UNIVERSITY OF MARYLAND
Claude D. Pepper Older Americans Independence Center

Jay Magaziner, Ph.D., M.S.Hyg **MPI**	410-706-3553	jmagazin@som.umaryland.edu
Alice Ryan, Ph.D. **MPI**	410-605-7851	aryan@som.umaryland.edu
Les Katzel, M.D., Ph.D. **MPI**	410-605-7248	lkatzel@som.umaryland.edu
Anne Sullens, M.A **Program Administrator**	410-706-1695	asullens@som.umaryland.edu

CENTER DESCRIPTION

The mission of the UM-OAIC is to address the process by which function is lost, and the multiple factors that affect the onset and progression of disability. Building on these important perspectives, the UMOAIC focuses on the restoration of function (i.e., enablement) in order to improve function in those with impairments, and prevent or delay further progression in those who are already disabled. This is accomplished by 1) conducting research that examines the mechanisms underlying the functional impairments associated with chronic diseases in older people, such as stroke, hip fracture, obesity, Type-2 diabetes, osteoarthritis, Parkinson's disease, and vascular disease; 2) designing novel, efficacious rehabilitation interventions that produce clinically relevant outcomes and study the mechanisms underlying these interventions; 3) translating interventions found to be efficacious in UM-OAIC clinical laboratories and other clinical centers for implementation and rigorous evaluation outside the clinic (e.g., home, senior center, gym); 4) supporting pilot and exploratory studies (PESs), UM-OAIC REC Scholar research, development projects (DPs), and externally funded projects (EP) that are consistent with the UM-OAIC theme; and 5) supporting the development of junior faculty and REC Scholars from multiple disciplines as they pursue careers as independent, academic scientists with expertise in the study of older persons with disabling diseases through mentor-based, didactic and experiential training in bench-to-bedside-to-community translational research.

The UM-OAIC has three resource cores (RC): Biostatistics and Informatics (RC1); Applied Physiology and Mechanisms (RC-2); and Rehabilitation Science and Technologies (RC-3), that serve as resources for the conduct of innovative exercise and activity-based rehabilitation research. An enhanced Research Education Core (REC) will provide didactic and experiential, and leadership training under the guidance of an interdisciplinary mentoring teams to prepare the next generation of scientists committed to careers in aging research. A Pilot and Exploratory Studies Core (PESC) supports the development and execution of pilot and REC Scholar projects. Center aims will be accomplished by: 1) advancing our understanding of the mechanisms by which exercise and activity-based and multi-modal rehabilitation interventions directed a specific impairments affect multiple body systems; 2) developing and testing interventions to restore function and minimize disability following acute disabling events and to prevent declines related to serious chronic diseases; and 3) training the next generation of investigators who will further the understanding of the aging process and develop interventions that help promote health and independence in older adults with disabling medical conditions.

CORES

Leadership and Administrative Core (LAC)

Leader 1:	Jay Magaziner, PhD, MS Hyg.	jmagazin@som.umaryland.edu
Leader 2:	Leslie I. Katzel, MD	lkatzel@som.umaryland.edu
Leader 3:	Alice Ryan, PhD	aryan@som.umaryland.edu

The Leadership and Administrative Core (LAC) ensures that the UM-OAIC provides support for conducting novel research and training the next generation of scientists pursuing research careers in aging and oversight to the five UM-OAIC cores. Core leaders also foster maximal outreach and interaction with the rest of the University of Maryland, Baltimore (UMB) inter-professional campus, other OAICs, and research programs elsewhere pursuing work on areas relevant to the UM-OAIC's enablement theme. The LAC will receive input and guidance, and discuss program operations in the Core Leadership Executive Committee (CLEC) meeting of core leaders; the UM-OAIC Research and Education Advisory Panel (REAP) charged with reviewing proposed Development and Pilot Exploratory Studies and progress of Scholars; a Community Advisory Board (CAB) that will provide input on issues that are most relevant for enabling function in older persons with disabling conditions in different communities and on the merit of research that is being proposed and conducted in the UM-OAIC; an Internal Advisory Committee (IAC) that evaluates UM-OAIC progress and accomplishments, and provides advice on ways to extend research on aging to other university centers and departments; and an External Advisory Board (EAB) that will provide guidance to the program and report progress annually to the NIA. In addition, the LAC receives advice from an Internal Data and Safety Monitoring Board (I-DSMB) that will review the conduct of clinical protocols to ensure patient safety and progress of projects, and an External Data and Safety Monitoring Board (E-DSMB) that will provide another layer of review by experienced, impartial scientists that will monitor study progress and data quality and safety, and report to the NIA annually.

Research Education Component (REC)

Leader 1:	Mary-Claire Roghmann, MD, MS	mroghman@som.umaryland.edu
Leader 2:	Jack Guralnik, MD, PhD, MPH	jguralnik@som.umaryland.edu

The purpose of the Research Education Core (REC) is to support the development of junior faculty from multiple disciplines as they pursue careers as scientists with a focus on the restoration of function among older adults with impairments and on the prevention or delay of progression in those who are already disabled. The REC supports Scholars and affiliated faculty (who are former Scholars or junior faculty with career development awards related to our mission) in mentor-based research training and other career development activities in a supportive research environment. The REC will achieve the above with the following aims: 1) Recruit and retain REC Scholars and affiliated faculty committed to research careers congruent with the UM-OAIC mission; 2) train REC Scholars and affiliated faculty through mentored research projects and individualized training plans which use the resources of the UM-OAIC, the national OAIC network and other NIA supported programs; 3) Develop a Leadership Academy which will teach leadership skills and provide leadership experience for promising junior and mid-level scientists with demonstrated commitment and expertise to become the next leaders, in the UM-OAIC and nationally, in research aimed at improving function in older adults and 4) evaluate the UM-OAIC Research Education Core with the help of experts in the University of Maryland Baltimore (UMB) Faculty Center for

Teaching and Learning and in the Research Education Advisory Panel (REAP).

Pilot and Exploratory Studies Core (PESC)

Leader 1:	Stephen Seliger, MD, MS	sseliger@som.umaryland.edu
Leader 2:	Marc Hochberg, MD, MPH, MACP, MACR	mhochber@som.umaryland.edu

The purpose of the UM-OAIC Pilot and Exploratory Studies Core (PESC) is to provide critical initial funding for pilot and exploratory studies that are consistent with the UM-OAICs overall goal of advancing the study of enablement in older adults by: 1) identifying the deficits associated with specific disabling conditions; 2) investigating the mechanisms and pathophysiology responsible for these deficits; and 3) developing exercise, other activity-based interventions, and multi-modal rehabilitation strategies that target these mechanisms and deficits; 4) testing them in clinical laboratories/centers under carefully controlled conditions; and 5) adapting them for implementation and further testing in home and other settings outside the medical center. To meet this objective, the PESC will attract junior investigators (and established investigators new to aging research) across a broad range of disciplines to study rehabilitation and recovery in older adults and in relevant pre-clinical models, stimulate new studies in aging-related rehabilitation research through targeted funding, encourage new interdisciplinary collaborations, and translate efficacious therapies across the spectrum from bench to clinical laboratory to community practice. This will advance the UM-OAIC research goal of expanding therapies in the broadest context of rehabilitation that emphasizes restorative and preventive medicine to promote the recovery and enablement of older adults with disabling conditions.

