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): December 10, 2017

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.)**

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

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 December 10, 2017, data from preclinical studies of WVE-3972-01, Wave Life Sciences Ltd.'s (the "Company") investigational stereopure antisense oligonucleotide designed to target the pathogenic allele of the *C9ORF72* gene for the treatment of amyotrophic lateral sclerosis (ALS) and frontotemporal dementia (FTD), were presented at the 28th International Symposium on ALS/MND. These data were presented by Robert Brown, Jr., DPhil, MD, with whom the Company is working in collaboration to further understand neurodegenerative and neuromuscular diseases, including ALS, and characterize the pharmacology of oligonucleotides. The slides presented containing these data are furnished as Exhibit 99.1 to this Current Report on Form 8-K.

In addition, on December 11, 2017, the Company issued a press release announcing these data. A copy of the press release is furnished as Exhibit 99.2 to this Current Report on Form 8-K.

The information in Item 7.01 of this Current Report on Form 8-K, including Exhibits 99.1 and 99.2 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 filing.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits.

The following exhibits relating to Item 7.01 of this Current Report on Form 8-K shall be deemed to be furnished and not filed:

Exhibit No.	Description
99.1	Slides presented on December 10, 2017
99.2	Press release issued on December 11, 2017

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: December 11, 2017

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

WAVE™
LIFE SCIENCES

Preclinical Data for WVE-3972-01 Supporting ALS and FTD Programs

Robert Brown, Jr., DPhil, MD

Chair and Professor of Neurology at the
University of Massachusetts Medical School

28th International Symposium on ALS/MND

December 10, 2017

Disclosures

Robert Brown, Jr., DPhil, MD is Chair and Professor of Neurology at the University of Massachusetts Medical School.

In January 2017, Wave Life Sciences and the University of Massachusetts Medical School established a collaboration to further understand neurodegenerative and neuromuscular diseases, including ALS, and characterize the pharmacology of oligonucleotides. Research under this collaboration is conducted by Dr. Brown.

On December 10, 2017, during the closing plenary session of the 28th International Symposium on ALS/MND, Dr. Brown presented the following preclinical data for WVE-3972-01, Wave's investigational stereopure antisense oligonucleotide designed to target the pathogenic allele of the C9ORF72 gene for the treatment of ALS and FTD.

WAVE LIFE SCIENCES

Forward-looking statements

This document contains forward-looking statements. All statements other than statements of historical fact 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.

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Lessons from SOD1
Gene Silencing
Recent Data for SOD1
Novel Reagents for Silencing C9orf72
Targeting C9orf72 in ALS
University of Massachusetts Medical School
UMASS
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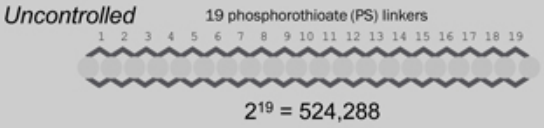
University of Massachusetts Medical School
UMASS
WAVE
LIFE SCIENCES
H. Tran
M. Moazami
C. Pinto
J. Watts
J. C. Dodart
Z. Zhong
Y. Liu

Stereopure Nucleic Acids Therapeutics: Wave Chemistry

Traditional method

- Chemically modified oligonucleotides are typically 20 nucleotides long and held together by a backbone of phosphorothioate linkages with uncontrolled chirality
- The orientation of atoms at each linkage occurs randomly, adopting either an “up” or “down” orientation
- These random orientations can result in a mixture of >500,000 unique molecules that may have implications for drug stability, activity, and safety

