Biogen Advances Leading Research in Spinal Muscular Atrophy (SMA) with New Data at AAN 2021 Exploring Opportunities to Improve Outcomes for Patients

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- Initial findings from the DEVOTE study suggest no new safety concerns and support continued development of a higher dose of SPINRAZA® (nusinersen)
- Additional research reinforces the potential of biomarkers and highlights new digital tools that may help guide future treatment approaches and decisions for people with SMA

CAMBRIDGE, Mass., April 19, 2021 (GLOBE NEWSWIRE) -- Biogen Inc. (Nasdaq: BIIB) today announced new data from the SPINRAZA® (nusinersen) clinical development program aimed at optimizing outcomes for people with spinal muscular atrophy (SMA) and advancing understanding of the disease. These data are being presented at the American Academy of Neurology (AAN) 2021 Virtual Annual Meeting, April 17-22.

"Biogen is humbled that we were pioneers in developing the first treatment for SMA, along with our collaboration partners Ionis Pharmaceuticals. We continue to be driven by the pursuit of better outcomes for patients, including exploring the potential of a higher dose of SPINRAZA in the DEVOTE study, in addition to initiating the RESPOND study," said Alfred Sandrock, Jr., M.D., Ph.D., Head of Research and Development at Biogen. "We are also evaluating the use of biomarkers and digital tools to supplement traditional clinical assessments for SMA and enhance disease monitoring. Through these collective research efforts, we aim to provide valuable data that may help guide future treatment approaches and decisions for people with SMA."

Exploring Opportunities to Optimize Treatment in SMA
Building on the proven efficacy and well-established safety of SPINRAZA in a broad range of patients with SMA, the Phase 2/3 DEVOTE study is evaluating the safety, tolerability and potential for even greater efficacy of SPINRAZA when administered at a higher dose than currently approved. The three-part study includes an open-label safety evaluation cohort (Part A), a pivotal, double-blind, active control randomized treatment cohort (Part B) and an open-label cohort (Part C) transitioning from the approved 12-milligram (mg) dose of SPINRAZA to the higher dose.

An analysis of the higher loading and maintenance dosing regimen in Part A (n=6; 28 mg) showed no new safety concerns in study participants who were followed for up to approximately five months (64-158 days). There were no adverse events (AEs) reported that were considered related to the higher dose study drug and there were no severe or serious AEs. Four patients reported mild or moderate AEs, including AEs considered related to the treatment administration procedure. This emerging safety profile supports Biogen's continued development of a higher dose of SPINRAZA, including ongoing enrollment of patients in the pivotal Part B of the DEVOTE study. This part will evaluate the higher-dose regimen (2 loading doses of 50 mg two weeks apart followed by 28 mg maintenance doses every four months) compared to the approved 12 mg dose of SPINRAZA: four loading doses, followed by maintenance doses every four months.[1] More information about DEVOTE is available at ClinicalTrials.gov (NCT04089566).

Using Biomarkers and Digital Tools to Enhance Disease Monitoring
Biogen is advancing research to evaluate biomarkers and digital tools that expand on traditional clinical assessments and incorporate more sensitive measures to help better predict and monitor the course of SMA.

New data in patients (n=75) from the CHERISH/SHINE studies build upon the body of evidence suggesting neurofilament levels – an indicator of ongoing biological disease activity – warrant further evaluation as a biomarker for treatment response in SMA. Data show that higher neurofilament levels at baseline were, on average, associated with greater improvements in motor function scores among SPINRAZA-treated individuals with later-onset SMA over a median of approximately four years. The use of biomarkers could improve the understanding of disease mechanisms and interventions for SMA and other neurological diseases. Therefore, measuring neurofilament levels have been integrated as an exploratory endpoint in the DEVOTE and RESPOND (NCT04488133) studies.

