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## **ALZHEIMER'S ASSOCIATION AWARDS GRANTS TO MASSACHUSETTS-BASED RESEARCHERS**

WALTHAM, MA – The Alzheimer's Association announced it has awarded grants to four Massachusetts-based researchers to help uncover new insights into Alzheimer's and dementia. The newly-awarded grants are part of the Alzheimer's Association International Research Grant Program (IRGP), which funds investigations to advance the understanding of Alzheimer's disease, identify new treatment strategies, improve care for people with dementia, and further knowledge of brain health and disease prevention.

The four research projects will examine sex differences in risk for Alzheimer's disease dementia, group home telemedicine interventions to support those with dementia, the processes underlying the protective effects of higher physical activity and lower vascular risk with respect to cognitive decline, and neuroimaging and blood-based biomarkers to predict dementia in persons with cerebrovascular disease. These studies will be funded over the next three years with a total of \$579,559 in funding.

"The funding awarded to local researchers through our International Research Grants Program ensures that we will continue to have an impact on the quest for an effective treatment and cure for this devastating disease," said Jim Wessler, CEO of the Alzheimer's Association Massachusetts/New Hampshire Chapter.

In 2019, the Alzheimer's Association awarded nearly \$1.2 million in research funding across Massachusetts and New Hampshire, bringing the total to \$9.75 million in active funding to local leading research institutions.

### **Jeremy Pruzin, M.D., Boston, MA**

#### *Modulation of Imaging Biomarkers by Activity Level and Vascular Risk in ADAACSF*

Many modifiable factors influence resilience to, and susceptibility of cognitive decline associated with Alzheimer's disease and brain amyloid. The goal of my research is to better understand the processes underlying the protective effects of higher physical activity and lower vascular risk with respect to cognitive decline and to determine how these protective factors interact with Alzheimer disease pathology in the brain. Through the Harvard Aging Brain Study, we are able to examine the interaction of physical activity and vascular risk with Alzheimer's disease molecular pathology using different imaging modalities including structural MRI, functional MRI, amyloid PET, and tau PET in a group of clinically characterized individuals who undergo yearly neuropsychological testing and clinical follow up. Characterizing how and to the degree that readily modifiable factors like physical activity and vascular risk can attenuate cognitive decline will help promote and develop important, actionable, low-risk interventions of clinical benefit currently available to all persons. Furthermore, understanding the mechanism and pathophysiology responsible for the benefits seen from increasing physical activity and minimizing vascular risk deepen understanding of the complex disease process with the potential to elucidate practical, novel, and ready to implement treatment approaches.

**Rachel Buckley, Ph.D., Massachusetts General Hospital, Boston, MA**

*Sex, tau accumulation, and the role of menopause in AD pathogenesis*

Dr. Rachel Buckley studies sex differences in risk for Alzheimer's disease dementia with the Harvard Aging Brain Study under the mentorship of Dr. Reisa Sperling. Specifically, her work focuses on neuroimaging markers of amyloid and tau in the brain and how these markers might differ between men and women. Her earlier work found that healthy older women tend to show similar levels of amyloid to men, but that when brain amyloid levels are abnormal, women show higher levels of tau than men. This might suggest a greater vulnerability to tau in women that deserves further exploration. With support from the Alzheimer's Association Dr. Buckley will now examine whether healthy older women also show faster changes in tau accumulation than men, and to what extent this might impact future memory performance. She will also try to understand the role of sex hormonal changes during menopause to explain some of these sex differences in tau levels. Over the next three years, Dr. Buckley will partner with both the Harvard Aging Brain Study (Massachusetts General Hospital) and Framingham Heart Study (Boston University) to address these questions.

**Steven Shirk, Ph.D., Bedford VA Research Corporation, Inc., Bedford, MA**

Group telemedicine to improve the lives of dementia dyads

The >16 million Americans who are informal caregivers for people with Alzheimer's and other dementias face barriers to receiving adequate education to manage the disease. This lack of adequate training negatively impacts the wellbeing of caregivers and care-recipients alike. We will investigate whether an effective group educational intervention can be delivered via video into the home of caregivers to improve wellbeing. Informal caregivers of 40 individuals with Alzheimer's disease will undergo a group home telemedicine educational intervention. With recent changes in regulations around both telemedicine reimbursement and newly available video visit options for participation in a group from home, now is the time to begin laying the groundwork for the further development interventions necessary to reach this growing population. The study results will be foundational for the development of group home telemedicine interventions to support those with dementia and their informal caregivers, to ensure the highest quality of life.

Most patients with Alzheimer's disease (AD) are cared for by unpaid family members with no professional caregiver training. Most individuals diagnosed with AD will experience at least one neuropsychiatric symptom (NPS) throughout the disease. Literature suggests that NPSs are more distressing to caregivers than cognitive and functional decline, yet caregivers often lack the training required to manage NPS best. These challenges can undermine the wellbeing of both caregivers and persons with AD alike, eventually leading to placement outside of the home. The introduction of telemedicine can circumvent many of the barriers to programs intended to assist dementia dyads. For this project, over 2 years, we will lay the groundwork for an evidence-based, manualized, 5-session group CARE program for the management of NPS with 40 dyads via telehealth technology. By helping caregivers better manage the NPS of AD, we can improve the lives of both the caregiver and the person with AD.

**Hugo Aparicio, M.D., Boston University School of Medicine, Boston, MA**

*Blood biomarkers for prediction of vascular cognitive impairment & dementia*

The increasing prevalence of Alzheimer's disease and related dementias is a public health crisis that compels research for prevention. Cerebrovascular disease is a major cause of and contributor to dementia; however, we cannot currently identify which patients with cerebrovascular disease will progress to cognitive impairment. Dr. Aparicio's projects will investigate neuroimaging and blood-based biomarkers to predict dementia in persons with cerebrovascular disease, with the goal of identifying biomarkers to stratify high-risk patients who may benefit from early efforts to prevent and treat cognitive decline. The research will use previously collected blood biomarker, magnetic resonance imaging (MRI), and cognitive

testing data from Boston University's Framingham Heart Study and BU's Alzheimer's Disease Center (ADC). The Framingham Heart Study is a longitudinal cohort study that follows participants for diagnoses of stroke, mild cognitive impairment, and dementia and the BU ADC clinical cohort follows participants who are free of cognitive symptoms, as well as those with mild cognitive impairment and dementia.

Dr. Aparicio and his team will, (1) determine associations of neurofilament light chain, total tau, and YKL-40 proteins (blood biomarkers of neuron injury and inflammation), with evidence of white matter injury on brain MRI that may contribute to dementia; and (2) assess if a set of blood biomarkers (e.g., inflammatory, thrombotic, or hormonal signaling proteins) can be used with brain MRI to predict decline in memory, processing speed, or executive function on cognitive testing, or predict clinical onset of mild cognitive impairment or dementia in persons with cerebrovascular disease.

This work will characterize biomarkers of cerebrovascular disease, using cutting-edge laboratory and MRI techniques, and develop a biomarker panel to improve our ability to identify and treat individuals at highest risk for vascular cognitive impairment and dementia.

### **Alzheimer's Association®**

The Alzheimer's Association is a worldwide voluntary health organization dedicated to Alzheimer's care, support and research. Its mission is to lead the way to end Alzheimer's and all other dementia — by accelerating global research, driving risk reduction and early detection, and maximizing quality care and support. Visit [alz.org](http://alz.org) or call 800.272.3900.

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