

RADCO Study



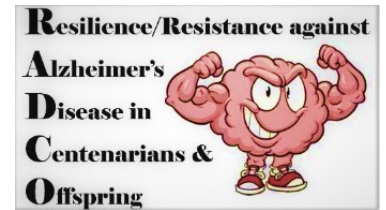
Dr. Stacy Andersen, (Boston University) co-leads RADCO and is in charge of studying the cognitive function aspects of the study.

Age is the number one risk factor for Alzheimer's disease and yet some people are able to live to extreme ages, even 100 years and over, and maintain good cognitive function. These people demonstrate remarkable resilience and resistance to Alzheimer's disease. Even more remarkably, within this group we have noted individuals who have truly exceptional cognitive function. They have memory abilities that match those of someone *thirty years younger*. We call these people **cognitive superagers**.

Those identified as being cognitively healthy or a cognitive superager through cognitive assessments done in the Centenarian & Offspring studies are invited to join the Resilience/Resistance against Alzheimer's Disease in Centenarians & Offspring study, better known as RADCO.

We use all of the data and biological samples collected in the Centenarian & Offspring studies and add additional measures of brain health in RADCO, such as repeated assessments of cognitive function over time, brain MRI data, and examine brain tissue for the presence or absence of markers of Alzheimer's disease after the participant passes away.

Together we are creating an unprecedented collection of data we believe will enable scientists to find out how and why some people are able to preserve brain health even to very old ages, and in the case of cognitive superagers, maintain exceptional levels of memory function. From these findings, we hope to discover strategies that will help everyone optimize their cognitive function throughout life.



Increased Genetic Protection Against Alzheimer's Disease in Centenarians

Dr. Harold Bae, Associate Professor at Oregon State University, who obtained his PhD at Boston University working with the New England Centenarian Study (NECS), led this analysis of genetic data from five collaborating studies: the NECS, Long Life Family Study (LLFS), the Longevity Genes Project, Tokyo Centenarian Study and the 100-Plus Study (Netherlands).

When a gene or combination of genes is discovered to be associated with a particular trait (like resilience against Alzheimer's), it is important to see if the discovery can be replicated in another group of subjects.

Thus, Dr. Bae and colleagues discovered among centenarians and their offspring in the NECS a combination of 83 genetic variants that together were associated with protection against Alzheimer's. This finding was replicated in the other studies.

The authors also found that the level of protection increased with older age beyond age 100. Next steps are to discover the actual biological mechanisms controlled by these genes.

Bae H, Song Z, Ali A, Sasaki T, Tesi N, Lords H, Leshchik A, Abe Y, Hirose N, Arai Y, Barzilay N, Weiss EF, Hulsman M, van der Lee S, van Schoor NM, Huisman M, Pijnenburg Y, van der Flier W, Reinders M, Holstege H, Milman S, Perls TT, Andersen SL, Sebastiani P. Increased genetic protection against Alzheimer's disease in centenarians. *Geroscience*. 2025 Jul 4. doi: 10.1007/s11357-025-01774-8.



MRI

Magnetic resonance imaging (MRI) has, over the past 30 years, revolutionized clinical neurology and research studies of the brain. The MRI uses magnets and radio waves to allow one to visualize brain structures and certain neurologic diseases that can't be seen and diagnosed in any other way, through a pain-free, non-invasive scan.

In RADCO, we use the MRI to measure the volume of specific regions important for specific brain functions (like memory), the integrity of pathways, connecting different parts of the brain, and the presence or absence of changes in the blood vessels feeding the brain.

From this imaging data, we are trying to learn about how underlying brain health (the integrity of the brain tissue) is related to cognitive function (memory and thinking abilities) and what changes are associated with healthy cognitive aging and cognitive superaging.

We currently have MRI sites available at Massachusetts General Hospital (**Boston, MA**), Columbia University (**New York, NY**), Georgia Tech (**Atlanta, GA**), UCLA (**Los Angeles, CA**), and University of Utah (**Salt Lake City, UT**). We plan to have new sites at University of Illinois (**Urbana, IL**) and UCSF (**San Francisco, CA**) soon.

If you are in RADCO and either live close enough to one of these sites or are willing to travel, please call us toll-free at 888-333-6327 for more information. There is a \$200 compensation for completing of the MRI.



Brain Donation

Brain donation is a hugely powerful and uniquely important gift for the RADCO study and the scientific study of both cognitive superaging and resilience against Alzheimer's and other causes of dementia. Microscopic and gene expression studies, diagnostic studies, and assessment of blood vessel integrity and the concentration of connections between brain cells are among the many studies that our neuropathology team at UCLA performs.

Brain donations enable us to determine if participants entirely escaped Alzheimer's disease (termed resistance to Alzheimer's disease) or if they had a buildup of Alzheimer's proteins, amyloid and tau, in their brain and yet remained cognitively healthy (termed resilience to Alzheimer's disease). From the brain tissue, we can learn what causes Alzheimer's disease and how some people are able to avoid it. The hope is to identify treatments against Alzheimer's and ways to improve brain health.

We encourage all RADCO participants to register in our brain donation program. You will sign a permission form while you are alive and our team will work with your family and funeral home to construct a smooth and efficient plan for the donation. Brain donation does not affect or delay funeral arrangements and there is no cost. Please call us today if you are willing to be a brain donor or have any questions!



If you are willing to complete the MRI portion of the study or register for brain donation, please contact us!

agewell@bu.edu

1-888-333-6327 (toll-free)