



# Annual Report

Grant Year 9, 2017-2018



**Wisconsin Alzheimer's  
Disease Research Center**

UNIVERSITY OF WISCONSIN  
SCHOOL OF MEDICINE AND PUBLIC HEALTH

“ Everything we have learned  
about memory, memory treatments,  
and memory disorders is known  
because someone volunteered  
for a research study.”

— Sanjay Asthana, MD, Director  
Wisconsin Alzheimer's Disease Research Center

## Director's Message

The Wisconsin Alzheimer's Disease Research Center (ADRC) is in its tenth year as a National Institutes of Health (NIH)-supported ADRC, a designation we are proud to carry and an honor that fuels our work to find a cure for this disease. While this Annual Report offers an overview of our center's Grant Year 9 accomplishments, I want to look ahead at some of our new initiatives.

Biomarkers are the new frontier of Alzheimer's disease research, and our center is uniquely poised to gain a greater understanding of the preclinical phase of this disease through our growing archive of brain imaging scans and cerebrospinal fluid samples. In Grant Year 9, our imaging core supported 618 MRI scans and 211 PET exams for 15 different research studies. New funding will provide for widespread PET scans in our longitudinal research participants, which will allow us to see in living people what scientists could only see upon autopsy just a few years ago.

In addition, our center is expanding its focus in two areas that will further elevate us nationally. The Research Education Component will offer training in all aspects of Alzheimer's disease research, particularly in preparing the next generation of researchers. A new Care Research Core, the first of its kind among NIH-supported ADRCs, is aimed at enhancing patient care and changing clinical practice to improve health of patients in Wisconsin and beyond.

Thank you for supporting our work through your participation in our studies, philanthropic dollars, and overall dedication to finding a cure for Alzheimer's disease. We could not do it without you.



*Sanjay Asthana, MD  
Duncan G. and Lottie H. Ballantine Chair in Geriatrics  
Associate Dean for Gerontology  
Director, Wisconsin ADRC and Madison VA GRECC  
UW School of Medicine & Public Health*



Wisconsin Alzheimer's Disease Research Center  
600 Highland Avenue | J5/1 Mezzanine  
Madison, Wisconsin 53792-2420 | [www.adrc.wisc.edu](http://www.adrc.wisc.edu)

## Who We Are

The Wisconsin Alzheimer's Disease Research Center (ADRC) combines academic, clinical, and research expertise from the UW School of Medicine and Public Health and the Geriatric Research, Education and Clinical Center (GRECC) of the William S. Middleton Memorial Veterans Hospital in Madison, Wisconsin. Founded in 2009, the ADRC receives funding from private, university, state, and national sources, including a National Institutes of Health/National Institute on Aging grant for Alzheimer's Research Centers (P50-AG033514).

## What We Do

The Wisconsin ADRC provides infrastructure for Alzheimer's disease research at UW-Madison. It encourages collaboration through educational events and training. The center also works to educate the general public on the latest news and updates concerning Alzheimer's disease research, prevention, and care.

## Get Involved

There are several ways you can get involved in our work and support our center. Volunteer to be a study participant, attend one of our events, listen to our podcast, follow us on social media, or make a financial contribution through the UW Foundation's Initiative to End Alzheimer's.

The Wisconsin Alzheimer's Disease Research Center receives funding from private, university, state, and national sources. Following are highlighted grants it received last year.

## NIH Grants

The neighborhoods where you lived throughout your life have an effect on your overall health, but no study has been conducted on neighborhood disadvantage and brain health. Utilizing public records, including U.S. Census data and city directories, **Amy Kind, MD, PhD**, and her research team will create detailed residential histories for deceased individuals through the Wisconsin Brain Donor Program and the University of California-San Diego Brain Bank.

studies, will allow Dr. Kind and her co-Principal Investigator Barbara Bendlin, PhD, to determine connections between neighborhood disadvantage and Alzheimer's disease risk.

