

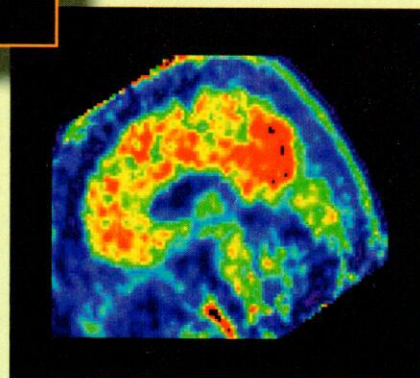
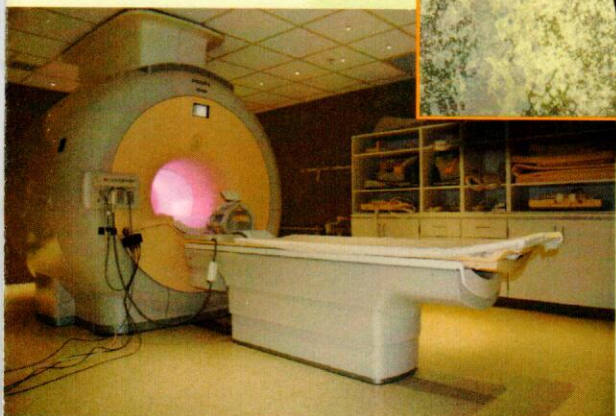
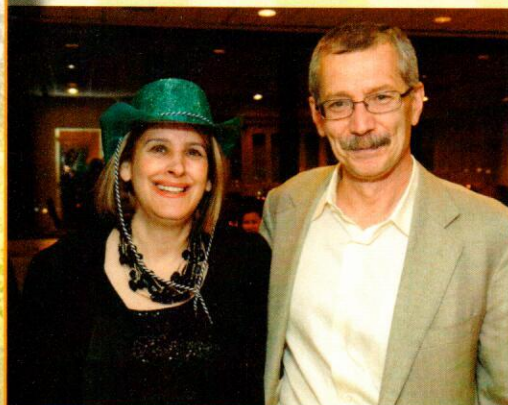
CENTER FOR VITAL LONGEVITY



Annual Report

June 2010 - May 2011

THE SCIENCE OF THE AGING MIND



The Center for Vital Longevity at The University of Texas at Dallas is a national leader in research focused on maintaining mental vitality for life. Led by co-directors Dr. Denise Park and Dr. Michael Rugg, center scientists are dedicated to national research excellence and scientific leadership, with a passionate commitment to learning to understand and optimize the function of the aging mind. Center scientists use advanced brain-imaging technology and research techniques in cognitive neuroscience to understand and facilitate cognitive function in older adults.

Research at the Center for Vital Longevity is advancing rapidly, and we have come far in a short time. Our investigators learn more every day about the brain's memory circuits, we have new data from investigations of interventions designed to stave off cognitive decline, and we're using the newest brain-imaging technology to understand better the progression of Alzheimer's disease years before symptoms appear. As we expand our cadre of outstanding investigators, we expect the Center for Vital Longevity to continue to be a leader in the frontiers of neuroscientific discovery on the aging mind.

Following are highlights of Center for Vital Longevity activities from June 2010 through May 2011.

