

## Director's Update

### Stephen Kritchevsky, PhD



#### A New Era in Human Aging Research?

I have been interested in aging since I was a graduate student

studying epidemiology at the University of North Carolina – Chapel Hill. I became very active in the field as part of the Health Aging and Body Composition Study team, which established a cohort of 3,075 older adults who have been followed since 1997. In 1997, if you asked me whether there would ever be a pill to slow aging, I would have answered “not in my lifetime.” This isn’t my answer any more.

In the past 20 years, there have been dramatic advances in our understanding of the biology of aging using simple model organisms ranging from yeast, worms and fruit flies to mice and rats. It has been known since the 1940s that life span can be extended in animals if they are fed less than they would normally choose to eat. The extension can be dramatic- up to 40 percent. This work has

shown that cellular machinery involved in sensing the amount of energy available is critical to this change in life span. The close study of longer-lived individuals (both human and animals) has identified pathways involving growth hormone and related compounds also to be important in life span determination. These major advances in understanding have led to the identification of drugs to extend life span by targeting these pathways. The National Institute on Aging sponsors the rigorous Interventions Testing Program that systematically evaluates compounds for their ability to increase the life span and health span of mice. So far, five compounds that are also approved for human use have been shown to increase life span in either male or female mice. What we don’t know is whether these or similar compounds will have any beneficial effects in humans.

The Sticht Center on Aging is actively involved in the translation of these animal findings to the clinic. We are currently evaluating new clinical research approaches to rapidly and efficiently screen

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## Fall 2015 Newsletter



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## The Mission of the Sticht Center on Aging:

*To promote the health and independence of older adults by fostering multidisciplinary collaboration in basic and clinical research, research training, professional education and community outreach.*

# Research Revelations

## Abnormal Stress-related Arterial Stiffness in Older Adults with Impaired Fasting Glucose and High Risk for Heart Failure



Sujethra Vasu, MD

Symptomatic congestive heart failure occurs more frequently in people who are diabetic. A potential mechanism that precipitates the onset of heart failure in persons with impaired glucose regulation may be through abnormally high stress-related arterial stiffness.

This study measured arterial stiffness using dobutamine magnetic resonance stress imaging (80 percent of age-adjusted predicted maximum heart rate) in 373 older adults (69±8 years) with either normal fasting glucose, impaired fasting glucose or diabetes who were at risk for symptomatic heart failure. Compared to those with normal fasting glucose, those with diabetes or impaired fasting glucose had higher stress measures of arterial stiffness—even after accounting for common cardiovascular risk factors of hypertension, sex, coronary artery disease, smoking, medications, hypercholesterolemia and visceral fat area. Distensibility of the proximal ascending aorta was also impaired in those with impaired fasting glucose and diabetes.

These results provide new information regarding the impact of glycemic status on stress-related measures of aortic stiffening in persons at risk for, but not yet exhibiting, symptomatic heart failure. Future studies will need to determine whether stress-related elevations in arterial stiffness are related to onset and symptom severity of heart failure.

Vasu S, Morgan TM, Kitzman DW, Bertoni A, Stacey RB, Hamilton C, Chiles C, Thohan V, Hundley WG. Abnormal stress-related measures of arterial stiffness in middle-aged and elderly men and women with impaired fasting glucose at risk for a first episode of symptomatic heart failure. *J Am Heart Assoc.* 2015 Jan 14;4(1). PMID: 25589534 PMCID: PMC4330048

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## Treatment of Generalized Anxiety Disorder with Telephone-delivered Cognitive Behavioral Therapy in Older Adults

Generalized Anxiety Disorder (GAD), characterized by excessive and uncontrollable worry accompanied by restlessness, fatigue, poor concentration, irritability, muscle tension and/or sleep disturbance is one of the most common anxiety disorders in older adults. It is associated with poor quality of life, increased health care utilization, impaired memory, and possibly increased morbidity and mortality.



Gretchen A. Brenes, PhD

Although pharmacological treatments demonstrate some success in treating GAD, they are associated with some potentially serious side effects for older adults, and alternatives to pharmacotherapy are needed. Further, many older adults prefer psychotherapy to pharmacotherapy for the treatment of anxiety.

