Biogen Announces New Updates Across its SMA Research Program at 2022 MDA Conference

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- First patient treated in the ASCEND study evaluating the potential benefit of investigational higher dose nusinersen in children, teens and adults previously treated with Evrysdi® (risdiplam)
- Baseline characteristics indicate all nine infants and toddlers enrolled in RESPOND had suboptimal clinical status in ≥2 areas after receiving Zolgensma® (onasemnogene abeparvovec); there were no new safety findings with subsequent SPINRAZA® (nusinersen) treatment
- New NURTURE results continue to show the potential long-term benefit of early treatment before SMA symptom onset, with 92 percent of participants now able to walk alone, most in age-appropriate timelines

CAMBRIDGE, Mass., March 14, 2022 (GLOBE NEWSWIRE) -- Biogen Inc. (Nasdaq: BIIB) today announced new data and updates from its SPINRAZA® (nusinersen) and spinal muscular atrophy (SMA) research program aimed at improving clinical outcomes for people impacted by the disease, including the ASCEND, RESPOND and NURTURE studies. These updates will be presented at the 2022 Muscular Dystrophy Association (MDA) Clinical & Scientific Conference (March 13-16, 2022).

First Patient Treated in Phase 3b ASCEND Study
The ASCEND study is currently enrolling with the first patient treated in Q1 2022. At the conference, Biogen will present the design of the open-label, global Phase 3b study to evaluate the potential benefit of investigational higher dose nusinersen* in later-onset, non-ambulatory SMA patients previously treated with Evrysdi® (risdiplam).

“As the SMA community gains more experience with available therapies, we are gleaning new insights about how these treatments can enhance the lives of individuals impacted by SMA. However, unmet needs still remain for the community,” said Basil Darras, M.D., professor of Neurology at Harvard Medical School and director of the Neuromuscular Center and Spinal Muscular Atrophy Program at Boston Children's Hospital. “The ASCEND study seeks to generate data that have the potential to inform decisions regarding treatment for our patients with later-onset SMA.”

The primary endpoint in ASCEND is the total change from baseline in the Revised Upper Limb Module (RULM) score. The study will integrate smartphone-based digital assessments as an exploratory endpoint using Konectom™ NMD, a mobile application developed by Biogen Digital Health that will allow teen and adult participants to quantitatively and remotely self-assess motor function in their daily lives. Biogen Digital Health, a global unit of the company dedicated to pioneering personalized and digital medicine in neuroscience, will present more details about using digital outcome assessments within the core clinical development program to evaluate daily activities impacted by neuromuscular diseases. ASCEND aims to enroll approximately 135 children, teens and adults previously treated with Evrysdi (a nusinersen-naïve group and a nusinersen-experienced group). All participants will receive higher dose nusinersen in the study.

Information on the ASCEND study (NCT05067790) is available at clinicaltrials.gov.

Ongoing Research Aims to Inform SMA Treatment Decisions
Biogen will also present baseline characteristics from the RESPOND study investigating the efficacy and safety of SPINRAZA in infants and toddlers who still have unmet clinical needs following treatment with Zolgensma® (onasemnogene abeparvovec). All study participants (enrolled as of August 2021, n=9) who previously received the gene therapy showed suboptimal clinical status in two or more domains at baseline, the most common being motor and respiratory function. Initial safety findings indicate none of the adverse events (AEs) or serious AEs (parainfluenza virus infection and viral upper respiratory tract infection) reported were considered related to SPINRAZA treatment.

Additionally, the latest results from NURTURE, a study in infants treated in the presymptomatic stage of SMA, demonstrate that early and sustained treatment with SPINRAZA for up to 5.7 years (median 4.9 years) helped participants to maintain and make progressive gains in motor function. After 11 months of additional follow-up since the 2020 interim analysis, all children who were able to walk alone maintained this ability and one child gained the ability to walk alone, increasing the total percentage to 92 percent (23/25). Most children achieved motor milestones within age-appropriate timelines[1] and no major motor milestones were lost. The safety of SPINRAZA over this extended follow-up period was consistent with previously reported findings.

