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A Novel Statistical Method Using Case-Control and Family Data

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To identify genes associated with increased risk for disease, scientists apply sophisticated statistical techniques to large databases containing information about disease incidence, family history and genetic characteristics of many people. These studies, known as genome-wide association studies (GWAS), allow scientists to identify specific genetic variations that are associated with increased risk of certain disease. Because of the complexity and magnitude of the datasets, scientists continue to develop better methods for analyzing the data.

Ren-Hua Chung, Ph.D. and colleagues at the Miami Institute for Human Genetics have developed and used a statistical method known as the Association in the Presence of Linkage (APL) test. Recently, the researchers have developed an extension of the APL test called the CAPL test. The CAPL test will allow them to analyze genetic variations from multiple datasets with complex data about family history and case-control studies. For this proposal, Dr. Chung and colleagues plan to test the ability of the CAPL test to provide valid and reliable results. Once the CAPL test is validated, the researchers will create computer software that performs the CAPL test, and they will distribute the software so that other researchers around the world can use it to perform GWAS analyses. The new CAPL method will allow Alzheimer researchers to perform comprehensive analyses of genetic variations associated with an increased risk for the disease.