This study compared the effects of cognitive-behavioral therapy with nondirective supportive therapy, both delivered by telephone, on anxiety, worry, GAD symptoms and depressive symptoms. A total of 141 adults 60 years and older who lived in rural N.C. were randomized to one of the two treatments. Both treatments produced declines in anxiety, worry, GAD symptoms and depressive symptoms; however, cognitive-behavioral therapy resulted in greater improvements. Thus, cognitive-behavioral therapy delivered by telephone is superior to nondirective supportive therapy for reducing worry, GAD symptoms and depressive symptoms in older adults.

*Brenes GA, Danhauer SC, Lyles MF, Hogan PE, and Miller ME. Telephone-delivered cognitive behavioral therapy and telephone-delivered nondirective supportive therapy for rural older adults with generalized anxiety disorder: A randomized clinical trial. JAMA Psychiatry. 2015 Aug [Epub ahead of print]. PMID: 26244854*

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## **Improved Muscle Strength with Resistance Training Associates with Muscle-specific miRNAs in Older Adults**

Regular exercise, particularly resistance training (RT), is the only therapy known to consistently improve muscle strength and quality (force per unit of muscle) in older persons, but there is considerable variability in responsiveness to training. Identifying sensitive diagnostic biomarkers of responsiveness to RT may inform the design of a more efficient exercise regimen to improve muscle strength in older adults. MicroRNAs (miRNAs) are small non-coding RNAs that regulate gene expression. We aimed to understand if muscle-specific miRNAs are altered by RT and are associated with improved strength.

Levels of six muscle-specific miRNAs (miR-1, -133a, -133b, -206, -208b and -499) were measured in muscle tissue and blood plasma in seven older (age=70.5 ± 2.5 years) adults before and after five months of RT. MiRNAs differentially responded to RT; muscle miR-133b decreased, while all plasma miRNAs tended to increase. Percent changes in knee extensor strength with RT showed strong positive correlations with percent changes in muscle miR-133a, -133b, and -206 and with percent changes in plasma miR-499. Thus, RT alters muscle-specific miRNAs in muscle and plasma and these changes account for some of the variation in strength responses to RT in older adults.

*Zhang T, Birbrair A, Wang ZM, Messi ML, Marsh AP, Leng I, Nicklas BJ, Delbono O. Improved knee extensor strength with resistance training associates with muscle specific miRNAs in older adults. Exp Gerontol. 2015 Feb;62:7-13. PMID: 25560803; PMCID: PMC4314447*

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## Effects of Physical Activity vs Health Education on Cognitive Outcomes



Kaycee Sink, MD

Epidemiological evidence suggests that greater physical activity is associated with slower cognitive decline with age. However, evidence for an effect of physical activity on cognitive decline from randomized trials has been limited and mixed. This study analyzed cognitive outcomes in sedentary older (70-89 years) adults who were at risk for mobility disability and enrolled in the Lifestyle Interventions and Independence for Elders study (LIFE, n=1,635). Participants were randomly assigned to 24 months of moderate-intensity physical activity that included walking, light strength training and flexibility exercises or to a health education program of educational workshops and upper-extremity stretching.

The data showed that cognitive function remained stable over the two years of follow-up in both groups; thus the physical activity intervention did not result in better global or domain-specific cognition compared to health education. There was also no significant difference between groups in the incidence of MCI or dementia (13.2 percent in the physical activity group vs. 12.1 percent in the health education group). In sub-group analyses, those participants in the physical activity group who were  $\geq 80$  years old and those with poorer baseline physical performance had improvements in executive function compared with health education. Therefore, further research is needed to definitely determine whether physical activity in the more vulnerable oldest-old adults can enhance executive function and prevent or delay cognitive decline. Most importantly, since cognition was maintained in both groups, this study reinforces the benefits of engaging in stimulating physical, educational and social activities on cognition in older age.

