

# Neural Activities

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THE NEWSLETTER OF THE CENTER FOR VITAL LONGEVITY

## DIRECTOR'S MESSAGE

### A Grand Challenge



Dr. Michael Rugg

Welcome to our Fall 2016 newsletter. With the new academic year, we at the CVL are looking forward to expanding our research to advance our understanding of how the brain and mind change with age, and how we can maintain cognitive vitality throughout life. Our research falls squarely within the "Grand Challenge in Neuroscience" identified by UT Chancellor William McRaven as a research priority for the coming years. The Challenge recognizes the potential of neuroscience research to enhance quality of life, and emphasizes the importance of collaborations between basic and clinical scientists. I'm pleased to say examples of these collaborations are already plentiful at the CVL, where all faculty enjoy successful and productive interactions with colleagues at UT Southwestern Medical Center, our sister UT institution in Dallas.

On a related topic, CVL faculty have recently been awarded several peer-reviewed research grants (and we are optimistic of more in the coming few months). As I've mentioned previously, peer-reviewed grants are important both because they allow us to continue and expand our research efforts, and because they demonstrate the high regard with which our research is viewed by our fellow scientists. We hope we have earned the same regard from you, our friends in the community here in Dallas, and we will strive to make that regard all the more deserved in the future. ☀



Dr. Michael Rugg

## National Alzheimer's Association Funds CVL Research on Brain Iron Accumulation and Possible Links to Dementia

In support of her efforts to understand the effects of iron accumulation in the brain and evaluate iron as a possible indicator of neuropathological aging, Dr. Karen Rodrigue has been awarded \$100,000 by the national Alzheimer's Association.

The new study will investigate the hypothesis that brain iron accumulation is an important age-related marker of risk for cognitive decline and for preclinical brain changes, such as the accumulation of beta-amyloid plaque, that develop long before the clinical symptoms of Alzheimer's Disease. Excessive accumulation of heavy metals, such as iron, is associated with oxidative stress and free radical damage in the brain and may serve as a predictive factor of risk for cognitive decline. Specifically, there is evidence from animal research that iron dysregulation may play an important role in the accumulation of beta-amyloid, but this has yet to be examined with neuroimaging techniques in the living human brain.

"Since no studies have yet examined the association of amyloid plaque and iron accumulation in the human brain, results from a new study made possible by these funds may shed new light on important neural mechanisms of age-related cognitive decline," Dr. Rodrigue said. "Establishing these associations in preclinical to mildly impaired adults could allow therapeutic targets to be applied to an earlier part of the lifespan,

before symptoms of significant cognitive impairment appear."

The new study will examine both cognitively healthy adults and individuals diagnosed with mild cognitive impairment, with a particular focus on individuals with a genetic risk of developing Alzheimer's.

"I am very grateful to the Alzheimer's Association for its support of this research effort," said Dr. Rodrigue. "The receipt of this new investigator grant will enable the launch of a new and important area of study of aging in our laboratory." ☀



Dr. Karen Rodrigue

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# CVL Councilmember Laree Hulshoff Career in Finance Leads to Urgent Effort to Raise Awareness and Funding for Memory Research

Laree Hulshoff is a Center for Vital Longevity councilmember and a prolific fundraiser. She grew up in Oklahoma, where she completed her undergraduate and master's degrees at Oklahoma State University. After graduating she taught 7th and 11th grade English before she made her way North to pursue her post-doctoral studies at SUNY Buffalo, while working as a guidance counselor. She then moved into investment management.