“SPINRAZA has demonstrated significant benefit in individuals with SMA, from presymptomatic infants to adults with later-onset SMA. Biogen is working to address remaining unmet needs and answer critical questions for the SMA community through our new and ongoing research, including studies like ASCEND and RESPOND, as well as digital solutions to advance clinical care and patient empowerment,” said Maha Radhakrishnan, M.D., Chief Medical Officer at Biogen. “Additionally, the latest results from the landmark NURTURE study continue to show that most infants who began treatment with SPINRAZA before the clinical onset of symptoms achieved motor milestones in timeframes consistent with normal development.”

Featured SPINRAZA Data Presentations Include:

- Nusinersen Effect in Infants in the Presymptomatic Stage of SMA: 4.9-Year Interim of the NURTURE Study (oral presentation)
- Rationale and Design of ASCEND: A Phase 3b Study Evaluating Higher Dose Nusinersen in Risdiplam-Treated Participants With Spinal Muscular Atrophy
- Baseline Characteristics and Initial Safety Results in RESPOND: A Phase 4 Study of Nusinersen in Children With SMA Who Received Onasemnogene Abeparvovec

- Exploring the Content Validity of Konectom™ NMD Digital Outcome Assessments: Perspectives of Adults Living With SMA and ALS

**Nusinersen is currently commercialized under the brand name SPINRAZA® and the U.S. Food and Drug Administration-approved dose is 12 mg.*

About SPINRAZA® (nusinersen)
The SPINRAZA clinical development program encompasses 10 clinical studies, which have included more than 300 individuals across a broad spectrum of patient populations,[2] 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 Spinal Muscular Atrophy (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.[3] 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.[3] Some individuals with SMA may never sit; some sit but never walk; and some walk but may lose that ability over time.[4] In the absence of treatment, children with the most severe form of SMA would not be expected to reach their second birthday.[3]

SMA impacts approximately 1 in 11,000 live births,[5-8] is a leading cause of genetic death among infants[9] and causes a range of disability in teenagers and adults.[4]

About Biogen
As pioneers in neuroscience, Biogen discovers, develops, and delivers worldwide innovative therapies for people living with serious neurological 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, Sir Kenneth Murray, and Nobel Prize winners Walter Gilbert and Phillip Sharp. Today, Biogen has a leading portfolio of medicines to treat multiple sclerosis, has introduced the first approved treatment for spinal muscular atrophy, and is providing the first and only approved treatment to address a defining pathology of Alzheimer's disease. Biogen is also commercializing biosimilars and focusing on advancing the industry's most diversified pipeline in neuroscience that will transform the standard of care for patients in several areas of high unmet need.

In 2020, Biogen launched a bold 20-year, $250 million initiative to address the deeply interrelated issues of climate, health, and equity. Healthy Climate, Healthy Lives™ aims to eliminate fossil fuels across the company's operations, build collaborations with renowned institutions to advance the science to improve human health outcomes, and support underserved communities.

The company routinely posts information that may be important to investors on its website at www.biogen.com. To learn more, please visit www.biogen.com and follow Biogen 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 nusinersen; the results of certain real-world data; our research and development program for the identification and treatment of SMA; clinical development programs, clinical trials and data readouts and presentations; the potential benefits and results from early treatment of SMA; 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 relating to the occurrence of adverse safety events and/or unexpected concerns that may arise from additional data or analysis, including from the ASCEND study; the risk that we may not fully enroll our clinical trials, including the ASCEND study, or enrollment will take longer than expected; failure to obtain regulatory approvals in other jurisdictions; risks of unexpected costs or delays; failure to protect and enforce our data, intellectual property and other proprietary rights and uncertainties relating to intellectual property claims and challenges; regulatory authorities may require additional information or further studies; product liability claims; third party collaboration risks; 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.

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