Applied Physiology and Tissue Mechanisms

Leader 1:	Alice Ryan, PhD	aryan@som.umaryland.edu
Leader 2:	Leslie I. Katzel, MD	lkatzel@som.umaryland.edu
Leader 3:	Chris Ward, PhD	ward@som.umaryland.edu

RC-2 provides UM-OAIC investigators comprehensive support for quantified physical activity, functional and metabolic phenotyping, and blood and tissue bioassays to advance clinical research. Research performed by UM-OAIC investigators demonstrates that various modes of exercise, and/or rehabilitation training, improve cardiovascular fitness, muscle endurance, strength, neuromotor control, and body composition in older people with chronic disease and disability such as those with stroke, peripheral arterial disease (PAD), congestive heart failure, obesity, diabetes, hip fracture, an intensive care unit stay, HIV and cancer. Collectively, these works inform our overarching hypothesis that exercise, activity-based, and multi-modal rehabilitation can improve multiple physiological systems in older mobility-limited individuals which in turn can improve functional performance, reduce cardiometabolic disease risk, and prevent further functional decline. To achieve this goal, RC2 implements specific aims that: 1) advance research focused on the mechanisms of functional decline in older persons with disability and the mitigation of decline with exercise or activity-based or multi-modal rehabilitation and 2) provide mentoring and training to REC Scholars, affiliated faculty, and UM-OAIC researchers in the performance of aging research relevant to exercise and rehabilitation-based restoration of function and the prevention of functional declines in older people with chronic disabling diseases.

Biostatistics and Informatics

Leader 1:	John D. Sorkin, MD, PhD	jsorkin@som.umaryland.edu
Leader 2:	Michael Terrin, MD, MPH	mterrin@som.umaryland.edu

Leader 3: Laurence Magder, PhD lmagder@som.umaryland.edu

The goal of the Biostatistics and Informatics Core (RC-1) plays a central role in UM-OAIC research helping investigators design, conduct, and report results of research studies. RC-1 plays a key role in the coordination and integration of UM-OAIC. Our informatics infrastructure facilitates UM-OAIC operation and oversight by tracking study progress, recording and reporting adverse events, monitoring core requests and use, and providing reports to PIs and Core leaders. RC-1 participates in REC organized education efforts and participates in other research training initiatives at the university. This core has 2 two major goals: 1) to support the conduct of studies that promote the independence of older adults with disabling conditions; 2) train the next generation of investigators who will conduct studies that promote health and independence in older adults. One-on-one training will take place as we help Scholars and other investigators design, execute, analyze and publish their results and as we participate in Research Design Studios, Project Initiation Support Groups and Research Working Groups. In addition, the RC-1 will help investigators find and enroll participants for their research projects, we are expanding our recruitment efforts by adding an investigator experienced in recruiting older persons. Finally, the core will also develop biostatistical methods and informatics resources that facilitate funded and supported projects of the UM-OAIC.

Rehabilitation Science and Technologies Core

Leader 1: Li-Qun (Larry) Zhang, PhD l-zhang@som.umaryland.edu
Leader 2: Kelly Westlake, PhD, MSc, PT kwestlake@som.umaryland.edu

Rehabilitation Science and Technologies Resource Core 3 (RC-3), aims to improve our ability to prevent and reverse these declines. We build on this core's strengths in rehabilitation medicine and physical therapy with a focus on gait, balance and mobility research, by expanding to mechanistic studies of motor learning and activity-dependent plasticity. Incorporation of new bioengineering capacity has expanded the resources and mentoring needed by UM-OAIC investigators to design, test, and translate novel rehabilitative technologies and engineering-informed approaches into new services and products. Technology transfer processes and academic-private partnerships are introduced to accelerate translation into community practice and into products with public health impact. The central hypothesis of RC-3 is that rehabilitation science-based therapeutics that leverage activity-dependent plasticity and neuromotor learning (including balance, mobility training, and bioengineering-modelled rehabilitation robotics and other technologies) will improve recovery and enhance function in older adults with functional limitations and disability and will be accomplished through the following aims: Specific Aim 1. To support investigations of sensory, motor, and cognitive mechanisms that underlie loss of functional independence and improvements produced by preventative or rehabilitative interventions. This will be accomplished by providing a repertoire of rehabilitation assessment and training of sensory, motor and cognitive function, development of assistive technologies, assessments of neuroplasticity, and tests of neurocognitive function. Specific Aim 2. To mentor and support REC Scholars and UM-OAIC researchers in the design, development and implementation of sensory, motor, and cognitive rehabilitation studies. These studies may involve implementation of technologies and examining underlying sensory, motor, and cognitive mechanisms to reduce and prevent functional declines in older persons with or at risk for functional limitations . Specific Aim 3. To facilitate translation of UM-OAIC discoveries across the mechanistic, rehabilitation engineering, applied clinical testing, and technology transfer phases into evidence-based clinical assessments and interventions using novel products and tools for precision rehabilitation.

CAREER DEVELOPMENT

REC Scholar, Research & Grants Funded During Pepper Supported Time	Years / Publications

Stephanie Jo, MD, PhD — 2023-2025 / 18 (total) / 7 (1st/Sr)

Assistant Professor / Department of Diagnostic Radiology and Nuclear Medicine, UMSOM

Identification of high-risk prognostic factors of osteoarthritis based on single nucleotide polymorphism and MRI morphometry utilizing the Osteoarthritis Initiative database

Hypothesis: OA susceptibility SNPs along with semiquantitative and quantitative knee MRI features of OA can predict future knee arthroplasty and severity of pain. Specific aims: Specific aim 1: Identify SNPs associated with semiquantitative and quantitative OA features on knee MRI: Current studies have identified OA susceptibility SNPs based on clinical diagnosis and radiographs. This study will utilize MRI features, which are more specific and sensitive for early OA and OA severity, for SNP association. Specific aim 2: Develop models to predict future knee arthroplasty and pain score based on SNPs and semiquantitative and quantitative OA features on MRI: OA susceptibility SNPs are not part of OA assessment in the current clinical setting, and evaluating 100+ SNPs may not be practical. Also, no studies have yet evaluated the additional predictive value of SNPs and MRI features of OA over the clinical symptoms and signs. This aim will develop OA prediction models with SNP genotype and MRI phenotype for clinical use.