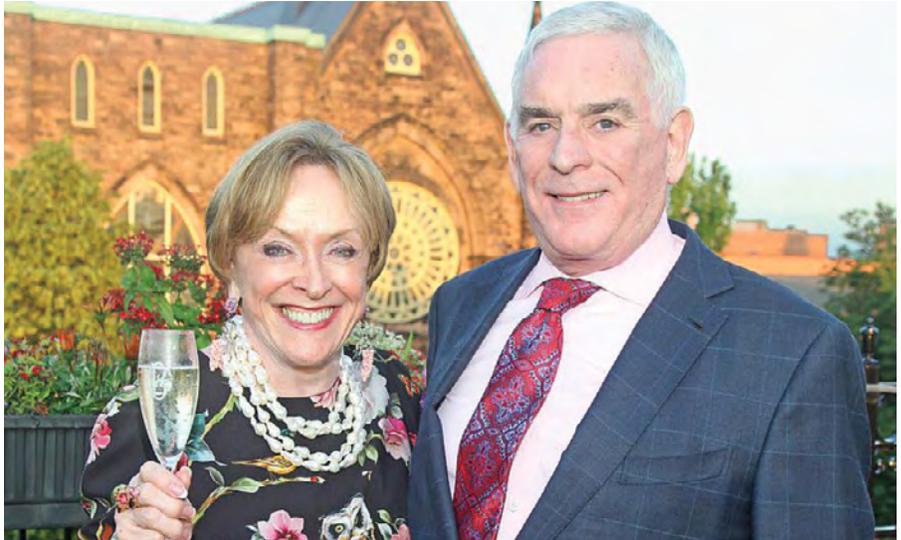
Laree retired in 2010 as a Senior Vice President and Senior Investment Manager at Morgan Stanley when she moved to Texas to join her fiancé, Ben Fischer. Their mutual love for art and respect for each other's tastes made combining their households a work of art itself. The 23rd floor of Museum Tower overlooking Dallas' vibrant Arts District is now their home.

"Retirement" in Dallas didn't last long, though. "I had to get back to work again so I could rest," she jokes.

Laree dived into fundraising in support of research aimed at helping the aging mind protect itself from cognitive decline — the kind of research undertaken at Center for Vital Longevity.

Laree has seen too many of her friends suddenly just "melt away," she says. One recent afternoon at her Museum Tower home, Laree reflected on people she's seen at the top of their game suddenly succumb to the ravages of dementia — in a matter of months.

Motivated not only by protecting her friends, but also by addressing the looming public health crisis that will be caused by unchecked pathological cognitive aging, Laree and the late Bill Booziotis set out to fundraise for the Center for Vital Longevity in order to help fund dementia research into staving off cognitive decline.



CVL Council-member Laree Hulshoff and her husband, Ben Fischer in Buffalo, NY.

In 2013, the Aging Mind Foundation was founded to address and support critical issues unique to the aging mind, including research, treatment, education and advocacy. Laree and Bill, along with founding board members, Barbara Buzzell, Barbara Daseke, Jo Marie Lilly, Lisa Shardon and Julie Tregoning (soon joined by Mike Masters and Greg Patterson), set out to plan the first benefit event. Bill Booziotis brought in Laura and Owen Wilson to support and honor Bob Wilson, Owen's father, at the inaugural gala, which took place at the Joule Hotel in February 2015. That first year, the Aging Mind Foundation raised over \$329,000, which funded CVL's three-year Aging Mind Foundation Postdoctoral Fellowship, held by Dr. Sara Festini. In 2016, the gala raised over \$350,000, which funded a three-year Aging Mind Foundation fellow at the Center for Brain Health, held by Dr. Namrata Singh.

This year the Aging Mind Foundation has grown to 27 very involved and active board members and six medical advisory board members. The Joule Hotel has been

the presenting sponsor and underwriter of the Aging Mind Foundation gala since the beginning. Other generous sponsors include: YUM! Brands, Needle in a Haystack, POGO's and Forty Five Ten, which are all instrumental in the Foundation's fundraising success.

Laree and the Aging Mind Foundation board are busy planning the 3rd annual gala, honoring George Kline, Dallas businessman and former television executive. The gala will take place on February 25, 2017 and will benefit Baylor AT&T Memory Center.

Nearly \$700,000 has been raised by the Foundation since its inception in 2013. With a growing board and a couple of years of experience under its belt, the Aging Mind Foundation hopes to raise that amount this year alone.

"Dallas is an incredibly generous and big-hearted place," she said. "The energy and optimism that characterizes Dallas and is part of the city's history makes it an ideal place to take up big challenges," like delaying or even preventing Alzheimer's Disease. ☀

# Cherished Center Supporter Bill Booziotis Remembered

In May, the Center for Vital Longevity lost one of its most beloved and indefatigable supporters — Bill Booziotis — to whom the Center owes so much. Everyone at CVL deeply mourns the loss of an intellectual and social luminary who played a huge role in introducing CVL to the Dallas community, based on his extensive network of deep and lasting friendships in Dallas.

