



# EXAMINING AGING

At the University of Florida Institute on Aging, we leave no aspect of aging unstudied.

Zoom to the cellular level. There, we aim to uncover the biologic processes of aging. The IOA's division of biology of aging, together with Northwestern University, has funded several grants to study the role of antioxidants in peripheral artery disease, a disease that hampers the ability of older adults to walk.

Pull back a little bit. Older adults often experience chronic, low-grade inflammation throughout their bodies that could impact their mobility. This year, we celebrated the funding of the study Enabling Reduction of Low-Grade Inflammation in Seniors, or ENRGISE. This multi-center trial will examine whether blood pressure therapies losartan and fish oil could battle the mobility-limiting effect of inflammation.

But we also need accurate ways to assess the mobility of the participants in our studies. The leaders of the Data Science Core of the UF Claude D. Pepper Older Americans Independence Center are developing computer software for use with smartphones, smartwatches and wearable fitness trackers to track study participants' movement. Their software will also help researchers draw conclusions about health out of huge amounts of data.

Just like the body, the brain must remain healthy. The IOA and the Cognitive Aging and Memory Clinical Translational Research Program are also launching studies that examine normal cognitive aging as well as cognitive decline thanks to chronic illness or neurodegenerative disease such as Alzheimer's or dementia.

We hope that the conclusions we draw and the therapies we explore in these studies will ultimately end up in the hands of the physicians, nurses and caretakers we continue to train through our educational programs.

In each of our endeavors, the goal of the IOA is to help older adults age healthfully, whether the goal is to study walking ability in older adults, to examine the biologic processes of aging or to train the next generation of physicians, nurses and caretakers.

Marco Pahor, M.D.  
Director, UF Institute on Aging





# EDUCATING THE NEXT GENERATION OF CARETAKERS

Every day, 10,000 baby boomers turn 65, according to the Pew Research Center. This underscores what health care professionals call the “silver tsunami” — a wave of older adults who will soon need specialized health care. The department of aging’s division of career development and education is educating the current and next generation of geriatric caregivers.

## Geriatrics boot camp

After its fourth iteration in November, the geriatric care boot camp has educated more than 170 professionals. Lauren Solberg, J.D., M.T.S., an assistant professor with appointments in the departments of community health and family medicine, psychiatry and aging and geriatric research, published a paper in the Journal of the American Geriatrics Society about the first boot camp’s outcomes. Attendees reported being more knowledgeable and comfortable caring for older adults, and said they shared that knowledge with students, nurses and patient families.

## Graduate Certificate in Aging and Geriatric Practice

Eleven people have signed up for the graduate certificate in aging and geriatric practice, which is offered entirely online. In the program, students study theories of aging, geriatric and age-related diseases, foundations in aging and geriatric research and the law and ethics of aging. Twenty-six graduate students from across the UF Health campus have taken aging courses as electives, and three of these students decided to pursue the graduate certificate. Students may also apply their graduate certificate credits to earning the master’s degree in aging and geriatric practice.

## Master’s Degree in Aging and Geriatric Practice

Nine people are now enrolled in the online master of science in medical sciences with a concentration in aging and geriatric practice. Designed for working professionals, the program includes the same core courses as the graduate certificate as well as courses in population-based research on aging and lifestyle interventions in aging.



## STUDYING PAIN IN OLDER ADULTS



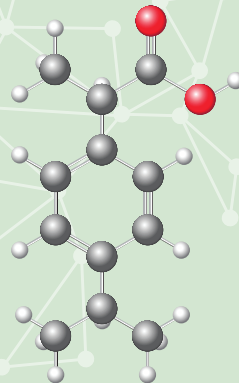
*Yenisel Cruz-Almeida,  
Ph.D., MSPH*

When we age, our brains undergo significant change. One of those changes may result in older adults experiencing greater clinical pain than younger adults. Yenisel Cruz-Almeida, Ph.D., MSPH, an assistant professor in the UF Institute on Aging and member of the UF Pain Research and Intervention Center of Excellence, has received a five-year grant, National Institute on Aging grant K01AG048259-01A1, to establish the initial steps for identifying changes to the brain areas known to regulate the perception of pain. These changes may place older adults at an increased risk to develop clinical pain and disability. Cruz-Almeida hopes to identify brain circuits that may serve as future targets for pain prevention and treatment.

