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

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**FORM 8-K**

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

**Date of report (Date of earliest event reported): September 18, 2017**

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

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**Singapore**  
(State or other jurisdiction  
of incorporation)

**001-37627**  
(Commission  
File Number)

**Not Applicable**  
(IRS Employer  
Identification No.)

**8 Cross Street #10-00, PWC Building**  
**Singapore 048424**  
(Address of principal executive offices)

**048424**  
(Zip Code)

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

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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.

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**Item 7.01 Regulation FD Disclosure.**

From time to time, Wave Life Sciences Ltd. (the “Company”) presents and/or distributes slides and presentations to the investment community at various industry and other conferences to provide updates and summaries of its business. On September 18, 2017, the Company updated its corporate presentation, which is available on the Investors & Media section of the Company’s website at <http://ir.wavelifesciences.com/>, in order to, among other things, disclose that its sixth development program will be in Duchenne muscular dystrophy (“DMD”) targeting exon 53. This presentation is attached as Exhibit 99.1 and is incorporated by reference herein.

The information in Item 7.01 of this Form 8-K, including Exhibit 99.1 attached hereto, is intended to be furnished and shall not be deemed “filed” for 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, nor shall it be deemed incorporated by reference in any filing under the Securities Act of 1933, as amended, or the Exchange Act, except as expressly set forth by specific reference in such a filing.

**Item 9.01 Financial Statements and Exhibits.**

(d) Exhibits

<u>Exhibit No.</u>	<u>Description</u>
99.1	<a href="#">Corporate presentation of Wave Life Sciences Ltd., dated as of September 18, 2017</a>

**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: September 18, 2017

/s/ Keith C. Regnante

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Keith C. Regnante  
Chief Financial Officer



Wave Life Sciences  
September 18, 2017



# 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.

# Genetic medicines company

Developing targeted therapies for patients impacted by rare diseases

- Rationally designed stereopure nucleic acid therapeutics
- Utilizing multiple modalities including antisense, exon skipping and RNAi
- 6 proprietary neurology development programs by the end of 2018
- Expertise and core focus in neurology
  - 2 Phase 1b/2a trials initiated in Huntington's disease
  - DMD Exon 51 trial expected to initiate in 2017
  - Clinical data readouts anticipated in 2019 for first 3 programs
- Robust R&D platform, ability to partner additional therapeutic areas
- Cash position \$197MM as of June 30 2017

**WAVE**<sup>™</sup>  
LIFE SCIENCES

# Paving the way to potentially safer, more effective medicines



**1**  
first to design  
and bring stereopure  
and allele-specific  
medicines to clinic



**6**  
neurology  
development  
programs  
by end of 2018



**3**  
clinical studies  
expected to initiate  
in 2017



**10K+**  
Wave stereopure  
oligonucleotides  
created and  
analyzed to date



**5**  
nucleic acid  
modalities being  
advanced with Wave  
stereopure chemistry



**12+**  
discovery programs



**5**  
therapeutic  
areas under  
active investigation






**25M+**  
total potentially  
addressable patients  
amenable to Wave's  
partnered and  
proprietary programs

**WAVE**  
LIFE SCIENCES



# Pipeline spanning multiple modalities, novel targets

	DISEASE	TARGET	BIOMARKER	ESTIMATED U.S. ADDRESSABLE PATIENTS *	MECHANISM			NEXT ANTICIPATED MILESTONES
					DISCOVERY	CANDIDATE	CLINICAL	
CNS	Huntington's disease	mHTT SNP1	mHTT	~10k / ~35k	A	●	●	Phase 1b/2a Top line data 1H 2019
	Huntington's disease	mHTT SNP2	mHTT	~10k / ~35k	A	●	●	Phase 1b/2a Top line data 1H 2019
	Amyotrophic lateral sclerosis	C9orf72	dipeptide	~1,800	A	●	●	Trial initiation Q4 2018
	Frontotemporal dementia	C9orf72	dipeptide	~7,000	A	●	●	Trial initiation Q4 2018
MUSCLE	Duchenne muscular dystrophy 51	exon 51	dystrophin	~2,000	E	●	●	Trial initiation Q4 2017
	Duchenne muscular dystrophy 53	exon 53	dystrophin	~1,250	E	●	○	Trial initiation Q1 2019
HEPATIC		APOC3			○	●	○	
		undisclosed			○	●	○	
		undisclosed			○	●	○	

A = allele-specific silencing. E = exon skipping.



# Neurology leadership

## Current programs

- Huntington's disease (HTT SNP1)
- Huntington's disease (HTT SNP2)
- Duchenne muscular dystrophy (exon 51)
- Duchenne muscular dystrophy (exon 53)
- Amyotrophic lateral sclerosis (C9orf72)
- Frontotemporal dementia (C9orf72)

## Discovery engine

### Neuromuscular diseases

- DMD (additional exons)
- Spinal muscular atrophy (SMN2)
- Charcot-Marie-Tooth type 1A (PMP22)

### Neurodegenerative movement disorders

- Spinocerebellar ataxia (ATXN3)

