



**FOR IMMEDIATE RELEASE**

April 3, 2015

Niigata University

Eisai Co., Ltd.

**NIIGATA UNIVERSITY AND EISAI PRESENT**  
**RESULTS OF JOINT RESEARCH IN U.S. ACADEMIC JOURNAL**  
*MEASURING COGNITIVE DECLINE IN PATIENTS WITH ALZHEIMER'S DISEASE*  
*USING BLOOD-BASED BIOMARKERS*

A research group led by Professor Takeshi Ikeuchi of the Department of Molecular Genetics within the Brain Research Institute at Niigata University (Location: Niigata prefecture, President: Sugata Takahashi) and Eisai Co., Ltd. (Headquarters: Tokyo, CEO: Haruo Naito, "Eisai") announced today that, according to their joint research, the amount of plasma desmosterol was found to be highly correlated with longitudinal cognitive decline in patients with Alzheimer's disease. These findings were published online in the U.S. academic journal *Alzheimer's & Dementia: Diagnosis, Assessment & Disease Monitoring* on March 31.

Although Alzheimer's disease may be diagnosed by methods such as brain imaging scans and cerebrospinal fluid examination, a number of issues exist including the need for expensive equipment and the invasive nature of the examination. As there is a need to develop a method of diagnosis that lowers invasiveness and can be conducted anywhere using blood, a joint research group consisting of Niigata University and Eisai has worked to develop a blood-based biomarker for Alzheimer's disease.

In this joint research project, plasma samples were taken from 200 Japanese patients with Alzheimer's disease and 200 Japanese age-matched cognitively normal elderly individuals, and the amount of plasma desmosterol in the blood was measured using mass spectrometry. A significant decline in plasma desmosterol/cholesterol (DES/CHO) was apparent in patients with Alzheimer's disease compared to normal individuals (figure 1). Also, plasma DES/CHO was seen to be highly correlated with MMSE (Mini-Mental State Examination) scores, which are used to assess cognitive function (figure 2). In addition, Alzheimer's disease patients were tracked over time, and in examining the changes in both plasma DES/CHO levels and cognitive function, it was found that during the observation period, patients who had experienced a rapid loss of cognitive function also experienced a severe decline in plasma DES/CHO (figure 3). Furthermore, it was found that changes in plasma DES/CHO were highly correlated with the longitudinal changes in cognitive function in normal elderly individuals, patients with mild cognitive impairment and patients with Alzheimer's disease (figure 4).

The results of this joint research show that desmosterol measurement may be helpful in both the diagnosis of Alzheimer's disease and as an indicator of cognitive function decline. Further measurement of plasma desmosterol during periods of normal cognitive function and mild cognitive impairment may lead to various applications such as prediction of dementia onset and assessing the efficacy of medicines. On the other hand, in order to commercialize this technique, other issues remain such as the requirement of a high throughput system to efficiently manage a large number of samples and how to minimize the costs of testing. Niigata University and Eisai are striving to overcome these issues and pave the way toward a blood-based diagnostic method for Alzheimer's disease.

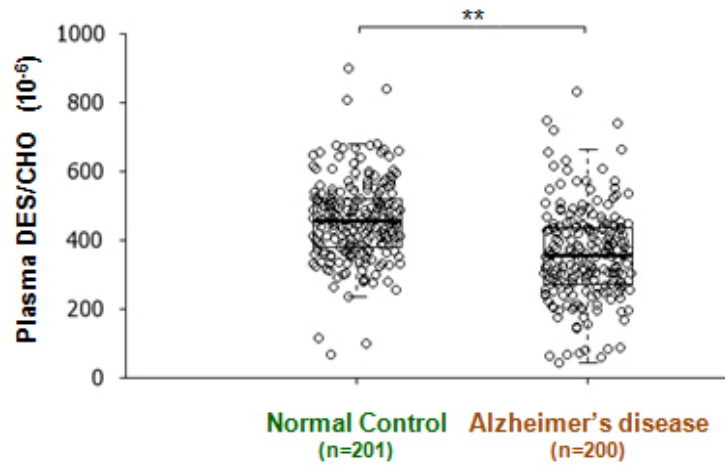


Figure 1. Plasma DES/CHO levels in Alzheimer's disease patients and cognitively normal individuals