Sink KM, Espeland MA, Castro CM, Church T, Cohen R, Dodson JA, Guralnik J, Hendrie HC, Jennings J, Katula J, Lopez OL, McDermott MM, Pahor M, Reid KF, Rushing J, Verghese J, Rapp S, Williamson JD; LIFE Study Investigators. Effect of a 24-Month Physical Activity Intervention vs Health Education on Cognitive Outcomes in Sedentary Older Adults: The LIFE Randomized Trial. *JAMA*. 2015 Aug 25;314(8):781-90. PMID: 26305648

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new treatments in humans and non-human primates. On the national stage, Dr. Mark Espeland and I are on the executive committee of the Targeting Aging with Metformin (TAME) Study Group, which is designing a clinical trial to determine whether this drug can slow the onset of multiple age-related chronic diseases in persons without diabetes. Its use is associated with many health benefits in persons with diabetes who take the drug, and there is information from rodent models indicating the extension of life.

There is great international interest in this study, and it will be featured in the upcoming National Geographic "Breakthrough" Documentary Series. The film titled "The Age of Aging" and directed by Ron Howard (Opie from the Andy Griffith Show) is scheduled to air in late November. It lays out the case that the most effective way to reduce the burden of age-related disease is to slow aging itself. The TAME study would be the first to attempt to do this in practice—a goal I would have said was unachievable 20 years ago.

# Newly Funded Grants

## Estrogen/GPR30 Modulation of Cardiac RAS Metabolism in Female Sex-Specific Hypertensive Heart Disease

**Dr. Leanne Groban** and members of the **Cardiac Aging Laboratory** are leading Project 3 (P01-HL051952-8267) and managing the Molecular and Biochemistry Core of a Program Project, “*Vaso-Hormonal Mechanisms in Hypertension*,” that was recently renewed by the National Heart Lung and Blood Institute (Ferrario: PI).

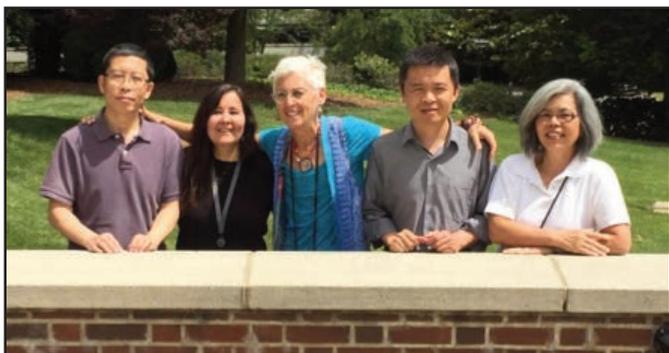
The overall focus of the project is to understand how changes in chymase/renin-angiotensin system (RAS) metabolism after estrogen loss triggers maladaptive pathways leading to fibrosis and left ventricular diastolic dysfunction. We hypothesize that expression and function of chymase and the angiotensin peptide Ang-(1-12) are higher in hearts of hypertensive animals with disrupted estrogen activity, and that these effects can be reversed with estrogen replacement and activation of its membrane receptor, GPR30. Indeed, hypertension and left ventricular diastolic dysfunction are seen more often in women with estrogen deficiency due to premature ovarian failure or menopause. Women develop diastolic heart failure twice as often as men; however, uncertainty regarding the action of estrogens on the heart persists and little is known about the influence of estrogens on RAS metabolism. Our innovative global systems biology approach integrates the use of physiological, biochemical, cellular and molecular methodologies; transgenic rodent and murine mod-

els; cultured mast cells and cardiomyocytes; and GPR30, and other estrogen-receptor-specific-gene silenced cells *in vitro*. The proposed research will unravel the link between estrogen loss and the pathways that contribute to diastolic dysfunction, and provide an explanation for the limited effectiveness of RAS-directed therapies in women with heart failure. Dr. Groban’s other co-investigators at Wake Forest involved in the P01 include **Drs. Safaraz Ahmad, Cheping Cheng, Carlos Ferrario and Jasmina Varagic**.

## Effect of Exercise Modality During Weight Loss on Bone Health in Older Adults

**Dr. Kristen Beavers** received a grant from the NIA (K01 AG047921) that will provide four years of protected time and mentored research training.