**Neighborhood Socioeconomic Contextual Disadvantage and Alzheimer's Disease**  
9/15/2017 – 6/30/2022

**Dorothy Farrar-Edwards, PhD**, received funding to examine barriers to participation in longitudinal studies, which can follow volunteers for decades and require regular study visits and testing. The results of this work will improve retention in Alzheimer's disease research in Wisconsin and across the country.

**Retaining Participants in Longitudinal Studies of AD**  
9/1/2017 – 7/31/2019

Age-related brain changes, such as cell death and tissue shrinkage, are typical side effects of aging. In some cases, these changes lead to neurodegenerative diseases such as Alzheimer's disease. **Luigi Puglielli, MD, PhD**, is working to uncover how and why these brain changes occur. He hopes his work will lead to



Dr. Luigi Puglielli

strategies to combat age-related brain changes and declines in memory and thinking abilities.

**Acetyl-CoA flux and Mitochondrial Adaptation: A Pathogenic Role in Aging and AD**  
9/15/2017 – 6/30/2022

**Andrea Gilmore-Bykovskyi, PhD, RN**, is helping doctors and nurses recognize undiagnosed dementia



Dr. Andrea Gilmore-Bykovskyi

in hospital patients. A new tool she is developing will comb the free-form text of a patient's electronic

health record for phrases and keywords that signal likely cognition and memory problems.

**Development and Validation of a Natural Language Processing Ontology to Improve Detection of Alzheimer's Disease Using Electronic Health Records**  
09/2017 – 08/2018

## Private Grants

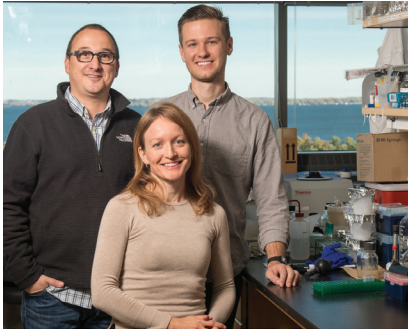
**Megan Zuelsdorff, PhD**, a postdoctoral fellow in the Wisconsin ADRC and the UW Center for the Demography of Health and Aging, was awarded a 2018 Alzheimer's Association Research Fellowship Award to study biological mechanisms linking adversity and dementia risk, and innate and social factors that associate with resilience to the negative impacts of stress.



Dr. Amy Kind

Dr. Kind will also use surveys to collect residential histories from living participants in the ADRC Clinical Core, as well as the Wisconsin Registry for Alzheimer's Prevention (WRAP). This data, paired with autopsy results and memory and cognition data collected by the ADRC and WRAP





Dr. Barbara Bendlin with microbiome research collaborators Federico Rey, PhD, *back left*, Department of Bacteriology, and Nicholas Vogt, *back right*, MD/PhD student.

## University Grants

**Barbara Bendlin, PhD**, is co-principal investigator on a research program studying the role of gut bacteria in the development and treatment of Alzheimer's disease. Her work is supported by the Wisconsin Partnership Program's Collaborative Health Science Program and the UW-Madison Microbiome Initiative.

**Subhojit Roy, MD, PhD**, was one of 21 investigators from across campus funded through the UW2020: WARF Discovery Initiative in 2017. His project, "A CRISPR/Cas9 Based Therapeutic Strategy for Alzheimer's Disease," aims to use gene editing technology to "cut and silence" Alzheimer's disease-related proteins in the brain and block progression of disease symptoms.

Each year, staff at the Wisconsin Alzheimer's Disease Research Center supports dozens of research studies looking at ways to prevent and reverse Alzheimer's disease and dementia. Following are two studies that launched participant recruitment last year.