## Opportunities for expansion

### Neurodegenerative movement disorders

- Parkinson's disease
- Progressive supranuclear palsy

### Neurodegenerative dementias

- Alzheimer's disease

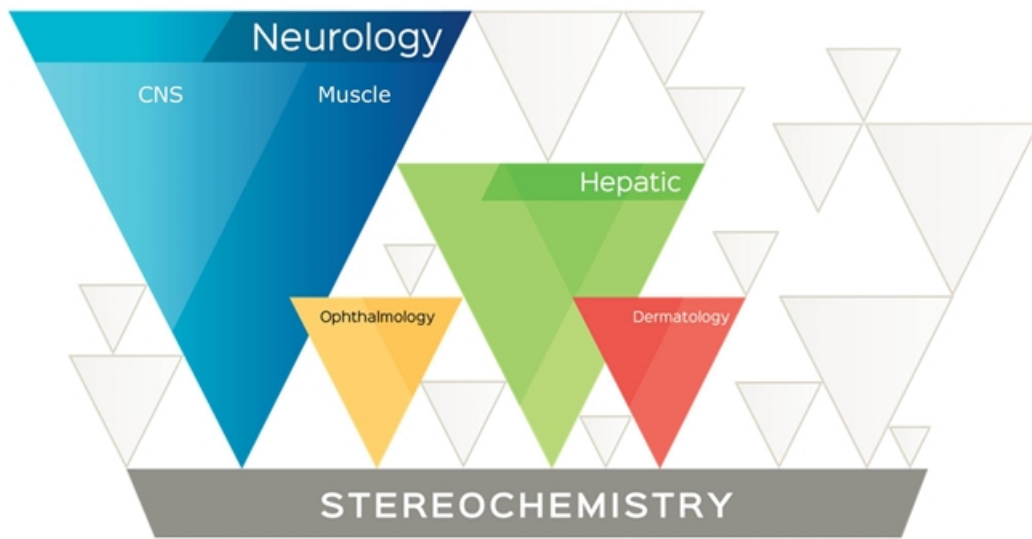
### Developmental diseases

- Fragile X
- Batten disease

### Neurophysiology/ neuropsychiatry/pain

- Epilepsy
- Schizophrenia

# Broad platform relevance across therapeutic areas



# Building the optimal, stereopure medicine



STANDARD OLIGONUCLEOTIDE APPROACHES

Pharmacologic properties include  
>500,000 permutations in every dose



Impact:  
Unreliable therapeutic effects  
Unintended off-target effects



WAVE RATIONAL DESIGN

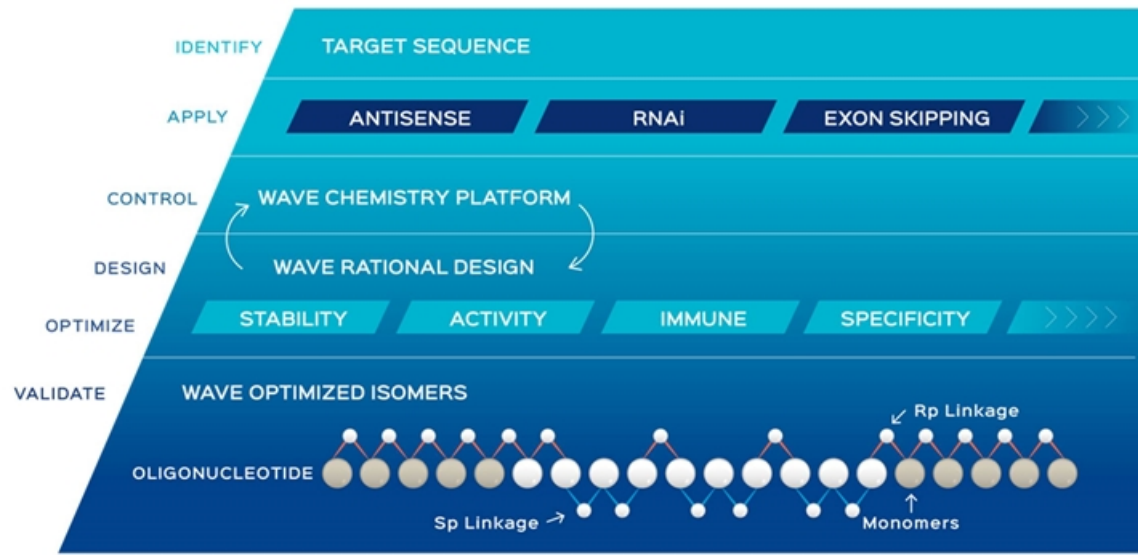
Stereochemistry enables precise control,  
ability to optimize critical constructs into  
one defined and consistent profile



Impact:  
Potential for safer, more effective,  
targeted medicines that can address  
difficult-to-treat diseases



# Creating a new class of oligonucleotides

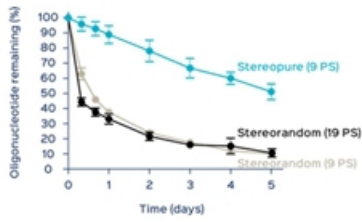


Source: Iwamoto N, et al. Control of phosphorothioate stereochemistry substantially increases the efficacy of antisense oligonucleotides. Nature Biotechnology. 2017.

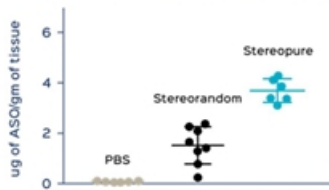
# Chemistry may optimize medicines across multiple dimensions

## Improved Stability

Stability of stereopure molecules with reduced PS content (liver homogenate)

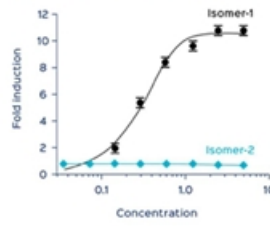


Oligonucleotide exposure (spinal cord)

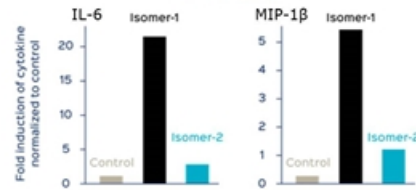


## Controlled Immunogenicity

Human TLR9 activation assay with 5mC modified CpG containing MOE gapmer

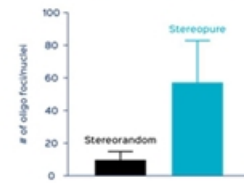


Cytokine induction in human PBMC assay

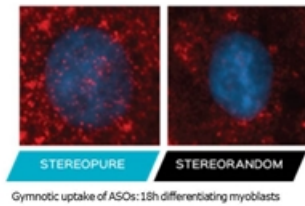


## Enhanced Delivery

Stereochemistry enables enhanced delivery of oligonucleotides



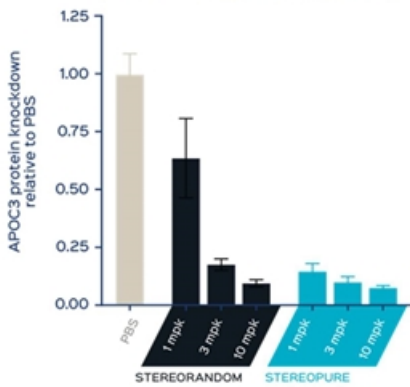
Uptake without transfection agent between a stereopure and stereorandom oligonucleotide



# Stereochemistry is applicable across modalities

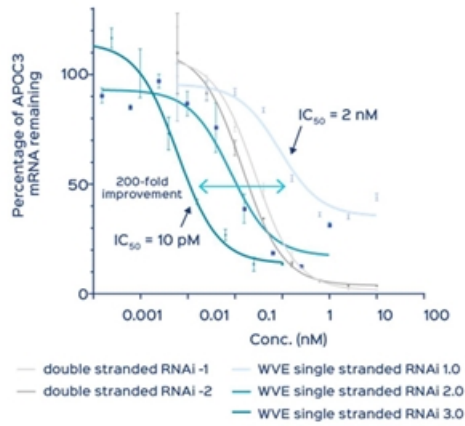
## Antisense

In vivo potency and durability  
(APOC3 transgenic mice, day 15)



