MEDIA CONTACT:

Biogen
Ligia Del Bianco
Ph: +1 781 464 3260
public.affairs@biogen.com

INVESTOR CONTACT:

Biogen
Ben Strain
Ph: +1 781 464 2442
IR@biogen.com

New Data Reaffirm Clinically Meaningful Benefit of SPINRAZA® (nusinersen) in Individuals with Spinal Muscular Atrophy Across Disease Severity

SPINRAZA Demonstrated Motor Function Improvements in Infants on Permanent Ventilation; No Increase in Risk of Adverse Events in Children with Scoliosis
Biogen Highlights SPINRAZA Data at the Cure SMA 2017 Annual SMA Conference

CAMBRIDGE, Mass., June 29, 2017 -- Biogen (NASDAQ: BIIB) will present robust efficacy and safety data from Phase 2 and 3 SPINRAZA® (nusinersen) studies at the Cure SMA 2017 Annual SMA Conference in Orlando, Fl, June 29 – July 2, 2017. The breadth of data presented reinforces the significant and clinically meaningful efficacy of SPINRAZA on the achievement of motor milestones and measures of motor function across a broad range of individuals with spinal muscular atrophy (SMA), as well as on survival endpoints in infantile-onset SMA.

"Data presented at the Cure SMA 2017 Annual SMA Conference further demonstrate the significant impact of SPINRAZA and the benefits of early treatment initiation. We are encouraged to see unprecedented motor function gains in infants on permanent ventilation and a continued favorable benefit-risk profile across a broad population including no increase in risk of adverse events in children who have developed scoliosis." said Wildon Farwell, M.D., M.P.H., senior medical director, Clinical Development, Biogen. "As part of our mission to make a meaningful difference in the lives of those affected by SMA, we continue to collect and evaluate data to provide a deeper understanding of the impact of SPINRAZA across SMA populations and share those results with the SMA community."

New SPINRAZA Data Show Robust Efficacy and Safety Across Broad Range of Individuals with SMA
In an analysis of the Phase 3 ENDEAR end of study results, a greater proportion of infants with SMA on permanent ventilation treated with SPINRAZA demonstrated clinical benefits compared to untreated infants.

End of study data from both the Phase 3 ENDEAR and CHERISH studies further demonstrate that earlier SPINRAZA treatment in individuals with SMA may lead to improved outcomes. In individuals with shorter disease durations (i.e., generally younger at symptom onset), infants in ENDEAR demonstrated a lower risk of death or permanent ventilation and children in CHERISH demonstrated greater motor function improvement from baseline to 15 months compared to untreated individuals.

In addition, further results from the interim analysis of the Phase 2 NURTURE study highlight the clinically meaningful efficacy of SPINRAZA on event-free survival, measures of motor function and

achievement of motor milestones when administered to infants with genetically-diagnosed SMA before symptom onset.

“New SPINRAZA data continue to reinforce the positive results seen in clinical studies and in my own practice,” said Thomas Crawford, M.D., co-director, Muscular Dystrophy Association Clinic at Johns Hopkins Medicine. “The SPINRAZA clinical development program demonstrates the impact of early treatment. The additional NURTURE data extends this finding by showing substantial improvements in motor milestones, generally consistent with normal development among infants with SMA who have yet to manifest symptoms before they were treated with SPINRAZA.”

SPINRAZA demonstrated a favorable benefit-risk profile, with commonly reported adverse events consistent with those expected in the general SMA population or related to a lumbar puncture procedure. Safety data involving the intrathecal administration of SPINRAZA showed the incidence and nature of the most common lumbar puncture-related adverse events were similar in children with later-onset SMA with or without scoliosis in the clinical studies.

Biogen to Participate in 15 Presentations at the Meeting
Select SPINRAZA data highlights are included below:

- Infants and children with SMA treated with nusinersen in clinical trials: Experience of risk for respiratory or other events with repeat anesthesia/sedation for intrathecal administration. June 29, 2017: 4:30-6:30 p.m. ET
- Infants and children with SMA treated with nusinersen in clinical trials: An integrated safety analysis. June 30, 2017: 12:45 p.m.-2:45 p.m. ET
- Nusinersen demonstrates efficacy in infants with and without permanent ventilation: Final results from the ENDEAR study. July 1, 2017: 11:00 a.m. ET
- Efficacy and safety of nusinersen in genetically diagnosed infants with presymptomatic spinal muscular atrophy (SMA): Results from the second interim analysis of the ongoing, phase 2 NURTURE study. July 1, 2017: 11:20 a.m. ET
- Efficacy and safety of nusinersen in children with later-onset spinal muscular atrophy (SMA): End of study results from the phase 3 CHERISH. July 1, 2017: 11:40 a.m. ET

For more information about SPINRAZA and U.S. prescribing information, visit www.SPINRAZA.com.

SPINRAZA Program Status
SPINRAZA was first approved by the U.S. Food and Drug Administration (FDA) for the treatment of SMA in pediatric and adult patients on December 23, 2016 within three months of regulatory filing. The European Commission (EC) granted a marketing authorization for SPINRAZA for the treatment of 5q SMA on June 1, 2017, making SPINRAZA the first approved treatment in the European Union for SMA.

