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Alzheimer's gene associated with failure to adapt to cognitive challenge in healthy adults

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Healthy adults carrying the gene APOE4—the strongest known genetic risk factor for Alzheimer's disease (AD)—may struggle to adapt their brain activity to increasing cognitive demands as they get older, according to a study published in *The Journal of Neuroscience*. This age-related effect, which was not observed in people without the risk factor, suggests that interventions targeting cognitive decline in at-risk populations may need to begin many years before any symptoms of the disease emerge in order to be effective.

Karen Rodrigue and colleagues assessed the performance of 31 adults (ages 20-86) with APOE4 on a distance judgment task at different levels of difficulty while measuring their brain activity.

Although these at-risk participants showed similar adjustment in brain activity to the difficulty of the task as non-APOE4 carrying adults of the same age, sex, and education level, this ability declined with increasing age in the individuals with APOE4.

These changes occurred in the precuneus, a part of the brain implicated in the early stages of AD, and reduced modulation of this area was associated with poorer performance on the task. These findings may help to inform the identification of individuals at increased risk of developing the disease.

More information: Differential aging trajectories of modulation of activation to cognitive challenge in APOE ε4 groups: Reduced

modulation predicts poorer cognitive performance, *Journal of Neuroscience* (2017). DOI: doi.org/10.1523/JNEUROSCI.3900-16.2017