UF Institute on Aging Mission

To serve as the major catalyst for developing interdisciplinary models and synergisms in the areas of research, education and health care across all Colleges and Departments at the University of Florida and its affiliates to improve the health, independence and quality of life of older adults.
Goals: “One stop shop”

• Interdisciplinary research focused on a common theme: “the etiology, prevention and rehabilitation of cognitive and physical disability”

• Career development and education

• Cross-campus system of integrated state-of-the-art health care for older persons
Our strategy

To attract investigators from diverse social, behavioral, clinical and basic science disciplines towards research on aging that focuses on a common theme.
UF Institute on Aging in numbers 2007

- $43.5 million in extramural funds
- 30 funded research projects
- 60 funded investigators - 27 trainees
- 11 partnering UF colleges
- 20,000 sq. ft. core research and office space
- 11 locations in Gainesville and beyond
- >900 patient base
Interactions of the Institute on Aging and Pepper Center with UF colleges and other organizations

Health Sciences Colleges
- Medicine
- Public Health & Health Professions
- Nursing
- Pharmacy
- Dentistry
- Veterinary Medicine

Other Colleges
- Liberal Arts & Sciences
- Health & Human Performance
- Engineering
- Journalism and Communications
- IFAS

Research Facilities
- Institute on Aging
- Genetics Institute
- Cancer Center
- Brain Institute
- VA GRECC
- GCRC

Clinical Facilities
- Clinic Settings
- VA Hospital
- Cancer Center
- Shands Hospital

UF Institute on Aging - Claude Pepper Older Americans Independence Center
- Fellows, House Staff, T-K trainees, VA, National Pool
- Junior Scholars Candidates Pool
Claude Denson Pepper
Politician, philanthropist and champion of the elderly

- Born in rural Alabama in 1900
- Graduate University of Alabama
- Graduate Harvard Law School
- Set up practice in Perry, Florida in 1925
- 1929-30 Florida State House of Representatives
- Elected to the U.S. Senate until 1951
- U.S. House of Representatives, 1962-89
- Chair of the House Select Committee on Aging in 1977
- In 1986 he established The Claude Pepper Foundation
- Died in 1989
Pepper Center Features

Older Americans Independence Center (OAIC)

• NIH-NIA Center Grant
• High national visibility
• Core structure - overarching theme
• Interdisciplinary research
• Training future leaders
Claude Pepper Older Americans Independence Centers (OAIC) Funded by the National Institute on Aging

- Duke U
- J Hopkins U
- UCLA
- U Florida
- U Maryland
- U Michigan
- U Pittsburgh
- U Texas MB
- Wake Forest U
- Yale U
UF Pepper Center 2007-2012

The theme
Sarcopenia: prevention and rehabilitation of disability

is being pursued using an interdisciplinary approach that traverses the entire spectrum of biomedical investigation, including molecular biology, animal studies, clinical research, behavioral sciences, epidemiology and health services
UF Pepper Center Mission

• To assess the risk factors and better understand the biological mechanisms of physical disability in older adults
• To develop and test effective prevention and rehabilitation therapies
• To train future leaders and researchers in the arena of aging and disability
Projected US population aged $\geq 65$ years according to disability (IADL+ADL)
Challenge to expand active life expectancy

Age (years)

% 50

Active life

Survival

Active life free of disability
Causal model of functional limitation and disability in aging

Genes

Social, economic & environmental factors

Biological factors
- inflammation, hormones, oxidative damage, anemia, renin-angiotensin system

Co-morbid factors
- CVD, COPD, cognitive disorders, depression, diabetes, osteoporosis, osteoarthritis

Behavioral factors
- Physical exercise - diet

Sarcopenia

Adiposity

Impairment

Functional limitation

Disability
Leadership Core

• Scientific leadership
• Cohesive focus
• Strategic planning
• Organization and administrative operations
• Review and evaluation
• Tracking and monitoring of the research and training program
Research Career Development Core

• Develops careers of future research leaders in the area of aging and independence
• Develops multidisciplinary skills for translating across traditional boundaries of scientific disciplines
• Selects, tracks and monitors Pepper Center Junior Scholars
Pilot and Exploratory Studies Core

• Supports research to acquire information needed to conduct future clinical and preclinical research studies in the areas of Pepper Center focus
Clinical Research Core

