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FAU Researchers Receive Grants to Combat Alzheimer's Disease in Florida

FAU Awarded \$641,818 from the Ed and Ethel Moore Alzheimer's Disease Research Program

April 15, 2021 – Four researchers from Florida Atlantic University's Schmidt College of Medicine and Charles E. Schmidt College of Science have received grants totaling \$641,818 from the Florida Department of Health's Ed and Ethel Moore Alzheimer's Disease Research Program. Award recipients also represent the FAU Brain Institute, which advances neuroscience research, promotes neuroscience education,

facilitates translational research discoveries and enhances public awareness, and the FAU Institute for Human Health and Disease Intervention (I-HEALTH), created to advance health through pioneering research and practical applications.

“We are excited to receive these important grants from the Ed and Ethel Moore Alzheimer’s Disease Research Program,” said Janet Robishaw, Ph.D., senior associate dean for research and chair of the Department of Biomedical Science in the Schmidt College of Medicine. “Using collaborative and multi-disciplinary approaches, our researchers are striving to understand basic biological mechanisms and cultivate new strategies to combat Alzheimer’s disease in South Florida and beyond through patient-centered research and discovery.”

The Ed and Ethel Moore Alzheimer’s Disease Research Program was established to fund research aimed at preventing or finding a cure for Alzheimer’s disease (AD). Objectives include improving the health of Floridians by researching better prevention, diagnoses, treatments and cures for AD, expanding the foundation of knowledge relating to prevention, diagnosis, treatment and cures, and stimulating economic activity in Florida in areas related to AD research.

“About 580,000 people aged 65 and older are living with Alzheimer’s disease in Florida and that number is expected to soar to 720,000 by 2025. Alzheimer’s disease is the sixth leading cause of death in Florida and more than 527,000 family caregivers bear the burden of the disease in our state,” said Randy Blakely, Ph.D., executive director, FAU Brain Institute. “These grants from the Ed and Ethel Moore Alzheimer’s Disease Research Program will help to propel our researchers’ pioneering work.”

More than 5 million Americans are living with AD and as many as 16 million will have the disease in 2050. The cost of caring for those with AD and other dementias totaled about \$277 billion in 2018, increasing to \$1.1 trillion (in today’s dollars) by mid-century. Nearly one in every three seniors who dies each year has AD or another dementia.

“Our researchers have received these grants from the Ed and Ethel Moore Alzheimer’s Disease Research Program to advance scientific research and clinical care for one of the most complex diseases that impacts our aging patient population in Florida and elsewhere,” said Gregg Fields, Ph.D., executive director, FAU I-HEALTH. “As Alzheimer’s disease and other related dementias continue to rapidly rise, research is imperative to help us understand what causes the disease, help us develop effective treatments, improve patient care, and ultimately one day find a cure.”

The FAU projects supported by the Ed and Ethel Moore Alzheimer’s Disease Research Program are:

- “A Novel Therapeutic Strategy for Alzheimer’s Disease”** (Qi Zhang, Ph.D., research assistant professor of biomedical science, FAU’s Schmidt College of Medicine, and a member of the FAU Brain Institute): To date, clinical trials for drugs for AD based on the amyloid hypothesis have been lackluster, leading to a renewed search for alternative theories and different pathogenic factors. Extensive genome-wide association studies of sporadic AD have consistently identified genetic risk factors associated with cholesterol (Chol) metabolism and cell membrane trafficking. More and more evidence has shown that neuronal Chol deficiency, rather than surfeit, is a causative factor for aging-associated brain disorders, including AD. For this project, Zhang will focus on rebalancing brain cholesterol, especially at nerve terminals, to reduce and even reverse neurodegeneration. By combining the power of induced human pluripotent stem cells (hiPSC) and novel mouse models, this preclinical project will provide new pathological insights as well as novel therapeutic strategies for AD.

- “Role of Hypoxia in Triggering Alzheimer’s Disease Pathogenesis: Sulindac as a Potential Therapeutic Intervention”** (Howard Prentice, Ph.D., a professor of biomedical science, FAU’s Schmidt College of Medicine, and a member of the FAU Brain Institute and FAU I-HEALTH): Oxidative damage and mitochondrial dysfunction are key factors in neuronal hypoxic injury and in development of AD; however,

there is no effective therapy that targets these mechanisms. Prentice previously demonstrated that the non-steroidal anti-inflammatory drug (NSAID) sulindac protects the myocardium against hypoxia/ischemia through the mechanisms of ischemic preconditioning, independent of its NSAID activity. For this project, Prentice and his team are investigating whether sulindac will protect against A-Beta aggregation and dysfunctional tau phosphorylation using an in vitro cell culture and an in vivo transgenic mouse model of AD. If successful, these studies will be the first to show the therapeutic potential of sulindac in slowing down the progression of AD.

•**“The Cellular Basis for Neurodegeneration in a Drosophila Model of Alzheimer’s”** (Alex Keene, Ph.D., a professor of biological sciences, FAU’s Charles E. Schmidt College of Science, and a member of FAU I-HEALTH): Powerful genetics in the fruit fly, *Drosophila melanogaster*, allow for manipulating gene function in defined neural circuits. This project will directly address the mechanisms of neurodegeneration and will use genomic approaches and behavioral screening to identify novel genetic regulators of neurodegeneration in AD models. Given the genetic conservation associated with aging and plasticity between fruit flies and mammalian systems, these findings have potential to identify conserved regulators of AD-mediated neurodegeneration that can be further investigated in mammalian models.

•**“Postdoctoral Research Fellowship in Neuropsychology and Brain Biomarkers of Abnormal Aging”** (Idaly Velez-Urbe, Ph.D., FAU’s Charles E. Schmidt College of Science, and Monica Roselli, Ph.D., a professor and associate chair of psychology, FAU’s Charles E. Schmidt College of Science, and a member of the FAU Brain Institute and FAU I-HEALTH): There is a scarcity of trained researchers in clinical neuropsychology who can evaluate and diagnose Hispanics in a culturally sensitive manner, including cognitively normal individuals and those presenting early signs of neurodegenerative diseases. Furthermore, standard clinical research trainings do not emphasize the role of cultural factors, quality and level of education, and language experience (i.e., bilingualism) in

assessments and interventions of the progression of abnormal aging. Moreover, ethnic minorities are underrepresented as professionals within the field of neuropsychology and as faculty in doctoral programs in psychology. This FAU project has been designed to target this disparity. Velez-Uribe's investigative work will focus on the complex interplay between bilingualism, cultural factors, cognitive decline, and biological markers of dementia.

About Florida Atlantic University:

Florida Atlantic University, established in 1961, officially opened its doors in 1964 as the fifth public university in Florida. Today, the University serves more than 30,000 undergraduate and graduate students across six campuses located along the southeast Florida coast. In recent years, the University has doubled its research expenditures and outpaced its peers in student achievement rates. Through the coexistence of access and excellence, FAU embodies an innovative model where traditional achievement gaps vanish. FAU is designated a Hispanic-serving institution, ranked as a top public university by U.S. News & World Report and a High Research Activity institution by the Carnegie Foundation for the Advancement of Teaching. For more information, visit www.fau.edu.

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