Beginning in 2010, Bill expressed a keen interest in supporting the fledgling new Center for Vital Longevity. From that day forward, he was a dedicated and energetic supporter of CVL. The first thing he did was to found the CVL Director's Research Circle, a highly successful philanthropic lecture series. Then, after the death of his wife, Jean, he established the Jean and Bill Booziotis Opportunity Fund.

"Dallas is very lucky to have these CVL scientists in our own backyard, and the scientists are lucky to be in such a supportive, philanthropic community," Bill said last year. "The hard-working scientists at the Center for Vital Longevity should be celebrated for their achievements and for putting

Dallas on the map of brain science in a big way with such demonstrated commitments to the scientific community, and to the public writ large."

An architect by training, Bill was a recognized civic leader and unparalleled supporter of the Center. Bill founded Booziotis & Company Architects in 1989, focusing on unique commissions requiring specialized design consideration, and has been involved in all phases and aspects of planning, architecture and interior design. With clients including Texas Instruments, the University of Texas and the Dallas Museum of Art, his work can be seen in projects from museums, churches and university buildings to sleek modern single-family homes and the restoration of historic Dallas homes.

He also designed and conceived the Communities Foundation of Texas building on Caruth Haven Lane, where the annual CVL public lecture bearing his late wife's and his name takes place every April. His support of this lecture series was rooted in the belief that distinguished visitors in the area



**Bill Booziotis**

of cognitive neuroscience should be welcomed to the city and given a forum to spread their knowledge and research through the community.

Bill also served on the CVL Advisory Council and was a member of the UT Dallas' Legacy Society.

"Bill was one of the CVLs and UTD's staunchest and most generous supporters, and advocated tirelessly on our behalf," says Center Director Dr. Michael Rugg. "He was also a wonderful friend whose advice and guidance were inestimable. He is sorely missed."

The Center got its start under the direction of Dr. Denise Park, now the Center's Director of Research. In her words, "Bill was a person of remarkable intellect, generosity and warmth. He had great wisdom combined with an unexpected irreverence that was delightful. His management of his illness was heroic. He brought goodness to my work and my life."

In 2015 Bill and his friends turned out to a fifth anniversary celebration of the Center to recognize the accomplishments of a program that had quickly achieved impressive marks for scientific achievements.

The Center has come a long way with Bill at its side, and his lasting contributions have ensured the Center will continue to make an impact in the field and on the future of Dallas. 🌟



The annual lecture series in Booziotis' name was established in 2014. Bill (far right) pictured here with Drs. Michael Rugg, John Jonides (the series' inaugural guest speaker) and Denise Park.

# Benson Assumes Presidency of UT Dallas



**Dr. Richard C. Benson**

Dr. Richard C. Benson, the former dean of Virginia Tech's College of Engineering, has become the 5th president of The University of Texas at Dallas, succeeding Dr. David

Daniel, who left last summer to serve as UT System's deputy chancellor. Dr. Benson began his new role leading UT Dallas on July 15, taking over from Dr.

Hobson Wildenthal who was serving as president ad interim.

During Dr. Benson's tenure at Virginia Tech, the number of applicants to its College of Engineering nearly doubled. Before his deanship at Virginia Tech, Dr. Benson was head of the Department of Mechanical Engineering at Pennsylvania State University beginning in 1995. He previously served as chair of the Department of Mechanical Engineering at the University of Rochester, and prior to that was the associate dean for graduate studies in the university's College of Engineering and Applied Science.

Dr. Benson's research at the

University of Rochester was primarily focused on the mechanics of highly flexible structures. He has twice been honored by the American Society of Mechanical Engineers (ASME). In 1984, he received the ASME Henry Hess Award, which honors a research publication by a young author. He also became a fellow of ASME in 1998.

