

# Neural Activities

THE NEWSLETTER OF THE CENTER FOR VITAL LONGEVITY

## Science of memory, aging is focus of event



The D-ACC featured 22 invited speakers and drew more than 150 attendees during the course of the two-day event.

Scientific studies conducted at the Center for Vital Longevity and elsewhere around the world are paving the way to successfully combating age-related cognitive decline. The Center for Vital Longevity plays a key role in moving these discoveries forward. Its annual Dallas Aging and Cognition Conference (D-ACC) provides an important venue for scientists to present their latest findings. In February, an internationally eminent group of researchers dedicated to understanding how the aging brain affects

*D-ACC continued on page 5*

## On Our Minds *A message from the center directors*

### Benchmarks of research excellence: How the Center for Vital Longevity measures up



Denise Park, Ph.D.



Michael Rugg, Ph.D.

At the Center for Vital Longevity, our goals are to understand why and how the mind ages and to play a major role in developing ways to slow mental aging, enhance later life, and prevent or delay the onset of crippling disorders such as Alzheimer's disease. As its directors, we are committed to making the Center for Vital Longevity a national and international center of excellence. We are well under way and here present objective criteria that evidences our commitment and achievements. To meet our goals, we need the community to invest in the center and want to be sure you are aware of the caliber of the research your contributions will enable.

We are very proud to be Fellows of the American Association for the Advancement of Science, a benchmark

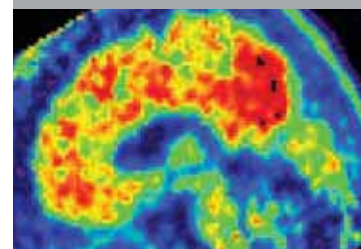
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## RESEARCH UPDATE

Center for Vital Longevity researchers are contributing to a fuller understanding of why certain kinds of memory are so vulnerable to advancing age.

Dr. Michael Rugg, one of the world's leading experts on the effects of aging on memory, joined the Center for Vital Longevity in early 2011 as co-director. His research investigates how patterns of activity in different brain regions give rise to fundamental cognitive functions such as memory.

His current focus is on the core neural systems and processes that allow healthy brains to both successfully acquire and retrieve memories.

He is especially interested in **episodic memory**, the type of memory that allows us to remember unique events that are tied to a particular place and time.

Dr. Rugg uses advanced imaging technology to scan the brains of research subjects as they are asked to perform specific tasks. For example, he images subjects' brains while they view photos of objects projected on a screen. Some time later, he tests their memories of those objects. By comparing the brain activity evoked by objects that are later successfully remembered with the activity evoked by later forgotten objects, he is able to identify which areas of the brain are involved in memory **formation**.

In other experiments, Dr. Rugg scans subjects while they try to retrieve memories, with the aim of identifying the regions of the brain that form the core network responsible for episodic memory **retrieval**.

"In effect, we're asking where in the brain does activity predict whether or not an event will later be remembered," said Dr. Rugg, who holds the Distinguished Chair in Behavioral and Brain Sciences at UT Dallas. "The difference in activity tells us something about the regions of the brain that get activated in concert with successful later retrieval of an episodic memory." 🌟

**"Understanding how episodic memories are formed and retrieved in healthy subjects is important because this type of memory declines sharply with age and is severely affected in the earliest stages of Alzheimer's."**

— Dr. Michael Rugg

## SCIENTIST SPOTLIGHT

**Meet the Center for Vital Longevity researchers.**



MARIANNE DE CHASTELAINE

Dr. Marianne de Chastelaine joined the center as a research associate in January, when she relocated with Dr. Michael Rugg from their California laboratory. A native of the United Kingdom, Dr. de Chastelaine received her master's degree in cognitive neuropsychology at Birkbeck College, London, and her Ph.D. in psychology from University College London. She uses functional magnetic resonance imaging (fMRI) and other techniques to study how humans form and retrieve memories. She has a special interest in the effects of aging on episodic memory.

## Mental Notes

### ***National priorities for Alzheimer's, cognitive decline: Center for Vital Longevity answering the call!***

The first of 78 million baby boomers in the U.S. turns 65 this year. As life expectancy for older Americans increases, the number of people experiencing age-related cognitive decline and Alzheimer's disease will rise dramatically. To evaluate this issue and its implications for society, the National Institutes of Health gathered a 15-member panel of experts in 2010 to prepare a State-of-the-Science Conference Statement on Preventing Alzheimer's Disease and Cognitive Decline.