Sui-Seng Tee, PhD — 2023-2025 / 11 (total) / 5 (1st/Sr)

Assistant Professor / Department of Diagnostic Radiology and Nuclear Medicine, UMSOM

Metabolic Imaging as a Biomarker of Muscle Aging

Metabolic imaging using hyperpolarized magnetic resonance imaging (HP-MRI) is based on injecting non-radioactive, carbon-13 (13C) labeled metabolites as contrast agents, allowing quantification of metabolic flux7. Uniquely, this technique uses non-ionizing radiation, allowing longitudinal imaging. Therefore, this grant breaks new ground in proposing to track metabolic flux in muscles over time, while the organism ages. Indeed, altered metabolism is a hallmark of aging8 and altered muscle metabolism is closely linked with age-related functional decline9. Our overarching hypothesis is HP-MRI detects alterations in glycolytic and mitochondrial metabolism that can be used as predictive and prognostic biomarkers. To this end, we propose 2 aims: Specific Aim 1: Longitudinal Muscle Imaging of Aging in Mice 1.1: Metabolic Imaging of Sarcopenia in a mouse model of physiological aging 1.2: Compare imaging with gold-standard body composition measures, frailty index and histology Specific Aim 2: Metabolic Imaging of Exercise Regimens in Mice 2.1: Compare high-intensity intermittent training (HIIT) with moderate intensity continuous training (MICT) using metabolic imaging 2.2: Validation of metabolic Imaging

- OAIC Coordinating Center: Early Career Faculty Flexible, High Value Award. Tee (PI). 07/2022-06/2023. $5,000

Jeanine Ursitti, PhD — 2021-2024 / 9 (total) / 2 (1st/Sr)

Assistant Professor / Department of Orthopaedics

Cell Mechanics as a Biomarker of Osteosarcopenia”

Abstract: Previous work has identified increased cytoskeletal stiffness, driven by increased levels of microtubules post-translationally modified by detyrosination, as a common predictor of biological dysfunction across bone, skeletal muscle, and cardiac tissue. Our new preliminary evidence in aging mice (17-78 weeks) finds increasing microtubule detyrosination in muscle and bone and increased stiffness/mechanics in the muscle fiber. The goal of this pilot project is to determine whether microtubule dependent cytoskeletal stiffness is a novel biomarker of biological aging. Here we will extend our measures of cell mechanics (in isolated intact skeletal muscle fibers) and tubulin biochemistry (in skeletal muscle and bone), to circulating peripheral blood mononuclear cells (PBMCs), to test our hypothesis that the level of

microtubule detyrosination, and microtubule dependent cytoskeletal stiffness, are biomarkers of biological age. Hypothesis/Aims: We hypothesize that age-related changes in microtubule (MT) structure and post-translational modifications in Peripheral Blood Mononuclear Cells (PBMCs) will track with changes in skeletal muscle fibers, bone osteocytes, and perhaps other tissues, making it a predictive, easily assessable biomarker. We further hypothesize that the cellular stiffness of PBMCs will track with deTyrosinated MTs (deTyr-MTs) in aging skeletal muscle. We have two specific aims: Aim 1: Define age dependent changes in cytoskeletal structure and properties across disparate tissues and blood monocytes. Aim 2. Determine age-related changes in PBMC mechanics as a biomarker of aging and treatment efficacy.

- OAIC Coordinating Center: Early Career Faculty Flexible, High Value Award. Ursitti (PI). 07/2021-06/2022. $5,000

Andrea Levine, MD 2022-2024 /
Assistant Professor / Department of Medicine 28 (total)
The Longevity of ARDS Inflammatory Subphenotypes and Their Role in Predicting Functional Recovery in Older Adults 9 (1st/Sr)

Abstract: Acute Respiratory Distress Syndrome (ARDS) is a life-threatening illness of severe hypoxemia. A hyper- and hypo-inflammatory subphenotype exist with a differential treatment effect. We aim to describe the longevity of the subphenotypes determine whether these subphenotypes can predict functional recovery in older adult patients. Hypothesis/Aims: Subphenotype longevity: To determine whether the ARDS subphenotype established on hospital admission is sustained during the inpatient hospitalization and post-acute recovery phase. Approach: We will utilize a parsimonious combination of validated plasma biomarkers (IL-8, HCO-3, and Protein C) to determine whether ARDS subphenotypes established at admission are maintained through the duration of the inpatient hospitalization and at post-acute follow-up three months after discharge in older adult patients. Aim 2: Correlation with longitudinal functional recovery: To determine whether ARDS subphenotype predicts the trajectory of functional recovery in older survivors of ARDS. Approach: In a pilot study, survivors of ARDS will be followed at three months after hospital discharge and assessed for pulmonary recovery via spirometry, neurocognitive function using the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS), psychiatric status using the Hospital Anxiety and Depression Survey (HADS) and PCL-5 and neuromuscular function using a six-minute walk test and short physical performance battery (SPPB). We will determine whether the inflammatory subphenotype assigned at hospital discharge predicts functional recovery at three-months after hospital discharge.

- UM-OAIC Pilot Award: The Longevity of ARDS Inflammatory Subphenotypes and Their Role in Predicting Functional Recovery in Older Adults. Levine (PI). 07/2021-06/2024. $46,350
- NIH Loan Repayment Program: The Longevity of ARDS Inflammatory Subphenotypes and Their Role in Predicting Functional Recovery in Older Adults. Levine (PI). 07/2022-06/2024. $100,000

Past Scholars

F. Rainer von Coelln, Dr. med, Department of Neurology, University of Maryland School of Medicine (2017-2020)
Tasneem Khambaty, PhD, Department of Psychology, University of Maryland Baltimore County (2018-2021)
Sarasijhaa Desikan, MD, Department of Surgery, University of Maryland School of Medicine (2020-2022)
Jason Falvey, PT, DPT, PhD, Department of Physical Therapy and Rehabilitation Science (2021-2021)

PILOT/EXPLORATORY PROJECTS (14 Pilot Projects Listed)

1. **Project Title:** **Relations of Glucose Variability with Cognitive Function and Functional Status among Older Adults at Risk for Diabetes**

   Leader: **Tasneem Khambaty, PhD**

   Abstract: Type 2 diabetes (T2DM) is an independent risk factor for dementia and less severe forms of cognitive dysfunction and may compromise functional status. Metrics derived from continuous glucose monitoring (CGM) technology – i.e., glucose variability – may facilitate the detection of impaired glycemia much earlier than the conventional glycemic metrics. We propose a robust characterization of intra- and inter-day variability in glucose regulation and a deeper understanding of the extent to which this variability influences cognitive aging and functional decline in persons at risk for diabetes. Understanding this early aging trajectory is an important step towards discerning the mechanisms underlying various aspects of glycemia and neurocognition. Hypotheses: Our central hypothesis is that even before diabetes onset, glucose variability will be associated with worse cognitive function and lower functional status among older adults. Our specific aims are to examine the association of glucose variability derived from CGMS over a 10-day self-monitoring period with cognitive function, and functional status among individuals with prediabetes, aged 50 or older.

2. **Project Title:** **Home Exercise (HEX) for Homebound Older Adults**

   Leader: **Alyssa Stookey, PhD**

   Abstract: Little is known about the feasibility and utility of pragmatic home-based exercise in older homebound adults with severe mobility disability. We propose a feasibility study to design and implement a pragmatic 12-week home exercise program (HEX) intervention program to improve physical functioning and quality of life in homebound older adults with mobility disability.