Dr. Benson holds a bachelor of science and engineering in aerospace and mechanical science from Princeton University, a master's in mechanical engineering from the University of Virginia, and a doctorate in mechanical engineering from the University of California, Berkeley. ☀

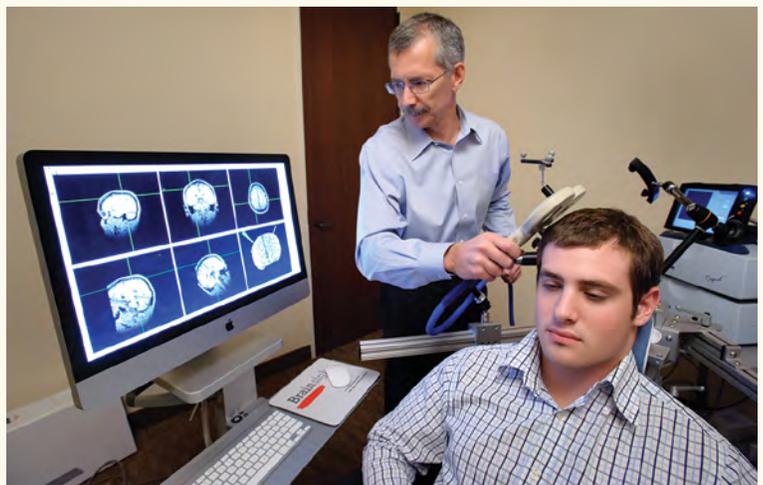
## Center Receives New Federal & Non-Profit Funding for Memory Research

In addition to an award from the Alzheimer's Association (see page 1), CVL researchers recently received three other awards from national funding bodies.

The James S. McDonnell Foundation chose CVL's Dr. Gagan Wig this fall to receive a 2016 Understanding Human Cognition Scholar Award. Providing \$600,000 over six years, the award is geared toward researchers who are studying how neural systems support cognitive functions and how cognitive systems are related to observable behavior. Of the twenty nominees, Dr. Wig, along with seven other researchers from institutions around the world, including Harvard University, Stanford University and Princeton University, were selected for the award.

With the help of this funding, Dr. Wig aims to establish a framework for studying age-related cognitive decline from a complex networks perspective. So far, according to Dr. Wig, researchers have not been able to deeply explore age-related cognitive decline and maintenance from a network-based perspective, for lack of a formal network-analysis approach toward understanding the healthy aging brain and how cognitive abilities change as we age. Previous work in the field has largely focused on describing differences in function at the level of activity in separate

**Dr. Michael Rugg conducting transcranial magnetic stimulation, the method to be used in one of the new federally funded studies at CVL.**



brain areas without delving into macro-level connections.

Earlier this summer, the laboratory led by CVL director Dr. Michael Rugg was awarded grants from the National Science Foundation (NSF) and the National Institute on Aging (NIA). Totalling nearly \$1 million, the grants will support novel investigations into memory across the lifespan, focusing on studies that compare the brain activity supporting memory in young and healthy older adults.

The NSF award of approximately \$544,000 spans three years while around \$421,000 from the NIA will be spread over two years. The NSF award

will support research on memory for specific events (episodic memory), which is highly vulnerable to aging. Using functional magnetic resonance imaging (fMRI), Dr. Rugg and his colleagues will examine brain activity associated with episodic memory retrieval in groups of young and older adults.

The NIA-funded project will use fMRI in concert with transcranial magnetic stimulation (TMS) to investigate the neural underpinnings of a specific aspect of memory known as "post-retrieval monitoring" — cognitive processes that support the evaluation of information retrieved from memory in relation to current behavioral goals. ☀

# An Evening with Dr. Denise Park and the Director's Research Circle



**DRC evening speaker  
Dr. Denise Park.**

Dr. Denise Park addressed CVL's Director's Research Circle on Oct. 4, speaking to more than 50 DRC members and other Center supporters about the increasing threat that Alzheimer's Disease poses as we age.

By age 85, approximately 40 percent of adults develop the disease, Dr. Park said. "And

the increase in sheer numbers will be epic, as current baby boomers age," she added.

Dr. Park presented an overview of her two major research projects at CVL. She first talked about the Dallas Lifespan Brain Study, which seeks to predict who will and will not age well, and to determine the neural signatures of healthy aging.