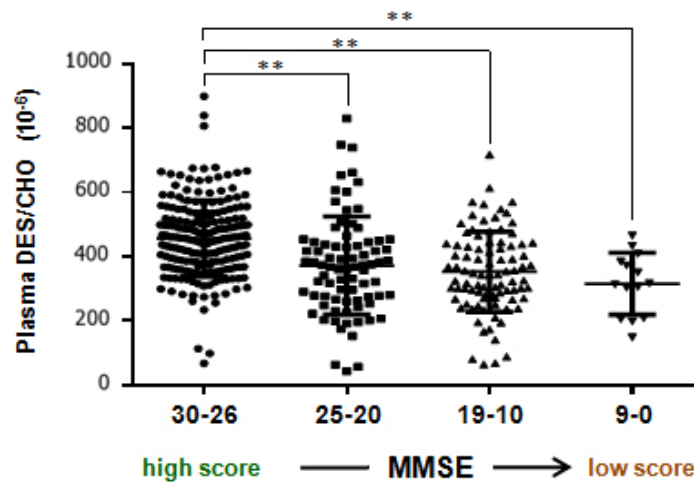


Figure 2. Comparison of plasma DES/CHO among groups classified as MMSE groups

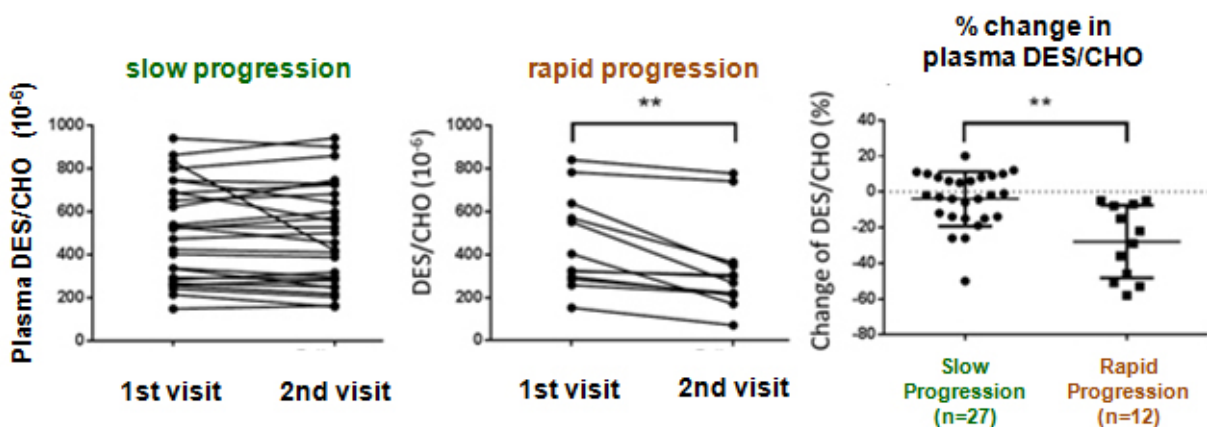


Figure 3. Change in plasma DES/CHO between baseline and follow-up visits

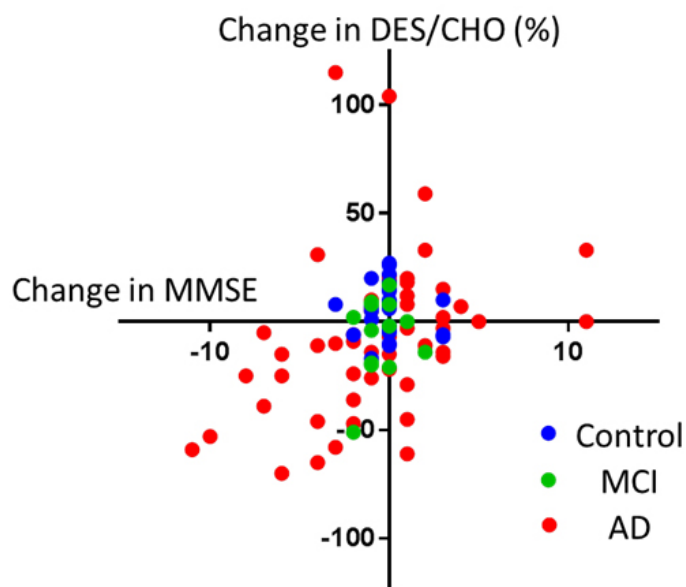


Figure 4. Correlation between longitudinal changes in MMSE and plasma DES/CHO in Alzheimer's disease patients, patients with mild cognitive impairment and healthy individuals

Title of paper:

Reduced plasma desmosterol/cholesterol and longitudinal cognitive decline in Alzheimer's disease.

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