



Dear Friends and Colleagues,

2013 was a year of significant change and a momentous growth for the UF Institute on Aging. We completed the move into our new home at the Clinical and Translational Research Building; our clinical practice for older adults, UF Health Senior Care, joined us in the comprehensive new facility. We welcomed new research partners and new leaders, including a new chief of geriatric medicine.

We launched several new clinical studies in areas such as fall prevention and loss of brain function. We successfully completed the LIFE study in 1635 older adults to assess whether physical activity may prevent mobility disability. We teamed our geriatricians with critical care and surgery specialists to tailor care for older adults in the trauma, orthopaedic surgery and hospital medicine units. We were invited to Washington by Senator Nelson to educate members of congress about innovations in technology and health that benefit older Americans.

We made great strides with cutting-edge technology — human electrophysiological recording, stem cell research, noninvasive brain stimulation techniques — in our ongoing effort to slow or avert age-related cognitive and physical decline. We expanded our research, creating a Data Science Core and continuing to build our Cognitive Aging and Memory Clinical Translational Research Program.

Finally, many of our junior faculty, through the mentorship of our Research Career Development Core, obtained extramural funding so that they may move forward with their own aging research.

During the next year, the UF Institute on Aging will use this momentum to carry us onward and upward as we pursue our great goal: to help older adults lead healthy, independent lives. Thank you for your invaluable support during this exciting time.

Sincerely,

Marco Pahor
Director, UF Institute on Aging

A NEW LEADER

In April, Laurence M. Solberg, M.D., joined the UF College of Medicine department of aging and geriatric research as its chief of the division of geriatric medicine. Solberg earned his medical degree at Jagiellonian University in Kraków, Poland and completed his internal medicine and geriatric medicine training at Yale University. He was recruited to UF from Vanderbilt University, where he started the geriatrics consult service and served as its chief. Under his leadership, the IOA division is launching initiatives that will improve the quality of care for older adults within the UF Health system and surrounding communities.

► Senior Care Clinic

A primary care clinic that provides primary and consultative care to older adults with a focus on geriatric syndromes.

► Geriatric Consult Service

UF Health physicians can request a consultation for patients who are 65 years old and older. Geriatricians also evaluate the patient's medications and help family members and medical staff understand the patient's condition and needs.

► Geriatric Clerkship

A required two-week geriatrics rotation for all third and fourth year medical students, wherein they learn some of the nuances of caring for older patients by working with them in various settings.



THE PEPPER CENTER 2013

Spotlight on newly funded studies

Since the UF Institute on Aging established Florida's first Claude D. Pepper Older Americans Independence Center in 2007, its mission has been to maintain and restore independence in older adults through research and training.

Shinichi Someya, Ph.D. | NIH/NIDCD R01 DC012552

- ▶ **Mitochondrial Thioredoxin, Caloric Restriction and Age-related Hearing Loss**
 - Examining how caloric restriction slows the progression of age-related hearing loss.

Todd Manini, Ph.D. | NIH/NIA R01AG042525

- ▶ **Metabolic Cost of Daily Activities in Older Adults**
 - Evaluating the caloric cost of performing a variety of common daily tasks (e.g. washing dishes) across the age span to better predict how older age affects caloric expenditure.

Stephen Anton, Ph.D. | NCCAM/NIA R01 AT007564

- ▶ **RIVE - Resveratrol to Enhance Vitality and Vigor in Elders**
 - Evaluating whether a dietary supplement containing resveratrol, a plant compound, can affect our cells' mitochondria, and whether this improves physical function in older adults.

Kimberly Sibille, Ph.D. | NIH/NIAMS K23 AR062099

- ▶ **Biological Markers of System Burden in Symptomatic Knee OA: A Prospective Study**
 - Evaluating a group of older adults with and without knee osteoarthritis for differences in symptoms and limitations to identify and evaluate targets for treatment.

Thomas Buford, Ph.D. | American Heart Association, Young Investigator Award | NCT01891513

- ▶ **Multimodal Intervention to Reduce Cardiovascular Risk Among Hypertensive Older Adults**
 - Comparing the effects of three common antihypertensive medications among older adults who participate in regular physical activity — evaluating them on physical function and cardiovascular risk.