"We have studied nearly 500 healthy people for the past eight years, using the most advanced neuroimaging technology available," she told the group. "Over eight years, some people declined in cognition, while others maintain function. Using brain scans, we can determine the neural footprint associated with different trajectories of aging. We think we will be able to predict in middle age who is at risk of aging poorly, with the hope that interventions can prevent this outcome."

She also gave an overview of the Synapse Project, which is focused on understanding whether mentally demanding leisure activities facilitate cognition and slow cognitive aging.

The Director's Research Circle is composed of Center donors who make a commitment to support CVL with an annual gift of \$2,500 or a minimum \$12,500 donation over five years. To learn more about the benefits of joining the Director's Research Circle, please visit <http://vitallongevity.utdallas.edu/support>.



**A mix of DRC members and friends attended Dr. Park's talk at CVL.**

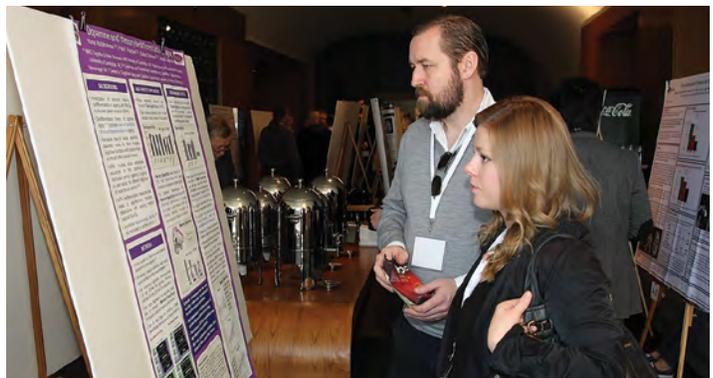
## Dallas to Play Host Again to CVL's Premier Aging and Cognition Conference in 2017

The Center for Vital Longevity (CVL) is gearing up to host the 5th Dallas Aging and Cognition Conference at Marriott City Center in the heart of the Dallas Arts District. The biennial conference brings together scientists focused on the cognitive neuroscience of aging to share their latest findings and insights. The conference will run from Jan. 28 to Jan. 30, 2017.

Twenty-five talks from leading scholars across the world will be presented. Speakers include Dr. Cheryl Grady, University of Toronto; Dr. William Jagust, University of California Berkeley; Dr. Cindy Lustig, University of Michigan; and Dr. Yaakov Stern, Columbia University.

In addition, there will be an additional 60 poster presentations at the conference.

"We expect well over 200 scientists representing the strongest national and international research programs focused on the study of the aging mind," Dr. Denise Park said. "This has become a highly anticipated event among the research community and we are proud to host an event that grows larger with each successive conference," said Dr. Park, the conference organizer and Director of Research at CVL. Topics to be considered include early brain precursors of Alzheimer's Disease, how aging can disrupt connected brain networks and the consequences for cognition, as well as how education and neural or cognitive stimulation can protect or improve cognition. Information about the conference is available on the Center's website, [cvlinfo.org](http://cvlinfo.org).



**Attendees at the last DACC in 2015 review findings during one of the conference's poster sessions.**

## Consider a Gift of Life Insurance

A life insurance policy is a wonderful asset that can be used to create a much greater philanthropic impact at CVL than you might have thought possible.

If you are carrying more insurance coverage than your family obligations now require, or if you would like to explore a low-cost/large impact gift generally, consider using life insurance to create a meaningful legacy at the Center for relatively little cost.

- Donate an existing policy
- Donate a new policy
- Designate UT Dallas as a beneficiary

To learn more, contact Diana Aguirre at [diana.aguirre@utdallas.edu](mailto:diana.aguirre@utdallas.edu) or 972-883-3728.