   Hypothesis: Our general hypothesis is HEX will prove feasible and effective in maintaining and restoring physical functioning and perceived quality of life. Aim #1: We will work with providers and patients to develop a feasible and pragmatic, multi-component home exercise program targeting mobility, strength, and performance of task-oriented ADLs. Aim #2: Perform a small study to better assess feasibility and determine the effect(s) of the home-based intervention created in Aim 1 on functional outcomes and QOL(at baseline, 6 weeks, and 12 weeks) in older, homebound adults.

3. **Project Title:** **Mobile Sensor Investigation of Gait Variability and Hip abductors**

   Leader: **Odessa Addison, DPT, PhD**

   Abstract: Our work suggests that dysfunction of the hip abductors may contribute to balance and mobility limitations resulting in increased fall risk. We have previously shown that gait variability, defined as fluctuations between gait cycles, are an important assessment of mobility and balance function and related to muscle composition of the hip abductor muscles. Gait variability is traditionally assessed via a short 25-foot walk way. However, this distance is too short to account for the impact of fatigue. We propose examining changes in gait variability over a six-minute walk distance may allow for an earlier detection of fall risk by exposing impairments that occur under conditions of fatigue that would otherwise go undetected. The

overall aim of our work is to study the use of technology-based assessments and interventions which impact enablement of older adults. Hypothesis/Aims: Aim 1: Examine changes in gait variability between the early and late phase of the six-minute walk. Aim 2: Compare how gait variability in the early and late phases of the six-minute walk relates to muscle size and composition of the hip abductors. Aim 3: Examine how changes in the hip abductors after a 12-week intervention relates to changes in gait variability during the early and late phases of the six-minute walk.

4. Project Title: **Neural Mechanisms of Motor Recovery with Technology Assisted Training for Post-stroke Hemiparesis**

Leader: **Robynne Braun, MD, PhD**

Abstract: Arm weakness persists chronically in 40% of stroke survivors and accounts for at least half of the decline in quality of life after stroke. Our preliminary work indicates that technology-assisted-training can provide clinically meaningful improvements in arm function for approximately 30% of patients with chronic post-stroke-hemiparesis. The goals of this proposal are: 1) to investigate brain network activity changes that occur during technology-assisted-training and 2) to determine the baseline residual brain network connectivity required for patients to respond to technology-assisted-training, The results of this study will lead to establishment of a personalized medicine algorithm for technology-assisted-training to the patients most likely to respond to it, shifting the delivery of therapy for chronic stroke-induced arm weakness towards individualized, evidence-based care. Hypothesis/Aims: Aim 1: Define cortical connectivity dynamics during technology-assisted-training. Hypothesis: Technology- assisted- training induced increases in cortical connectivity between bilateral primary motor areas and angular gyrus and parietal operculum will positively correlate with improvement in technology-assisted-assessments. Approach: Near infrared spectroscopy brain imaging will be used to measure cortical activity in motor and non-motor cortical areas real-time during 9 sessions of technology-assisted-training over 3 weeks in a cohort of 10 patients with chronic post-stroke-hemiparesis. The relationships between cortical connectivity and measures of movement and proprioception will be analyzed and compared between stroke survivors and 10 healthy controls. Aim 2: Identify baseline brain network connectivity predictors of technology-assisted-training impairment reductions. Hypothesis (a): Baseline connectivity of angular gyrus and parietal operculum to sensorimotor networks will predict reductions in impairment induced by technology-assisted-training. Approach: We have brain MRI baseline network functional connectivity data on 66 patients with chronic post-stroke hemiparesis who have undergone 3 months (~36 sessions) of technology-assisted-training of the upper extremity. This aim will analyze baseline brain functional connectivity prior to the onset of training to find correlates of training induced impairment reduction.

5. Project Title: **Ryanodine Receptors as Novel Targets in Chronotropic Incompetence in the Aging Heart**

Leader: **B. Maura Greiser, PhD**

Abstract: Chronotropic incompetence is the hallmark of the aging heart. This means that the heart's pacemaker, the sino-atrial node (SAN), fails to produce a heart rate that is fast enough to match circulatory demand. This results in reduced left ventricular output over time in the aging heart compared to younger hearts. Hypothesis/Aims: The goal of this Pilot Project is to provide foundational evidence linking RyR2 dysfunction to chronotropic incompetence. We further want to test whether aging-mediated RyR2 dysfunction in SAN cells can be partially reversed by a) pharmaceutical agents that stabilize RyR2 function and b) by reducing the levels of intracellular reactive oxygen species (ROS).

6. Project Title: **Persistence of Depression and Pain and Functional Outcomes in Knee Osteoarthritis**

Leader: **Alan Rathbun, PhD, MPH**

Hypothesis/Aims: Aim 1: To assess how the persistence of depressive symptoms cumulatively affect functional outcomes among persons with or at risk for symptomatic knee OA. Hypothesis: Greater persistence of depressive symptoms is associated with worse function over time in a dose-dependent manner. Aim 2: To determine whether dynamic fluctuations in knee pain mediate the association between persistent depression and functional outcomes. Hypothesis: Higher pain severity will be associated with a stronger indirect (mediated) effect of depressive symptoms on functional outcomes.

7. Project Title: **Cell Mechanics as a Biomarker of Osteosarcopenia**

Leader: **Jeanine Ursitti, PhD**

Abstract: Previous work has identified increased cytoskeletal stiffness, driven by increased levels of microtubules post-translationally modified by detyrosination, as a common predictor of biological dysfunction across bone, skeletal muscle, and cardiac tissue. Our new preliminary evidence in aging mice (17-78 weeks) finds increasing microtubule detyrosination in muscle and bone and increased stiffness/mechanics in the muscle fiber. The goal of this pilot project is to determine whether microtubule dependent cytoskeletal stiffness is a novel biomarker of biological aging. Here we will extend our measures of cell mechanics (in isolated intact skeletal muscle fibers) and tubulin biochemistry (in skeletal muscle and bone), to circulating peripheral blood mononuclear cells (PBMCs), to test our hypothesis that the level of microtubule detyrosination, and microtubule dependent cytoskeletal stiffness, are biomarkers of biological age. Hypothesis/Aims: We hypothesize that age-related changes in microtubule (MT) structure and post-translational modifications in Peripheral Blood Mononuclear Cells (PBMCs) will track with changes in skeletal muscle fibers, bone osteocytes, and perhaps other tissues, making it a predictive, easily assessable biomarker. We further hypothesize that the cellular stiffness of PBMCs will track with deTyrosinated MTs (deTyr-MTs) in aging skeletal muscle. We have two specific aims: Aim 1: Define age dependent changes in cytoskeletal structure and properties across disparate tissues and blood monocytes. Aim 2. Determine age-related changes in PBMC mechanics as a biomarker of aging and treatment efficacy.