This K01 Mentored Research Scientist Development Award will allow Dr. Beavers to receive essential training and conduct a clinical study to clarify whether performing resistance or aerobic exercise during a weight loss treatment provides greater health benefits to older adults, while minimizing loss of bone mass and quality. Weight loss improves many clinical consequences of obesity, yet despite its benefits, dietary-induced weight loss is not routinely recommended for older adults, partially because of bone mass loss and the potential to worsen age-related risk of osteoporosis and fractures. The addition of either aerobic or resistance exercise training to a dietary weight loss therapy may attenuate reductions in bone mineral density; however, which type of exercise is most effective for maintaining bone density during weight loss is not known. Dr. Beavers will analyze areal bone density via dual-energy X-ray absorptiometry at clinically important sites of osteoporotic fracture (proximal femur and lumbar spine) at baseline and at 6- and 18-months of follow-up in a parent trial that randomized 252 older, obese individuals to a weight loss-only intervention or weight loss plus aerobic exercise or weight loss plus resistance exercise. The K01 resources will also allow for the measurement of biomarkers of bone turnover, as well as



*The Cardiac Aging Team, from left: Drs. Xuming Sun, Gisele Sudo (visiting professor- Brazil), Leanne Groban, Hao Wang and Ms. Marina Lin*

computed tomography imaging to quantify vertebral and femoral volumetric bone mineral density, morphometry and strength, in a subset of participants.

## Diet, ER stress and Osteoarthritis

**Dr. Raghu Yammani** recently received an R01 grant from the National Institute of Arthritis and Musculoskeletal and Skin Diseases (R01 AR066105).

The long-term goal of the project is to understand the mechanisms by which high-fat diet/obesity contributes to the pathogenesis of osteoarthritis (OA). The focus will be on mechanisms by which lipid toxicity promotes joint tissue destruction as accumulation of free fatty acids in other tissues has been shown to cause cellular dysfunction, inflammation and cell death.

The study will test the hypothesis that, in high-fat diet/obesity-induced OA, accumulation of excess lipid in joint tissues induces endoplasmic reticulum stress and activates an unfolded protein response, which promotes inflammation and cell death leading to destruction of joint tissues and development of OA. The project will also elucidate the mechanisms by which unfolded protein responses to a high-fat diet promote inflammation and cell death in the articular cartilage and meniscus.

The expected results from the supported experiments will establish the role of endoplasmic reticulum stress as a mechanistic link between a high-fat diet/obesity and OA and should identify new targets for improved therapeutic treatments for obesity-linked OA.

## Obesity-Related Epigenetic Changes and Type-2 Diabetes

**Drs. Jingzhong Ding** and **Yongmei Liu** received an R01 grant from the National Institute of Diabetes and Digestive and Kidney Diseases (R01 DK101921).

The increasing prevalence of obesity-related type-2 diabetes poses an enormous health challenge, especially to a society with an aging population—thus, new therapies that prevent diabetes need to be identified. Several lines of evidence indicate that disruption of certain aspects of intracellular cholesterol homeostasis can lead to pathological processes preceding type-2 diabetes. The overall goal of this project is to elucidate the temporal relationship between molecular features of the cholesterol metabolism gene network and onset of type-2 diabetes. The study will integrate genetic, epigenetic, transcriptional, and clinical data, and a 7-year follow-up, from 1536 adults in the Multi-Ethnic Study of Atherosclerosis (MESA) cohort, along with in vitro experimental studies in monocytes. With a novel focus on the cholesterol metabolism network in monocytes, using existing samples from a large, well-characterized multi-ethnic sample, this genome-wide DNA methylation and transcriptional study will cost-effectively take a crucial step forward in understanding molecular mechanisms associated with obesity-related type-2 diabetes, possibly leading to novel prevention or treatment strategies.