# NEW FACES

## Chris Foster, Research Associate, Rodrigue Lab



Chris joined the Rodrigue Lab this summer as a research associate, freshly minted with a Ph.D. from the University of North Carolina at Chapel Hill in cognitive psychology. Chris obtained his undergraduate degree from Western Carolina University, taking time afterward to do undertake clinical neuropsychological and cognitive testing for a clinician specializing in memory and psychiatric disorders. The experience taught him the finer points of interacting with patients, as well as the vagaries of health insurance claims and reimbursements. After his time as a psychometrician, Chris moved onto graduate school and began a research program under the direction of Dr. Kelly Giovanello, studying the cognitive neuroscience of memory in human subjects with a focus on aging. He also investigated the cognitive and neural correlates of early Alzheimer's Disease using MRI and PET. Chris will continue focusing on aging and early Alzheimer's at CVL, working on a recently collected lifespan dataset that includes cognitive, structural, functional, and genetic data. In his spare time, Chris has plied craftsmanship into two of his favorite pastimes: furniture-making and brewing beer. ☀

## Sophie Slater, Research Assistant, Rugg Lab



Sophie joined the Rugg Lab in the summer, after receiving her bachelor's in psychology from UT Dallas. She also earned a minor in neuroscience. Prior to earning her degree, she served as an intern for the Parkland and UT Southwestern Neuropsychology Departments for a year, working with disadvantaged populations to whom she administered assessments, and helping her supervisors create neuro-behavioral profiles to aid clinicians in their diagnoses. "I liked being involved in the process between finding a dysfunction and determining treatment; that is, I enjoyed investigating the symptoms as opposed to treating them," she says. Sophie has had an interest in psychology since high school, and has developed a strong interest in clinical neuropsychology and, most recently, neuroimaging research. She plans to work in research for two years, after which she will pursue a graduate program in clinical psychology with a later focus on neuropsychology. Since arriving at CVL, she has gained valuable experience in designing and creating experiments using tools, such as MATLAB. She has also participated in EEG and fMRI recordings with study participants. Some of her hobbies include planting, leatherworking, and woodworking. Originally from Fort Worth, she lives with her fiancé and their two cats in Dallas. ☀

## Lisa Ball, Administrative Associate, Park Lab



No stranger to higher education and science, Lisa joined Park Lab in October, hailing from New Jersey, where she worked at Princeton University as an undergraduate administrator for many years. At Princeton, Lisa worked primarily with the Department of East Asian Studies, in the same science hall that once housed the math department and the work of Albert Einstein, as well as the Department of Molecular Biology. An avid writer, Lisa holds a bachelor's in journalism from Rider University and is currently pursuing a master's in business communication. As Administrative Associate to Dr. Denise Park, Lisa manages operational activities that relate to non-scientific operations. She also handles travel and reconciles accounts. Lisa says she's glad to give up the congestion of the Northeast in favor of more space in Texas. ☀

## Kay Moolenijer, Lab Manager, Rugg Lab



Kay originally joined the Rugg Lab in 2011, left for a couple of years and was lucky enough to return recently. Kay received her BS from the University of Washington in 1980 and has spent nearly her entire professional life in research, mostly involving healthy aging (both as a research interest and a personal goal), working in universities all over the world. Her interests are in data collection, especially interacting with older adults, assuring the quality of data, and data analysis. She has several publications, ranging from lung function in working uranium miners, to supplement use in older populations, to the relationship between depressive symptoms and cognitive training. Outside of work Kay sings with The Women's Chorus of Dallas, is an avid skier, traveler and reader. ☀

## Linh Trieu, Research Assistant, Kennedy Lab



Linh earned her master's in applied cognition and neuroscience from UT Dallas last December and joined Dr. Kennedy's lab in the summer, after previously serving as a volunteer in the lab during the course of her master's program. Her current research interests center on how cognition develops and changes throughout the lifespan, its relation to white matter integrity, and exploring structural and cognitive differences between healthy and clinical populations (e.g., those suffering from mental disorders such as depression and ADHD). Lately at CVL she has been exploring different methods of neuroimaging, including diffusion tensor imaging. She plans to pursue a Ph.D. focusing on cognitive neuroscience, and will be applying to programs this fall. In her spare time, Linh enjoys playing sports and video games, knitting and crocheting, and reading fiction. She is a native of Brenham, Texas, home of Blue Bell Ice Cream. ☀