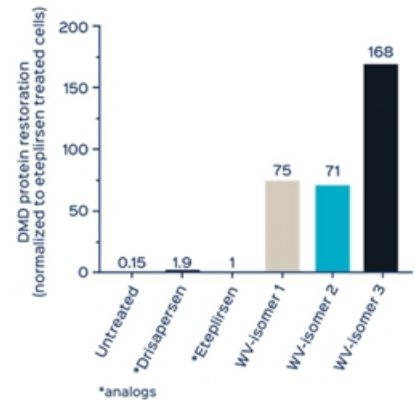
## RNAi

200 Fold Higher Potency from  
Original ssRNAi Designs



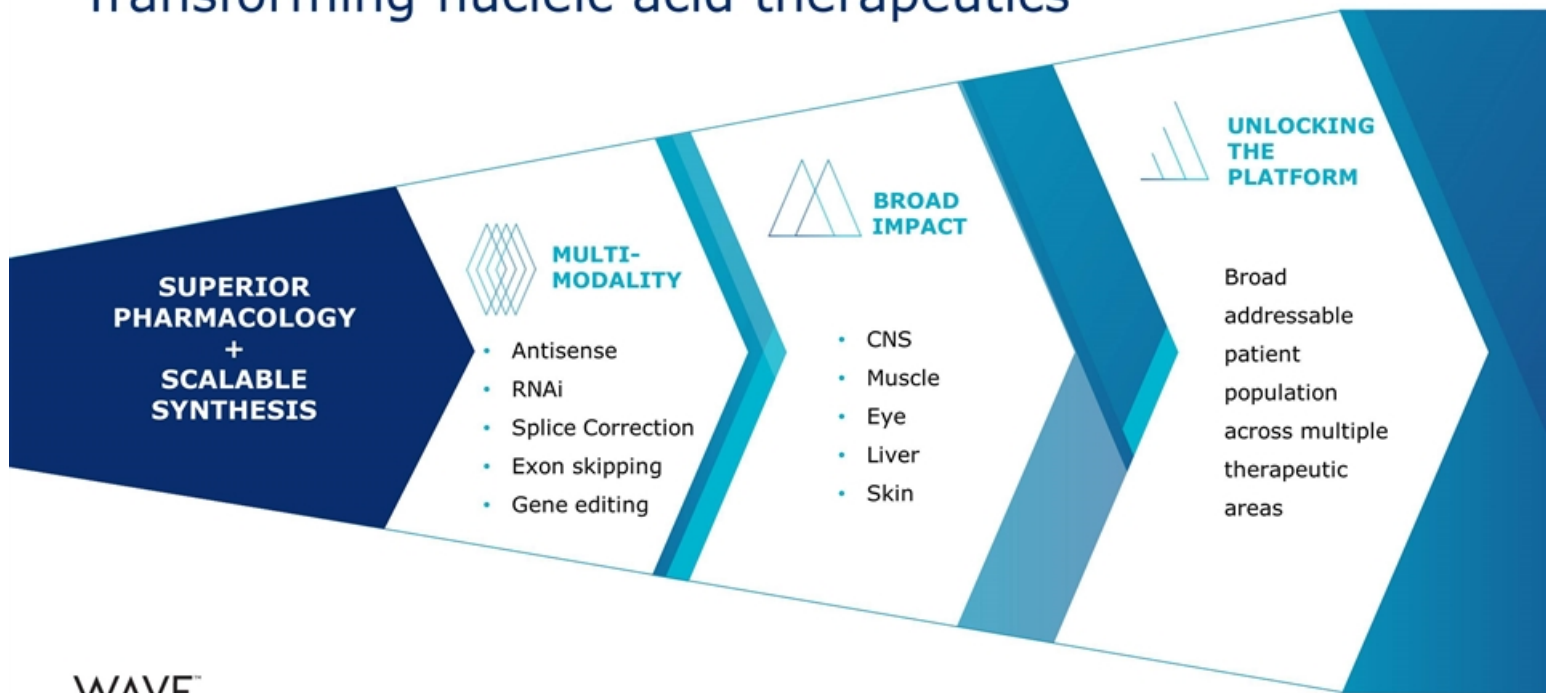
## Exon skipping

71-168 Fold Increase in  
Protein Restoration \*

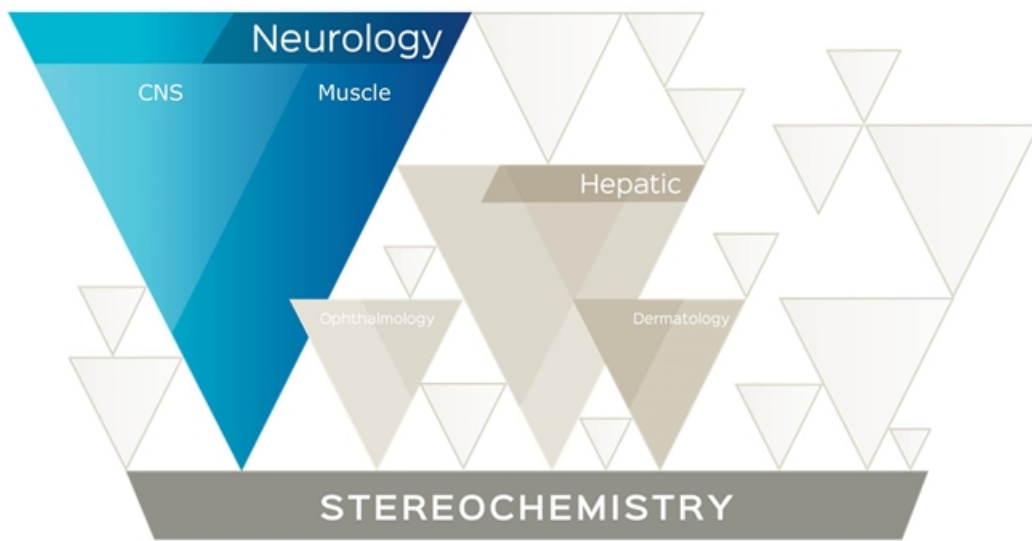


Stereochemistry allows for novel approaches to previously difficult diseases and inaccessible targets

# Transforming nucleic acid therapeutics



# Neurology

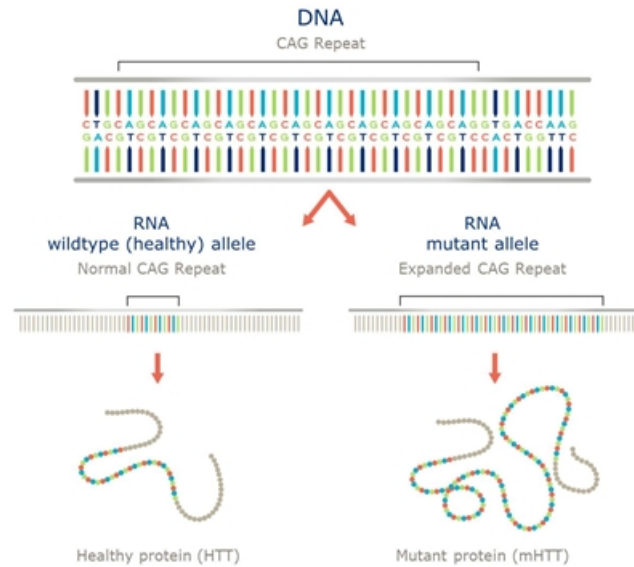




## Huntington's Disease

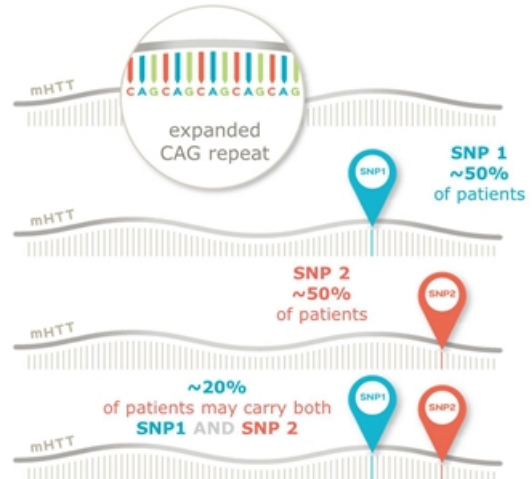
# Huntington's Disease: a hereditary, fatal disorder

