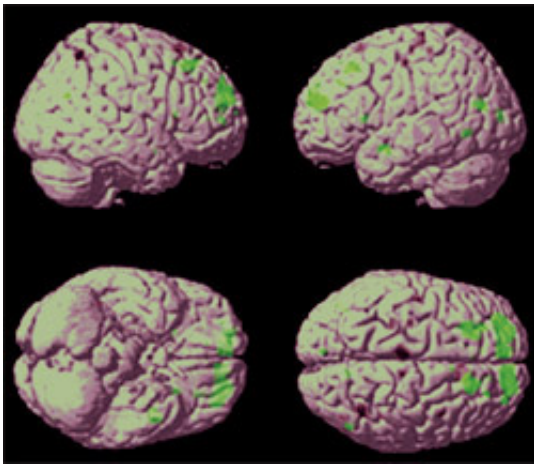


# Researchers identify brain network that may help prevent or slow Alzheimer's

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These highlighted spots of activity represent a brain network. Credit: Columbia University

Columbia University Medical Center researchers have identified a brain network within the frontal lobe that is associated with cognitive reserve, the process that allows individuals to maintain function despite brain function decline due to aging or Alzheimer's disease. This finding may provide a hint about how higher levels of cognitive reserve – which is believed to build by regularly engaging in mentally-stimulating activities such as taking classes, gardening and volunteering, provides protection against Alzheimer's disease or dementia by “exercising” the brain.

The study was led by principal investigator Yaakov Stern, Ph.D., a

professor at the Taub Institute for the Research on Alzheimer's Disease and the Aging Brain and director of the Cognitive Neuroscience Division of the Gertrude H. Sergievsky Center at Columbia University Medical Center. It is published in the current issue of *Cerebral Cortex*.

To obtain the data evaluated in the study, participants, categorized as young (between 18-30 years of age) and elderly (between 65-80 years of age), were given one of two different memory tasks – one involving a series of letters and a second involving a series of nonsensical shapes, to complete while undergoing functional magnetic resonance imaging (fMRI). The tasks were designed with increasing difficulty to allow the research team to observe the participants' brain activation as tasks got progressively harder. This activation is known to correlate with IQ level and educational background, which Dr. Stern and his team have determined to be measures of cognitive reserve, with higher levels corresponding with higher levels of cognitive reserve.

Findings demonstrated that participants with higher levels of cognitive reserve were able to activate this network in the brain while working on more difficult tasks, while participants with lower levels of reserve were not able to tap into this particular network.

“With the identification of this brain network – located within the frontal lobe – that is active during the performance both of these verbal and spatial tasks and probably other types of tasks as well, we believe we have accomplished an important first step towards improving our understanding of how cognitive reserve is expressed within the brain,” said Dr. Stern, who is a professor of clinical neuropsychology in the Departments of Neurology, Psychiatry, and Psychology at the Columbia University College of Physicians and Surgeons.

Dr. Stern's hope is that with this new understanding, he and other experts can continue working towards developing interventions to increase

cognitive reserve and prevent or delay the onset of Alzheimer’s disease or other age-related memory conditions.

“Interestingly, the network was found more often in younger participants, signifying that the network may degrade during the natural aging process,” said Dr. Stern. “If this degradation process can be slowed or halted, it may benefit the millions of people living with devastating memory decline.”

Source: Columbia University

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