## Mitochondrial Bioenergetics in Heart Failure with Preserved Ejection Fraction and Optimized Intervention Strategies

**Dr. Anthony Molina** recently received a Clinical and Population Research Award from the American Heart Association.

Dr. Molina's laboratory will collaborate with Dr. Dalane Kitzman's research team to examine the mechanisms underlying skeletal muscle bioenergetic decline in patients with heart failure with preserved ejection fraction (HFpEF). Multiple lines of evidence suggest that non-cardiac factors contribute to reduced exercise capacity in older HFpEF patients. The proposed study will test the hypothesis that skeletal muscle bioenergetic decline, due to mitochondrial dysfunction, is a major contributor to exercise intolerance in these patients. Pilot data show that HFpEF is accompanied by impaired skeletal muscle mitochondrial biogenesis and dynamics, the processes that mediate mitochondrial

structure and the disposal of dysfunctional organelles by autophagy. This system, referred to as mitochondrial quality control (mitoQC), is critical for the maintenance of cellular bioenergetics. The proposed study will: 1) comprehensively examine bioenergetic differences in skeletal muscle samples from HFpEF patients compared to healthy controls; and 2) examine the role of mitoQC in exercise intolerance. The results of this study could shift the focus of HFpEF treatment to include strategies for improving mitochondrial function.

## Impaired Protein Synthesis Capacity and Development of Dementia in Alzheimer's Disease

**Dr. Tao Ma** recently received a New Investigator Research grant from the Alzheimer's Association. Concomitant with the rapid growth of the aging population, incidence of Alzheimer's disease (AD) is rising worldwide, becoming a global threat to public health. Meanwhile, no interventions have been discovered to either slow the progress of AD or cure

the disease, and recent clinical trials have not succeeded in identifying disease-modifying strategies. Thus, there is an urgent need to develop novel therapeutics targeting AD pathophysiology. The long-term goal of this project is to determine the relationship between new protein synthesis and AD-associated memory loss. The focus will be on the role of eukaryotic elongation factor 2 (eEF2), and its only kinase, eEF2K, in AD-associated synaptic failure and memory loss. The central hypothesis is that AD-associated impairments in synaptic plasticity and memory can be alleviated by restoring the capacity of new protein synthesis, via inhibiting eEF2K activity and thus eEF2 phosphorylation. To achieve the goal, Dr. Ma's group will utilize multiple cutting-edge techniques including molecular biology, synaptic electrophysiology, behavioral tests, transgenic mouse models, and confocal imaging. Completion of this project will provide insights into molecular mechanisms underlying synaptic and memory failure in AD, particularly a better understanding of the role of eEF2-related protein synthesis regulation for AD pathophysiology. This will lay the foundation for developing novel therapeutic avenues for AD and perhaps other dementia syndromes.

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## Awards & Accomplishments

**Raghu Yammani, PhD**, received the Wake Forest School of Medicine **2015 Early Career Investigator in Basic Sciences Award** for his research accomplishments.

**Dalane Kitzman, MD**, received the Wake Forest School of Medicine **2015 Established Investigator in Clinical Sciences Award** for his research accomplishments.

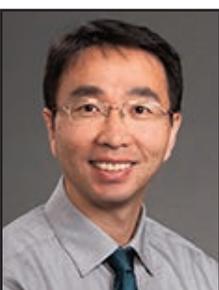
**Mark Espeland, PhD**, was inducted as a Fellow in the American Association for the Advancement of Science in recognition of distinguished scholarship and publications in statistical/clinical trial methods and clinical medicine.

# New Faculty

**Jennifer Gabbard, MD**, is a newly hired Assistant Professor in the Section on Gerontology and Geriatric Medicine as of August 2015. She completed training in Internal Medicine, Geriatric and Palliative Care medicine at the University of Arizona and a clinician-educator fellowship at Johns Hopkins University. Dr. Gabbard's clinical interests include integration of early palliative care into the management of advance chronic diseases, and care of comorbid chronically ill and frail older adults. Her research focuses on the role of palliative care in the management of chronic obstructive pulmonary disease and renal disease, along with enhanced quality assessment that will transcribe into improved health care quality and effectiveness.



**Rebecca Henderson, MD, PhD**, completed her clinical geriatric fellowship in the Section on Gerontology and Geriatric Medicine in 2014 and joined the Sticht Center on Aging as an Assistant Professor in July 2015. As a board-certified geriatrician, Dr. Henderson's clinical interests include the personalization of medical care for older adults. This informs her research interest in maintaining and maximizing physical function in the aging population. She was also recently awarded research support as an Emerging Scholar in the Wake Forest Pepper Center.