- Autosomal dominant disease, characterized by cognitive decline, psychiatric illness and chorea; fatal
- No approved disease-modifying therapies
- Expanded CAG triplet repeat in HTT gene results in production of mutant huntingtin protein (mHTT); accumulation of mHTT causes progressive loss of neurons in the brain
- Wildtype (healthy) HTT protein critical for neuronal function; suppression may have detrimental long-term consequences
- 30,000 people with Huntington's disease in the US; another 200,000 at risk of developing the condition



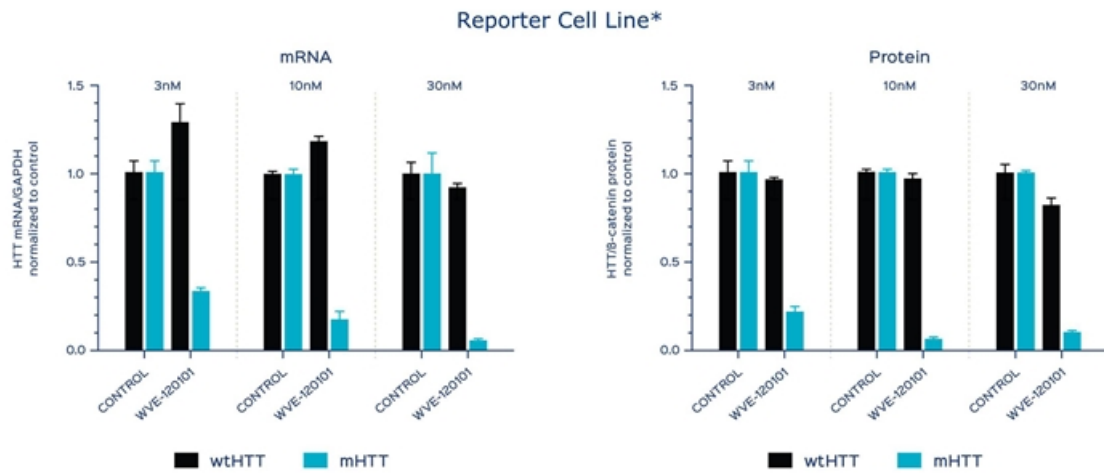
# Wave approach: novel, allele-specific silencing

- Utilize association between single nucleotide polymorphisms (SNPs) and genetic mutations to specifically target errors in genetic disorders, including HD.
- Allele-specificity possible by targeting SNPs associated with expanded long CAG repeat in mHTT gene
- Approach aims to lower mHTT transcript while leaving healthy HTT relatively intact
- Potential to provide treatment for up to 70% of HD population (either oligo alone could address approximately 50% of HD population)



Total: Due to overlap, an estimated **~70%** of the total HD patient population carry SNP 1 and/or SNP 2

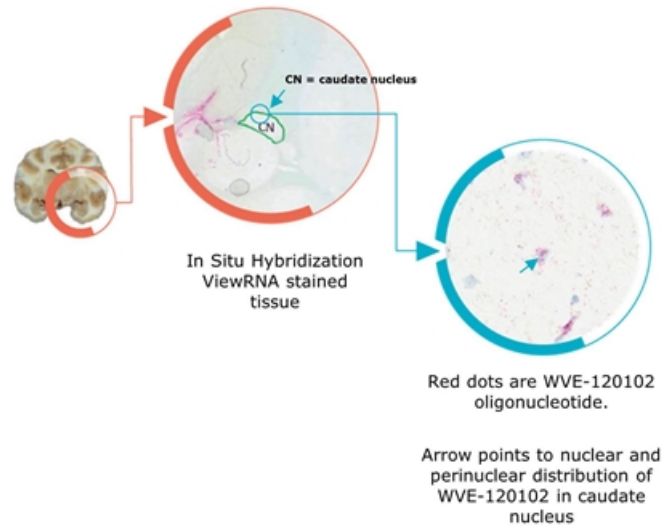
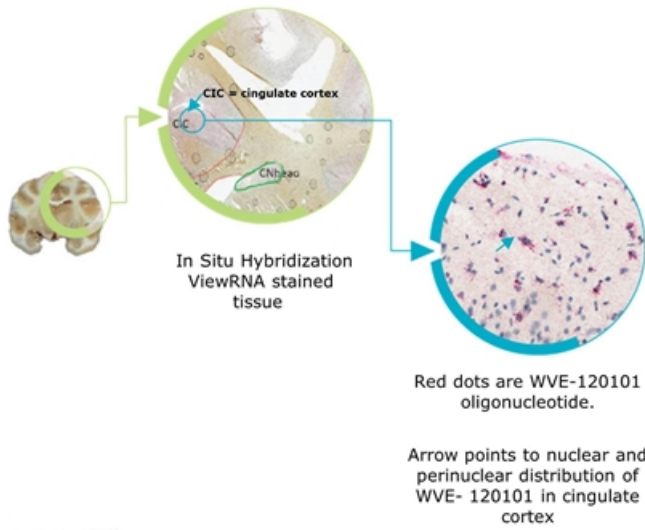
# Selective reduction of mHTT mRNA & protein



\*These results were replicated in a patient-derived cell line

# Demonstrated delivery to brain tissue

- WVE-120101 and WVE-120102 distribution in cynomolgus non-human primate brain following intrathecal bolus injection



# Mutant huntingtin: a powerful, novel biomarker

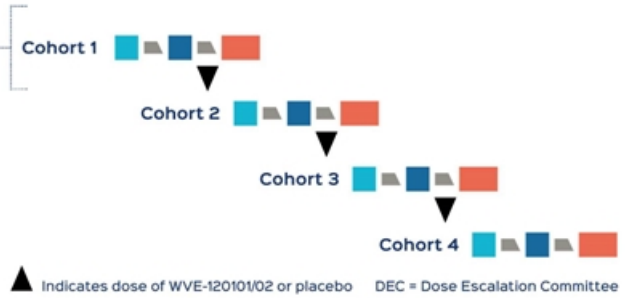
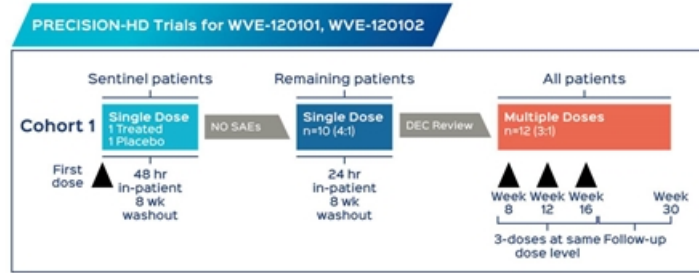
- Novel immunoassay allows for quantification of mutant huntingtin, the cause of HD
- Level of mHTT detected is associated with time to onset, increased with disease progression, and predicts diminished cognitive and motor dysfunction
- Assay currently being utilized in clinical studies