- Supports research in human subjects (controlled trials, observational studies)
- Selects and utilizes optimal measures
- Studies the mechanisms contributing to changes in walking
- Conducts secondary analyses of existing studies
- Develops interventions to improve physical function and quality of life of older adults
Pre-clinical Research Core

• Conducts mechanistic and intervention studies in animal models
• Results and hypotheses are translated and applied to clinical research studies
• Concepts on disability that are developed in the clinical arena are applied in animal models
Biostatistics and Data Management Core

- Supports all research activities in the planning, implementation and analytical phases
- Develops and implements novel analytical methodologies
- Is responsible for data management and quality control
Recruitment Core

- Supports recruitment of research study participants
- Promotes adherence and retention
- Develops novel recruitment, retention and adherence strategies with particular focus on minorities
Genomics and Biomarkers Core

- Conducts studies on biomarkers and genetics of sarcopenia, physical function and disability
- Primary focus on mitochondrial energy utilization, inflammation, oxidative stress, and apoptosis
Aerobic exercise

Outdoor walking

BP check

Taking a break during the walk
Flexibility stretching
LIFE-Pilot study: SPPB score

Means estimated from repeated measures ANCOVA adjusted for gender, field center and baseline values

LIFE Pilot study: Cumulative hazard of time until major mobility disability

SA = Successful aging
PA = Physical Activity

Number at risk

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Cumulative endpoints

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Cumulative Hazard

- Successful aging
- Physical activity
  - p = 0.25
  - HR = 0.74, 95% CI = [0.44, 1.24]
LIFE main study

Outcomes

Primary: Major mobility disability defined as incapacity to walk 400 m

Secondary:
- Cognitive function
- Serious fall injuries
- Persistent mobility disability, mobility disability/death
- Disability in activities of daily living (ADLS)
- Cardiovascular events
- Nursing home/hospital admissions
- HRQL (depression, sleep, stress, life satisfaction)
- Cost-effectiveness
- Mild cognitive impairment/dementia
LIFE main study Field Centers

N = 2,000 - Average Follow-up 4.5 yrs
Grip Strength Meter
Regulation of Macroautophagy

Autophagy: housekeeping process through which damaged cellular constituents, such as dysfunctional mitochondria, are removed.
Muscle cross-sections of vastus lateralis

27 yr-old

73 yr-old

Apoptosis TUNEL Positive Nuclei
Pepper Center Supported External Grants

• Physical Exercise to Prevent Disability - LIFE Study, Dr. Pahor
• The Epidemiology of Stress and the Metabolic Syndrome, Dr. Pahor
• ACE Inhibition and Physical Performance in Aged Rats, Dr. Carter
• Leptin resistance: mechanism underlying age-related obesity, Dr. Scarpace
• Apoptosis and life-long caloric restriction, Dr. Leeuwenburgh
Pepper Center Supported Pilot and Research Development Projects

- Autophagy and Sarcopenia in a Transgenic Mouse Model, Dr. Wohlgemuth
- Longitudinal Examination of Physical Performance, Dr. Daniels
- Skeletal Muscle Apoptosis and Physical Performance, Dr. Leeuwenburgh
- Leptin Inhibition, Blood Flow and Sarcopenia, Dr. Tümer
- A Network Based Analysis of Systemic Inflammation, Dr. Borsa
Pepper Center Supported Pilot and Research Development Projects

- ACE inhibition and muscle quality Dr. Carter
- Biological Effects of Weight Loss and Exercise in Elders, Dr. Perri
- Physical Exercise, Inflammation and Oxidative Damage Dr. Cesari
Our Leaders

M. Pahor, MD
H. Baker, PhD
R. Beyth, MD
L. Crump, MPH
M. Daniels, PhD
C. Leeuwenburgh, PhD
M. Marsiske, PhD
M. Perri, PhD
P. Scarpace, PhD
E. Shenkman, PhD
R. Shorr, MD
Pepper Junior Scholars
Our Leaders of Tomorrow

S. Anton, PhD
M. Bautista, MD
M. Cesari, MD, PhD
S. Kwon, PhD, RPh
T. Manini, PhD
E. Marzetti, MD, PhD
B. Rahim-Williams, PhD
S. Wohlgemuth, PhD