrocnemius in *mdx23* mice at 4 weeks



Experimental conditions: *mdx23* mice received a single IV injection of PBS or DMD-1742 (150 mg/kg).
Immunohistochemistry: Blue: Nuclei, Hoechest; Yellow: Rabbit anti-Dystrophin(#ab15277) 1:400 diluent, 555/Cy3, Yellow is a fake color for Cy3.
10X magnification.

Stereopure surrogate restores dystrophin in muscle fibers after multiple doses

Immunohistochemistry of dystrophin in gastrocnemius in *mdx23* mice at 4 weeks



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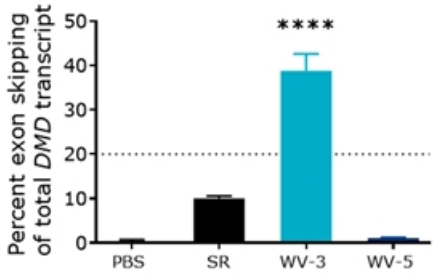
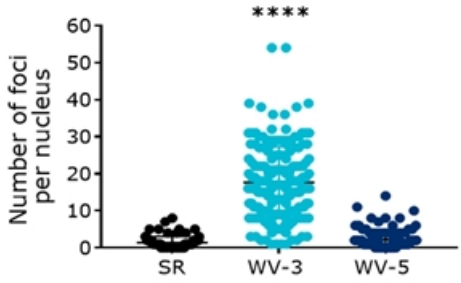
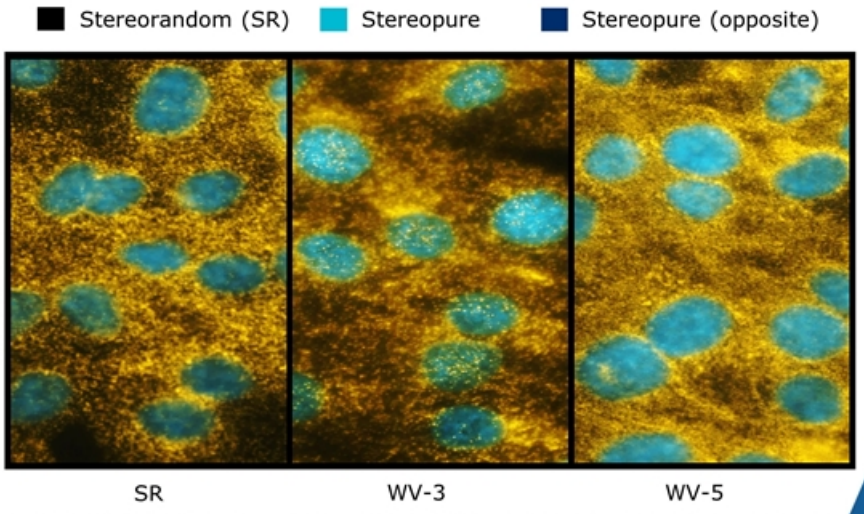
Experimental conditions: *mdx23* mice received 4 weekly IV injections of PBS or DMD-1742 (150 mg/kg).
Immunohistochemistry: Blue: Nuclei, Hoechest; Yellow: Rabbit anti-Dystrophin(#ab15277) 1:400 diluent, 555/Cy3, Yellow is a fake color for Cy3.
10X magnification.

Stereopure oligonucleotide traffics to nuclei in myoblasts





Stereopure ASO enters the nuclei of cultured myoblasts and promotes efficient exon 51 skipping



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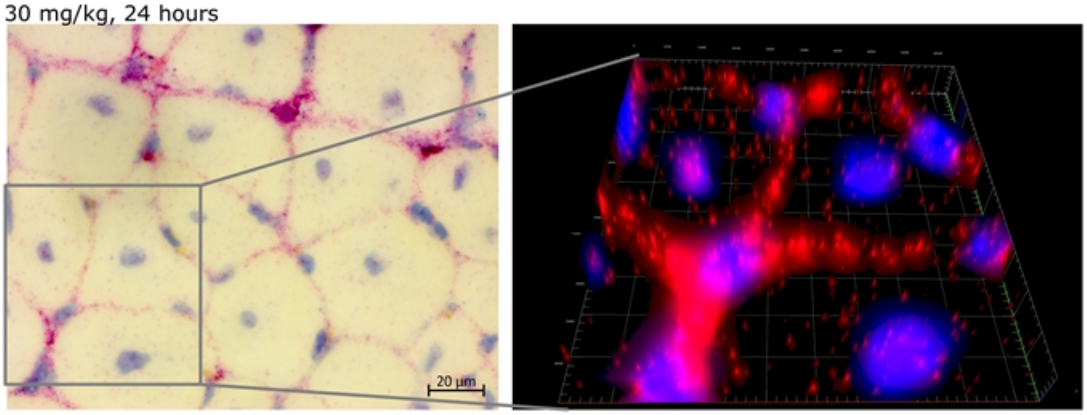
Cultured myoblasts were treated with 10 μM of the indicated ASO under free-uptake conditions. ASO was detected with ViewRNA; nuclei are stained with DAPI. Exon skipping efficiency was quantified by Taqman assay. Nuclear ASO was quantified with ImageJ software (https://imagej.nih.gov/ij/).