8. Project Title: **The Longevity of ARDS Inflammatory Subphenotypes and Their Role in Predicting Functional Recovery in Older Adults**

Leader: **Andrea Levine, MD**

Hypothesis/Aims: Subphenotype longevity: To determine whether the ARDS subphenotype established on hospital admission is sustained during the inpatient hospitalization and post-acute recovery phase. Approach: We will utilize a parsimonious combination of validated plasma biomarkers (IL-8, HCO-3, and Protein C) to determine whether ARDS subphenotypes established at admission are maintained through the duration of the inpatient hospitalization and at post-acute follow-up three months after discharge in older adult patients. Aim 2: Correlation with longitudinal functional recovery: To determine whether ARDS subphenotype predicts the trajectory of functional recovery in older survivors of ARDS. Approach: In a pilot study, survivors of ARDS will be followed at three months after hospital discharge and assessed for pulmonary recovery via spirometry, neurocognitive function using the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS), psychiatric status using the Hospital Anxiety and Depression Survey (HADS) and PCL-5 and neuromuscular function using a six-minute walk test and short physical performance battery (SPPB). We will determine whether the inflammatory subphenotype assigned at hospital discharge predicts functional recovery at three-months after hospital discharge.

9. Project Title: **The Effects of Neuromuscular Activity and Muscle Structure on Stepping Performance in older Adults**

Leader: **Marcel Lanza, PhD**

Abstract: This pilot project seeks to understand the effects that age has on the time to transfer weight, torque production, and neuromuscular control during the weight transfer for different step directions and whether a step direction is more impaired. The results of this project may provide insight into the direction most likely to result in a fall among older adults. Hypothesis/Aims: The aims of this project are: 1) to determine the age associated changes in the control of the weight transfer of the lateral, forward, and backward steps by comparing older to younger adults; 2) to determine the age associated changes in the hip abductors and adductors rate of torque development and rate of activation of the lateral, forward, and backward steps between young and older adults; 3) to determine the age associated changes in the hip abductors and adductors muscle structure and association with the weight transfer.

10. Project Title: **A Combination Therapy with a Brain-Selective Estrogen and Physical Exercise to Halt or Slow the Progression of Cognitive Decline**

Leader: **Jacek Mamczarz, PhD**

Abstract: The mice are treated continuously with DHED, a brain selective precursor for estrogen synthesis, for 3 months with subcutaneously implanted Alzet pumps, while exercising groups have free access to running wheels. Time spent exercising and distance is monitored over the course of the experiment. Muscle strength and bone density is evaluated every 4 weeks. After 1.5 months on the treatment/exercising, mice are subjected to a battery of tests evaluating motor coordination/motor learning and cognitive behavior. Hypothesis/Aims: We hypothesize that a combination therapy with DHED and physical exercise will provide better outcome in naturally aged female mice than these therapies alone, improving neuromuscular and cognitive functions.

11. Project Title: **Retinal Blood Flow and its Evolution with Aging**

Leader: **Osamah Saeedi, MD, MS**

Abstract: We are investigating objective and quantitative retinal vascular biomarkers of functional performance, specifically cognition, and mobility in older adults. We anticipate that participants with lower cognitive and balance scores will have significantly lower vessel density, retinal blood flow velocity, and vasomotion. Hypothesis/Aims: Specific Aim 1: Quantitively investigate the relationship between cognitive and mobility performance with retinal microvascular metrics: Aim 1A: Correlate cognitive and mobility performance with retinal vessel density and flow rate using in vivo measures of ocular blood flow: optical coherence tomography angiography (OCTA) and laser speckle contrast imaging (LSCI). We hypothesize that participants with lower cognitive and balance scores will have significantly lower vessel density and retinal blood flow velocity as measured by OCTA and LSCI respectively. Aim 1B: Correlate cognitive and mobility performance with vasomotion using in vivo erythrocyte mediated angiography (EMA). We hypothesize that vasomotion, as quantified by vascular erythrocyte pausing in the optic disc and the macula, will be significantly impaired in participants with lower cognitive and balance scores. Specific Aim 2: Confirm the validity of these vascular biomarkers in comparison with the systemic microvasculature using in vivo nailfold video capillaroscopy (NVC). We hypothesize that the retinal vascular parameters will demonstrate greater diagnostic accuracy in differentiating participants according to their cognitive and balance performance levels.

12. Project Title: Exercise Capacity Improvement in Heart Failure with Preserved Ejection Fraction and Pulmonary Hypertension (PH-HFpEF) after SGLT2 Inhibitor (Empagliflozin) Initiation

Leader: Steven Cassady, MD

We propose a pilot study to evaluate use of SGLT2 inhibitors on functional outcomes in a cohort of patients with HFpEF and pulmonary hypertension determined by echocardiography. Our primary outcome will be the change in peak VO2 achieved by patients during maximal cardiopulmonary exercise testing (CPET) from within 20 days of drug initiation to 90 days after drug initiation. Secondary outcomes will include CPET-derived measures of ventilatory efficiency as well as changes in performance on the Short Physical Performance Battery and six-minute walk testing. Through the establishment of improved functional outcomes in this specific patient population, we hope to demonstrate sufficient benefit to encourage wider prescribing of SGLT2 inhibitors in PH-HFpEF and to generate promising data for larger scale studies in this population. Additionally, this study would also function to provide blood samples to be used for future investigation of the metabolic effects of SGLT2 inhibitor use in this group.

13. Project Title: Time-restricted eating to entrain circadian rhythm, increase physiological responsiveness, and prevent stressor-induced frailty

Leader: Amber Kleckner, PhD

Frailty affects more than 5.4 million people over the age of 65 in the United States alone (>10%) and is one of the main reasons older adults lose independence. Frailty, or the reduction of physiological reserve, does not progress linearly; its pathogenesis often accelerates in response to a “stressor event,” for example cancer and its treatment. Specifically, a diagnosis with prostate cancer and androgen deprivation therapy (ADT) treatment are associated with accelerated frailty. While the body is resilient to everyday stressors, large-scale, enduring stressors can accumulate and cause the body to have difficulty predicting energy supply and

demand. The result is that stress-induced energy costs compete with cellular growth, maintenance, and repair, i.e., frailty. Treatments for frailty are intensive (e.g., resistance exercise) and often unsuccessful, and there are critical needs to 1) develop effective interventions to prevent and treat frailty, and 2) identify physiological precursors to frailty so that we can provide timely intervention(s) to prevent progression to the frail state. We theorize that entrainment of circadian rhythm, or the body's internal body clock, will improve the body's ability to predict energy supply and demand, and therefore enable the body to allocate more resources to anabolic processes and promote resilience to toxicities caused by ADT. Time-restricted eating (TRE) entails consuming food within a defined, consistent window every day. It has emerged as a powerful intervention to entrain circadian rhythm and regulate metabolic homeostasis. We hypothesize that, by entraining circadian rhythm, TRE can enhance physiological regulation and prevent stressor-induced frailty. To test this hypothesis, we will recruit 30 patients over 55 years old undergoing ADT therapy for prostate cancer. Participants will be randomized 1:1 to a 12-week TRE intervention or a time- and attention-matched nutrition control intervention; both groups will be under the supervision of a licensed clinical nutritionist with expertise in the cancer population to ensure adequate nutrient intake. At baseline and post-intervention, we will assess frailty using Fried's Frailty Index and a novel set of five physiological responsiveness measures: a) lying-to-standing blood pressure, b) heart rate variability, c) oral glucose tolerance test, d) 24-hour circadian cortisol rhythm, and e) usual vs. fast gait speed. These data will allow us to test the feasibility of TRE among patients with prostate cancer during ADT treatment and optimize measures of reduced physiological reserve with the ultimate goal of optimizing an intervention to prevent the progression of frailty.