David Clark, Sc.D. | Department of Veterans Affairs Veterans Health Administration, Merit Review Award

- ▶ **Rehabilitation of Corticospinal Control of Walking Following Stroke**
 - Targeting the motor impairments of post-stroke individuals through a series of mobility tasks in an attempt to engage the cerebral pathways crucial to locomotor control.

THE DATA SCIENCE CORE

Todd Manini, Ph.D., department of aging and geriatric research

Sanjay Ranka, Ph.D., department of computer and information science and engineering

The Data Science Core is a new addition to the UF Pepper Center's suite of research services. This core focuses on "big data" collected in hospital systems and through body-worn sensors that measure movements. This data is analyzed to monitor and enhance the health of older adults — for example, to discover reasons why older adults have trouble recovering their function after being hospitalized, or to understand how movement patterns are connected to our future physical and cognitive health.

LAKE NONA

Research at the IOA's Orlando unit

Since opening in Nov. 2012, the UF Institute On Aging's 4,200-square-foot clinical research institute within the UF Research and Academic Center at Lake Nona has provided residents of Orlando and surrounding areas opportunities to participate in studies of older adults.

Two studies are actively recruiting participants. The trials are testing myostatin, a regulator of muscle growth expressed principally in skeletal muscle. The studies will observe the effect of the drug on muscle size, strength and function in older adults who are at risk for loss of physical function.






LIFE STUDY COMPLETE

The goal of the Lifestyle Interventions and Independence for Elders, or LIFE, study conducted across eight sites around the country, is to find definitive evidence regarding whether physical activity is effective and practical for preventing major mobility disability.

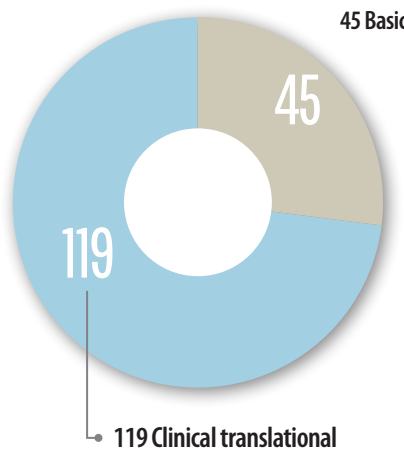
In this multicenter, randomized controlled trial, we sought to compare a moderate-intensity physical activity program to a successful aging health education program in 1,635 sedentary older adults.

We completed the study in Nov. 2013 and will be revealing the results of the study at the annual meeting of the American College of Sports Medicine in Orlando, Florida on May 27, 2014.

To date, five papers have been published and eight ancillary research studies have been completed or are in progress. Among several other projects, we explored the role of mitochondrial function on exercise and fatigue, the quantifying of the physical activity intervention using accelerometry, complex mobility and executive function and the effect of the LIFE interventions on global gene expression.



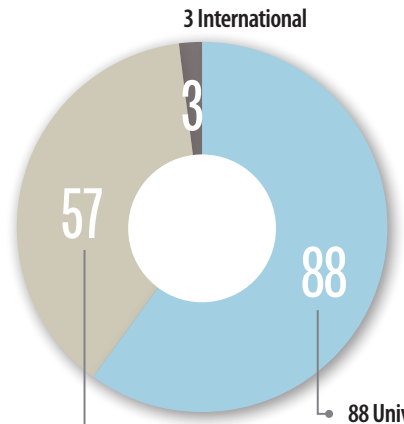
2013: YEAR IN REVIEW



164 Active projects



343 Study participants



148 Investigators



11 Affiliated UF colleges

- 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



424 Peer-reviewed publications

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

Basic Research:

Electrical stimulation aids breathing in surgery

Periods of mechanical ventilation during and after surgery can lead to ventilator-induced diaphragmatic dysfunction, leading to problems restoring normal breathing. We found that very brief periods of electrically stimulating the diaphragm during surgery can improve mitochondrial function in the human diaphragm.