Uncontrolled

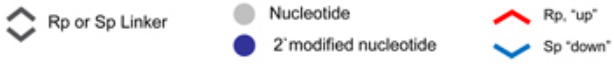


$2^{19} = 524,288$

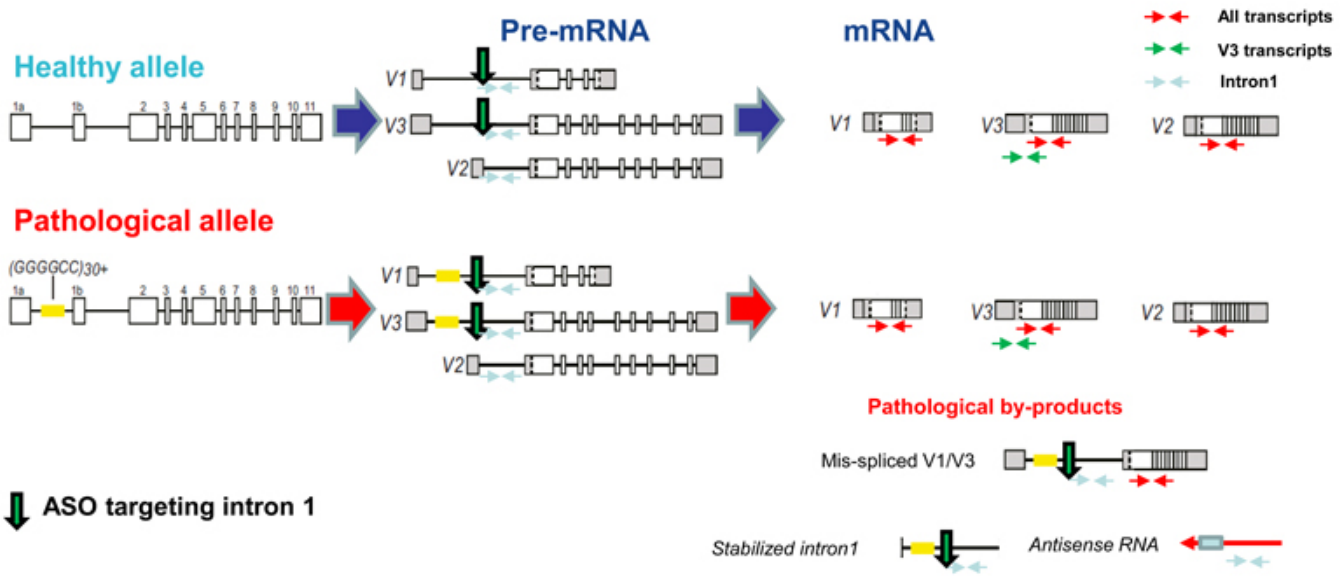
Wave’s method

- Wave’s proprietary chemistry and stereochemistry platform enable the **precise design**, optimization and production of stereopure oligonucleotides
- These are **novel molecules** with atoms precisely arranged in three-dimensional orientation at each linkage
- Precisely designing and controlling chirality **improves stability, potency and duration of effect *in vitro***