## TRAINING THE NEXT GENERATION OF PAIN RESEARCHERS

The UF Pain Research and Intervention Center of Excellence, or PRICE, and the UF Institute on Aging have partnered together to offer a new postdoctoral fellowship in pain and aging research. The fellowship program, called the Integrative and Multidisciplinary Pain and Aging Research Training Program, or IMPART, is a three-year fellowship that includes coursework, mentored research experience, training in scholarly writing and career development opportunities. Fellows will benefit from resources available through both PRICE and the IOA as well as a cadre of highly accomplished mentors with broad ranges of interest.

Fellows may develop careers addressing the biological and psycho-social mechanisms underlying age-related changes in the experience of pain as well as careers dedicated to designing clinical interventions to ease acute and chronic pain in older adults. The National Institute on Aging grant 1 T32 AG0049673-01 funds the program.



## NEWLY FUNDED RESEARCH

Yenisel Cruz-Almeida, Ph.D. | NIH 1K01AG048259

### Neuroimaging age-related changes in pain modulation

Providing training to establish a neuroscience research program to study the neurobiological mechanisms underlying abnormal pain modulation in older adults.

Vonetta Dotson, Ph.D. | NIH 1K01AG048259

### Dissociating Components of Anhedonia in Older Adults: A Pilot fMRI Study

Studying anhedonia — the inability of older adults to take interest or pleasure in experiences — in community-dwelling older adults by gathering behavioral and functional magnetic resonance imaging data.

Natalie Ebner, Ph.D. | NSF/SES0-1450624

### Age-Targeted Automated Security Cueing Against Web-Based Social Engineering Attacks

Examining age-specific vulnerabilities to hacking and cybercrime, and developing a web browser tool that can help older adults figure out whether an email they receive is a hacking or cybercrime scheme.

Todd Manini, Ph.D. | NIH HHSN261201500014C

### PEAKS: Validation of Mobile Technologies for Clinical Assessment and Intervention

Assessing the use of mobile and wireless technologies that support cancer prevention, treatment, disease management or survivorship.

David Nelson, M.D. | NIH UL1TR001427

### Together: Transforming and Translating Discovery to Improve Health

Improving human health by accelerating the translation of scientific discoveries and the implementation of evidence-based best practices for the diagnosis, treatment, prevention and cure of human diseases.

Marco Pahor, M.D. | NIH U01AG050499

### ENRGISE: Enabling Reduction of Low-Grade Inflammation in Seniors

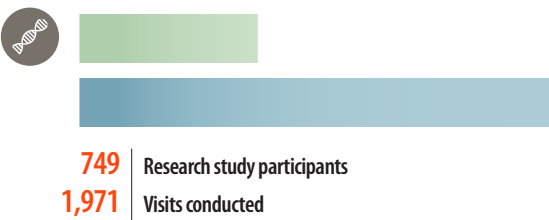
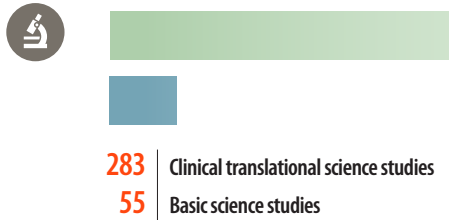
Evaluating whether lowering chronic inflammation with fish oil or the blood pressure drug losartan could improve physical function.

Shinichi Someya, Ph.D. | NIH R01 DC014437

### Studying the Cochlear Detoxification System

Studying how the cochlear system — the part of the ear that processes sound — protects itself by breaking down toxins on a molecular level.

