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New Funding Will Support Research on Neighborhood Greenness and Brain and Vascular Health

The National Institute on Aging of the National Institutes of Health have awarded Scott Brown, Ph.D., research associate professor, and José Szapocznik, Ph.D., professor and chair emeritus, of the Department of Public Health Sciences, and Tatjana Rundek, M.D. (PI), professor and vice chair of clinical research in the Department of Neurology a four-year, $3 million grant to investigate the relationship between block-level greenness, cognitive decline and vascular outcomes.

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The project, titled "Greenness, Cognitive Performance and Vascular Outcomes in the NOMAS Study," builds on the Northern Manhattan Study (NOMAS), which conducts research on stroke and stroke risk factors in the multi-cultural, aging population based in northern part of the borough of Manhattan in New York City.

Older racial/ethnic minority adults experience high incidence of Alzheimer's disease and related dementias (AD/ADRD), age-related cognitive decline, stroke, and heart disease.

"Our research has linked block-level greenness [e.g., tree canopy] to lower rates of chronic diseases, including Alzheimer's disease and cardiometabolic indicators such as diabetes, hypertension, and hyperlipidemia, heart disease and stroke," Dr. Brown said.

Goals of the Grant

Scott C. Brown, Ph.D.

The study has several objectives. First, it will determine if a high degree of block-level greenness slows the age-related cognitive decline and risk for stroke and other vascular

outcomes over 10 to 14 years. It will also examine mechanisms that the research group believes might explain how greenness impacts brain and vascular health. These mechanisms include physical activity, social support, depression, diabetes, hypertension, hyperlipidemia, inflammation, white matter hyperintensities in the brain, and silent brain infarcts. Additionally, the study will also study what kinds of individuals and what kinds of social conditions may benefit the most from greenness to slow the deterioration of cognitive performance and vascular outcomes that occur with aging.

A novel aspect of this study is that it will for the first time explore if greenness improves brain reserve — if it builds "neurobiological capital," protecting the number of neurons and the connections between neurons. Finally, the group will determine if greenness may protect against Alzheimer's disease, and Alzheimer's disease related dementias.
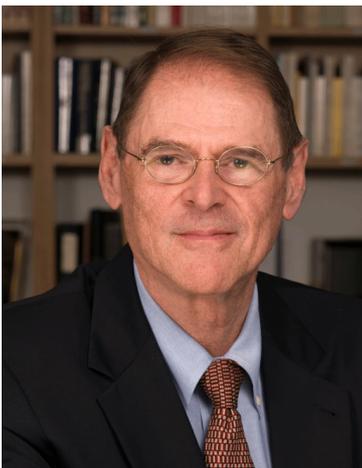
Dr.   José
Szapocznik

The study on cognitive performance will use data collected

over 10 years among 1,290 participants. Magnetic resonance imaging will be used to evaluate brain health. The study on vascular outcomes will involve all 3,298 NOMAS participants assessed over approximately 14 years. The study will also determine how APOE, a gene that has been related to Alzheimer's disease risk, interacts with greenness to influence brain and vascular health.

Impact on Public Health

Previous research on neighborhood greenness and health has demonstrated the health benefits that can be achieved even with small increases in greenness. For instance, studies have shown that a greater presence of neighborhood greenness is associated with a lower prevalence of Alzheimer's disease by 20%.

Tatjana Rundek, M.D., Ph.D.

"Imagine if it were possible to establish that greening interventions (i.e., tree planting) could prevent Alzheimer's disease and related dementias, as well as other brain and vascular health outcomes. A relatively inexpensive intervention could dramatically reduce suffering in millions

of persons and save billions of dollars in health care costs,"
Dr. Szapocznik said.

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