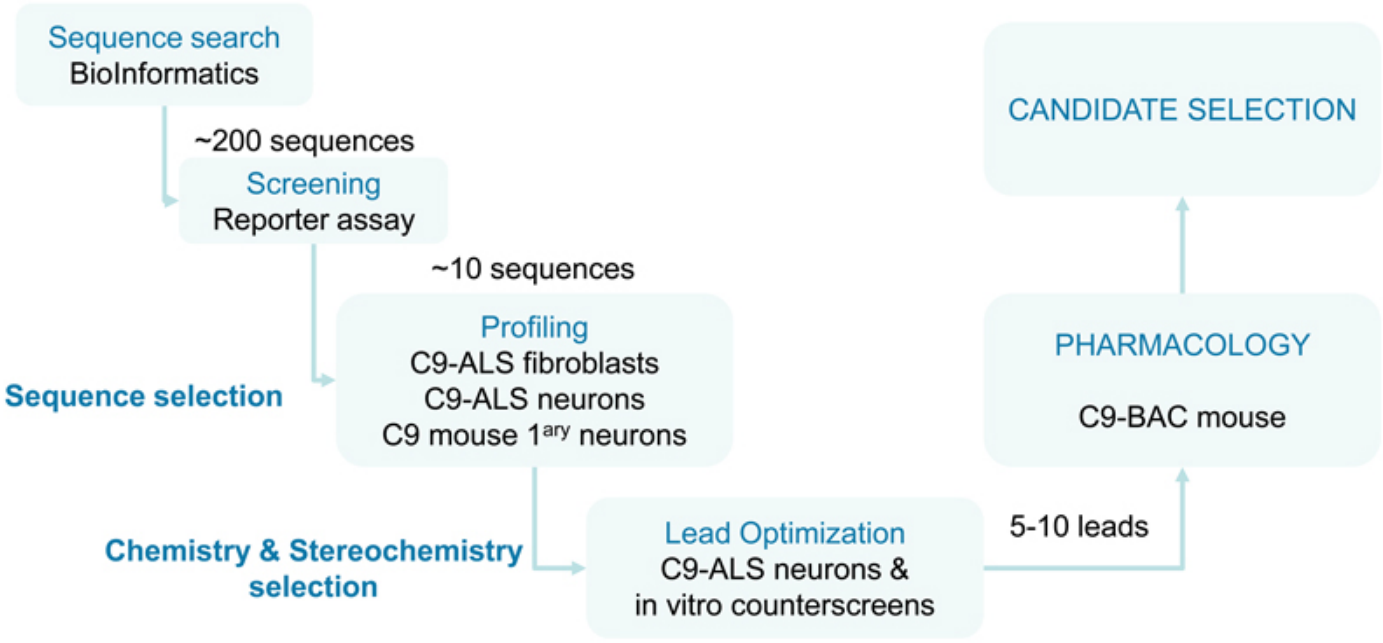
Controlled and optimized



Preferential knockdown of repeat-containing transcripts by targeting intron 1
(with the toxic hexanucleotide expansion)

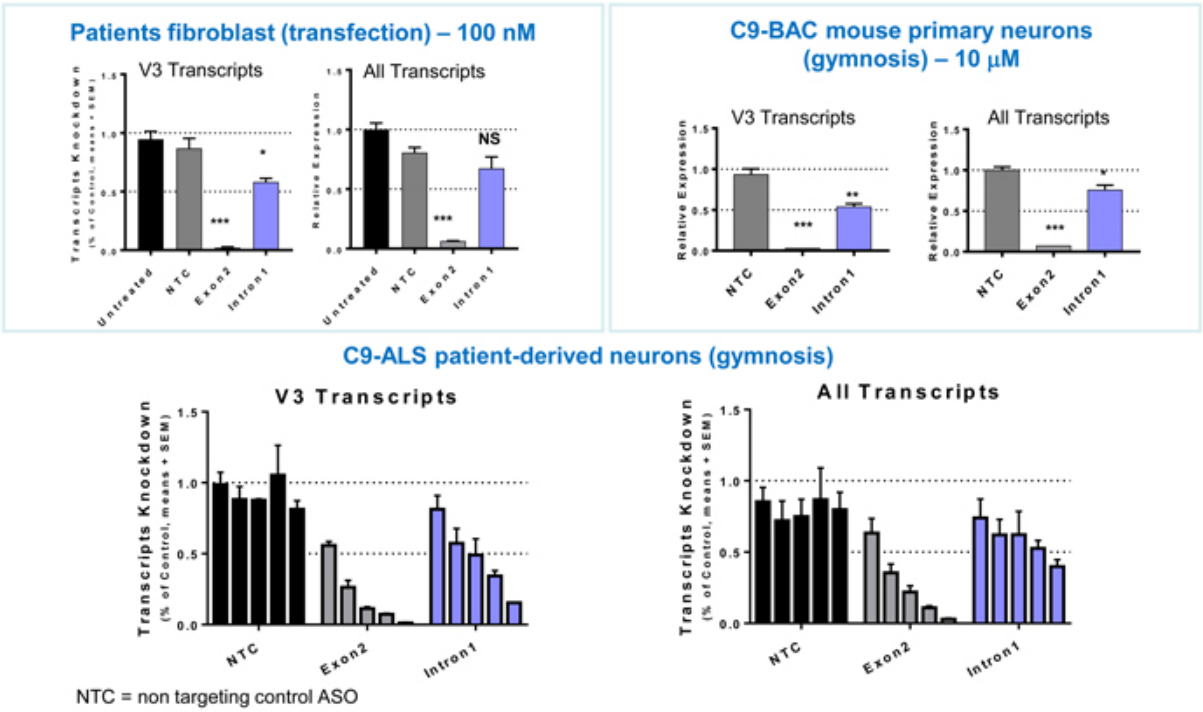


Screening and lead optimization funnel



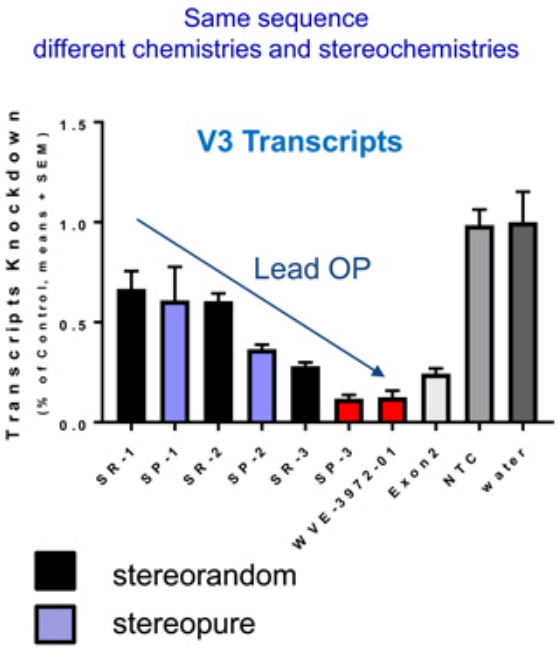
Targeting intron1 leads to preferential reduction in repeat-containing C9orf72 transcripts (vs. exon 2 targeting)