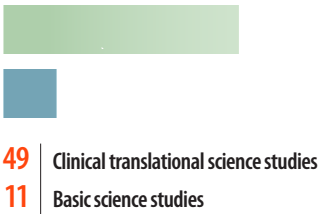
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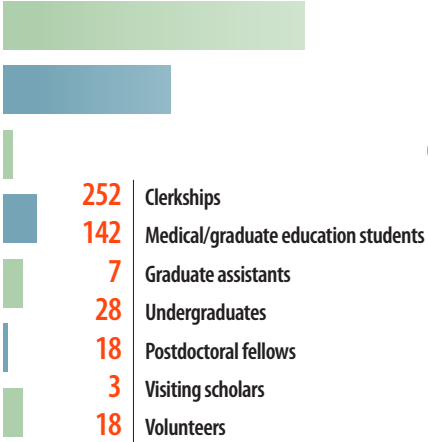
11 UF Colleges involved

- Agricultural and Life Sciences
- Dentistry
- Education
- Engineering
- Health and Human Performance
- Liberal Arts and Sciences
- Medicine
- Nursing
- Pharmacy
- Public Health and Health Professions
- Veterinary Medicine

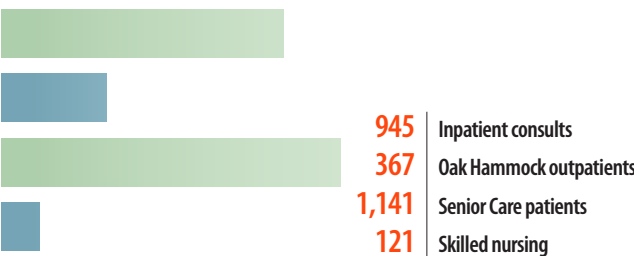
60 Research projects



469 Trainees



3,237 Patients seen



UF Claude D. Pepper Older Americans Independence Center: Research areas and key findings

Practicality of intermittent fasting in humans

Fasting has been shown in mice to extend lifespan and to improve age-related diseases. But fasting every day, which could entail skipping meals or simply reducing overall caloric intake, can be hard to maintain. We found that intermittent fasting caused a small increase to SIRT 3, a well-known gene that promotes longevity as involved in protective cell responses.

Wegman M, Guo M, Bennion D, Shankar M, Chrzanowski S, Goldberg L, Xu J, Williams T, Lu X, Hsu S, Anton S, Leeuwenburgh C.

Rejuvenation Research. 2015 April 18(2):162-72. doi: 10.1089/rej.2014.1624.

Defining successful aging

The concept of successful aging has long intrigued the scientific community — but we lack a clear set of characteristics to define such a complex, multi-dimensional phenomenon. We have published a study that defines successful aging. Building on markers of successful aging that are most developed, such as physical function, we will provide an overview and discussion of specific health

conditions, behavioral factors and biological mechanisms that mark declining mobility and physical function, and we will explore promising interventions to counter these effects.

Anton S, Woods A, Ashizawa T, Barb D, Buford T, Carter CS, Clark D, Cohen R, Corbett D, Cruz-Almeida Y, Dotson V, Ebner N, Efron P, Fillingim R, Foster T, Gundermann D, Joseph A, Karabetian C, Leeuwenburgh C, Manini T, Marsiske M, Mankowski R, Mutchie H, Perri M, Ranka S, Rashidi P, Sandesara B, Scarpace P, Sibille K, Solberg L, Someya S, Uphold C, Wohlgemuth S, Wu S, Pahor M

Aging Research Reviews. 2015 Nov. 24(Pt.B): 304-27. doi: 10.1016/j.arr.2015.09.006. Epub 2015 Oct. 14.

The effect of physical activity on cognition

Studies often show that older adults find cognitive benefit from exercise, but we found frail older adults gain no such benefit from moderate physical activity. We drew our data for this study from the Lifestyle Interventions and Independence for Elders study, which randomly divided more than 1,600 older adult participants into two groups:

those who exercised and those who received health education. At the beginning and end of the intervention, each participant were tested for cognition and the speed at which they could process commands. One subgroup in the study did see a small benefit: participants were 80 or older and had the lowest physical function of the group.

Sink K, Espeland M, Castro C, Church T, Cohen R, Dodson J, Guralnik J, Hendrie H, Jennings J, Katula J, Lopez O, McDermott M, Pahor M, Reid Kieran, Rushing J, Verghese J, Rapp S, Williamson J

Journal of the American Medical Association. 2015 Aug. 25;314(8):781-90. doi: 10.1001/jama.2015.9617.