14. Project Title: Using Deep Learning to Measure Quantitative Imaging Biomarkers of Body Composition on MRI of the Knee in Older Adults With or At-Risk for Knee Osteoarthritis

Leader: Paul Yi, MD

Osteoarthritis (OA) of the knee is a leading cause of disability in older adults and a driver of healthcare spending. Preventing the incidence and progression of knee OA would have tremendous impact on both the health of older adults and the healthcare system. Prior work has shown that body composition biomarkers derived from thigh MRIs, such as muscle cross-sectional area, are associated with progression of knee OA, suggesting they can be used to initiate neuromuscular stimulation and strength training to prevent the progression of knee OA. Unfortu-nately, thigh MRIs are impractical for real-world monitoring because they are not routinely obtained in clinical practice. In contrast, knee MRIs are routinely obtained. Therefore, development of analogous quantitative bi-omarkers of body composition on knee MRI could facilitate evaluation for potentially modifiable risk factors for knee OA as part of routine clinical care. This project proposes to use deep learning (DL), a state-of-the-art set of artificial intelligence (AI) machine learning techniques, to develop an automated tool for measuring quantitative imaging biomarkers of body composition on knee MRIs in older adults with or at-risk of knee OA. We will use knee MRIs from the NIH Osteoarthritis Initiative (OAI) dataset to train and test a DL algorithm for segmentation of muscle, fat, and bone in images of the distal thigh and proximal calf – these segmentations will be used to quan-tify imaging biomarkers, such as tissue cross-sectional area and intramuscular fat. This tool will allow for auto-mated measurement of these biomarkers that would otherwise be practically infeasible and time-consuming, and which could be used in the future to identify older adults

at-risk of knee OA progression and tailor treatment reg-imens to prevent the onset and/or progression of this debilitating disease.

DEVELOPMENT PROJECTS (0 Development Projects Listed)

No development projects.

RESEARCH (0 Projects Listed)

PUBLICATIONS

2024

2023

1. **Association Between Race and Receipt of Home- and Community-Based Rehabilitation After Traumatic Brain Injury Among Older Medicare Beneficiaries.**
   Albrecht JS, Kumar A, Falvey JR
   JAMA Surg, 2023 Apr 1, 158(4): 350-358
   https://doi.org/10.1001/jamasurg.2022.7081 | PMID: 36696119 | PMCID: PMC9878433
   Citations: NA | AltScore: 40.1
2. **Traumatic Brain Injury and Risk of Long-Term Nursing Home Entry among Older Adults: An Analysis of Medicare Administrative Claims Data.**
   Bailey MD, Gambert S, Gruber-Baldini A, Guralnik J, Kozar R, Qato DM, Shardell M, Albrecht JS
   J Neurotrauma, 2023 Jan, 40(2-Jan): 86-93
   https://doi.org/10.1089/neu.2022.0003 | PMID: 35793112 | PMCID: PMC10162579
   Citations: 1 | AltScore: NA
3. **Predictors of mobility status one year post hip fracture among community-dwelling older adults prior to fracture: A prospective cohort study.**
   Bajracharya R, Guralnik JM, Shardell MD, Hochberg MC, Orwig DL, Magaziner JS
   J Am Geriatr Soc, 2023 Mar 14, 71(8): 2441-2450
   https://doi.org/10.1111/jgs.18327 | PMID: 36918363 | PMCID: PMC10440300
   Citations: NA | AltScore: 9.2
4. **Plasma neurofilament light and brain volumetric outcomes among middle-aged urban adults.**
   Beydoun MA, Noren Hooten N, Beydoun HA, Weiss J, Maldonado AI, Katzel LI, Davatzikos C, Gullapalli RP, Seliger SL, Erus G, Evans MK, Zonderman AB, Waldstein SR
   Neurobiol Aging, 2023 Sep, 129: 28-40
   https://doi.org/10.1016/j.neurobiolaging.2023.04.013 | PMID: 37257406 | PMCID: PMC10524231
   Citations: NA | AltScore: 9.5
5. **Plasma neurofilament light as blood marker for poor brain white matter integrity among middle-aged urban adults.**
   Beydoun MA, Noren Hooten N, Weiss J, Maldonado AI, Beydoun HA, Katzel LI, Davatzikos C, Gullapalli RP, Seliger SL, Erus G, Evans MK, Zonderman AB, Waldstein SR
   Neurobiol Aging, 2023 Jan, 121: 52-63
   https://doi.org/10.1016/j.neurobiolaging.2022.10.004 | PMID: 36371816 | PMCID: PMC9733693
   Citations: 4 | AltScore: 14.5
6. **The timing and amplitude of the muscular activity of the arms preceding impact in a forward fall is modulated with fall velocity.**
   Borrelli J, Creath R, Rogers MW
   J Biomech, 2023 Mar, 150: 111515
   https://doi.org/10.1016/j.jbiomech.2023.111515 | PMID: 36867953 | PMCID: PMC10257944
   Citations: NA | AltScore: NA
7. **Associations between living alone, social interactions, and physical performance differ**

by sex: Results from the Baltimore Hip Studies.
C?mara SMA, Falvey JR, Orwig D, Gruber-Baldini AL, Auais M, Feng Z, Guralnik J, Magaziner J
J Am Geriatr Soc, 2023 May 12, 71(9): 2788-2797
https://doi.org/10.1111/jgs.18403 | PMID: 37171145 | PMCID: PMC10524112
Citations: 2 | AltScore: NA

