Predicting Risk of Developing Alzheimerâ€™s Disease

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Technology description

Summary

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a genetic test for identifying individuals with a greater than 85 percent risk of developing Alzheimerâ€™s disease.

Description

Alzheimerâ€™s disease is a progressive neurodegenerative disorder that is the most common form of dementia. More than five million Americans over age 65 have Alzheimerâ€™s disease, and 10 million baby boomers are expected to develop the disease during their lifetimes.

Currently there is no cure for Alzheimerâ€™s disease. Treatment, which involves lifestyle and diet changes and may include medication, focuses on slowing progression of the disease. Identification of people at risk for developing Alzheimerâ€™s disease would allow for earlier and more aggressive treatment of the disease that could extend their quality of life.

But no conclusive method of predicting risk of developing Alzheimerâ€™s disease currently exists. Some non-genetic risk factors, including gender, age, high blood pressure, type 2 diabetes and high cholesterol, have been identified, but not enough is known about how much they contribute to risk. The only genetic risk factor that has been identified is the Apolipoprotein Eε4 allele, but half of those who develop the disease do not possess this allele. Improved methods of assessing risk are needed.

A UW-Madison researcher has identified single nucleotide polymorphisms (SNPs) that are associated with Alzheimerâ€™s disease. These SNPs include variations in two components of the steroid synthesis pathway: luteinizing hormone receptor (LHR) and follicle-stimulating hormone (FSH). Information about these SNPs can be combined with information about gender and Apolipoprotein E status to identify patients at high risk of developing Alzheimerâ€™s disease.

To assess whether a patient has Alzheimerâ€™s disease or is likely to develop the disease, a nucleic acid sample is taken from the patient and analyzed to determine if any of the SNPs are present. Female

patients who have at least one APOEε4 allele and are homozygous for either the C or G allele of the LHR SNP are at 100 percent risk of developing Alzheimerâ€™s disease. Females with at least one APOEε4 allele and at least one C allele for the FSH SNP have more than a 90 percent chance of developing the disease. Patients of either gender have a greater than 85 percent chance of developing Alzheimerâ€™s disease if they have at least one APOEε4 allele and at least one C allele for the FSH SNP and are homozygous for the C or G allele from the LHR SNP.

Institution

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