

ADRC Begins Funding Dementia Research Across Utah

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ADRC Director Beth Fauth recognizes the importance of providing support to Alzheimer's patients and their caregivers.

With the Alzheimer's Disease and Dementia Research Center (ADRC) entering its second year, the state-funded center at Utah State University is now funding Alzheimer's and dementia research across the state. In its first year, the ADRC financially supported research projects only at USU, with the goal of opening statewide applications in its second year. The purpose of the ADRC has always been to distribute funds to support a variety of projects throughout Utah. "We are ready to establish these contracts with other universities," says Elizabeth Fauth, director of the ADRC. "State funding is ongoing and the ADRC is looking forward to facilitating many more of these research opportunities every year."

For 2024, in addition to USU, researchers from the University of Utah and Brigham Young University were awarded ADRC pilot grants. "There are many talented researchers in Utah and we're excited to support studies at multiple universities," Fauth says. "Expanding the number of researchers the center supports and reaching a wider range of scientific disciplines helps us have even greater impact on understanding, preventing, and treating Alzheimer's and related dementias in Utah."

To receive a grant from the ADRC, scientific reviewers assessed the grant proposals, which encompassed a variety of research approaches and scientific disciplines. The ADRC prioritized smaller-to-midsize grants so funds could be spread among many pilot projects, as opposed to awarding funds to one or two large projects. A sample of funded projects from outside USU is described here.



Dr. Vincent Koppelmans, research assistant professor in the Department of Psychiatry at the University of Utah

U of U Research: Improving Motor Function for Early Alzheimer's Patients

Vincent Koppelmans, a research assistant professor in the Department of Psychiatry at the University of Utah, will study the effects of the drug Lecanemab on motor behavior, brain activity, and brain connectivity. The drug was recently approved by the FDA to treat Alzheimer's Disease.

Because Lecanemab removes amyloid plaque buildup in the brain, it can slow the progression of the disease in someone who suffers from mild Alzheimer's, but little is known about the drug's impact on motor function. That's where Koppelmans' research comes in. He is hopeful that as Lecanemab removes the plaque buildup, he will see a positive effect on motor function for patients with mild cognitive impairment and early Alzheimer's.

"Determining to what extent Lecanemab affects the neural circuitry and how that impacts behavioral performance is a crucial first step in optimizing treatment," he said. Koppelmans believes that a more thorough understanding of how this drug impacts movement could lead to functional improvements in mild cognitive impairment and early Alzheimer's.

Koppelmans' interest in Alzheimer's and dementia began when he was collecting data on cognitively impaired elderly people for his thesis project. His research required him to visit nursing homes across Amsterdam. "I would visit participants in their rooms and administer a battery of memory, attention, motor, and other tests,"

he explained. “I was intrigued by the cognitive problems that the participants presented during testing as well as in conversation, and I wanted to understand them from a neural perspective.” As a neuroscientist in motor control, Koppelmans continues to focus on understanding how problems in the brain impact people’s cognition and movement in later life.



Dr. Xiaodong Ma, assistant professor in the Department of Radiology and Imaging Sciences at the University of Utah

U of U Research: Detecting Early Vascular Changes in the Brain through MRI

Xiaodong Ma, assistant professor in the Department of Radiology and Imaging Sciences at the University of Utah, will be using MRI and image analysis techniques to measure blood vessel changes in the brain. “I learned from my mentor Dr. Chun Yuan, a leader in the vascular imaging field, that half of dementia patients also have vascular diseases, indicating they may have what we call mixed dementia. But people do not know why,” said Ma. “That has inspired me to focus my research on studying this challenging and exciting field.”

Mixed dementia patients commonly experience blood vessel changes, which later lead to white matter lesions. These lesions predict an increased risk of stroke, dementia, and death and are becoming an important part of diagnoses. Ma and his team will develop comprehensive vascular imaging markers that can identify changes in vessels before the lesions occur. Such markers may help to detect vascular changes related to early dementia allowing for treatment that may slow the progression of the disease.

“As an MRI physicist, I know how much MRI can help better diagnose and evaluate brain diseases,” said Ma. “I’ve been working as a biomedical engineer for 12 years to develop MRI techniques, and the most exciting moment for my career is not about developing the technology itself, but the successful application of the technology to help patients.”



Dr. Jonathon Hill and Dr. Timothy Jenkins are associate professors in the Department of Cell Biology and Physiology at Brigham Young University.

BYU Research: Developing a Blood Test to Detect Brain Degeneration

Jonathon Hill and Timothy Jenkins, associate professors in the Department of Cell Biology and Physiology at Brigham Young University, will be developing a cost-effective, non-invasive blood test that can detect degeneration in the brain. Neurodegeneration, which is a core feature of dementia, has been shown to begin decades before symptoms are detected.

The blood test will detect the levels of cell-free DNA (cfDNA) in a patient’s blood. For healthy people, all cells release cfDNA into the blood, which can’t be detected in the bloodstream. But neurodegeneration significantly increases the amount of cfDNA that is released, making it detectable in the bloodstream. If they can see the increased levels of cfDNA in the blood test, Hill and Jenkins are hopeful earlier diagnoses will be possible. This will enable patients to seek interventions that are more likely to benefit them before the disease progresses.

The majority of their work will include performing the blood test on blood samples of people with known Alzheimer’s Disease to verify that the test can correctly predict diagnosis. “So far, the data looks very promising,” said Jenkins. “But we need to increase the number of tests we’re running, which is what this grant from the Alzheimer’s Disease and Dementia Research Center will help us do.”

In addition to Vincent Koppelmans and Xiaodong Ma, University of Utah researchers Jim Heys and Neil Patel also received funding. USU recipients of the 2024 funding are Vasile Buhusi, JoAnn Tschanz, Amy Odum, Debasree DasGupta, Kimberly Clevenger, and Heather Kelly.

Beyond the pilot grant projects, the ADRC continues to fund research personnel, researchers in grant mentorship programs, as well as undergraduate and graduate researchers. It is also developing support services for people living with Alzheimer's Disease and their caregivers.