8. **A Cartographic Tool to Predict Disease Risk-associated Pseudo-Dynamic Networks from Tissue-specific Gene Expression.**
Chen C, Shen B, Zhang L, Yu T, Wang M, Wu R
Bio Protoc, 2023 Jan 5, 13(1):
pii: e4583. https://doi.org/10.21769/BioProtoc.4583 | PMID: 36789091 | PMCID: PMC9901473
Citations: NA | AltScore: NA
9. **Frailty and Aging in HIV- Status Post 13 Years of National Awareness.**
Eke UA, Mohanty K, Gruber-Baldini AL, Ryan AS
J Frailty Aging, 2023, 12(1): 49-58
https://doi.org/10.14283/jfa.2022.45 | PMID: 36629084 | PMCID: PMC10082638
Citations: NA | AltScore: 1.5
10. **Severe neighborhood deprivation and nursing home staffing in the United States.**
Falvey JR, Hade EM, Friedman S, Deng R, Jabbour J, Stone RI, Travers JL
J Am Geriatr Soc, 2023 Mar, 71(3): 711-719
https://doi.org/10.1111/jgs.17990 | PMID: 36929467 | PMCID: PMC10023834
Citations: 1 | AltScore: 417.65
11. **Patterns, Predictors, and Intercenter Variability in Empiric Gram-Negative Antibiotic Use Across 928 United States Hospitals.**
Goodman KE, Baghdadi JD, Magder LS, Heil EL, Sutherland M, Dillon R, Puzniak L, Tamma PD, Harris AD
Clin Infect Dis, 2023 Feb 8, 76(3): e1224-e1235
https://doi.org/10.1093/cid/ciac504 | PMID: 35737945 | PMCID: PMC9907550
Citations: 7 | AltScore: 11.35
12. **Calcium and bicarbonate signaling pathways have pivotal, resonating roles in matching ATP production to demand.**
Greiser M, Karbowski M, Kaplan AD, Coleman AK, Verhoeven N, Mannella CA, Lederer WJ, Boyman L
Elife, 2023 Jun 5, 12:
https://doi.org/10.7554/eLife.84204 | PMID: 37272417 | PMCID: PMC10284600
Citations: NA | AltScore: NA
13. **Association of parity with body mass index and cardiometabolic risk in high-parous women.**
He S, McArdle PF, Ryan KA, Daue M, Xu H, Barry KH, Magder LS, Shuldiner AR, Pollin TI, Mitchell BD
Menopause, 2023 May 9, 30(7): 703-708
https://doi.org/10.1097/GME.0000000000002194 | PMID: 37159869 | PMCID: PMC10313795
Citations: 1 | AltScore: NA
14. **Diagnostic rate estimation from Medicare records: Dependence on claim numbers and latent clinical features.**
Hogans B, Siaton B, Sorkin J

J Biomed Inform, 2023 Sep, 145: 104463
https://doi.org/10.1016/j.jbi.2023.104463 | PMID: 37517509 | PMCID: PMC10576984
Citations: NA | AltScore: NA

15. **Effect of Multicomponent Home-Based Training on Gait and Muscle Strength in Older Adults After Hip Fracture Surgery: A Single Site Randomized Trial.**
Huang MZ, Rogers MW, Pizac D, Gruber-Baldini AL, Orwig D, Hochberg MC, Beamer BA, Creath RA, Savin DN, Conroy VM, Mangione KK, Craik R, Zhang LQ, Magaziner J
Arch Phys Med Rehabil, 2023 Feb, 104(2): 169-178
https://doi.org/10.1016/j.apmr.2022.08.974 | PMID: 36087806 | PMCID: PMC10039715
Citations: 1 | AltScore: 0.5
16. **Longitudinal characteristics of physical frailty and its components in men and women post hip fracture.**
Huang Y, Orwig D, Hayssen H, Lu W, Gruber-Baldini AL, Chiles Shaffer N, Magaziner J, Guralnik JM
J Am Geriatr Soc, 2023 Sep 19
https://doi.org/10.1111/jgs.18595 | PMID: 37725439
Citations: NA | AltScore: NA
17. **Abnormal coordination of upper extremity during target reaching in persons post stroke.**
Koh K, Oppizzi G, Kehs G, Zhang LQ
Sci Rep, 2023 Aug 8, 13(1): 12838
https://doi.org/10.1038/s41598-023-39684-4 | PMID: 37553412 | PMCID: PMC10409717
Citations: NA | AltScore: NA
18. **Geriatric Syndromes and Health-Related Quality of Life in Older Adults with Chronic Kidney Disease.**
Liu CK, Miao S, Giffuni J, Katzel LI, Fielding RA, Seliger SL, Weiner DE
Kidney360, 2023 Apr 1, 4(4): e457-e465
https://doi.org/10.34067/KID.0000000000000078 | PMID: 36790849 | PMCID: PMC10278840
Citations: NA | AltScore: 5.85
19. **Associations of sex, Alzheimer's disease and related dementias, and days alive and at home among older Medicare beneficiaries recovering from hip fracture.**
Mutchie HL, Orwig DL, Gruber-Baldini AL, Johnson A, Magaziner J, Falvey JR
J Am Geriatr Soc, 2023 Jul 4, 71(10): 3134-3142
https://doi.org/10.1111/jgs.18492 | PMID: 37401789
Citations: NA | AltScore: NA
20. **Open reduction internal fixation of rib fractures: a biomechanical comparison between the RibLoc U Plus(?) system and anterior plate in rib implants.**
Oppizzi G, Xu D, Patel T, Diaz JJ, Zhang LQ
Eur J Trauma Emerg Surg, 2023 Feb, 49(1): 383-391
https://doi.org/10.1007/s00068-022-02075-x | PMID: 36018371 | PMCID: PMC10148598
Citations: NA | AltScore: 1.5
21. **Prevalence and socio-economic determinates of food insecurity in Veterans: findings from National Health and Nutrition Examination Survey.**
Robbins R, Porter Starr KN, Addison O, Parker EA, Wherry SJ, Ikpe S, Serra MC
Public Health Nutr, 2023 Mar 13, 26(7): 1478-1487
https://doi.org/10.1017/S1368980023000538 | PMID: 36912105 | PMCID: PMC10346074
Citations: NA | AltScore: 1.35

22. **Sex differences in muscle SIRT1 and SIRT3 and exercise + weight loss effects on muscle sirtuins.**
    Ryan AS, Li G
    Exp Biol Med (Maywood), 2023 Feb, 248(4): 302-308
    https://doi.org/10.1177/15353702221142619 | PMID: 36740765 | PMCID: PMC10159525
    Citations: 2 | AltScore: NA
23. **Effect of Long-term Exercise Training on Physical Performance and Cardiorespiratory Function in Adults With CKD: A Randomized Controlled Trial.**
    Weiner DE, Liu CK, Miao S, Fielding R, Katzel LI, Giffuni J, Well A, Seliger SL
    Am J Kidney Dis, 2023 Jan, 81(1): 59-66
    https://doi.org/10.1053/j.ajkd.2022.06.008 | PMID: 35944747 | PMCID: PMC9780154
    Citations: 3 | AltScore: 59
24. **Multi-Joint Assessment of Proprioception Impairments Post Stroke.**
    Xu D, Kang SH, Lee SJ, Oppizzi G, Zhang LQ
    Arch Phys Med Rehabil, 2023 Sep 13
    pii: S0003-9993(23)00524-5. https://doi.org/10.1016/j.apmr.2023.08.029 | PMID: 37714505
    Citations: NA | AltScore: NA

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RECOGNITION AND AWARDS (2023-2024)

Andrea Levine, MD, MS (2023)

- Educator of the year award in pulmonary and critical care medicine
- Woodward Award for Educator of the Year for the Department of Medicine
- COVID-19 Healthcare Hero award from The Daily Record

Jeanine Ursitti, PhD (2023)

- Best Poster award at the OAIC National meeting

Shari Waldstein, PhD (2023)

- Martica Hall Outstanding Mentor Award, Academy of Behavioral Medicine Research
- Inducted as Fellow, American Psychosomatic Society

MINORITY RESEARCH

General Brief Description of Minority Activities:
Not defined.