The benefits of an embedded geriatrician

When older adults have access to a geriatrician in the hospital, they are much less likely to die and more frequently leave the hospital healthier, according to a study we presented at the annual meeting of the American Geriatrics Society. The study found that embedding a geriatrician to consult with older patients for their care as soon as they come through the hospital doors caused the mortality rate of older patients in the trauma unit to drop by 50 percent and by 58 percent in the units where patients with chronic illness receive care. We also found a 4 percent increase in patients being able to go home after treatment, bypassing a long-term care facility.

Solberg L, Pei Q, Cruz M, Moore F, Pahor M, Wu S, Manini T. 2015 May. Paper presented at the annual meeting of the American Geriatrics Society, National Harbor, MD.

Severity of depressive symptoms and cortical thickness in older adults

The cerebral cortex is the folded gray matter that composes the surface of your brain, and it has many functions, including a role in thinking abilities, motor skills and mood. We found that the thickness of the cerebal cortex is associated with symptoms of depression in older adults. We imaged the brains of 43 community-dwelling older adults and found that two areas of the brain were thicker in older adults with more severe symptoms of depression — the isthmus cingulate and the precuneus. These regions are important for regulating emotions and processing information related to one's own person. Our findings can help us further understand the mechanisms of depression and the potential clinical significance of this relationship.

Szymkowicz SM, McLaren ME, Kirton JW, O'Shea A, Woods AJ, Manini TM, Anton SD, Dotson VM

International Journal of Geriatric Psychiatry. 2015 July 23. doi: 10.1002/gps.4324.

Pain and aging

As we age, we face an increased risk of developing frequent and prolonged pain as well as inflammation, also called inflammaging, but the interaction between chronic pain, aging and inflammation is currently unknown. We found that when older adults experience pain, certain kinds of pro-inflammatory cytokines, proteins responsible for painful inflammation, peak at a higher level than in younger people. They produce certain anti-inflammatory cytokines, the proteins that soothe inflammation, later than younger subjects. This helps support the idea that age-related immune system dysregulation may account for the increased prevalence of pain in older adults.

Cruz-Almeida Y, Aguirre M, Sorenson HL, Tighe P, Wallet SM, Riley JL

Experimental Gerontology 72(2015): 150-6. doi: 10.1016/j.exger.2015.09.017. Epub 2015 Oct. 9.

Neuroimaging age-related changes in pain modulation

Recent studies show that older adults seem to experience pain more frequently and chronically, but researchers don't know why. We have received funding to establish a research program that will identify the neurobiological mechanisms that contribute to this dysfunctional pain regulation. We will examine the structural and functional connectivity of cortico-striatl regions in older and younger adults and determine their association with an individual's ability to modulate pain. Our research program will be the first to evaluate age-related changes to the part of the brain that governs pain regulation, with the goal of understanding age-related changes in pain processing that may lead to personalized, targeted therapies for pain.

Cruz-Almeida Y, Cohen R, Fillingim R





**WHY EVERY DOLLAR COUNTS**

Unlocking life's mysteries — particularly the secrets of how long and how well we live — is the distinct focus of the University of Florida Institute on Aging. Our scientists and physicians are dedicated to achieving a better understanding of the biological mechanisms of aging and of how we can maintain or enhance our physical independence and cognitive abilities.

