

New method developed to identify genetic determinants of Alzheimer's disease

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A rapid and accurate DHPLC assay for determination of apolipoprotein E genotypes has been developed by researchers from the Department of Medical Genetics, School of Basic Medical Sciences, Southern Medical University, Guangzhou, China. This assay combines PCR and DHPLC and can be used to conduct efficient genotyping of the human population, which in turn will help in the diagnosis and treatment of Alzheimer's disease. A description of the assay has been published this month in the *Journal of Alzheimer's Disease*.

Apolipoprotein E is a predisposing gene of Alzheimer's disease and many other diseases. APOE has three major alleles, $\epsilon 2$, $\epsilon 3$ and $\epsilon 4$. The combinations of the three common alleles result in six genotypes ($\epsilon 2\epsilon 2$, $\epsilon 3\epsilon 3$, $\epsilon 4\epsilon 4$, $\epsilon 2\epsilon 3$, $\epsilon 3\epsilon 4$, and $\epsilon 2\epsilon 4$) that exist within the population. Many studies indicate that people who have the E4 allele are at greater risk to develop Alzheimer's disease than those with the E3 allele and that the E2 allele may even help resist Alzheimer's disease. As a result, the rapid and accurate determination of APOE genotypes and the assessment of disease predisposition will be extremely valuable in augmenting the clinical diagnosis and treatment of the disease.

The medical genetic team, led by Professor Xiang-Min Xu at Southern Medical University, developed the assay during research funded by the National Science Fund for Distinguished Young Scholars of China. The polymerase chain reaction (PCR) was designed to generate the 191-bp amplicons containing two common polymorphisms within codons 112 and 158 in exon4 of the APOE gene.

The PCR amplicons for each sample were subjected to denaturing high-performance liquid chromatography (DHPLC) analysis, which was performed under partially denaturing conditions as determined by profiling the mixture of a tested sample and a homozygous standard control amplicon at the given ratio. In almost 300 samples detected, the accuracy of the assay reached 100%.

Dr. Tian-Ming Gao, Head of the Neurobiology Department, School of Basic Medical Sciences, Southern Medical University: “As China has a huge population that is stepping into old age, the number of the victims of Alzheimer’s disease is on the rise. Therefore, we felt that the development of a rapid and accurate assay that can determine individuals predisposed to Alzheimer’s disease would have great utility.”

Dr. Wei-ping Liao, Head of the Institute of Neuroscience, Guangzhou Medical College: “This method can be applied to a vast range of diseases and has created a new approach for the molecular diagnosis of genetic diseases. Based on the results from this method, neurologists can know more about the genetic background of a patient. It will help in further diagnosis and treatment.”

Source: IOS Press

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