Novel approach enables precise measurement of target engagement and effect



# Two simultaneous Phase 1b/2a clinical trials

- Two parallel global placebo-controlled multi-ascending-dose trials for WVE-120101, WVE-120102
- Primary objective: assess safety and tolerability of intrathecal doses in early manifest HD patients
- Additional objectives: exploratory pharmacokinetic, pharmacodynamic, clinical and MRI endpoints
- Blood test to determine presence of SNP 1 or SNP 2 done at pre-screening
- Approximately 60 patients per trial
- Key inclusion criteria: age  $\geq 25$  to  $\leq 65$ , stage I or II HD
- Top line data anticipated 1H 2019



Duchenne  
Muscular Dystrophy  
(DMD)



# DMD: a progressive, fatal childhood disorder

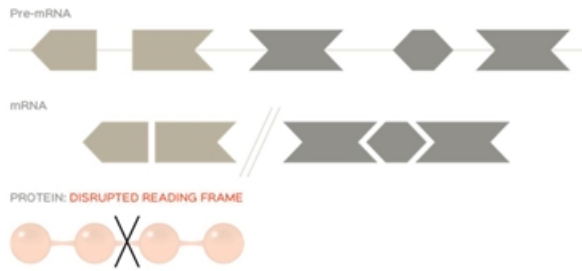
- Fatal, X-linked genetic neuromuscular disorder characterized by progressive, irreversible loss of muscle function, including heart and lung
- Genetic mutation in dystrophin gene prevents the production of dystrophin protein, a critical component of healthy muscle function
- Symptom onset in early childhood; one of the most serious genetic diseases in children worldwide
- Current disease modifying treatments have demonstrated minimal dystrophin expression and clinical benefit has not been established
- Impacts 1 in every 3,500 newborn boys each year; 20,000 new cases annually worldwide



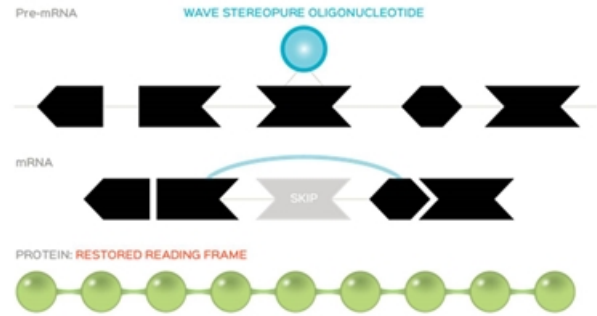
# Wave approach: meaningful restoration of dystrophin production through exon skipping

- Meaningful restoration of dystrophin production is expected to result in therapeutic benefit
- Exon-skipping antisense approaches may enable production of functional dystrophin protein
- Initial patient populations are those amenable to Exon 51 and Exon 53 skipping

## Dysfunctional splicing (Disease)



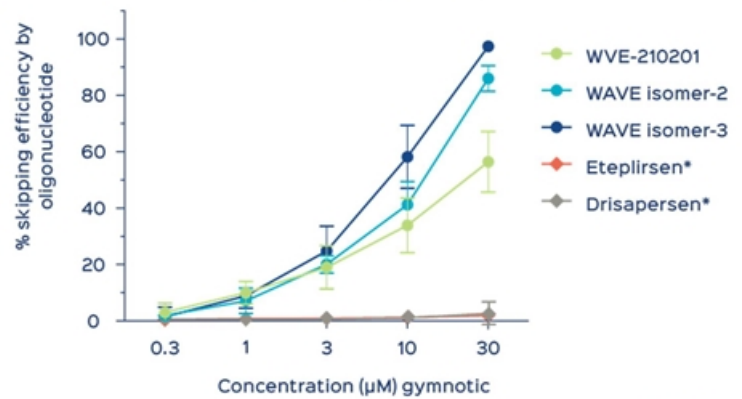
## Exon skipping (Potential Remedy)



# Exon 51: improved skipping efficiency

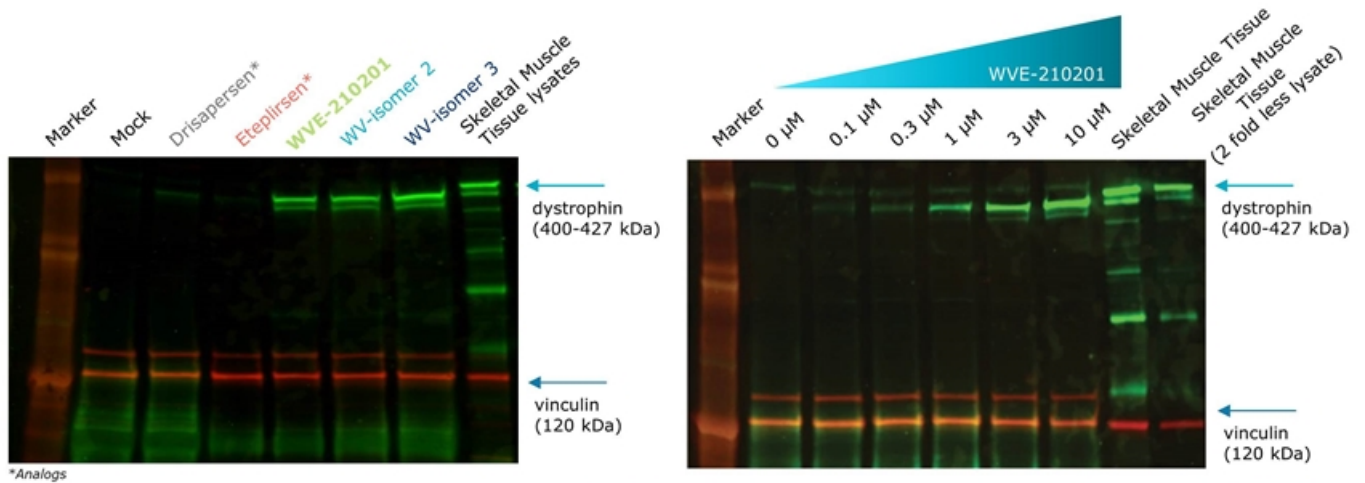
- RNA skipping determined by quantitative RT-PCR
- Wave isomers demonstrated a dose-dependent increase in skipping efficiency
- Free uptake at 10uM concentration of each compound with no transfection agent
- Same foundational stereopure chemistry for Wave isomers; individually optimized to assess ideal profile

Dose Response on Skipping Efficiency (mRNA, in vitro) (4 days)



