MedicalXpress

Study of 'SuperAgers' offers genetic clues to performance

May 30 2018

All humans experience some cognitive decline as they age. But how is it that some people in their 80s and beyond still have memory capacity of those 30 or more years younger?

Recent studies have shown that these SuperAgers have less evidence of brain atrophy, have thicker parts of the brain related to memory, and lower prevalence of the pathological changes associated with Alzheimer's disease.

Now, a study by the Translational Genomics Research Institute (TGen), an affiliate of City of Hope, and Northwestern University Feinberg School of Medicine suggests that having resilient memory performance during aging could be inherited, and that a particular gene might be associated with SuperAgers.

The study results, published today in the journal *Frontiers in Aging Neuroscience*, suggest that therapies targeting the MAP2K3 gene could reduce age-related memory decline, and perhaps the threat of memory loss posed by Alzheimer's disease.

"This study suggests that SuperAgers may have a genetic 'leg up' on the normal aging population—they may have higher resistance to age-related cognitive changes—and also that this might highlight a new way to enhance memory performance," said Dr. Matt Huentelman, Ph.D., TGen Professor of Neurogenomics, and the study's lead author.

Researchers sequenced the genomes of 56 SuperAgers in the hunt for genetic variations. They defined SuperAgers as those individuals 80 years or older who scored at or above average normative values for adults age 50-65 in episodic memory tests, and at least average-for-age in other cognitive tests.

They compared these to a control group of 22 cognitively average individuals, those who scored within the average-for-age on episodic memory and other cognitive tests, as well as with a large group of individuals from the general population.

They found that the SuperAgers were enriched for genetic changes in the MAP2K3 gene compared to the two control groups.

"Based on our findings, we postulate MAP2K3 inhibitors may represent a novel therapeutic strategy for enhanced cognition and resistance to Alzheimer's disease", said Dr. Emily J. Rogalski, Ph.D., Associate Professor at the Mesulam Cognitive Neurology and Alzheimer's Disease Center at Northwestern's Feinberg School of Medicine, and the study's senior author. "Replication of the finding and mechanistic studies are important next steps."

More information: Matthew J. Huentelman et al, Associations of MAP2K3 Gene Variants With Superior Memory in SuperAgers, *Frontiers in Aging Neuroscience* (2018). DOI: 10.3389/fnagi.2018.00155

Provided by The Translational Genomics Research Institute