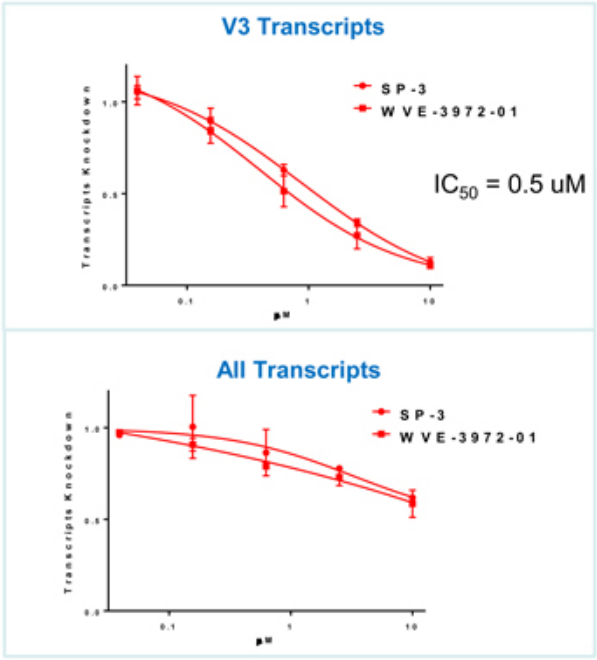
STEREORANDOM ASOs



NTC = non targeting control ASO

Chemical and stereochemical optimization greatly improve selectivity and potency in C9-ALS neurons

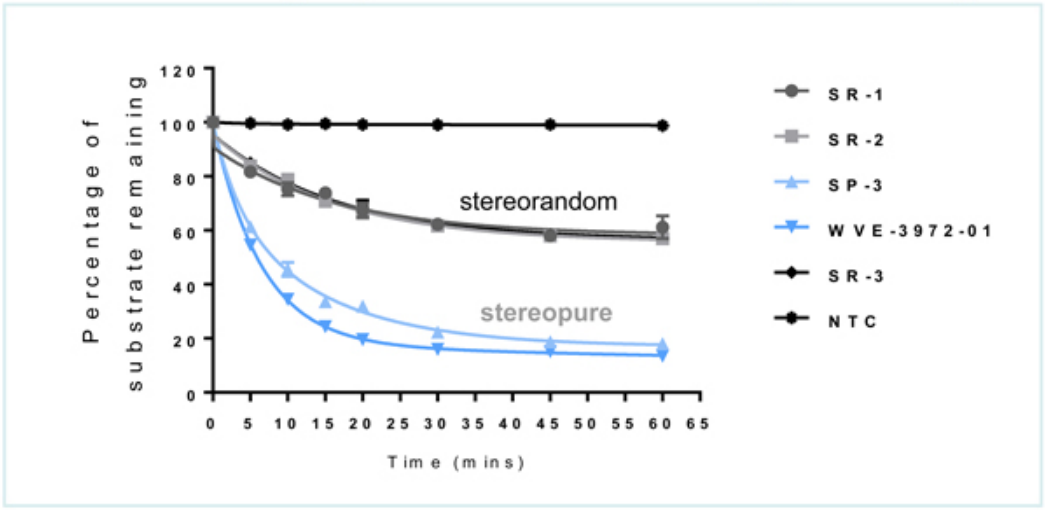




SR= stereorandom ASO; SP = stereopure ASO; NTC = non-targeting control ASO.