## New Clinical Trials

Men and women who experience active military duty carry a higher risk for Alzheimer's disease than the general population. Health care providers speculate this is due to veterans experiencing high cholesterol, traumatic brain injury, post-traumatic stress disorder, and depression at higher rates than the non-military population — all health concerns that increase a

person's risk for developing Alzheimer's disease. **Cynthia Carlsson, MD**, a geriatrician at the William S. Middleton Memorial Veteran's Hospital and an Alzheimer's disease researcher at the UW School of Medicine and Public Health,



Dr. Cynthia Carlsson

launched the BRAVE study, the goal of which is to determine whether a daily dose of prescription-strength fish oil can help improve brain health and reduce risk for Alzheimer's disease in veterans with a parental history of the disease. The BRAVE study team will recruit 150 Wisconsin veterans to participate in this research.



healthy memory and thinking skills as they age. **Ozioma Okonkwo, PhD**, an Alzheimer's disease researcher and an expert in the role exercise plays in reducing dementia risk, is the Wisconsin ADRC site principal investigator for the national EXERT study, a Phase III, randomized controlled trial that aims to determine whether physical exercise can slow the progression of mild memory loss and/or Mild Cognitive Impairment (MCI) in adults ages 65-89. The EXERT study aims to recruit 300 people at 13 sites nationwide.

Numerous studies have shown the benefits of exercise in reducing Alzheimer's disease risk and helping people maintain



Dr. Ozioma Okonkwo

Outreach efforts at the Wisconsin Alzheimer's Disease Research Center focus on educating the public about Alzheimer's disease prevention and reaching groups traditionally under-represented in research in order to help them connect with resources to improve brain health.

## Community Connections

The Wisconsin ADRC strives to educate its research participants and the public about Alzheimer's disease research



Community members participate in a Get Movin' gentle exercise class.

advancements. Each year, the center holds two public lectures and two participant-only events at which investigators share results and updates about their science. The center also produces periodic publications, participates in community dementia and aging events, and sends its investigators into the community for lectures and

presentations — all in an effort to educate the public about Alzheimer's disease prevention and research news.

The Wisconsin ADRC expanded its outreach efforts last year with the introduction of two community classes designed to promote healthy lifestyles and cognitive stimulation. These classes are offered for free to community members and are located in accessible locations in diverse neighborhoods. Free Beginner Computer Classes were held in partnership with the Urban League of Greater Madison and taught by an instructor from the UW-Madison Division of Continuing Studies.

More than 20 people participated in the six-week course. The Wisconsin ADRC also introduced its Get Movin' exercise series, designed to motivate non-exercisers to adopt more active lifestyles. A personal trainer leads classes several days a week, with daytime and evening options for men and women.

## Podcast Launch

In an ongoing effort to educate research participants and the general public about Alzheimer's disease research, the Wisconsin ADRC introduced a new podcast, "Dementia Matters." Host **Nathaniel Chin, MD**, interviews experts on Alzheimer's disease science, prevention, and caregiving. The series is available through iTunes, Spotify, Google Play Music, Podbean, and other popular podcasting platforms.

## Diversity in Research

African Americans are up to twice as likely to be diagnosed with Alzheimer's disease than non-Hispanic whites, and health disparity researchers are working to understand why. **Carey Gleason, PhD**, is principal investigator on African Americans Fighting Alzheimer's in Midlife (AA-FAiM). The goal of this



Dr. Carey Gleason with a research participant.

study is to examine modifiable risk factors for Alzheimer's disease in African Americans with the long-term goal of reducing disease burden in this population.



# Wisconsin ADRC In Numbers

The Wisconsin Alzheimer's Disease Research Center (ADRC) studies the causes, diagnosis, treatment, and prevention of Alzheimer's disease, as well as related topics such as caregiver stress and models of patient care. The following is a summary of who we are and what we have accomplished since the center was formally established in April 2009 through March 31, 2018.



**33**  
SCIENTISTS



**50+**  
ACTIVE RESEARCH  
STUDIES IN BASIC  
SCIENCE AND  
CLINICAL RESEARCH

**725**  
RESEARCH  
PAPERS  
PUBLISHED



**150+** completed  
research  
studies



**893**  
participants in  
Clinical Core  
23%  
from under-  
represented  
groups (URGs)



**177**  
community  
outreach  
and  
educational  
events in  
2017

**707**  
participants received  
Magnetic Resonance  
Imaging (MRI) scans

**499**  
participants received  
Lumbar Punctures  
(LPs)

**473**  
participants received  
combined  
MRI and LP