Minority Trainee(s):

- Abdou Simon Senghor , Postdoctoral Fellow, University of Maryland, School of Pharmacy
  Abdou is interested in bioethics and is mentored by Dr. C. Daniel Mullins.
- Alan Rathbun, PhD, MPH, Assistant Professor of Epidemiology and Public Health, University of Maryland School of Medicine
  Dr. Rathbun is a musculoskeletal epidemiologist whose current research career is focused in musculoskeletal disorders, epidemiological theory, research study design, causal inference, and applied biostatistics. He currently has a K01 award and a UM-OAIC pilot award and is collaborating with OAIC investigators on both of these projects.
- Bianka Onwumbiko, PhD Candidate, PhD Student, Psychology Department, University of Maryland Baltimore County
  Ms. Onwumbiko's interests include the role of epigenetic modifications such as DNA methylation in the relations of structural discrimination to racial health disparities. Her master's thesis project will examine the association between neighborhood disorder and DNA methylation based immunosenescence among African American and White women and men. Dr. Shari Waldstein currently serves as her mentor and master's thesis chair.
- Bisola Amodu, Clinical Research Coordinator and Pre-Med student, Department of Neurology, University of Maryland School of Medicine
  She is being mentored by Dr. Robynne Braun for training and education in the conduct of clinical trials and trained in the use of TMS for stroke recovery research.
- Candace Hall , PhD student, University of Maryland, School of Pharmacy
  She is interested in patient-centered research and community-engaged research and is mentored by Dr. C. Daniel Mullins.
- Danielle Beatty Moody, PhD, Assistant Professor of Psychology, University of Maryland Baltimore County
  Dr. Beatty Moody's area of interest includes relations of early life social disadvantage and perceived discrimination to cardiometabolic and brain health endpoints as a function of race, SES, gender and age. Dr. Shari Waldstein is her department mentor and primary mentor for Dr. Moody's current K01. She continues to work on her diversity supplement "Early life social disadvantage, brain, frailty, and physical function: HANDLS" that is funded from NIA through the UM-OAIC.
- Derik Davis, MD, Associate Professor of Diagnostic Radiology and Nuclear Medicine, University of Maryland School of Medicine
  Dr. Davis' current research career is focused in musculoskeletal radiology examining the effects of increased visceral adipose tissue (VAT) and reduced skeletal muscle (SMM) on cardiovascular disease (CVD), diabetes and functional outcomes in older adults. He collaborates with UM-OAIC studies performing radiology imaging and reading with Dr. Alice Ryan. He also has a R03 grant "Shoulder Pain, Rotator Cuff Tear, Coordination, and Mobility in Aging" funded by NIA.
- Derrick Larkins, DPT, PhD Candidate, PhD Student in the Department of Physical Therapy and Rehabilitation Science, University of Maryland, School of Medicine

Dr. Odessa Addison is his primary mentor, and he is interested in muscle quality and injury prevention.

- Frances Alfonzo, PhD Candidate, PhD Student, Psychology Department, University of Maryland Baltimore County
  Ms. Alfonzo's interests include relations of diabetes and pre-diabetes status to neurocognitive function. Her master's thesis project will examine potential interactive relations of prediabetes status and self-identified race to cognitive performance in midlife urban dwelling adults. Dr. Shari Waldstein currently serves as her mentor and master's thesis chair.
- Henry Asante Antwi , PhD Student, University of Maryland, School of Pharmacy
  His interest is patient-centered research and community-engaged research. His mentor is Dr. C. Daniel Mullins.
- Jennifer Kirk, BA, PhD Candidate, Gerontology PhD Student, Department of Epidemiology and Public Health, University of Maryland, School of Medicine
  Her research focus is disparities in bone health among older adults. She is currently conducting analyses using Medicare administrative claims data to estimate the impact of comorbid OSA on healthcare utilization among older adults with depression. Her dissertation title is "Individual, Neighborhood, and Provider-level Factors Associated with Racial and Ethnic Disparities in Osteoporosis Screening and Treatment." Dr. Jennifer Albrecht served as the chair of her dissertation committee and her mentor and Dr. Denise Orwig is her co-mentor.
- Lindsey Mathis, PT, DPT, PhD Student in Department of Physical Therapy and Rehabilitation Science, University of Maryland School of Medicine
  Her area of interest is: Disparities in Disability Outcomes Among Older Adults with Cardiopulmonary Disease. Dr. Jason Falvey serves as her co-primary mentor.
- Marcel Lanza, PhD, Research Associate of Physical Therapy and Rehabilitation Science, University of Maryland School of Medicine
  Dr. Lanza's area of research interest includes falls and stepping recovery and its relationship to muscle. He was recently awarded a UM-OAIC pilot study "The Effects of Neuromuscular Activity and Muscle Structure on Stepping Performance in Older Adults". He is co-mentored by Drs. Odessa Addison, Vicki Gray and Alice Ryan.
- Patrice Forrester , Postdoctoral Fellow, University of Maryland, School of Pharmacy
  Her interest is in patient-centered research and community-engaged research and she is mentored by Dr. C. Daniel Mullins.
- Pedro Rodriquez-Rivera , PhD student; Department of Diagnostic Radiology and Nuclear Medicine, University of Maryland, School of Medicine
  He is planning to use our ABCD dataset to study substance use on brain development and Dr. Linda Chang is the Chair of his PhD thesis committee.
- Peter MacIver, PhD Candidate, PhD Student, Psychology Department, University of Maryland Baltimore County
  Mr. Maciver's interests include disparities in relations of cardiovascular risk factors to cognitive function and MRI-assessed subclinical brain pathology as a function of race and socioeconomic status. His master's thesis examined relations of arterial stiffening (assessed by pulse wave velocity) to cognitive function and associated socio-demographic variation. His dissertation will examine relations of anxiety to cerebral perfusion as a function of race and sex. Dr. Shari Waldstein currently serves as his mentor and dissertation chair.
- Ruth Akinlosotu, PT, MPH, PhD Candidate, PhD student, Predoctoral Scholar, Department of Physical Therapy and Rehabilitation Science, University of Maryland School of Medicine
  She worked with Dr. Rainer von Coelln on the analysis of Dynaport data generated during his

UM-OAIC pilot project. She was a co-author on a poster with Dr. von Coelln during a University of Maryland School of Medicine Center for Research on Aging: Aging Research Symposium and at a recent Department of Neurology Research Day. She is mentored by Dr. Kelly Westlake.

- Shaline Escarfulleri, PhD Candidate, PhD Student, Psychology Department, University of Maryland, Baltimore County
  Ms. Escarfulleri's interests include the role of emotion regulation in the relation of stress exposure and negative affect to cardiometabolic risk factors and neurocognition as a function of socioeconomic status. Her master's thesis project will examine whether the relation of SES to carotid intimal medial thickening is partially mediated by negative affect. Dr. Shari Waldstein currently serves as her mentor and master's thesis chair.

No minority grant information specified.