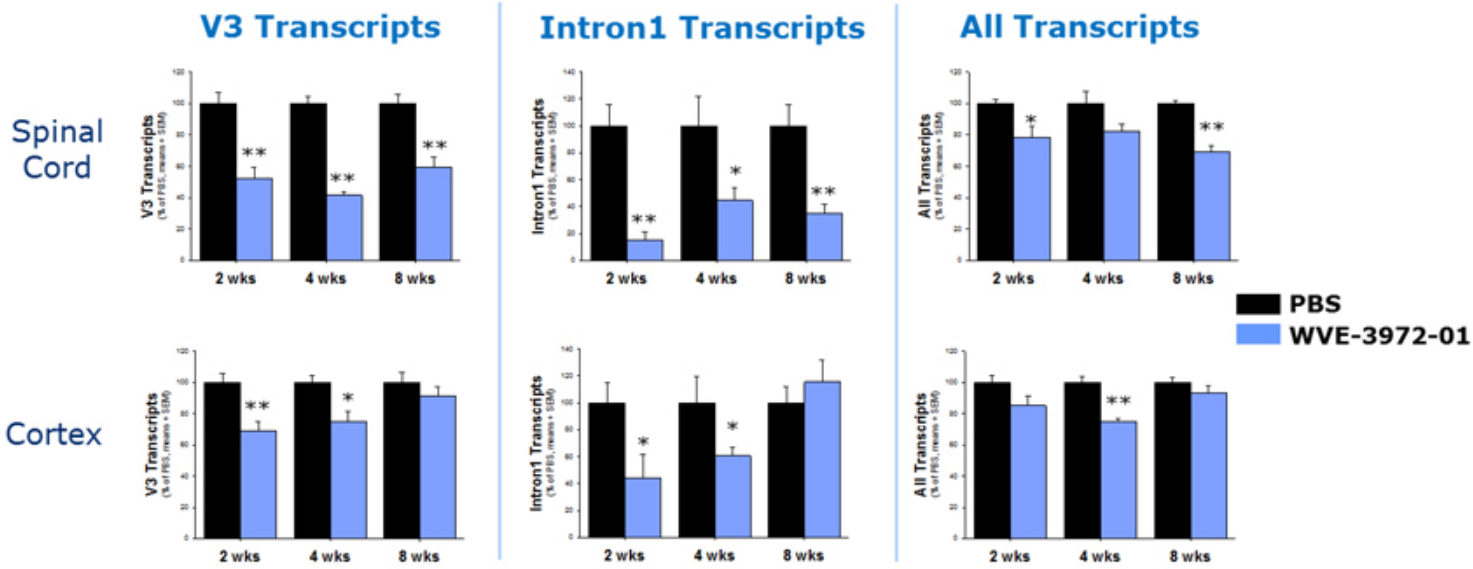
Stereochemical optimization dramatically improves ASO *in vitro* potency

Stereochemistry improves RNAse H cleavage efficiency



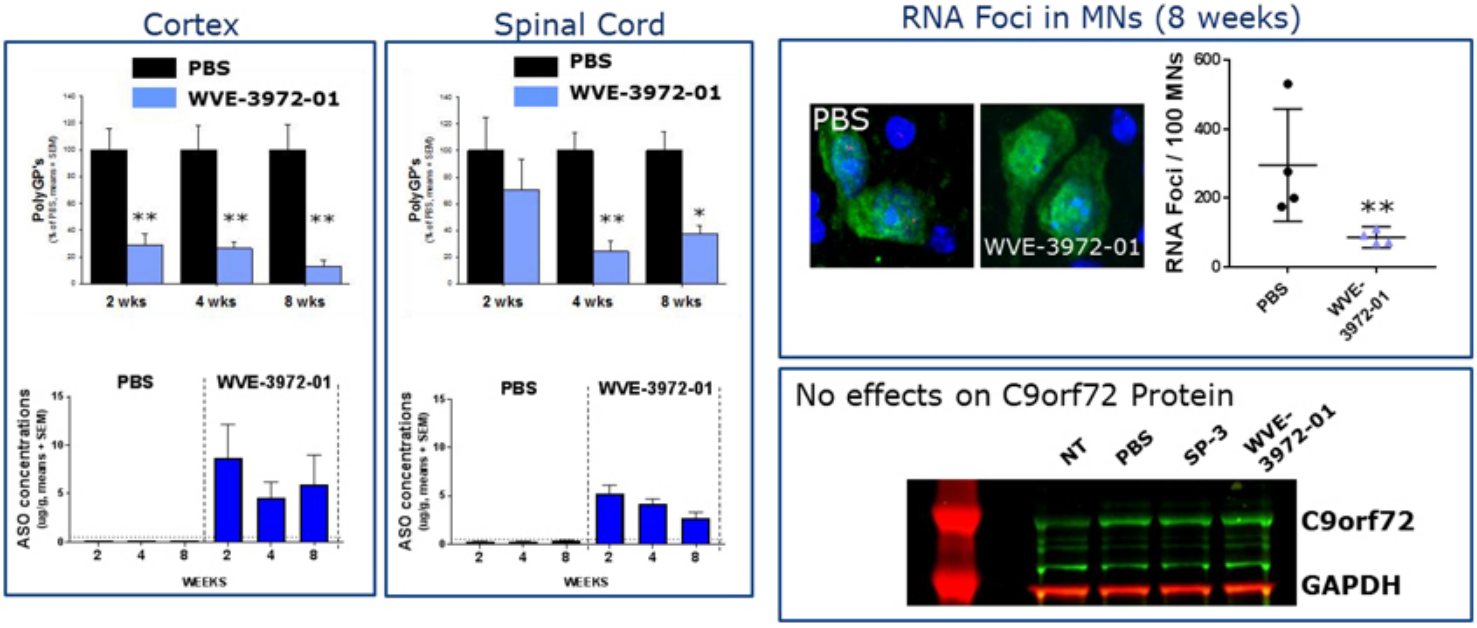
SR= stereorandom ASO; SP = stereopure ASO; NTC = non-targeting control ASO.