The independent panel of health professionals and public representatives came to several conclusions, including:

- There is insufficient evidence to support the use of drugs or dietary supplements to prevent age-related cognitive decline and Alzheimer's.
- Research studies have not definitively established therapeutic effects of cognitive training or cognitive engagement on preventing cognitive decline.
- Physical activity, including walking, may help maintain or improve cognitive function, but larger research trials are needed.
- Diabetes, genetic factors, smoking and depression are associated with increased risk of Alzheimer's disease and cognitive decline.

Center for Vital Longevity investigators are tuned in to these national priorities, said Dr. Denise Park, co-director of the center.

"Our active research projects are on the forefront of these issues," said Dr. Park, who holds the Distinguished University Chair in Behavioral and Brain Sciences and is a Regents' Research Scholar at UT Dallas. "Our group is developing new ways to predict the risk of cognitive decline in later years, and we are testing whether exercise and active learning can help maintain and improve cognitive function as we age." ☀

*The full NIH statement is available online: [consensus.nih.gov/2010/alzstatement.htm](http://consensus.nih.gov/2010/alzstatement.htm)*

## BENCHMARKS

### **Center for Vital Longevity scientists reach audiences far and wide**

One of the most important aspects of scientists' work is sharing their discoveries and research findings with other scientists. They do this by publishing in journals detailed articles that have been reviewed by top experts in their field, and by presenting their work at scientific conferences. Such sharing of new ideas helps to advance the state of the science, as well as suggest potential new directions for treatment strategies, therapy or drug development.

As well-known experts in cognitive neuroscience, memory and the aging brain, Center for Vital Longevity investigators not only publish research papers in the top echelon of scientific journals, but also are invited to share their research findings at many different scientific conferences (*see box, right*).

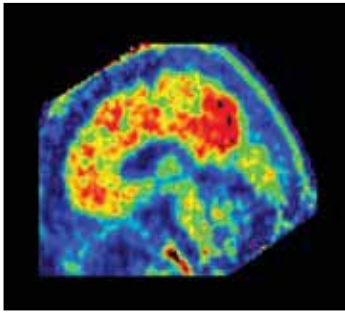
#### ***Center researchers have been invited to speak at several 2011 scientific meetings, including:***

- American Association for Geriatric Psychiatry annual meeting, San Antonio
- International Association of Cross Cultural Psychology's conference in Istanbul, Turkey
- American Psychological Association's annual convention, Washington, D.C.
- 11th International Conference on Cognitive Neuroscience in Mallorca, Spain
- University of Texas at Austin's Conference on Learning and Memory
- Symposium on Learning and Memory at the National Chengchi University in Taiwan
- 5th International Conference on Memory in York, U.K. ☀



## Questions About Cognition

Do you have a question about the aging mind and how it works? To submit a question, please visit us online at: [vitallongevity.utdallas.edu/newsletter](http://vitallongevity.utdallas.edu/newsletter)



In this PET scan, red and yellow areas indicate amyloid plaque deposits in the brain.

### Is there any way to predict someone's risk for Alzheimer's disease?

There is great hope for predicting Alzheimer's disease in its earliest stages, well before symptoms appear. New radiotracer substances, when injected into an individual, latch on to materials in the brain called amyloid plaques, which play a critical role in the diagnosis of Alzheimer's. By conducting a PET scan of the brain after injection, researchers for the first time can now see these amyloid plaques in living humans. These brain scans are not yet routinely available, but researchers believe they will soon be used to detect amyloid buildup well before cognitive decline sets in. Dr. Denise Park, co-director of the Center for Vital Longevity, has conducted considerable research on healthy adults using this radiotracer (*an example of a healthy adult with significant amyloid is shown above*). Although there currently is no cure for Alzheimer's, a proper diagnosis is important for testing new treatment options, as well as helping patients and families better prepare. ☀

## Support the Center

Research at the Center for Vital Longevity is at an exciting stage! We're learning more every day about the brain's memory circuits, and we're using brain-imaging technology to understand better the progression of Alzheimer's disease. We're developing the tools to help millions of older adults maintain cognitive vitality.