**Tan Zhang, MD, PhD**, joined the Sticht Center on Aging as an Assistant Professor in July 2015. Dr. Zhang is a molecular and cell biologist experienced in research on skeletal muscle protein and gene expression. During his post-doctoral training, he worked in cell signaling and mechanisms of skeletal muscle cell differentiation. His current research will focus on the biological and molecular mechanisms of aging skeletal muscle with the goal to elucidate the mechanisms that regulate muscle response to exercise interventions in older adults.

**Timothy Hughes, PhD**, completed training in neuroepidemiology at the University of Pittsburgh before training as a post-doctoral fellow in the Alzheimer's research group at the Sticht Center on Aging for the past two years. In February 2015, he was promoted to the faculty as an Instructor in the Section on Gerontology and Geriatric Medicine. Dr. Hughes's research examines the relationships between subclinical cardiovascular disease, metabolism and brain health in older adults. The goal of this work is to identify modifiable risk factors for Alzheimer's disease and other dementias that may help to delay or prevent cognitive problems in older adults.



**Tao Ma, PhD**, joined the Sticht Center on Aging as an Assistant Professor in August 2014. Dr. Ma received his PhD in Neuroscience from Mount Sinai School of Medicine at New York. He completed his post-doctoral training at Weill Cornell Medical College and New York University. Dr. Ma is a neuroscientist with specialization in learning, memory and synaptic plasticity. His research focuses on novel molecular mechanisms underlying pathophysiology of Alzheimer's disease (AD) and subsequently to identify potential therapeutic targets or biomarkers for AD and other aging-related cognitive impairments. Dr. Ma is the PI of a National Institute of Aging K99/R00 research grant and the Alzheimer's Association New Investigator award.

# Community Outreach

The **Sticht Center Community Advisory Board** will be celebrating its one-year anniversary in October.

When **Ben Wilson**, a charter Community Advisory Board member, was asked why it was important to him to participate in this effort he replied, “I have been involved in research studies at the Sticht Center for the past 10 years, so I feel that I have a good understanding of the amazing work that is being done there.” He continues, “being involved on this Board gives me a chance to support their ongoing efforts, as well as be a spokesperson for them in the community.”

“Frankly, I’m a bit surprised that the folks at the Sticht Center aren’t having to turn people away for their research studies,” Mr. Wilson adds. “Participating in their studies has many benefits, that include great care for the participant as well as knowing that we are making a difference for our future generations.”



*Ben Wilson, charter member of the Sticht Center Community Advisory Board*

“Having community leaders, such as Mr. Wilson, actively involved in the direction of the Sticht Center helps ensure that our programs remain meaningful and relevant for those we serve,” said **Stephen Kritchevsky, PhD**, Director, Sticht Center on Aging.

**Kaycee Sink, MD, MAS**, participated in the North Carolina Institute of Medicine’s Task Force on Alzheimer’s Disease and Related Dementia on June 26, 2015.

Her presentation, “Access to Care: one perspective,” examined the existing challenges and obstacles to accessing care from one patient’s, (and her family’s) experiences.

Her presentation focused on the current availability of specialized, geriatric psychiatry beds throughout North Carolina and the critical need for more. She also addressed the statewide shortage of physicians with speciality training in Dementia diagnosis and care.

Her recommendations included:

- ◆ Create programs to increase the knowledge

and competence among primary care providers for dementia-related assessment and care.

- ◆ Increase the number of Acute Care for the Elderly (ACE) units in hospitals to care for acutely ill patients with Alzheimer’s disease.
- ◆ Improve access to adult day centers.