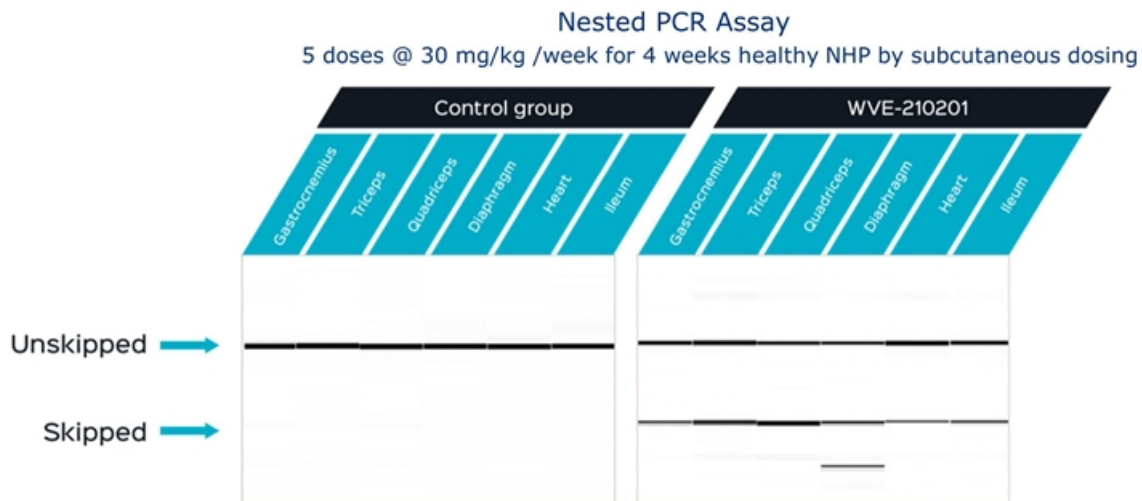
\*analogs

# Exon 51: increased dystrophin restoration



*Dystrophin protein restoration in vitro was quantified to be between 50-100% of normal skeletal muscle tissue lysates, as compared to about 1% by drisapersen and eteplirsen analogs*

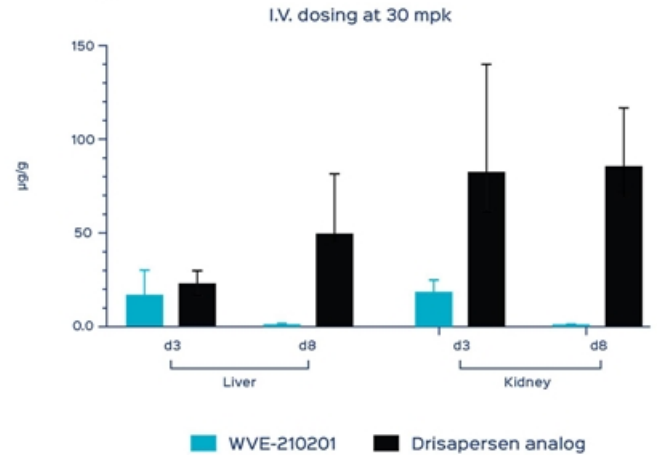
# Exon 51: target engagement in healthy non-human primate



# Exon 51: no apparent tissue accumulation observed

- Standard oligonucleotides tend to accumulate in liver and kidney
- Wave rationally designed oligonucleotides optimized to allow compound to clear more effectively
- WVE-210201 demonstrated wide tissue distribution in dose dependent fashion
- No apparent accumulation observed after multiple doses

## Single in-vivo I.V. dose at 30 mpk in MDX 23 mice

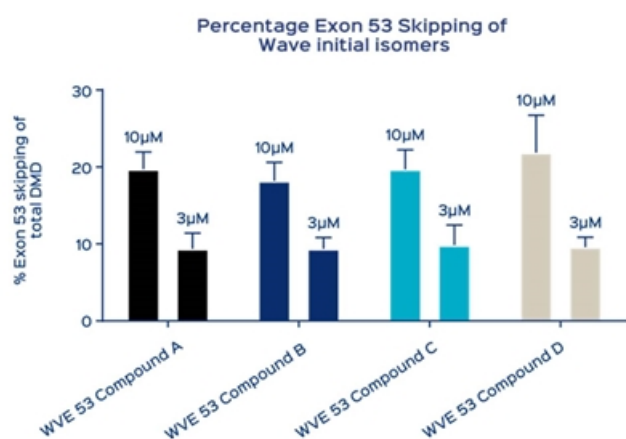


## Exon 51: WVE-210201 clinical trial design

- Clinical trials expected to initiate for WVE-210201 in Q4 2017
- Protocol development in collaboration with DMD community
- Intend to explore intravenous and subcutaneous administration
- Trials to include ambulatory and non-ambulatory patients
- Objective is to allow inclusion of patients previously treated with other exon skipping therapies
- Measurement of dystrophin via standardized Western Blot

# Exon 53:

## Stereopure lead molecules advancing toward candidate



- RNA skipping determined by quantitative RT-PCR
- Free uptake at 10uM and 3uM concentration of each compound with no transfection agent
- Current published clinical dystrophin levels achieved for Exon 53 are ~1%

**Early Exon 53 data suggests initial skipping efficiency around 20% pre-optimization**



## C9orf72

Amyotrophic Lateral Sclerosis (ALS)  
Frontotemporal Dementia (FTD)

# C9orf72: a critical genetic risk factor

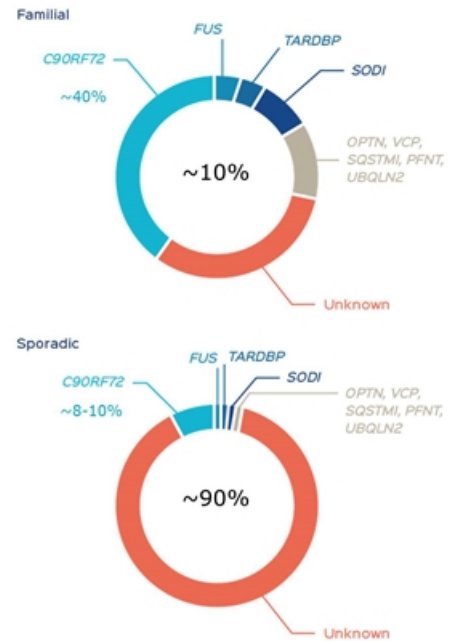
- C9orf72 gene provides instructions for making protein found in various tissues, with abundance in nerve cells in the cerebral cortex and motor neurons
- C9orf72 genetic mutations are the strongest genetic risk factor found to date for the more common, non-inherited (sporadic) forms of Amyotrophic Lateral Sclerosis (ALS) and Frontotemporal Dementia (FTD); GGGGCC repeat drives the formation and accumulation of dipeptide repeat proteins that accumulate in brain tissue
- First pathogenic mechanism identified to be a genetic link between familial (inherited) ALS and FTD
- Most common mutation identified associated with familial ALS and FTD
- Availability of dipeptide biomarker in CSF has potential to accelerate drug development



# Amyotrophic lateral sclerosis

- Neurodegenerative disease characterized by the progressive degeneration of motor neurons in the brain and spinal cord
- Affects approximately 15,000-20,000 people in the US with a median survival of 3 years
- C9orf72 is present in approximately 40% of familial ALS and 8-10% of sporadic ALS; currently the most common demonstrated mutation related to ALS, far more so than SOD1 or TDP-43
- Pathogenic transcripts of the C9orf72 gene contain hundreds to thousands of hexanucleotide repeats compared to 2-23 in wild-type transcripts; dominant trait with high penetrance