WVE-3972-01 produces a sustained reduction in repeat-containing transcripts in C9-BAC transgenic mice



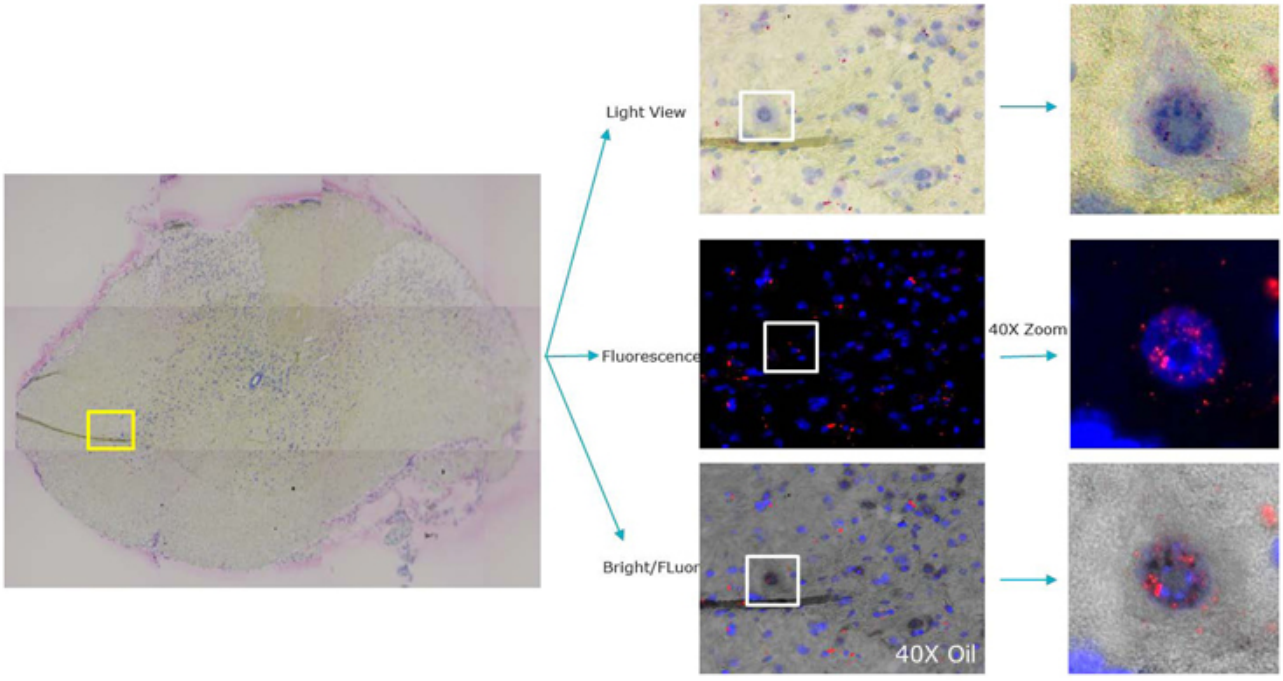
C9-BAC mice were administered 50µg of ASO ICV on day 1 and day 8; tissues were collected 2, 4 or 8 weeks after 1st injection.
*Stats: One-way ANOVA followed by Student-Newman-Keuls analyses; * $p < 0.05$ and ** $p < 0.01$ versus PBS control group.*

