Nature Publishes Results from Pre-Clinical Research and Phase 1b Study of Biogen's Investigational Alzheimer's Disease Treatment Aducanumab

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Dose-Dependent Reduction of Amyloid-β Plaque Observed in Pre-Clinical Research Replicated in Phase 1b Study in Prodromal and Mild Alzheimer's Disease Patients

Phase 1b Exploratory Results Also Showed Dose-Dependent Slowing of Clinical Decline

CAMBRIDGE, Mass.--(BUSINESS WIRE)--Results from pre-clinical research and PRIME, the Phase 1b study of Biogen's (NASDAQ: BIIB) investigational treatment for early Alzheimer's disease (AD), aducanumab, were published today in *Nature*. The full manuscript titled, "The Antibody Aducanumab Reduces Aβ Plaques in Alzheimer's Disease," can be found in the 1 September, 2016 issue of *Nature* http://www.nature.com/nature/journal/v537/n7618/full/nature19323.html.

The pre-clinical animal model and Phase 1b placebo-controlled study in prodromal and mild AD patients (n=165), both demonstrate that aducanumab reduced amyloid-beta in the brain and the reduction was dose-dependent. Amyloid-beta plaque is associated with the development of AD and it is hypothesized that removing it may slow the clinical decline of people who have AD.

"These early studies of aducanumab show its effectiveness in removing amyloid plaque from the brain as well as its potential effect on the slowing of cognitive decline in patients suffering from Alzheimer's disease," said Alfred Sandrock, M.D., Ph.D., executive vice president and chief medical officer at Biogen. "Publication in *Nature* is an achievement we share with the many scientists and clinical investigators who conducted this research as well as the patients who volunteered to participate in our clinical trial; we are grateful to all of them."

In addition to the results observed on amyloid plaque reduction, exploratory results from the Phase 1b study also demonstrated dose- and time-dependent slowing of clinical decline as measured by the Clinical Dementia Rating-Sum of Boxes (CDR-SB) and the Mini-Mental State Examination (MMSE) scores. In the Phase 1b study, aducanumab demonstrated acceptable safety and tolerability profiles. The most frequently reported treatment-related serious adverse event (SAE) and adverse event (AE) was ARIA (amyloid-related imaging abnormalities).

The pre-clinical research included in this manuscript was first presented at the International Conference on Alzheimer's and Parkinson's Diseases (AD/PD) in Florence, Italy, March 2013. The Phase 1b data were first presented at AD/PD in Nice, France, March 2015.

Aducanumab is currently being evaluated by Biogen in two global Phase 3 studies, ENGAGE and EMERGE, which are designed to evaluate its safety and efficacy in slowing cognitive impairment and the progression of disability in people with early Alzheimer's disease.

For more information about the Phase 3 studies, including information about participating centers, visit www.ClinicalTrials.gov (NCT02477800 or NCT02484547).

About Aducanumab
Aducanumab (BIIB037) is an investigational compound being developed for the treatment of early Alzheimer's disease. Aducanumab is a human recombinant monoclonal antibody (mAb) derived from a de-identified library of B cells collected from healthy elderly subjects with no signs of cognitive impairment or cognitively impaired elderly subjects with unusually slow cognitive decline using Neurimmune's technology platform called Reverse Translational Medicine (RTM). Biogen licensed aducanumab from Neurimmune under a collaborative development and license agreement.

Aducanumab is thought to target aggregated forms of amyloid-beta including soluble oligomers and insoluble fibrils deposited into the amyloid plaque in the brain of AD patients. Based on pre-clinical and interim Phase 1b data, treatment with aducanumab has been shown to reduce amyloid plaque levels.

About Alzheimer's Disease
Alzheimer's disease (AD) is a progressive neurodegenerative disorder characterized by cognitive decline and behavioral disturbances that eventually result in a person's inability to perform daily activities. In 2010, it was estimated that 25 million individuals were living with AD worldwide [i]. Evidence suggests that pathophysiological changes such as deposition of amyloid plaque typically begin years prior to the symptoms that lead to a clinical diagnosis. As the disease progresses, cognitive impairments, behavioral changes and ability to function commonly associated with AD begin to manifest.

About Biogen
Through cutting-edge science and medicine, Biogen discovers, develops and delivers worldwide innovative therapies for people living with serious neurological, autoimmune and rare diseases. Founded in 1978, Biogen is one of the world's oldest independent biotechnology companies and patients worldwide benefit from its leading multiple sclerosis and innovative hemophilia therapies. For more information, please visit www.biogen.com. Follow us on Twitter.

Biogen Safe Harbor
This press release contains forward-looking statements, including statements about the Phase 1b study and potential clinical effects of aducanumab. These statements may be identified by words such as "believe," "expect," "may," "plan," "potential," "will" and similar expressions, and are based on our current beliefs and expectations. Drug development and commercialization involve a high degree of risk, and only a small number of research and development programs result in commercialization of a product. Results in early stage clinical trials may not be indicative of full results or results from later stage or larger scale clinical trials and does not ensure regulatory approval. Factors which could cause actual results to differ materially from our current expectations include the risk that we may not fully enroll our clinical trials or enrollment will take longer than expected, unexpected concerns may arise from additional data, analysis or results obtained during our clinical trials, regulatory authorities may require additional information or further studies, or may fail or refuse to approve or may delay approval of our drug candidates, or we may encounter other unexpected hurdles. For more detailed information on the risks and uncertainties associated with our drug development and commercialization activities, please review the Risk

Factors section of our most recent annual or quarterly report filed with the Securities and Exchange Commission. Any forward-looking statements speak only as of the date of this press release and we assume no obligation to update any forward-looking statements.

[i] World Health Organization Dementia a Public Health Priority.
http://www.who.int/mental_health/publications/dementia_report_2012/en/. Accessed 23 May 2016.

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