

Brain aging is conclusively linked to genes

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For the first time in a large study sample, the decline in brain function in normal aging is conclusively shown to be influenced by genes, say researchers from the Texas Biomedical Research Institute in San Antonio and Yale University.

"Identification of genes associated with [brain](#) aging should improve our understanding of the biological processes that govern normal age-related decline," said John Blangero, Ph.D., a Texas Biomed geneticist and the senior author of the paper. The study, funded by the National Institutes of Health (NIH), is published in the November 4, 2013 issue of the *Proceedings of the National Academy of Sciences*. David Glahn, Ph.D., an associate professor of psychiatry at the Yale University School of Medicine, is the first author on the paper.

In large pedigrees including 1,129 people aged 18 to 83, the scientists documented profound aging effects from young adulthood to old age, on neurocognitive ability and brain white matter measures. White matter actively affects how the brain learns and functions. Genetic material shared amongst biological relatives appears to predict the observed changes in [brain function](#) with age.

Participants were enrolled in the Genetics of Brain Structure and Function Study and drawn from large Mexican Americans families in San Antonio. Brain imaging studies were conducted at the University of Texas Health Science Center at San Antonio Research Imaging Institute directed by Peter Fox, M.D.

"The use of large human pedigrees provides a powerful resource for measuring how [genetic factors](#) change with age," Blangero said. By applying a sophisticated analysis, the scientists demonstrated a heritable basis for neurocognitive deterioration with age that could be attributed to genetic factors. Similarly, decreasing [white matter](#) integrity with [age](#) was influenced by genes., The investigators further demonstrated that different sets of genes are responsible for these two biological aging processes.

"A key advantage of this study is that we specifically focused on large extended families and so we were able to disentangle genetic from non-genetic influences on the aging process," said Glahn.

More information: Genetic basis of neurocognitive decline and reduced white-matter integrity in normal human brain aging, www.pnas.org/cgi/doi/10.1073/pnas.1313735110

Provided by Texas Biomedical Research Institute

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