Martin AD, ● Joseph AM, Beaver TM, Smith BK, Martin TD, Berg K, Hess PJ, Deoghare HV, ● Leeuwenburgh C. *Crit Care Med.* 2013 Oct 13.

- circle in front of name indicates UF Institute on Aging researcher

Mouse models to test motor function

A test battery was established to assess motor function and endurance capacity in mice. The magnitude and relative time course of changes were similar in mice and humans in each subdomain except balance/coordination. Thus, this mouse model indicates that the preclinical model can be used to test strategies to reduce age-associated declines in motor function.

Justice JN, ● Carter CS, Beck HJ, Gioscia-Ryan RA, McQueen M, Enoka RM, Seals DR. *Age (Dordr).* 2013 Oct 13.

Protein combats hearing loss

While reducing calorie intake delays the progression of age-related hearing loss, it may not be a desirable and realistic option for most people. We found that the protein mitochondrial Sirt3 mimicked the caloric restriction anti-aging effects on hearing loss in mice.

● Han C, ● Someya S. *Exp Gerontol.* 2013 Oct;48(10):1091-5.

Mutation means loss of muscle mass

Mitochondrial DNA mutations lead to decreased mitochondrial function and have been linked to sarcopenia. Using a mouse model, we found that mice with these mutations display higher mitochondrial fission and autophagy levels that likely contribute to the sarcopenic phenotype observed in premature aging. This research may help identify targets in humans as points of intervention.

● Joseph AM, ● Adihetty PJ, Wawrzyniak NR, Wohlgemuth SE, Picca A, Kujoth GC, Prolla TA, ● Leeuwenburgh C. *PLoS One.* 2013 Jul 23;8(7):e69327.

Clinical Translational Research:

Hours spent sitting affects diabetes risk

We evaluated the association between daily sitting time and the incidence of Type 2 diabetes in postmenopausal women. A group of women without diagnosed diabetes reported how many hours they sat on a typical day. After a decade of assessment, it was found that each hour of sitting time increases the risk of diabetes in obese women.

● Manini TM, Lamonte MJ, Seguin RA, Manson JE, Hingle M, Garcia L, Stefanick ML, Rodriguez B, Sims S, Song Y, Limacher M. *Obesity (Silver Spring).* 2013 Sep 30. doi: 10.1002/oby.20620.

Depression speeds white matter disease in men

White matter disease is an age-related disorder in the brain that can lead to problems with mobility. We found that the disease and the effects it has on the vascular system may be a consequence of depression in men but not in women. Therefore, intervention strategies for depression may slow the progression of the disease in older men.

● Dotson VM, Zonderman AB, Kraut MA, Resnick SM. *Int J Geriatr Psychiatry.* 2013 Jan;28(1):66-74.