CENTER WELCOMES DR. MICHAEL RUGG AS CO-DIRECTOR

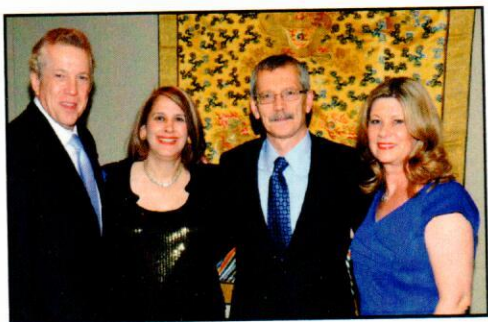
In January 2011, Dr. Michael Rugg moved his lab to Dallas from the University of California, Irvine, where he was director of the Center for the Neurobiology of Learning and Memory. One of the world's leading experts on human memory processes and the effects of age on memory, Dr. Rugg uses advanced neuroscientific techniques to investigate how patterns of neural activity in the brain change as we engage in memory, attention and language. A Fellow of the Royal Society of Edinburgh and the American Association for the Advancement of Science, Dr. Rugg has made major contributions to the understanding of how the brain forms and retrieves memories—one of the most important problems associated with aging that must be understood for advances to occur in the treatment of Alzheimer's disease. He is particularly interested in episodic memory, the type of memory that is most susceptible to aging and is affected most profoundly by Alzheimer's. Episodic memory allows us to remember the details of recent events—when and where they occurred and whom we were with. Dr. Rugg is a professor in the School of Behavioral and Brain Sciences at UT Dallas and holds a Distinguished Chair in the school.



CENTER SCIENTISTS AND STAFF

The center includes two major research laboratories that employ more than 25 people. In the fall of 2011, a third major lab will be added. Dr. Chandramallika Basak joins us from Rice University, along with her lab personnel. In addition, seven postdoctoral fellows currently are on site at the center, with four more on the way. During the reporting period, Drs. Park and Rugg gave more than 20 invited talks at scientific meetings and universities worldwide and published more than 20 articles in peer-reviewed research publications. Center investigators maintain affiliations and research collaborations with local, national and international universities and institutions, including UT Southwestern Medical Center, UT Arlington, the Institute of Exercise and Environmental Medicine at Presbyterian Hospital, University of Illinois, University of Michigan, University of Pennsylvania, Duke National University of Singapore and University College, London.

CENTER EVENTS



From left, Mr. Richard Collins, Dr. Denise Park, Dr. Michael Rugg and Ms. Sandra Thomas attend a center-sponsored dinner.

In September 2010, Texas Governor Rick Perry helped us launch the center at its new Viceroy Drive location near the Advanced Imaging Research Center. Our facility includes 30,000 square feet of space for faculty and staff offices, cognitive testing rooms, meeting rooms and laboratory space. We have hosted meetings of several organizations, including the Alzheimer's Association and the American Heart Association. In addition, the center regularly hosts visitors—more than 500 to date—including top business and community leaders. We also reach out to the community by making presentations about our research programs. Regular events are held at the center for our advisory council, donors and community leaders, including dinners and informal gatherings with center scientists and researchers from institutions worldwide. In Spring 2011 we hosted 12 internationally recognized experts from leading universities at our Science Luncheon Series for center researchers and the local scientific community.

2011 DALLAS AGING AND COGNITION CONFERENCE, FEB. 12-14

The Center for Vital Longevity's showcase event is the Dallas Aging and Cognition Conference, which draws scientists, postdoctoral researchers and graduate students from around the world to share their latest scientific findings in the field of neurocognitive aging. The 2011 conference was held at the Las Colinas Four Seasons and welcomed more than 150 attendees and 22 premier scientific speakers, including speakers from Duke; Harvard; University of California, San Francisco; Stockholm University; University of Cambridge; University of Michigan; Johns Hopkins University; National Institute on Aging; Rotman Institute (Canada); University of California, Irvine; and UT Southwestern Medical Center.



RESEARCH ACTIVITIES

Scientists at the Center for Vital Longevity are engaged in a wide variety of ongoing studies that are yielding new data on diverse topics. Examples of ongoing studies include:

Dallas Lifespan Brain Study (DLBS)

Dr. Park and her lab members are undertaking an ambitious study—the Dallas Lifespan Brain Study—that is making strides in understanding who ages successfully and why, as well as who is at risk for Alzheimer's disease well before symptoms appear. The study utilizes new radiotracer substances that allow researchers for the first time to see amyloid plaques in the living human brain. Amyloid buildup plays a critical role in the diagnosis of Alzheimer's. Dr. Park's research group images this substance in healthy middle-aged and older individuals, with the goal of identifying the characteristics of individuals who would benefit from cognitive intervention years before symptoms appear. The DLBS is one of the largest lifespan studies of the brain in the world.