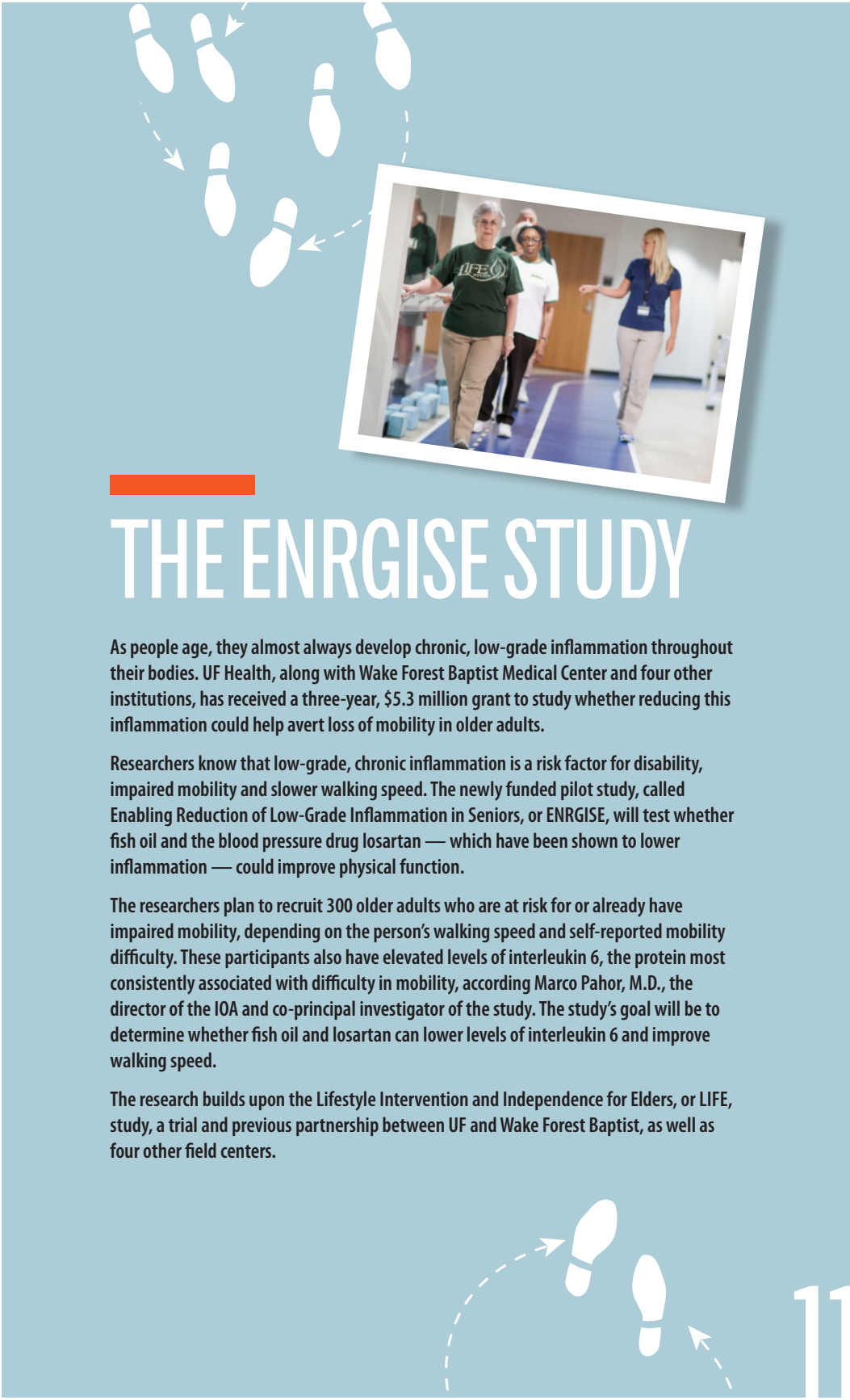
Private philanthropy is essential to our work; your gift, regardless of size, can make the critical difference in funding new scientific endeavors. Imagine discoveries that fuel positive cellular changes or lead to new therapies to help rehabilitate aging bones and joints ... private philanthropy makes all this and much more possible.

To learn more about how you can invest in a healthier and more independent tomorrow for us all, please contact Mary Ann Kiely at 352-273-9620 or [mkiely@ufl.edu](mailto:mkiely@ufl.edu).

**UF** Institute on Aging  
UNIVERSITY of FLORIDA



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**THE ENRGIZE STUDY**

As people age, they almost always develop chronic, low-grade inflammation throughout their bodies. UF Health, along with Wake Forest Baptist Medical Center and four other institutions, has received a three-year, \$5.3 million grant to study whether reducing this inflammation could help avert loss of mobility in older adults.

