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Alzheimer's Disease Neuroimaging Initiative announces completion of genome-wide analysis

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Researchers announced today that a high-density genome wide analysis of participants in the Alzheimer's Disease Neuroimaging Initiative (ADNI; www.adni-info.org) is more than 95% complete and that data will be shared with scientists around the world for further analysis.

The ADNI data will be used by researchers to search for genes that contribute to the development of Alzheimer's disease, which currently affects up to 5 million people in the United States alone.

ADNI, an ongoing $60 million project, is a public-private partnership supported primarily by the National Institutes of Health (NIH) with pharmaceutical and related industries and not-for-profit organizations providing support through the Foundation for the National Institutes of Health (FNIH). One of the largest scale neuroimaging projects ever undertaken, ADNI involves longitudinal magnetic resonance imaging (MRI) and positron emission tomography (PET) brain imaging and blood, urine and spinal fluid biomarker studies of more than 800 individuals, half of whom have mild cognitive impairment, a condition placing them at high risk for developing Alzheimer's disease or another dementia.

The primary goal of ADNI is to determine whether brain imaging, other biological markers, and clinical and neuropsychological assessment can accurately measure the progression of mild cognitive impairment and

early Alzheimer's disease. The identification of specific biomarkers of early Alzheimer's disease and disease progression will provide a useful tool for researchers and clinicians in both the diagnosis of early Alzheimer's disease and in the development, assessment and monitoring of new treatments.

One major Alzheimer's disease risk gene, APOE, has been consistently shown to be associated with the form of the disease arising later in life that accounts for approximately 95 percent of all cases. It is widely suspected that variants in an ensemble of other genes play a role in susceptibility to the disease and may influence the age of onset, expression and rate of progression of neurodegenerative changes in the brain.

"This new data set provides a unique opportunity to evaluate the associations between a highly comprehensive dataset based on brain imaging, clinical examinations and other biomarkers and the entire genome or selected candidate genes," said Andrew Saykin, Psy.D., director of the IU Center for Neuroimaging at the Indiana University School of Medicine, who leads the genetics research team.

"Where most prior research focused on the association between genetic variations and the presence or absence of Alzheimer's disease, the new project and data should facilitate novel gene discovery based on associations with neuroimaging patterns detected in the ADNI data," Dr. Saykin said.

For example, "this data set can be analyzed to indentify unanticipated genes associated with hippocampal atrophy, a characteristic of Alzheimer's disease," said Steven Potkin, M.D, director of the Brain Imaging Center of the University of California, Irvine, an investigator involved in the data analysis.

ADNI Principal Investigator Michael Weiner, M.D., director of the Center for the Imaging of Neurodegenerative Diseases at the San Francisco VA Medical Center and professor of radiology, medicine, psychiatry, and neurology at the University of California, San Francisco, said, "The release of this genetics data, in combination with the clinical, cognitive, MRI, PET, and blood/cerebrospinal fluid data already in the ADNI database, will now allow investigators to explore genetic factors related to the rate of progression of Alzheimer's disease. Access to this huge amount of data on a public website, from an ongoing clinical study, is unprecedented."

All data from the ADNI consortium are available to qualified investigators through a web-based database (www.loni.ucla.edu/ADNI).

"It is critical that data generated by the support of public funds be made available as quickly as possible to the research community," said Neil Buckholtz, Ph.D., chief of the Dementias of Aging Branch at the National Institute on Aging (NIA) at NIH. "ADNI is fast becoming a model for how data can be shared and how it can be done with speed, so that important investigations to provide answers on Alzheimer's disease can be pursued more intensively."

The ADNI genetics study employed the Illumina 610 Quad array with more than 620,000 markers for this investigation.

Source: Indiana University (news : web)