Arterial plaque impairs physical function

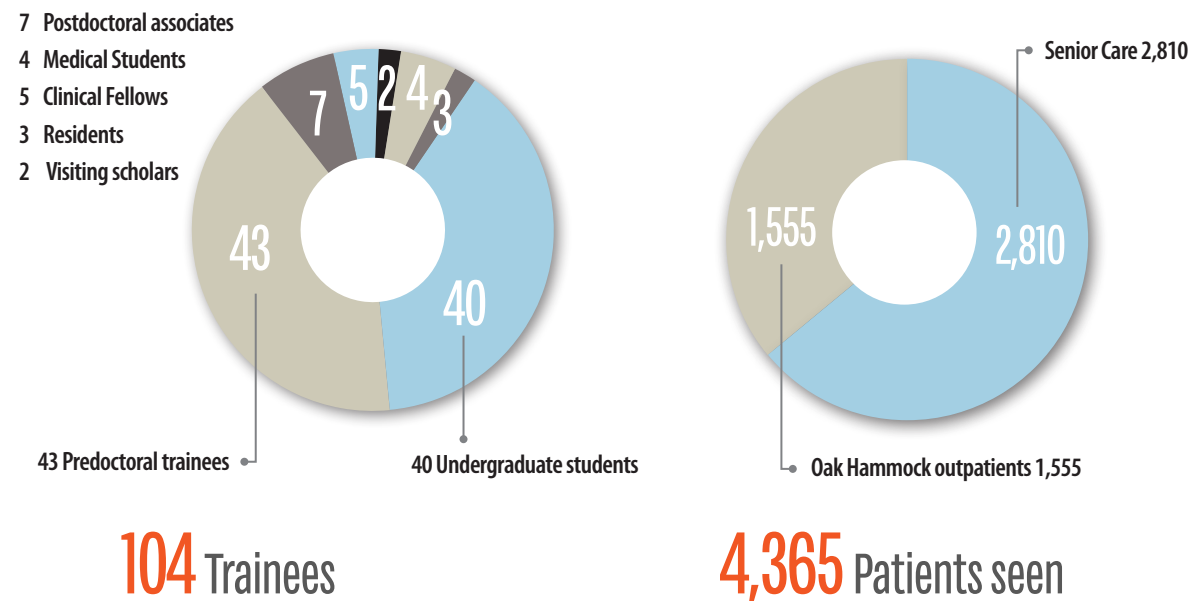
The ankle-brachial index test evaluates the severity of peripheral arterial disease — a disease in which arteries, usually in the legs, are blocked with plaque. We found that adults with lower ankle brachial index values have greater impairments in physical function, suggesting that plaque blockages may be a common yet preventable cause of functional limitations in older people.

McDermott MM, Applegate WB, Bonds DE, ● Buford TW, Church T, Espeland MA, Gill TM, ● Guralnik JM, Haskell W, Lovato LC, ● Pahor M, ● Pepine CJ, Reid KF, Newman A. *J Am Heart Assoc.* 2013 Nov 12;2(6):e000257. doi: 10.1161/JAHA.113.000257.

The advantage of maximum walking speed

We found that maximum walking speed may offer an advantage over usual walking speed for clinical assessment of age-related declines in mobility function caused by neuromuscular impairment. The capability to rapidly activate muscle is correlated with maximum walking speed, while healthy participants with a slower walking speed reveal impaired muscle activation.

● Clark DJ, ● Manini TM, Fielding RA, Patten C. *Exp Gerontol.* 2013 Mar;48(3):358-63.



Clinical Translational Research:

The “obesity gene” and memory

Few studies have characterized the extent to which the fat mass and obesity-associated (FTO) gene affects cognitive function. By studying the differences between risk allele carriers and non-carriers, we found that the FTO gene risk allele is associated with reduced memory performance, especially memory encoding and delayed recall.

Alosco ML, Benitez A, Gunstad J, Spitznagel MB, McCaffery JM, McGeary JE, Poppas A, Paul RH, Sweet LH, Cohen RA. Psychogeriatrics. 2013 Mar;13(1):35-40.

Optimism's effect on knee pain

Can a psychological profile determine someone's relationship to pain? Using four profiles, we found that highly optimistic individuals with knee osteoarthritis spent less time thinking about their pain and had less anger, depression, overall pain and disability than individuals with low optimism. This could lead to multidisciplinary/individualized pain treatment strategies.

• Cruz-Almeida Y, King CD, Goodin BR, • Sibille KT, Glover TL, Riley JL, Sotolongo A, Herbert MS, Schmidt J, Fessler BJ, Redden DT, Staud R, Bradley LA, • Fillingim RB. *Arthritis Care Res (Hoboken). 2013 Jul 16.*

SARCOPENIA STUDY

Anna-Maria Joseph, Ph.D., uses groundbreaking stem cell technology

Human aging is associated with a decline in muscle mass and function called sarcopenia, which leads to increased frailty and loss of independence in the elderly. It's estimated that the annual health care costs attributable to sarcopenia exceed \$18 billion in the U.S., and that number is only expected to escalate given the growing elderly population.

Thus, understanding the molecular underpinnings of this condition and developing novel therapeutic strategies to delay muscle wasting represents a highly relevant and significant public health concern.