Biogen has also submitted regulatory filings in Japan, Canada, Australia, Switzerland, and Brazil and plans to initiate additional filings in other countries in 2017.

Biogen licensed the global rights to develop, manufacture and commercialize SPINRAZA from Ionis Pharmaceuticals (NASDAQ: IONS), a leader in antisense therapeutics. Biogen and Ionis conducted an innovative clinical development program that moved SPINRAZA from its first dose in humans in 2011 to its first regulatory approval in five years.

About SMA 1-5
Spinal muscular atrophy (SMA) is characterized by loss of motor neurons in the spinal cord and lower brain stem, resulting in severe and progressive muscular atrophy and weakness. Ultimately, individuals with the most severe type of SMA can become paralyzed and have difficulty performing the basic functions of life, like breathing and swallowing.

Due to a loss of, or defect in, the SMN1 gene, people with SMA do not produce enough SMN protein, which is critical for the maintenance of motor neurons. The severity of SMA correlates with the amount of SMN protein. People with Type 1 SMA, the form that requires the most intensive and supportive care, produce very little SMN protein and do not achieve the ability to sit without support or live beyond two years without respiratory support. People with Type 2 and Type 3 SMA produce greater amounts of SMN protein and have less severe, but still life-altering forms of SMA.

About SPINRAZA ® (nusinersen)
SPINRAZA is being developed globally for the treatment of SMA.

SPINRAZA is an antisense oligonucleotide (ASO), using Ionis Pharmaceuticals' proprietary antisense technology, that is designed to treat SMA caused by mutations or deletions in the SMN1 gene located in chromosome 5q that leads to SMN protein deficiency. SPINRAZA alters the splicing of SMN2 pre-mRNA in order to increase production of full-length SMN protein.6 ASOs are short synthetic strings of nucleotides designed to selectively bind to target RNA and regulate gene expression. Through use of this technology, SPINRAZA has the potential to increase the amount of full-length SMN protein in individuals with SMA.

SPINRAZA must be administered via intrathecal injection, which delivers therapies directly to the cerebrospinal fluid (CSF) around the spinal cord,7 where motor neurons degenerate in individuals with SMA due to insufficient levels of survival motor neuron (SMN) protein.8

SPINRAZA demonstrated a favorable benefit-risk profile. The most common adverse reactions reported for SPINRAZA were upper respiratory infection, lower respiratory infection and constipation. Serious adverse reactions of atelectasis were more frequent in SPINRAZA-treated patients. Coagulation abnormalities and thrombocytopenia, including acute severe thrombocytopenia, have been observed after administration of some antisense oligonucleotides. Individuals may be at increased risk of bleeding complications. Renal toxicity has been observed after administration of some antisense oligonucleotides. SPINRAZA is present in and excreted by the kidney.

About Biogen
Through cutting-edge science and medicine, Biogen discovers, develops and delivers innovative therapies worldwide for people living with serious neurological and neurodegenerative diseases. Founded in 1978, Biogen is a pioneer in biotechnology and today the Company has the leading portfolio

of medicines to treat multiple sclerosis, has introduced the first and only approved treatment for spinal muscular atrophy, and is at the forefront of neurology research for conditions including Alzheimer's disease, Parkinson's disease and amyotrophic lateral sclerosis. Biogen also manufactures and commercializes biosimilars of advanced biologics. For more information, please visit www.biogen.com. Follow us on social media – Twitter, LinkedIn, Facebook, YouTube.

Biogen Safe Harbor

This press release contains forward-looking statements, including statements made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995 relating to the potential benefits, safety and efficacy of SPINRAZA, the results of certain real-world data, the status of current regulatory filings, plans for additional regulatory filings in other jurisdictions, planning and timing for commercial launch, and availability of patient access and reimbursement pathways, which may vary on a country-by-country basis. These forward-looking statements may be accompanied by words such as "anticipate," "believe," "could," "estimate," "except," "forecast," "intend," "may," "plan," "potential," "possible," "will" and other words and terms of similar meaning. You should not place undue reliance on these statements or the scientific data presented. Drug development and commercialization involve a high degree of risk. These statements involve risks and uncertainties that could cause actual results to differ materially from those reflected in such statements, including without limitation uncertainty of success in commercialization of SPINRAZA, which may be impacted by, among other things, the level of preparedness of healthcare providers to treat patients, difficulties in obtaining or changes in the availability of reimbursement for SPINRAZA, the effectiveness of sales and marketing efforts, problems with the manufacturing process for SPINRAZA, the occurrence of adverse safety events, unexpected concerns that may arise from additional data or analysis; regulatory authorities may require additional information or further studies, or may fail to approve or may delay approval of Biogen's drug candidates or expansion of product labeling; or Biogen may encounter other unexpected hurdles which may be impacted by, among other things, the occurrence of adverse safety events, failure to obtain regulatory approvals in certain jurisdictions, failure to obtain regulatory approvals in other jurisdictions, failure to protect intellectual property and other proprietary rights; product liability claims; or third party collaboration risks. 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 Biogen's most recent annual or quarterly report and in other reports Biogen has 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 press 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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