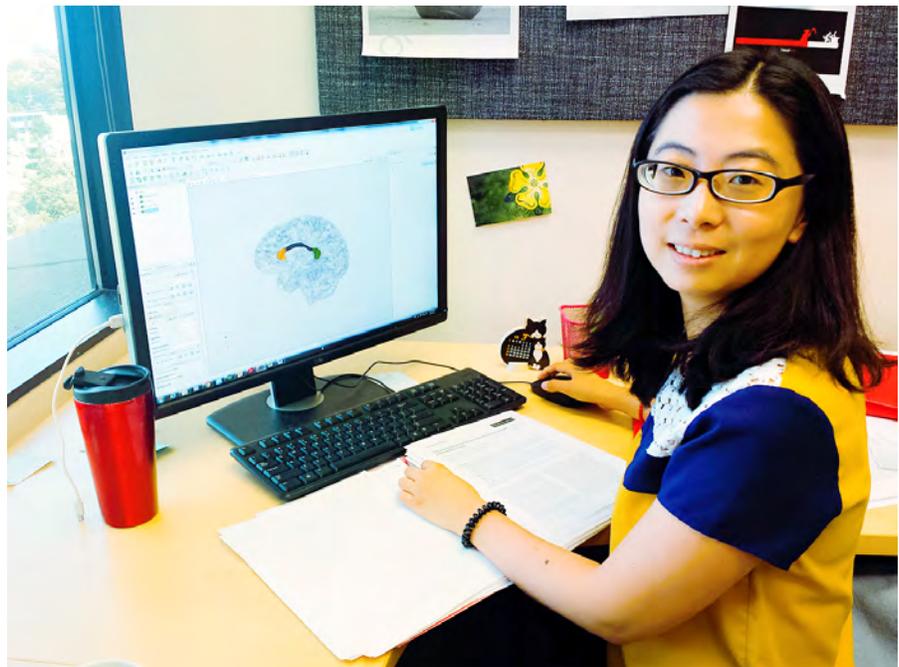
# Basak Lab Student Wins Funding for Research on Exercise and Memory

CVL graduate student Shuo Qin was awarded a prestigious grant from the Natural Sciences and Engineering Research Council (NSERC) of Canada for “meritorious work based on academic excellence,” and to pursue post-graduate study on the impact of physical fitness on memory in older adults.

A graduate student in Dr. Chandramallika Basak’s lab, Shuo submitted an application to NSERC earlier this year and was informed this summer of her selection. Her research with this funding will focus on a group of older adults equipped with the popular Fitbit fitness-tracking device that monitors physical activity and sleep patterns, along with additional measures of physical fitness assessed in Dr. Basak’s laboratory.

The aim of the study is to analyze how fitness may enhance memory performance. While not a training study in which participants will be prescribed a specific exercise regimen, Shuo said, data from the devices will be downloaded and analyzed to look for relationships with performance on memory tests undertaken in the lab. Researchers in Dr. Basak’s group hope to determine which fitness measures — when controlled for other factors like sleep — might lend themselves to enhanced cognitive vitality.

Participants are expected to fall roughly into two groups: high-fit and low-fit. The high-fit older adults might tend to walk every evening or lead a more active lifestyle. Low-fit activity adults might depend on cars for most of their errands and may not



**Shuo Qin will record physical activity and sleep patterns in a group of healthy older adults to analyze how fitness may enhance memory performance.**

take many steps each day — the Fitbit is usually able to tell. Gauging memory performance among these groups should yield some interesting results, she said.

A Fitbit wearer herself, Shuo said the research will involve both verbal and visual cognition. She is designing the study to test for age-related differences in verbal and visual working memory in the same group of healthy older adults, aged 60 to 80. Some studies have shown that decreases in hippocampal volumes are associated with memory deficits in older adults. While it has been suggested that an active lifestyle and good sleep may boost visuo-spatial memory and preserve hippocampal

volume in healthy older adults, more evidence is needed before a causal link can be determined, researchers say.

The two-year funding offered by NSERC will allow Shuo to further work in this field, and generate findings that will motivate larger studies of Fitbit-wearing older adults in the future.

“I was glad to get the (funding) news after having worked very hard on the application,” Shuo said.

NSERC is Canada’s flagship government science agency — equivalent to the U.S. National Science Foundation — that provides grants for research in the natural sciences and in engineering, with a mandate to promote and assist research across North America. ☀



CENTER FOR  
VITAL LONGEVITY

THE SCIENCE OF THE AGING MIND

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