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**Topic**: Genetics; Neurogenetics; Bioinformatics; Alzheimer’s Disease

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**Title**: Frequency of APOE in Hispanic Populations Effect on Alzheimer's Disease and Inheritance​

**Abstract**

Alzheimer’s Disease (AD) is a neurodegenerative, terminal disease that has no cure. Common symptoms of the disease are memory loss, confusion, loss of independence, etc. The disease is surging in Hispanic communities, despite the lack of knowledge as to why. Genetic links to the disease are strongly implicated by past research, and researchers have recently uncovered apolipoprotein E and its alleles ε2, ε3, and ε4. Apolipoprotein E is a lipoprotein which is involved in cholesterol metabolism and packaging of lipids and/or proteins; it is found in neurons and produced by astrocytes, a type of glial cell. This research aims to understand the frequency of the alleles in Hispanic communities and estimate the effects the alleles have on inheritance and the progression of AD. Through the use of genomic data provided by government and Columbia University’s databases, cox regression analysis, kaplan-meier curves, principal component analysis, GENESIS packages, and ancestry estimates, the alleles’ frequencies and effects on participants can be assessed. It is anticipated to find that ε2 has increased age-of-onset (AOO) for patients, ε3 is neutral, and ε4 decreases AOO and intensifies risk of inheriting AD. However, the frequency of APOE is most likely to be decreased in Hispanic participants. As a result, this suggests environmental risks, alternative pathways, or unknown variants acting as the underlying cause of AD inheritance. Such variants can be local ancestry-based or linked to genes such as PSEN1, PSEN2, GRN, or MAPT. Environmental risks must also be researched further due to the variability, yet high inheritance rate. The research would also anticipate to support previous studies indicating that ε4 increases chances of AD inheritance and suggest genetic targets for future AD research.