Additionally, in consultation with SMA experts, Biogen has developed a conceptual clinical framework to evaluate the potential value of Konectom™, a mobile application, to enable adults living with SMA to quantitatively and remotely self-assess motor function in their daily lives. Currently used only in research settings, Konectom leverages smart sensing technologies like touchscreen and accelerometry to capture tangible data in studying neurological diseases. In SMA, monitoring fatigue and smartphone typing skills may be useful to assess functional impact across a broad range of patients with varying levels of disease severity. Biogen is also studying Konectom's potential utility in multiple sclerosis and other neurological diseases, with the goal of providing a more accurate and complete picture of how neurological diseases impact a person's daily life.

SMA Data Presentations Featured at AAN:

- Escalating Dose and Randomized, Controlled Study of Nusinersen in Participants With Spinal Muscular Atrophy (SMA); Study Design and Part A Data for the Phase 2/3 DEVOTE (232SM203) Study to Explore High-Dose Nusinersen – P6.080
- Baseline Plasma Phosphorylated Neurofilament Heavy Chain (pNF-H) Level Is Associated With Future Motor Function in Nusinersen-treated Individuals With Later-onset Spinal Muscular Atrophy (SMA) – S13.005 – Monday, April 19, 2:40 p.m. ET
- Konectom™ Smartphone-Based Digital Outcome Assessments for Adults Living With Spinal Muscular Atrophy (SMA): A Conceptual Framework – P8.010

About SPINRAZA® (nusinersen)
SPINRAZA is approved to treat infants, children and adults with spinal muscular atrophy (SMA) and is available in more than 50 countries. As a foundation of care in SMA, more than 11,000 individuals have been treated with SPINRAZA worldwide.[2]

SPINRAZA is an antisense oligonucleotide (ASO) that targets the root cause of SMA by continuously increasing the amount of full-length survival motor neuron (SMN) protein produced in the body.[1] It is administered directly into the central nervous system, where motor neurons reside, to deliver treatment where the disease starts.[1]

SPINRAZA has demonstrated sustained efficacy across ages and SMA types with a well-established safety profile based on data in patients treated up to 7 years, combined with unsurpassed real-world experience.[3] The SPINRAZA clinical development program encompasses 10 clinical studies, which have included more than 300 individuals across a broad spectrum of patient populations,[3] including two randomized controlled studies (ENDEAR and CHERISH). The ongoing SHINE and NURTURE open-label extension studies are evaluating the long-term impact of SPINRAZA. The most common adverse events observed in clinical studies were respiratory infection, fever, constipation, headache, vomiting and back pain. Laboratory tests can monitor for renal toxicity and coagulation abnormalities, including acute severe low platelet counts, which have been observed after administration of some ASOs.

Biogen licensed the global rights to develop, manufacture and commercialize SPINRAZA from Ionis Pharmaceuticals, Inc. (Nasdaq: IONS), the leader in antisense therapeutics. Please click here for Important Safety Information and full Prescribing Information for SPINRAZA in the U.S., or visit your respective country's product website.

About SMA
SMA is a rare, genetic, neuromuscular disease that affects individuals of all ages. It is characterized by a loss of motor neurons in the spinal cord and lower brain stem, resulting in progressive muscle atrophy and weakness.[4] SMA is caused by a deficiency in the production of survival motor neuron (SMN) protein due to a damaged or missing SMN1 gene, with a spectrum of disease severity.[4] Some individuals with SMA may never sit; some sit but never walk; and some walk but may lose that ability over time.[5] In the absence of treatment, children with the most severe form of SMA would not be expected to reach their second birthday.[4]

SMA impacts approximately one in 11,000 live births in the U.S.,[6] is a leading cause of genetic death among infants[6] and causes a range of disability in teenagers and adults.[5]

