

# COMMONWEALTH OF VIRGINIA

## Alzheimer's and Related Diseases Research Award Fund

### 2020-2021 ALZHEIMER'S RESEARCH AWARD FUND RECIPIENTS ANNOUNCED

The Alzheimer's and Related Diseases Research Award Fund (ARDRAF) was established by the Virginia General Assembly in 1982 to stimulate innovative investigations into Alzheimer's disease and related disorders along a variety of avenues, including the causes, epidemiology, diagnosis, and treatment of the disorder; public policy and the financing of care; and the social and psychological impacts of the disease upon the individual, family, and community. The ARDRAF competition is administered by the Virginia Center on Aging in the College of Health Professions at Virginia Commonwealth University. Questions about the projects may be directed to the investigators or the ARDRAF administrator, Dr. Constance Coogle ([ccoogle@vcu.edu](mailto:ccoogle@vcu.edu)).

**Hunter Holmes Kathryn Holloway, MD, and Mark Baron, MD**

**McGuire VA Medical Center** *Deep Brain Stimulation of the Nucleus Basalis of Meynert: Using electricity to regenerate and restore cognitive function in dementia rodent model*

Deep brain stimulation (DBS) has resulted in significant quality of life and survival in Parkinson's disease (PD). The electrical stimulation of a diseased circuit in the brain allows us to overcome some of the deficiencies in that circuit with resultant symptom improvement. In PD this has meant that PD patients stay active and therefore live longer. The investigators are turning to a cognitive circuit in the brain to reactivate this failing function by stimulating the nucleus basalis of Meynert, which waters the cortex with growth factors and chemicals that promote learning. The investigators plan to study this in an animal model of dementia where a chemical is used to degenerate the nucleus and they utilize DBS to revitalize it. They plan to study the preservation of the dying neurons, neurogenesis, or birth of new nerve cells, and the ability of the rats to recover lost cognitive abilities. *(Dr. Holloway may be contacted at 804-828-9465, [kathryn.holloway@vcuhealth.org](mailto:kathryn.holloway@vcuhealth.org); Dr. Baron may be contacted at 804-828-9350, [mark.baron@vcuhealth.org](mailto:mark.baron@vcuhealth.org))*

**UVA Meghan Mattos, PhD, Justin Mutter, MD, MSc, and N. Aaron Yao, PhD**  
*Interprofessional Home-Based Medical Care and Education Program Serving Rural Adults Living with Dementia*

Homebound persons with dementia require healthcare services that increase with physical and cognitive changes over time. Due to medical and psychosocial complexity, older persons with dementia are often caught in a web of fragmented care, such as frequent transitions in health care settings and recurrent hospitalizations. Virginia at Home (VaH) is an innovative program at UVA Health for homebound older persons with dementia and multimorbidity that brings together an interprofessional VaH team partnering with the patients' primary care providers, home health agencies, and caregivers to optimize care in the home through regular house calls, telehealth visits, caregiver support, and advanced care planning. The investigators will examine the impact of the VaH program on care experiences through questionnaires and interviews with persons with dementia and their caregivers and interviews with community partners and the interdisciplinary VaH team. The importance of this project lies in the delivery of quality, person-centered care in the home to ever-increasing, at-risk groups of aging persons with dementia and their caregivers. *(Dr. Mattos can be contacted at 434-243-3936, [ms2bv@virginia.edu](mailto:ms2bv@virginia.edu); Dr. Mutter can be contacted at 434-982-6282; Dr. Yao can be contacted at 434-243-4874, [ayao@virginia.edu](mailto:ayao@virginia.edu))*

**UVA Maureen Metzger, RN, PhD, Ishan Williams, PhD, FGSA, and Emaad Abdel-Rahman, MD, PhD**  
*A Study Describing the Unique Needs of Caregivers of Patients with Both End-Stage Kidney Disease and Cognitive Impairment*

Despite widespread acknowledgment that caregivers of patients with cognitive impairment superimposed on another chronic life-limiting illness, such as end-stage kidney disease (ESKD), are at-risk for numerous adverse outcomes, there are currently few available resources for them. In fact, despite recommendations, most dialysis centers providing care to patients with ESKD do not routinely screen for cognitive impairment or assess caregiver challenges. Lack of screening results in missed opportunities to identify patients who may benefit from additional evaluation and intervention. Furthermore, without an adequate understanding of the prevalence of cognitive impairment among patients with ESKD and its impact on caregivers, it is nearly impossible to develop effective interventions. This study will shed light on possible barriers to routine screening of cognitive function in patients with ESKD and the unique challenges confronted by their caregivers. Feasibility and acceptability of cognitive screening will be assessed using percentages of patients who completed screening and tracking resource