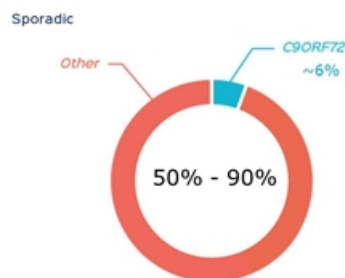
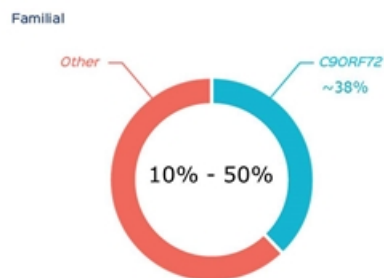
Initiation of clinical study expected 4Q '18



# Frontotemporal dementia

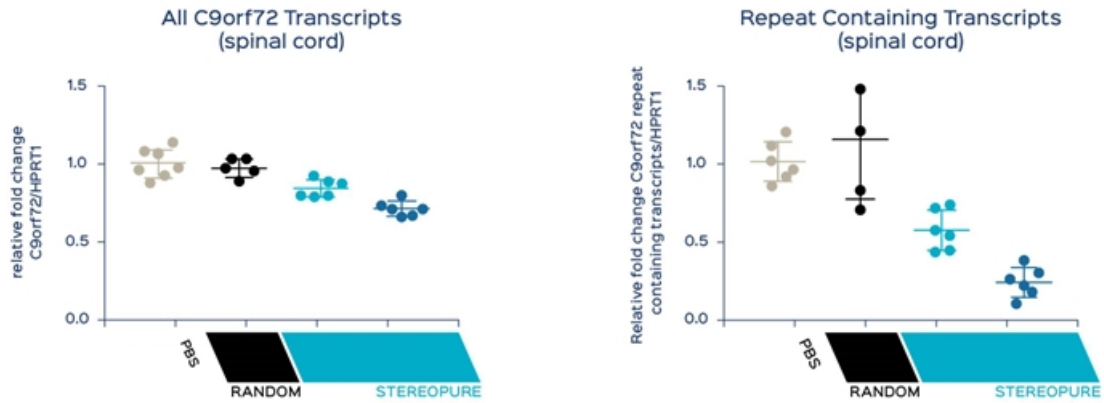
- Progressive neuronal atrophy with loss in the frontal and temporal cortices characterized by personality and behavioral changes, as well as gradual impairment of language skills
- Affects approximately 55,000 people in the US
- Second most common form of early-onset dementia after Alzheimer's disease in people under the age of 65
- Up to 50% of FTD patients have a family history of dementia, many inheriting FTD as an autosomal dominant trait with high penetrance
- Pathogenic transcripts of the C9orf72 gene contain hundreds to thousands of hexanucleotide repeats compared to 2-23 in wild-type transcripts

Initiation of clinical study expected 4Q '18

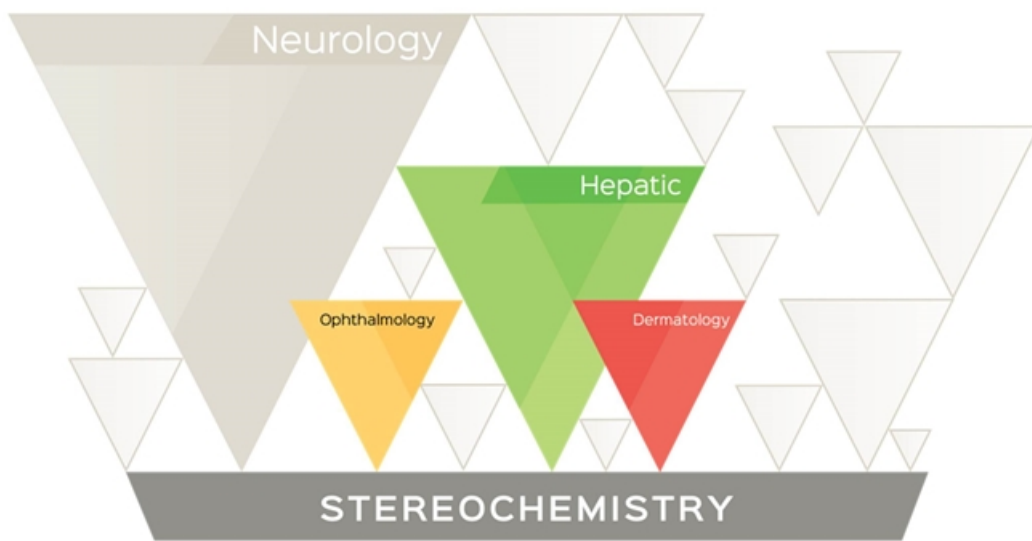


# Selective silencing of expanded C9orf72 repeat

- Wave has developed a series of highly optimized antisense compounds which selectively silence the repeat containing transcript in C9orf72 transgenic mice
- These compounds show target engagement across cell types and regions of the nervous system critically implicated in ALS



# Emerging areas



# Pfizer hepatic collaboration

- Initiated May 2016
- Exploring targets across modalities, including ASO and ssRNAi
- Up to 5 hepatic-metabolic programs
  - 3 targets declared; APOC3, 2 undisclosed
  - Option to declare 2 additional targets
- Access to Pfizer's hepatic targeting technology
  - Potentially increasing potency beyond GalNAc
  - Freedom to leverage beyond collaboration targets

# 40

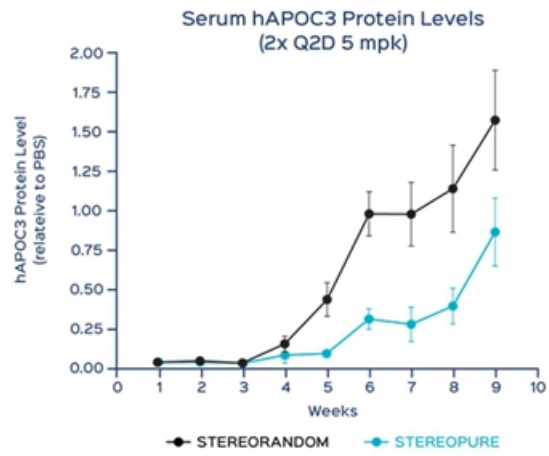
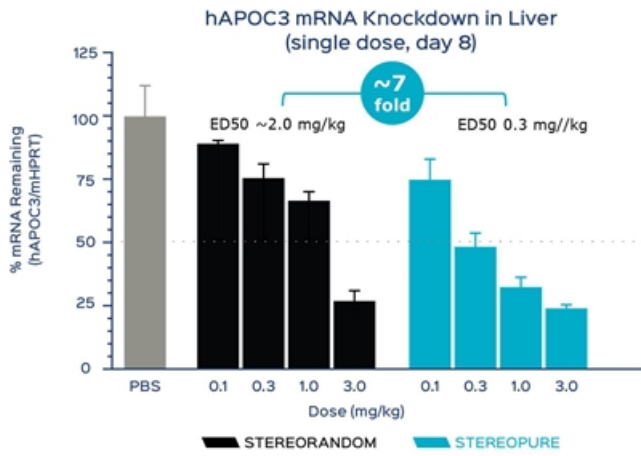
\$M upfront  
payment

# 871

\$M in potential  
milestone payments  
and royalties

# Stereopure ASOs: improved potency, extended duration

- Potency equivalent to state-of-the-art GalNAc conjugated double strand RNAi (ED50 0.3 mg/kg)
- Demonstrated increase in durability over GalNAc conjugated stereorandom



Experimental description: Male human APOC3 transgenic mice were dosed with APOC3 ASOs with indicated doses. APOC3 mRNA quantification in the liver was performed using Taqman assay specific for hAPOC3. For protein analysis, plasma samples were collected weekly and analyzed by ELISA assay specific to human APOC3 protein.