Researchers know that low-grade, chronic inflammation is a risk factor for disability, impaired mobility and slower walking speed. The newly funded pilot study, called Enabling Reduction of Low-Grade Inflammation in Seniors, or ENRGIZE, will test whether fish oil and the blood pressure drug losartan — which have been shown to lower inflammation — could improve physical function.

The researchers plan to recruit 300 older adults who are at risk for or already have impaired mobility, depending on the person's walking speed and self-reported mobility difficulty. These participants also have elevated levels of interleukin 6, the protein most consistently associated with difficulty in mobility, according Marco Pahor, M.D., the director of the IOA and co-principal investigator of the study. The study's goal will be to determine whether fish oil and losartan can lower levels of interleukin 6 and improve walking speed.

The research builds upon the Lifestyle Intervention and Independence for Elders, or LIFE, study, a trial and previous partnership between UF and Wake Forest Baptist, as well as four other field centers.

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# UNCOVERING THE BIOLOGY OF AGING

## Unpacking peripheral artery disease

Recently, the division of the biology of aging, housed within the UF department of aging and geriatric research, has funded three grants with Northwestern University to examine peripheral artery disease in older adults.

Peripheral artery disease in the lower extremity — usually the legs — of older adults is a condition in which arteries leading to the limbs are narrowed, reducing blood flow.

Christiaan Leeuwenburgh, Ph.D., vice chair of research for department and chief of the division of biology of aging, is working with Mary McDermott, an internationally renowned investigator of the disease at the Northwestern University Feinberg School of Medicine.

The first grant will fund research examining whether cocoa, which is rich in an antioxidant called epicatechin, can help the function of those blood vessels, maintain muscle function and improve overall lower extremity function in people with the disease.

A second grant will allow researchers to study whether participants with the disease will improve their walking performance over a six-minute period when they take 125 milligrams of the antioxidant supplement resveratrol. In the third grant, researchers will study whether supervised, high-intensity exercise can improve the participants' ability to walk.

"Working with Dr. McDermott will be very exciting for the division of biology of aging," Leeuwenburgh said. "Dr. McDermott is a world-renowned expert on peripheral artery disease."



Christiaan Leeuwenburgh, Ph.D.

# RESEARCH: THE NEXT GENERATION

## Big data, wearable devices and the health of older adults

Scientists can now conduct studies that generate more information than ever before. Information from vast numbers of anonymous hospital records and technology that can monitor the movement of health of older adults both have the potential detect trends in health care and predict illnesses.

This is a boon for research — but these studies can generate a massive amount of data, often referred to as big data. Helping to corral and interpret big data is the focus of the UF Claude D. Pepper Older Americans Independence Center's Data Science and Applied Technology Core.

*A new wave of wearable devices monitors the health of older adults.*



Todd Manini, Ph.D., and Sanjay Ranka, Ph.D.

The core, led by Todd Manini, Ph.D., an associate professor in the department of aging and geriatric research, and by Sanjay Ranka, Ph.D., a professor in the UF College of Engineering's department of computer and information science and engineering, pairs scientists in computer engineering with scientists in aging research to make sense out of big data.

Manini and Ranka are investigating the use of wearable technologies to monitor the health care of older adults. Wearable technologies such as smartphones, smart watches and bracelets can keep tabs on activity patterns and community mobility. That information could be used in intervention research and to help target public services to homebound older adults.

"Nothing exists that can track that. We know that older adults who get out of their homes tend to be healthier, but we don't know if that's happening or not," Manini said. Manini also noted that caregivers could use these kinds of technologies to make sure their loved one is active.

Manini and Ranka are also considering software that could map how older adults move around the towns they live in across the state of Florida. That way, researchers could monitor the development mobility problems.

"This idea of real-time monitoring is on the horizon, but nothing out there is linked up very well right now," Manini said. "The Data Science and Applied Technology Core will help provide this link for older adults."

## HELPING THE BRAIN AGE WELL

The focus of the Cognitive Aging and Memory Clinical Translational Research Program, or CAM-CTRP, is to study normal cognitive decline and cognitive decline because of disease, and to develop therapies and practices to help combat both. To do this, the program, led by Ronald Cohen, Ph.D., a professor of aging and geriatric research, neurology and psychiatry, has several broad areas of research focus.