### Join our Directors' Council!

We're looking for like-minded forward-thinkers to share in our excitement and to join us as we pursue new opportunities to advance and grow. We recently established the center's Directors' Council, a core group of donors committed to sustainable support and to playing a key role in leveraging additional private-sector funding. Directors' Council-level donors will **attend scientific roundtables, have dinner with faculty and early-career scientists, tour the center, and receive briefings on the latest research findings on the aging brain.** Options for becoming a Directors' Council donor include an annual gift of \$2,500, or a commitment of \$12,500 over five years.

Scientific advances depend on a blend of public and private support. Private funding helps us launch pilot studies, which are critical for gathering the initial data that is often needed to apply for federal grants for larger studies. By making a gift **of any size** to the Center for Vital Longevity, you can support continued innovation and advance the science that will improve our ability to maintain the health of the aging mind. Gifts also would allow us to:

- Establish a distinguished lecture series, bringing top thought leaders to the community.
- Provide scholarship or fellowship funds to recruit exceptional students and postdoctoral fellows to Dallas.
- Support critical new lines of research.
- Establish Dallas as a nexus of aging research by attracting leading faculty scholars to join the center.

To discuss opportunities for supporting the center's work, please contact Melinda Ellis, director of development, at **972-883-3728**, or visit [vitallongevity.utdallas.edu/support](http://vitallongevity.utdallas.edu/support) to make a gift online.

## D-ACC *continued from page 1*

memory and other key cognitive functions came together at the center-sponsored 2011 D-ACC.

“Dissemination of new scientific information will help investigators develop interventions to slow or halt mental decline in a graying population,” said Dr. Michael Rugg, co-director of the Center for Vital Longevity and an organizer of the conference. He holds the Distinguished Chair in Behavioral and Brain Sciences at UT Dallas.

Speakers hailed from universities around the world, including Duke, Harvard, Johns Hopkins, the University of Edinburgh, Stockholm University, the Rotman Research Institute in Ontario, and the National Institute on Aging, as well as from UT Dallas and UT Southwestern Medical Center.

“The Center for Vital Longevity is earning international recognition for scientific excellence, and its efforts help put Dallas on the map as a major focus for research into the aging mind,” said Dr. David E. Daniel, president of UT Dallas.

Dr. Randy Buckner, professor of psychology and neuroscience at Harvard and a Howard Hughes Medical Institute investigator, was one of the invited speakers.

“One lesson that emerged from a number of presented discoveries is that the aging brain is sometimes resilient to disease,” Dr. Buckner said. “How? My hunch is that understanding how the brain is naturally capable of warding off cognitive decline in some people will give us insight into how all of us can stave off cognitive illness.”

Dr. Adam Gazzaley, associate professor of neurology, physiology and psychiatry and director of the Neuroscience Imaging Center at the University of California, San Francisco, said the event provided “an amazing opportunity” for postdoctoral researchers and students to communicate informally with top scientists in their field.

“This type of sharing among investigators is vital for the continued development of our own laboratories, as well as for cross-lab collaborations,” said Dr. Gazzaley, who also was an invited speaker. 🌞



From left, center co-director Denise Park; advisory council member Sallie Asche; Jim Bartlett, professor of behavioral and brain sciences at UT Dallas; advisory council member Mary Susan Barnhill; and center co-director Michael Rugg enjoy a break during the 2011 Dallas Aging and Cognition Conference.

## ON OUR MINDS *continued from page 1*

of excellence for individual scientists. This is a high honor where one is elected by peers in recognition of sustained, highly significant contributions to a scientific discipline.

Another major benchmark of excellence for scientific research in the biomedical field is the receipt of peer-reviewed grants from federal funding sources, most importantly, the National Institutes of Health (NIH). These highly competitive grants require a score within the top 10 percent of proposals to gain funding. Center researchers currently oversee 10 major NIH grants, with another on the way. We are particularly pleased that two of our postdoctoral fellows hold prestigious NIH Pathway to Independence Awards, which are grants that foster the development of early-career scientists.

A final important benchmark for excellence is the quality of the scientific journals that publish papers describing research findings. Our papers regularly appear in the top echelon of these journals.

As measured by nationally and internationally accepted criteria for research excellence, the Center for Vital Longevity already “walks the walk” of elite scientific achievement. As the center grows, we aim to ensure that its excellence is not only undiminished but further enhanced. 🌞

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Center for Vital Longevity  
The University of Texas at Dallas  
1600 Viceroy Drive, Suite 800  
Dallas, Texas 75235  
972-883-3200

THE SCIENCE OF THE AGING MIND

CENTER FOR  
VITAL LONGEVITY