utilization associated with screening. Structured interviews and questionnaires completed by caregivers of patients with and without cognitive impairment will highlight the unique experiences of caregivers of patients with ESKD and cognitive impairment. Findings will inform the development of interventions targeting the most significant barriers to screening and the most pressing needs of this vulnerable population. (*Dr. Metzger can be contacted at 434-924-0112, [mjm9cd@virginia.edu](mailto:mjm9cd@virginia.edu); Dr. Williams can be contacted at 434-924-0480, [icw8t@virginia.edu](mailto:icw8t@virginia.edu); Dr. Abdel-Rahman can be contacted at 434-924-1984, [ea6n@hscmail.mcc.virginia.edu](mailto:ea6n@hscmail.mcc.virginia.edu)*)

VCU

Ana Mills, PsyD, and Bridget Xia, SLP

*The Feasibility of an Interdisciplinary Rehabilitation Program for Supporting Cognitive Health in Older, Low-Income Adults*

Interdisciplinary interventions targeting modifiable health behaviors, such as the Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER), have been shown to improve cognitive outcomes in older adults. However, implementing a similar program in an urban and economically underserved population remains challenging due to barriers such as low health literacy, lack of transportation, and limited financial resources. This study will examine the feasibility of a collaborative, interdisciplinary rehabilitation program supporting cognitive wellness in older, low-income adults, a population that is known to be at greater risk for developing dementia. The study will be based on long-standing community partnerships between VCU Health, Sheltering Arms Rehabilitation Center, and the Hunter Holmes McGuire VAMC and will provide testing and intervention services that target modifiable health behaviors such as exercise, nutrition, sleep, cognitive stimulation, and stress management. The feasibility study will generate crucial information needed to develop a successful large-scale randomized controlled trial examining the impact of interdisciplinary rehabilitation interventions on health behavior and cognitive functioning in older adults at risk for Alzheimer's disease and related dementias. (*Dr. Mills can be contacted at 804-327-1166, [ana.mills@vcuhealth.org](mailto:ana.mills@vcuhealth.org)*)

VCU

Dong Sun, MD, PhD, Xiang-Yang Wang, PhD, and Shijun Zhang, PhD

*TBI-induced immune/inflammatory response to the development of Alzheimer's disease*

Thus far, the mechanisms by which traumatic brain injury (TBI) contributes to the development of Alzheimer's disease (AD) and dementia remain elusive. In both TBI and AD, neuroinflammation is the common and essential player in their pathological progression. Furthermore, inflammatory genes associated with the innate immune system have been recognized as risk factors for both TBI and AD. Recent studies have identified that the NLRP3 inflammasome is a critical multiprotein platform that tightly regulates the innate immune response and the production of pro-inflammatory cytokines. Notably, emerging evidence has established that TBI induces activation of NLRP3 inflammasome in the brain, and NLRP3 inflammasome is critical for the onset of AD. The investigators speculate that TBI changes the innate immune response thus accelerating the development of AD, and modulating the immune response will have a neuroprotective effect on the development of AD. To test their hypotheses, the investigators will use AD triple transgenic mice combined with manipulation of NLRP3 inflammasome following a repetitive mild TBI. They believe that the results of this study will likely point to the critical role of TBI-induced changes of immune/inflammatory response in the development of AD, and will have a significant impact in TBI and AD research in novel therapeutic advancement. (*Dr. Sun can be contacted at 804-828-1318, [dong.sun@vcuhealth.org](mailto:dong.sun@vcuhealth.org); Dr. Wang can be contacted at 804-628-2679, [xiang-yang.wang@vcuhealth.org](mailto:xiang-yang.wang@vcuhealth.org); Dr. Zhang can be contacted at 804-628-8266, [szhang2@vcu.edu](mailto:szhang2@vcu.edu)*)

#### *2020-2021 ARDRAF Awards Committee*

The Virginia Center on Aging acknowledges the dedicated work of this independent committee of subject matter experts and gratefully thanks them for contributing their time and expertise.

Paul Aravich, PhD

Eastern Virginia Medical School

Anne Brown, PhD

Virginia Tech

Severn Churn, PhD

National Institute of Neurological Disorders and Stroke

Jorge Cortina, MD, DFAPA

UniCare Health Plan of West Virginia

J. William Kerns, MD

VCU-Shenandoah Valley Family Practice Residency Program

Christianne Nesbitt, DNP, RN, FNP-BC

Old Dominion University

Beverly Rzigalinski

Virginia Tech

Ning Zhang, PhD

Virginia Commonwealth University