WVE-3972-01 shows significant and sustained decreases in polyGPs and RNA foci in C9-BAC transgenic mice



C9-BAC mice were administered 50µg of ASO ICV on day 1 and day 8; tissues were collected 2, 4 or 8 weeks after 1st injection.
*Stats: One-way ANOVA followed by Student-Newman-Keuls analyses; * $p < 0.05$ and ** $p < 0.01$ versus PBS control group.*
NT= non-transgenic.

Widespread and sustained distribution of ASOs in the nuclei of motor neurons of the spinal cord up (*8 weeks after treatment)*



Conclusions: C9 Program

- *In vitro*, stereopure ASOs showed greater selectivity and potency in knockdown of repeat-containing transcripts vs. stererandom ASOs
- *In vivo* studies in C9-BAC transgenic mice:
  - Confirmed selectivity and potency, and showed sustained reduction of repeat-containing transcripts
  - Dramatic reduction of DPRs and RNA foci in CNS
  - Minimum effective dose established
- Toxicology studies ongoing
- On track for clinical trial initiation in Q4 2018

Preclinical Data Supporting Wave Life Sciences ALS and FTD Programs
Presented at 28th International Symposium on ALS/MND

Lead candidate targets C9ORF72; in vivo animal data demonstrate potent, sustained and preferential knockdown of toxic biomarkers associated with ALS and FTD

CAMBRIDGE, Mass., December 11, 2017 – Wave Life Sciences Ltd. (NASDAQ: WVE), a biotechnology company focused on delivering transformational therapies for patients with serious, genetically-defined diseases, today announced data from preclinical studies of WVE-3972-01, the company's investigational stereopure antisense oligonucleotide designed to target the pathogenic allele of the *C9ORF72* gene for the treatment of amyotrophic lateral sclerosis (ALS) and frontotemporal dementia (FTD). In preclinical studies, WVE-3972-01 demonstrated substantial reduction in disease-associated biomarkers and superior potency to stereorandom oligonucleotides. Wave Life Sciences intends to initiate clinical trials of WVE-3972-01 in ALS and FTD in Q4 2018.

Data from *in vitro* and *in vivo* studies of stereorandom and stereopure oligonucleotides, including WVE-3972-01, were presented by Robert Brown, Jr., DPhil, MD at the 28th International Symposium on ALS/MND in Boston during the closing plenary session on December 10, 2017. Dr. Brown is Chair and Professor of Neurology at the University of Massachusetts Medical School.

"The degree of silencing of C9orf72 by WVE-3972-01 and the potency of this stereopure antisense oligonucleotide preclinically are quite compelling," said Dr. Brown. "We are very excited at the prospect of seeing these unique oligonucleotides in clinical trials in C9orf72 patients in the near term."

Mutations in the *C9ORF72* gene are believed to be the most common cause of familial ALS and FTD. These mutations cause the production of repeat-containing transcripts, resulting in accumulation of RNA foci and an increase in dipeptide repeat proteins in the brain and spinal cord. *C9ORF72*-associated diseases such as familial ALS and FTD are postulated to arise from a reduction of normal C9orf72 protein or a gain in toxic RNA foci or dipeptide repeat proteins.

Wave Life Sciences, in collaboration with Dr. Brown and his team, showed that WVE-3972-01 preferentially reduced repeat-containing transcripts versus all transcripts in neurons derived from ALS patients with a *C9ORF72* mutation and demonstrated greater potency when compared with stereorandom oligonucleotides of the same sequence. *In vivo* studies conducted in a transgenic animal model containing the mutated *C9ORF72* gene demonstrated that WVE-3972-01 produced a significant and sustained preferential knockdown of repeat-containing transcripts, RNA foci and dipeptide repeat proteins without altering total C9orf72 protein levels. When measured at eight weeks after treatment, RNA foci in the spinal cord were reduced by 70%. Dipeptide repeat proteins achieved a maximum reduction of 76% and 87% in the spinal cord and the cortex, respectively, and remained significantly low through eight weeks, the last observed time point.