*Kaycee Sink, MD, MAS*

# Education and Training

## Research Fellow Joins Aging Center

During the summer of 2015, **Jamie Justice, PhD**, joined the Sticht Center on Aging as a research fellow. She is supported by the Center's Ruth L. Kirschstein National Research Service Award Institutional Research Training Grant from the National Institute on Aging. Dr. Justice will work with Drs. Steve Kritchevsky and Carol Shively to identify novel biological and behavioral factors that contribute to physical function decline and to test new or repurposed compounds with potential to slow the trajectory of age-related functional decline using an translational approach from non-human primates to human clinical trials. Dr. Justice joins us as a third-year post-doctoral student with prior training from the Neurophysiology of Movement and Integrative Physiology of Aging Laboratories at the University of Colorado, Boulder.

## Clinician-researchers selected as research scholars through OAIC Research Career Development Core

**Dr. Candace Parker-Autry** specializes in Female Pelvic Medicine and Reconstructive Surgery and plans to examine the relationship between physical function decline and urinary incontinence. Her pilot study is focused on testing a synergistic exercise intervention that targets the pelvic floor, core, and lower extremities to treat both urinary incontinence and functional decline in older women.

**Dr. Sunghye Kim** is evaluating the role of preoperative identification of patients at risk for adverse functional outcomes and tailored preoperative and postoperative care plans to prevent or minimize adverse postoperative functional outcomes. She was recently awarded a Grants for Early Medical/Surgical Specialists' Transition to Aging Research (GEMSSTAR) grant to study the effects of aquatic prehabilitation in patients with osteoarthritis on knee arthroplasty outcomes.

**Dr. Rebecca Henderson** is a geriatrician conducting research aimed at targeting interventions to specific populations or personalizing treatments to individuals to maximize functional gains. She is currently conducting a pilot study focused on testing frequency and intensity of follow-up required to extend functional gains following a resistance exercise training intervention.

# 2015 Fall / Winter Conference on Aging Schedule

Second & Fourth Wednesdays 1:30 – 2:30 pm Sticht Center Auditorium

Date		Speaker	Title/Topic	Host
Sept 2015	9	<b>Cheryl Bushnell, MD, MHS</b> Professor of Neurology Director, Wake Forest Baptist Stroke Center	A Pragmatic Clinical Trial of COMprehensive Post-Acute Stroke Services (COMPASS): A New Model of Post-Acute Stroke Care	Geriatrics
	23	<b>No Conference on Aging</b>		
	25	<b>William R. Hazzard, MD,</b> <b>Translational Research in</b> <b>Aging Symposium</b> 8 am – 3 pm <b>Salemtowne Retirement</b> <b>Community</b>	Nutritional Strategies for Aging Well	Geriatrics/ Translational Science Institute
	30	<b>Jeffrey N. Katz, MD, MS</b> Professor of Medicine and Orthopaedic Surgery, Harvard Medical School Professor of Epidemiology and Environmental Health at Harvard School of Public Health	Osteoarthritis in Older Persons: Management Considerations	Geriatrics/ WFU Health & Exercise Science
Oct 2015	14	<b>Stephen B. Kritchevsky, PhD</b> Professor, Section on Gerontology & Geriatric Medicine Department of Internal Medicine Director, Sticht Center on Aging	Targeting Aging with Metformin	Geriatrics
	28	<b>Barbara J. Nicklas, PhD</b> Professor, Section on Gerontology & Geriatric Medicine Department of Internal Medicine	Intervening on Sedentary Behavior to Prevent Weight Regain in Older Adults	Geriatrics

Please note the date  
of this additional  
Conference on Aging  
guest speaker:

Date		Speaker	Title/Topic	Host
Nov. 2015	11	<b>GSA Presentations</b>	Recent findings in Gerontology from the Sticht Center on Aging to be presented at the 2015 Gerontological Society of America Annual Meeting	Geriatrics
	25	<b><i>No Conference on Aging Due to the Thanksgiving Holiday</i></b>		
Dec. 2015	9	<b>Andrew Ow, MD</b> Clinical Fellow, Section on Gerontology and Geriatric Medicine Department of Internal Medicine	Clinical Case	Geriatrics
		<b>Raghunatha Yammani, PhD</b> Associate Professor, Section on Molecular Medicine Department of Internal Medicine	Unfolded Protein Response (UPR) Signaling and Osteoarthritis	
	23	<b><i>No Conference on Aging Due to the Holiday</i></b>		

Return Service Requested

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