Ronald Cohen, Ph.D.,  
director, CAM-CTRP

### The Active Brain

One project within the CAM-CTRP, called The Active Brain, focuses entirely on successful cognitive aging. The CAM-CTRP is working with the Evelyn F. and William L. McKnight Brain Institute at the University of Florida to develop a database of neuroimaging and cognitive performance data from people over the age of 85. The study will collect anatomical and functional neuroimaging information, information about blood proteins, information about inflammation and DNA analysis from 200 total participants.

### Normal Aging and Neurodegenerative Disease

Nearly everyone will experience some sort of cognitive decline because of age. But sometimes, that decline is because of diseases such as Alzheimer's or dementia. The CAM-CTRP is leading research to understand the boundary between decline caused by neurodegenerative disease and decline caused by normal aging.

### The Aging Brain

In addition to investigating cognitive decline because of age, the CAM-CTRP will focus on the effects of health problems such as obesity, diabetes, substance abuse and HIV on cognitive aging.

### Brain Stimulation

Research has shown that non-invasive brain stimulation can increase plasticity in the brain, which can lead to a better capacity to learn. Adam Woods, Ph.D., the assistant program director of the CAM-CTRP, the director of the CAM-CTRP's Neurophysiology and Neuromodulation Core and an assistant professor of aging and geriatric research, is using non-invasive approaches that include transcranial stimulation and magnetic stimulation to see if older adults' cognitive training can be enhanced.

### Supplementation

Apoptosis, or cell death, can cause cognitive decline in older adults, but some antioxidants may be able to combat this. Woods is working with Stephen Anton, Ph.D., the chief of the division of clinical research and an associate professor in the IOA, to study the use of a papaya supplement in older adults. The researchers will study the effect of papaya on whole body inflammation, physical function, fatigue and health-related quality of life.

## WELCOME, NEW FACULTY

Rui Xiao, Ph.D., an assistant professor in the department of aging and geriatric research's division of biology of aging researches why colder temperatures seem to slow the aging process. He recently identified a genetic pathway implicated in cold-promoted longevity in *C. elegans*, a nematode. Xiao comes to the department from the Life Sciences Institute at the University of Michigan, where he was a postdoctoral fellow. He completed his Ph.D. at Ohio State University in Columbus.



Rui Xiao, Ph.D.



Mallory Otto, M.D.

An assistant clinical professor and co-director of the geriatrics and rehabilitation clerkship, Mallory Otto, M.D., provides geriatric consultation as part of the embedded geriatrician model of care at UF Health Shands Hospital. Otto works in the trauma service in the surgical intensive care unit, focusing on transitions of care, such as when a patient is admitted or discharged from the hospital. Otto completed medical school at Weill Cornell Medical College, internal medicine training at NewYork-Presbyterian/Weill Cornell Medical Center and a geriatric medicine fellowship at Icahn School of Medicine at Mount Sinai Hospital.

Robert Fieo, Ph.D., joined the Cognitive Aging and Memory Clinical Translational Research Program team in 2015 as a research assistant professor. Fieo is interested in how cognitive enrichment models can serve to lessen cognitive decline in older adults. In addition, Fieo is employing Modern Test Theory to help quantify patient symptoms that are difficult to define because of their subjective nature, such as level of fatigue or motivation. He recently completed a research fellowship in Columbia University's department of neurology and was a postdoctoral associate at the University of Copenhagen's department of social medicine.



Robert Fieo, Ph.D.



Steven T. DeKosky, M.D.

Steven T. DeKosky, M.D., was named deputy director of the Evelyn F. and William L. McKnight Brain Institute in 2015, and has a joint appointment in the IOA to provide clinical trial and neurological expertise. DeKosky is a world-renowned neurology researcher with expertise in not only Alzheimer's disease, but also cognitive aging and many of the areas of research that take place within the Cognitive Aging and Memory Clinical Translational Research Program. His expertise will play an important role in the IOA's future studies.



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