"The high potency and sustained effect seen *in vivo* on important preclinical C9orf72 biomarkers make us optimistic regarding the potential of WVE-3972-01," said Michael Panzara, MD, MPH, Franchise Lead, Neurology at Wave Life

Sciences. “The reduction of mutant C9orf72 proteins with preservation of healthy C9orf72 proteins is likewise encouraging. We look forward to working with the ALS and FTD communities to bring WVE-3972-01 into clinical trials in Q4 2018.”

In January 2017, Wave Life Sciences and the University of Massachusetts Medical School established a collaboration to further understand neurodegenerative and neuromuscular diseases, including ALS, and characterize the pharmacology of oligonucleotides. Research under this collaboration is conducted by Dr. Brown, an internationally known researcher and physician leading basic and clinical research on ALS and other neurodegenerative diseases.

Today, Wave Life Sciences will be hosting an expert breakfast discussing the company’s neurology pipeline, which will include Dr. Brown presenting data from the preclinical studies of WVE-3972-01. A replay of this presentation will be available following the presentation and accessible on the company’s website for a limited time.

About Amyotrophic Lateral Sclerosis (ALS) and Frontotemporal Dementia (FTD)

ALS is a fatal, neurodegenerative disease in which the progressive degeneration of motor neurons in the brain and spinal cord leads to the inability to initiate or control muscle movement. People with ALS may lose the ability to speak, eat, move and breathe. ALS affects as many as 30,000 people in the United States.

FTD is a fatal, neurodegenerative disease in which progressive nerve cell loss in the brain’s frontal lobes and temporal lobes leads to personality and behavioral changes, as well as the gradual impairment of language skills. It is the second most common form of early-onset dementia after Alzheimer’s disease in people under the age of 65. FTD affects approximately 55,000 people in the United States.

ALS and FTD can be caused by mutations in the *C9ORF72* gene, which provides instructions for making protein found in various tissues, including nerve cells in the cerebral cortex and motor neurons. The *C9ORF72* genetic mutation consists of hundreds to thousands hexanucleotide repeats compared to two to 23 in wild-type transcripts, causing the formation and accumulation of mutant transcripts and proteins in brain tissue. Mutations of the *C9ORF72* gene are present in approximately 40% of familial ALS cases and 8% to 10% of sporadic ALS cases. In FTD, the mutations appear in 38% of familial cases and 6% of sporadic cases.

About Wave Life Sciences

Wave Life Sciences is a biotechnology company focused on delivering transformational therapies for patients with serious, genetically-defined diseases. Our chemistry platform enables the creation of highly specific, well characterized oligonucleotides designed to deliver superior efficacy and safety across multiple therapeutic modalities. Our pipeline is initially focused on neurological disorders and extends across several other therapeutic areas.

Forward-Looking Statements

This press release contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, as amended, including, without limitation, statements regarding the data from preclinical studies of our ALS and FTD candidate (WVE-3972-01); the degree to which our preclinical data will translate into clinical results; the anticipated timing of our potential future clinical trials for ALS and FTS; our ability to demonstrate the therapeutic benefits of our ALS and FTD candidate in clinical trials; our understanding of the correlation between the *C9orf72* gene and the cause of ALS and FTD, uncertainties inherent in research and drug development of WVE-3972-01; and Wave’s strategy and business plans. The words “may,” “will,” “could,” “would,” “should,” “expect,” “plan,” “anticipate,” “intend,” “believe,” “estimate,” “predict,” “project,” “potential,” “continue,” “target” and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. Any forward-looking statements in this press release are based on Wave management’s current expectations and beliefs and are subject to a number of risks, uncertainties and important factors that may cause actual events or results

to differ materially from those expressed or implied by any forward-looking statements contained in this press release, including, without limitation, uncertainties inherent in research and drug development, risks and uncertainties related to the delay of any current or planned clinical trials or the development of WVE-3972-01, the ability of our preclinical programs to produce data sufficient to support our clinical trial applications and the timing thereof, potential future clinical data and analysis, as well as those discussed or identified in Wave's public filings with the Securities and Exchange Commission (SEC). These and other risks and uncertainties are described in greater detail in the section entitled "Risk Factors" in Wave's Annual Report on Form 10-K for the year ended December 31, 2016, as filed with the SEC on March 16, 2017, and in other filings that Wave makes with the SEC from time to time. Any forward-looking statements contained in this press release represent Wave's views only as of the date hereof and should not be relied upon as representing its views as of any subsequent date. Wave explicitly disclaims any obligation to update any forward-looking statements.

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