Synapse Project: Use It or Lose It

One of Dr. Park's largest and most notable ongoing studies is the Synapse Project, which is testing the much-debated theory that you can keep your mind healthy in old age by leading an engaged lifestyle—the so called "Use it or lose it" hypothesis. In this study she is systematically testing whether an engaged lifestyle—including exercise, acquiring new skills, and/or participating in social activity—can slow down the process of cognitive aging by facilitating the development of supportive neural scaffolds in the brain. Data from this five-year study currently are being analyzed. A new, related pilot study called iCamp is testing whether older adults can expand their lives and independence, as well as benefit cognitively, by using an iPad to perform many everyday functions.

Selected 2010-2011 publications

Park, D.C., & Huang, C.M. (2010). Culture wires the brain: A cognitive neuroscience perspective. *Perspectives on Psychological Science*, 5, 391-400.

De Chastelaine, M., Wang, T.H., Minton, B., Muftuler, L.T., & Rugg, M.D. (in press). The effects of age, memory performance and callosal integrity on the neural correlates of successful associative encoding. *Cerebral Cortex*.

Rodrigue, K.M., & Kennedy, K.M. (2011). The Cognitive Consequences of Structural Changes to the Aging Brain. In Schaie, K.W. & Willis, S.L. (Eds.), *Handbook of the Psychology of Aging*. San Diego, CA: Academic Press.

RESEARCH FUNDING

Center scientists hold multiple awards from the National Institutes of Health. These prestigious awards are granted based on recommendations by leading scientists. They are a hallmark of national scientific excellence.

- 7 research grants totaling \$9 million over five years
- 2 additional major awards from the National Institute on Aging, totaling \$4.5 million, are expected, to be expended between 2011 and 2016
- 2 K-99 Pathway to Independence awards for early-career scientists, totaling \$2 million
- 2 subcontracts with UT Southwestern Medical Center researchers

Functional Neuroimaging of Memory

Dr. Rugg investigates how neural activity in the brain gives rise to fundamental cognitive functions like memory, attention and language. In pursuit of this question he has helped pioneer two different investigative methods—event-related potentials, or ERPs, and functional magnetic resonance imaging, or fMRI. These techniques measure the brain activity of healthy individuals while they undertake experimental tasks designed to tap specific cognitive abilities. Dr. Rugg currently uses these techniques to investigate how episodic memories are formed and retrieved. He also studies the relationship between age-related differences in the brain's structure and function and memory ability. This work promises to shed light on why memories function less well as we grow older and may contribute to identifying earlier individuals most at risk of developing Alzheimer's disease later in life.

FINANCIAL SUPPORT - PHILANTHROPY

To keep the Center for Vital Longevity on a path to important discoveries and scientific excellence, philanthropic support is essential. The Directors' Research Circle was established in the past year as a visible support mechanism for the center. We gratefully acknowledge and thank our generous donors whose philanthropic gifts, sponsorships and gifts-in-kind received or pledged during the reporting period total more than \$200,000. Our donors to date include:

Chela Abdallah - Directors' Research Circle
 Dr. Kenneth and Ruth Altshuler - Directors' Research Circle
 Anonymous
 Sallie and Frederic B. Asche - Directors' Research Circle
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 Sherri Wood

For information about opportunities to support the center's work, contact Melinda Ellis, director of development, at 972-883-3728, mellis@utdallas.edu or visit our website at <http://vitallongevity.utdallas.edu/>

We also thank our Advisory Council members for their time, their valuable input and their continued interest in advancing the mission and goals of the Center for Vital Longevity. We could not have achieved such a high level of success without their involvement.

Sandra Thomas, CPA (Chair)
 Chief Operating Officer,
 istation

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 Community Volunteer

Dr. Kenneth Altshuler
 Stanton Sharp
 Distinguished Professor,
 UT Southwestern
 Medical Center

Sallie Asche
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