The primary objective of Anna-Maria Joseph's research at the UF Institute on Aging is to develop a new experimental model to study age-related muscle changes using groundbreaking induced pluripotent stem cell (iPSC) technology.

“The potential of these cells is limitless,” said Joseph, an assistant scientist at the IOA. “These iPSCs will not only allow us to study aging in a dish, but they will also provide the opportunity for fast-track drug screening with the ultimate goal of developing clinical strategies that can delay the loss of muscle mass that we all experience as we get older.”



IOA IN WASHINGTON

UF Institute on Aging Director Dr. Marco Pahor and other faculty and staff traveled to the nation's capital in May at the invitation of Senator Bill Nelson, chairman of the U.S. Senate Special Committee on Aging, to take part in a Healthy Aging Expo hosted by the committee. The event marked the 50th anniversary of Older Americans Month and helped to educate members of congress about innovations in technology and health care that can help improve the health and well-being of older Americans. In August, Senator Nelson attended the ribbon-cutting ceremony for the IOA's new home — the Clinical and Translational Research Building.



PAIN CENTER

Pain represents the most prevalent and expensive public health problem in the United States. Among older adults, osteoarthritis and back pain are the most common offenders.

UF's newly formed Pain Research and Intervention Center of Excellence (PRICE) is a multi-college center that serves as the professional home for UF scientists, clinicians and trainees dedicated to improved understanding and treatment of pain. PRICE receives strong support from the UF Institute on Aging.

Directed by IOA executive board member Roger Fillingim, Ph.D., PRICE provides member investigators with resources and services to foster clinical and translational pain research at UF. A component of PRICE, the Pain Clinical Research Unit, provides a patient-oriented research venue to facilitate clinical and translational pain research at the university.



HOME AT LAST

In August, the UF Institute on Aging moved into a new building — a modern, environmentally friendly space that brings together researchers and clinicians from various fields. The Clinical and Translational Research Building houses basic science and clinical research as well as clinical practices, which provide primary care for adults age 65 and older.

The IOA's new home is a one-stop facility that makes it easier for mobility-restricted older adults to take part in clinical trials and strengthens connections among existing UF research centers, including the Clinical and Translational Science Institute, which also is headquartered in the new building.

The \$45 million, 120,000-square-foot complex was designed to meet the highest sustainability standards (LEED platinum) and make indoor spaces conducive to collaboration, good health and well-being.



THE AGING BRAIN

The CAM-CTRP combats cognitive decline in older adults

Approximately one in seven adults over the age of 65 experience moderate to severe cognitive impairments. The primary objective of the UF Institute on Aging's Cognitive Aging and Memory Clinical Translational Research Program, or CAM-CTRP, is to translate basic science discoveries into clinical applications in order to slow, avert or restore age-related cognitive decline and memory loss.

To achieve this objective, the CAM-CTRP is organized around several cores designed to focus on the aging brain. Adam Woods, Ph.D., an assistant professor of aging and geriatric research, leads the Human Electrophysiology and Neuromodulation Core, a multidisciplinary lab that explores the link between brain function and various processes in the body.

The lab has several upcoming projects that aim to address cognitive aging in healthy older adults using human electrophysiological recording, non-invasive brain stimulation and functional magnetic resonance imaging.

"The Human Electrophysiology and Neuromodulation Core has expanded our research facilities in the IOA," said Woods, who joined the institute in July. "We now have a relatively comprehensive technological repertoire for addressing key issues in cognitive aging and memory."



GIVING TO THE UF INSTITUTE ON AGING:

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 so 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.

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◀ Annual Report

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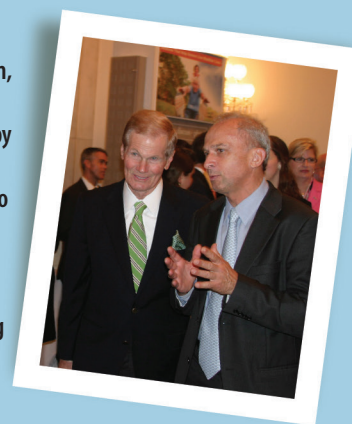
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