About Biogen
At Biogen, our mission is clear: we are pioneers in neuroscience. Biogen discovers, develops and delivers worldwide innovative therapies for people living with serious neurological and neurodegenerative diseases as well as related therapeutic adjacencies. One of the world's first global biotechnology companies, Biogen was founded in 1978 by Charles Weissmann, Heinz Schaller, Kenneth Murray and Nobel Prize winners Walter Gilbert and Phillip Sharp. Today Biogen has the leading portfolio of medicines to treat multiple sclerosis, has introduced the first approved treatment for spinal muscular atrophy, commercializes biosimilars of advanced biologics and is focused on advancing research programs in multiple sclerosis and neuroimmunology, Alzheimer's disease and dementia, neuromuscular disorders, movement disorders, ophthalmology, neuropsychiatry, immunology, acute neurology and neuropathic pain.

We routinely post information that may be important to investors on our website at www.biogen.com. Follow us on social media – Twitter, LinkedIn, Facebook, YouTube.

Biogen Safe Harbor
This news release contains forward-looking statements, including statements made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995, about the potential benefits, safety and efficacy of SPINRAZA; the results of certain real-world data; results from the DEVOTE study; the identification and treatment of SMA; our research and development program for the treatment of SMA; the potential benefits and results from early treatment of SMA and/or higher dose SPINRAZA; the enrollment of the DEVOTE study and the RESPOND study; the potential of our commercial business, including SPINRAZA; and risks and uncertainties associated with drug development and commercialization. These statements may be identified by words such as "aim," "anticipate," "believe," "could," "estimate," "expect," "forecast," "goal," "intend," "may," "plan," "possible," "potential," "will," "would" and other words and terms of similar meaning. You should not place undue reliance on these statements or the scientific data presented.

These statements involve risks and uncertainties that could cause actual results to differ materially from those reflected in such statements, including without limitation risks that we may not fully enroll the DEVOTE study and/or the RESPOND study or it will take longer than expected; uncertainty of success in the development and potential commercialization of higher dose SPINRAZA; unexpected concerns that may arise from additional data, analysis or results obtained during the DEVOTE study and/or the RESPOND study; regulatory authorities may require additional information or further studies, or may fail or refuse to approve or may delay approval of higher dose SPINRAZA; the occurrence of adverse safety events; risks of unexpected costs or delays; the risks of other unexpected hurdles; failure to protect and enforce our data, intellectual property and other proprietary rights and uncertainties relating to intellectual property claims and challenges; product liability claims; and the direct and indirect impacts of the ongoing COVID-19 pandemic on our business, results of operations and financial condition. The foregoing sets forth many, but not all, of the factors that could cause actual results to differ from our expectations in any forward-looking statement. Investors should consider this cautionary statement as well as the risk factors identified in our most recent annual or quarterly report and in other reports we have filed with the U.S. Securities and Exchange Commission. These statements are based on our current beliefs and expectations and speak only as of the date of this news release. We do not undertake any obligation to publicly update any forward-looking statements, whether as a result of new information, future developments or otherwise.

References:

1. SPINRAZA U.S. Prescribing Information. Available at: https://www.spinraza.com/content/dam/commercial/specialty/spinraza/caregiver/en_us/pdf/spinraza-prescribing-information.pdf. Accessed: April 2021

2. Based on commercial patients, early access patients, and clinical trial participants through December 31, 2021.

3. Core Data sheet, Version 9, January 2019. SPINRAZA. Biogen Inc, Cambridge, MA.

4. National Institute of Neurological Disorders and Stroke, NIH. Spinal Muscular Atrophy Fact Sheet. Available at https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Spinal-Muscular-Atrophy-Fact-Sheet. Accessed: April 2021.

5. Wadman RI, Wijngaarde CA, Stam M, et al. Muscle strength and motor function throughout life in a cross-sectional cohort of 180 patients with spinal muscular atrophy types 1c–4. Eur J Neurol. 2018;25(3):512-518.

6. Cure SMA. About SMA. Available at https://www.curesma.org/about-sma/. Accessed: April 2021

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