Stereopure oligonucleotides access myofiber nuclei in mice

Stereopure ASO targeting exon 53 rapidly enters myofibers in *mdx23* mice

30 mg/kg, 24 hours



Bright-field view
Nucleus: Hematoxylin (blue)
ASO: ViewRNA (red)

Fluorescence-field view (z stack)
Nucleus: Hoechst33342 (blue)
ASO: Fast Red (pink)

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Mdx23 mice were treated with a single 30 mg/kg dose of optimized, stereopure ASO (IV). Tissues were collected 24-hours post-dose. ASO was detected using ViewRNA, and nuclei were stained with Hoechst33342 or hematoxylin.

Summary

- We have developed a scalable process for generating stereopure ASOs
- Compared with stereorandom, stereopure ASOs are:
  - Taken up more readily by cells under gymnotic conditions in multiple cell lines
  - More potent in multiple tissues
  - More durable *in vivo*
- Optimized, stereopure ASOs exhibit improvements in multiple properties:
  - Precision and activity of RNase H
  - Potency correlation between *in vitro* and *in vivo*
  - Exon skipping efficiency
  - Rapid and broad tissue distribution
  - Nuclear uptake

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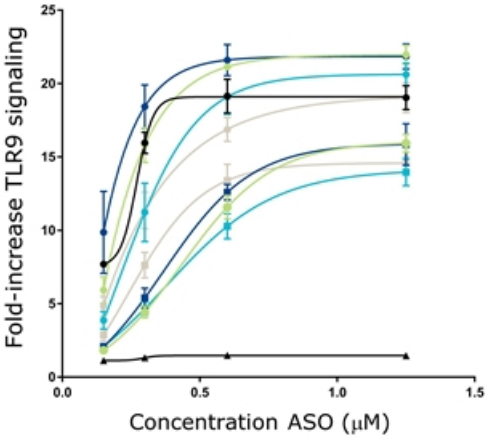
Future: Improving nucleic acid therapeutics through greater understanding of protein-nucleic acid interactions

Understanding innate immune receptor and broader DNA/RNA-protein interactions

TLR9 bound to stereopure, CpG-containing oligonucleotide

Stereochemistry of CpG-containing oligonucleotides impacts TLR9 activity



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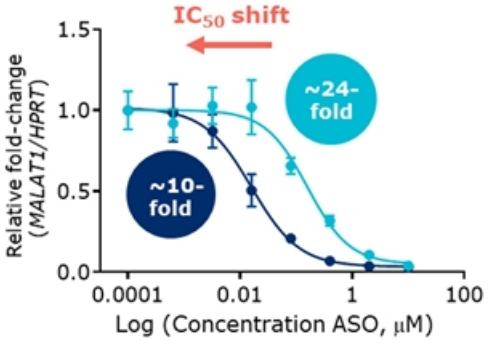
Future: More potent and durable CNS targeting with new chemistries

Antisense

In vitro potency

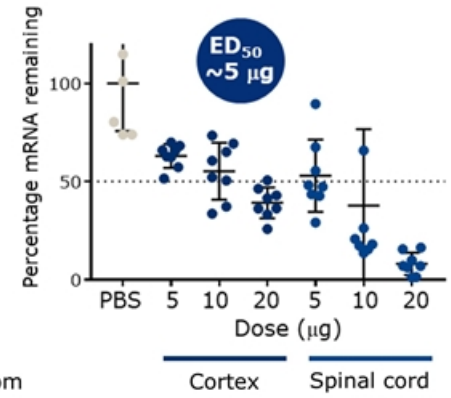
MALAT1 Knockdown in Human iCell Neurons
Under Free-Uptake Conditions



	Stereopure	Stereopure	Stereorandom
IC_{50}	15.9 nM	150 nM	2,900 nM

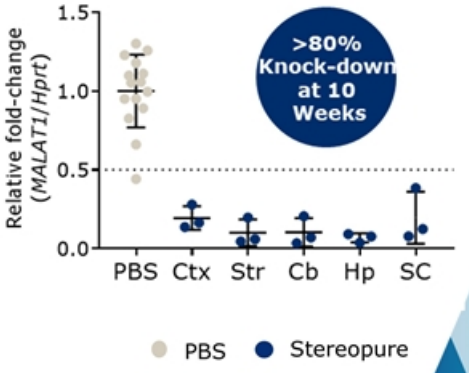
In vivo potency

MALAT1 Knockdown in Mice
1 week after single ICV injection



In vivo durability

MALAT1 Knockdown in Mice
10 weeks after single 100 μg injection



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PBS = phosphate buffered saline; Ctx = cortex; Str = striatum; Cb = cerebellum; Hp = hippocampus; SC = spinal cord.