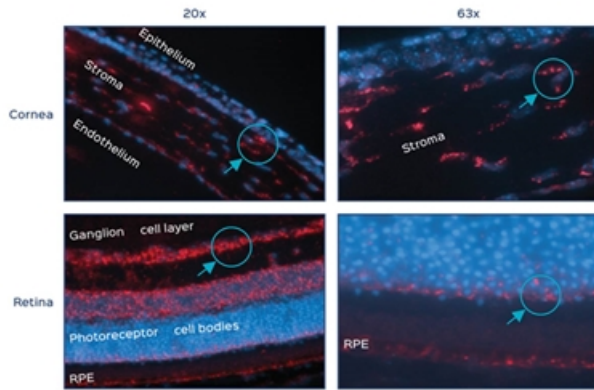




# Distribution and target engagement

## Ophthalmology

Distribution of oligonucleotide to key cellular Compartments following intravitreal injection in murine eye

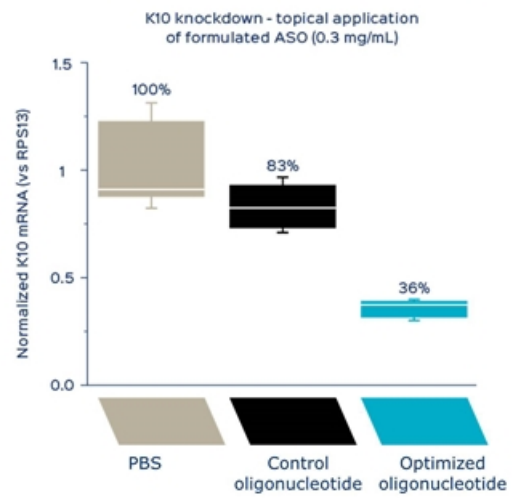


Red dots = Oligonucleotides

**WAVE**  
LIFE SCIENCES

## Dermatology

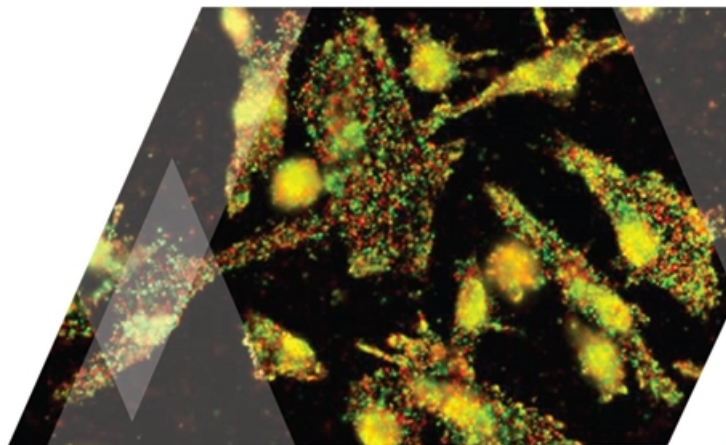
Target engagement following topical administration on human skin explant model



# Enabling technologies: enhancing stereopure platform



- Collaboration leverages ReadCoor's proprietary FISSEQ (Florescent In-Situ Sequencing) platform designed to provide critical spatial data by combining next generation sequencing and three-dimensional imaging
- Developing a registry of brain cell network maps
- Advancing chemistry for targeted delivery to the brain

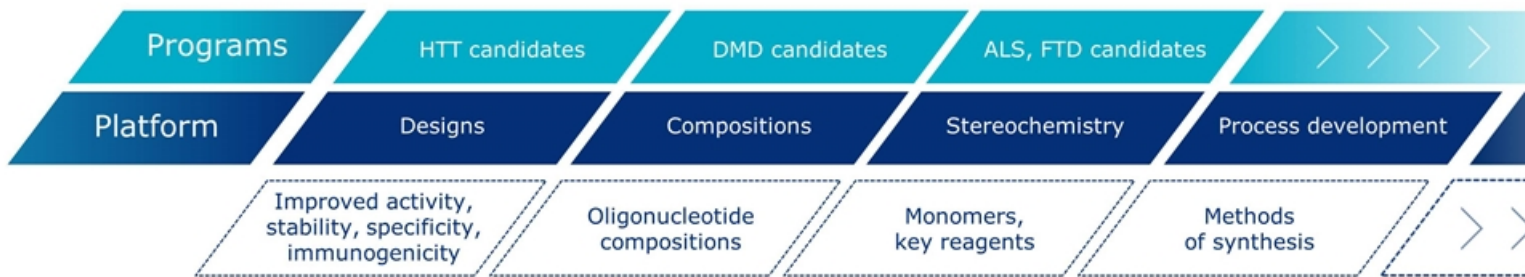


# Scalable nucleic acid synthesis

- Oligonucleotide synthesis capacity ranging from high throughput to large scale GMP production
- 90,000 square foot facility
- Ability to continue to meet synthesis demands of growing portfolio and increase control and visibility of product supply chain
- Comparable yield and cost-of-goods to standard stereorandom oligonucleotides
- Industry standard equipment with no biological processing required
- GMP manufacturing capacity potentially available to partners



# Secure patent and intellectual property position



# Wave catalysts

- **Initiated two clinical trials in Huntington's disease mid-2017**
  - Potential to be first two allele-specific disease-modifying therapies
  - Received U.S. orphan drug designation for WVE-120101 and WVE-120102
  - Top line data for WVE-120101 and WVE-120102 expected 1H 2019
- **Expect to initiate clinical trials in DMD Q4 2017**
  - First stereopure oligonucleotide targeting Exon 51 with potential to be best-in-class
- **Nominated three additional proprietary therapeutic candidates to progress to clinic:**
  - Target C9orf72 declared to address amyotrophic lateral sclerosis (ALS), trial initiation expected Q4 2018
  - Target C9orf72 declared to address frontotemporal dementia (FTD), trial initiation expected Q4 2018
  - DMD Exon 53 declared, trial initiation expected Q1 2019
- **Initiate in-house GMP production**

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Realizing the  
potential of  
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