NIA View of the Field
mHealth & Digital Health Approaches to Research in Aging

(Pre-GSA Workshop, November 2022)

Dana Plude, PhD
Deputy Director
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- Social, psychological, economic, and behavioral research on the processes of aging at the individual and population level

- **Cross-cutting themes:**
  - Understanding/Addressing Health Disparities
  - Life Course Perspective on Aging Processes
  - Biobehavioral and Biosocial Integration
  - AD/ADRD Research

**Data Resources**  
**Research Networks**  
**Centers Programs**

Director: Lis Nielsen, PhD  
Deputy Director: Dana Plude, PhD  
https://www.nia.nih.gov/research/dbsr
Digital Health Care can be broadly separated into two categories:

**eHealth** – the use of information and communication technologies for health
- Largely predicated on eHR and related issues such as interoperability, clinical decision support and transferability of patient data
- Promoted by Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009

**mHealth** - medical and public health practice supported by mobile devices, such as mobile phones, personal digital assistants and other wireless devices
- Expanded greatly by widespread availability and accessibility of internet and cellular services
- Pew (2019) survey showing smartphone ownership at 81%
- Smarthome technology has also penetrated the market and allows for ‘passive monitoring’ of health related behaviors
NIA Workshops on Digital Technology

- **Future Directions for Applying Behavioral Economics to Policy (2022)** – BSR/NASEM
- **Non-pharmacological Approaches to the Early Prevention of AD/ADRD (2021)** – BSR/NASEM
- **Applications of Machine Learning to Improve Healthcare Delivery for Older Adults** (2020) – BSR/NASEM
- **Mobile Technology for Adaptive Aging (2020)** – BSR/NASEM
- **Applying Digital Technology for Early Diagnosis and Monitoring of AD/ADRD (2019)** – DN/BSR/GCG
- **Cost-effective Early Detection of Cognitive Decline (2017)** - BSR
<table>
<thead>
<tr>
<th>FOA Number</th>
<th>Title</th>
<th>Exp. Date</th>
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<tbody>
<tr>
<td>RFA-AG-23-034</td>
<td>Mechanism-Focused Research to Promote Adherence to Healthful Behaviors to Prevent Mild Cognitive Impairment (MCI) and Alzheimer’s Disease (AD) and AD-Related Dementias (ADRD) (R61/R33 Clinical Trial Required)</td>
<td>1/20/2023</td>
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<tr>
<td>PAR-22-093</td>
<td>Research on Current Topics in Alzheimer’s Disease and It’s Related Dementias (R01 Clinical Trial Optional)</td>
<td>11/13/2024</td>
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<td>PAR-22-094</td>
<td>Research on Current Topics in Alzheimer’s Disease and It’s Related Dementias (R21 Clinical Trial Optional)</td>
<td>11/13/2024</td>
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<td>NOT-AG-21-048</td>
<td>NOSI: Digital Technology for Early Detection of AD/ADRD</td>
<td>11/13/2024</td>
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<tr>
<td>RFA-AG-20-022</td>
<td>Aging, Driving and Early Detection of Dementia (R01 Clinical Trial Optional)</td>
<td>10/23/2019</td>
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The Continuum of Alzheimer’s disease

- Preclinical: Neuroimaging, fluid biomarkers, but no functional readout
- MCI
- Aging: Neuropsychological tests / batteries
- Dementia: Screens (e.g., MMSE)

Adapted from Sperling et al., 2011
Challenge 1: Assessing Change

- Long-term (years, decades)
  (cortical thinning, amyloid burden)

- Mid-term (weeks, months)
  (chronic stress, inflammation)

- Short-term (hours, days)
  (stress, fatigue, social activity)

NIH National Institute on Aging

Sliwinski 2012
Challenge 2: Retest Effects

Large and Durable Retest Effects

Observed performance
Latent retest gains
Latent cognitive aging

Potential Masking of Retest Effects

Calamia et al. (2012)
Challenge 3. Age Trajectories Differ Across Cognitive Domains

Salthouse, 2019
RFA-AG-18-012
Mobile Monitoring of Cognitive Change (U2C)

May 2018 Council (Posted June 30 2017)

Funds Available and Anticipated Number of Awards

- The number of awards is contingent upon NIH appropriations and the submission of a sufficient number of meritorious applications.
- NIA intends to commit $2.25 million in FY2018 to fund 1 award. NIA also intends to commit a total of $3.75 million in FY2019, $3.75 million in FY2020, $2.25 million in FY2021, and $1.5 million in FY2022.

Two applications recommended for funding

- Award period for both 09/15/2018 – 05/31/2023
Two Awards for RFA-AG-18-012

The Mobile Toolbox for Monitoring Cognitive Function (1U2CAG060426-01 PI: Richard Gershon)

Ambulatory Methods for Measuring Cognitive Change (1U2CAG060408-01 PI: Martin J. Sliwinski)
Mobile Toolbox Project

https://www.mobiletoolbox.org/

Studying Cognition in the Real World
A set of smartphone tools that allow you to embed self-administered cognitive tests into your research study.

RFA-AG-23-021 – More Monitoring of Cognitive Change, Continued (M3C3)
CREATE Overview

CREATE is a multidisciplinary and collaborative center founded in 1999. It is dedicated to ensure that the benefits of technology can be realized by older adults to support and enhance the independence, productivity, health, safety, social connectedness and quality of life of older people.

The center strives to develop and evaluate interventions and design solutions to promote successful technology adoption among older adults.

CREATE represents a consortium of five universities:

News

Friday, July 29, 2022

GREAT NEWS! The CREATE Team is proud to announce that the Center has been awarded a five-year, $14.7 million renewal grant from the National Institute on Aging of the National Institutes of Health to continue their work on employing emerging and existing technologies to help promote the well-being, quality of life and independence of diverse populations of older adults and provide support for older adults with cognitive impairments. The new grant, CREATE V, is the fifth grant awarded to the CREATE Center since 1999 and will support the research collaboration at Weill Cornell Medicine, the University of Illinois Urbana-Champaign, Florida State University, and the University of Miami.

To view each site-relevant press release, click the links below!

Well Cornell Medicine
University of Illinois Urbana-Champaign
Florida State University

Monday, June 6, 2022
Collaborative Aging Research Using Technology (CART)

The Collaborative Aging (In Place) Research Using Technology (CART) Initiative is a multisite, nationwide research study that exploring how technology can provide insight into the aging process. Learn more
Closing the Gap Between Cognitive Healthspan and Human Lifespan
Resources to Support Research on Technology and Aging

Centers

Networks

Grants and Administrative Supplements

Small Business

NIH/NSF Smart and Connected Communities
NIA Centers Programs
Elaborate on Centers if needed/requested
A Sampling of Other NIA/NIH Resources
Collaboratories, Networks

https://impactcollaboratory.org/

https://www.stressmeasurement.org

The AGING Initiative

decisionneuroaging.network

Div of Behavioral & Social Science Research Networks
Recently Approved Concepts

NIA Alzheimer’s Disease and Alzheimer’s Disease-Related Dementias (AD/ADRD) Real-World Data Platform

Research Coordinating Center on the Exposome and Alzheimer’s Disease and Related Dementias: Elucidating the Role of Social and Behavioral Determinants of Health in AD/ADRD Etiology and Disparities

Roybal Centers for Translational Research in Aging
NIA Small Business Program
Digital Health and Sensing Technologies

**Benten Technologies**
Read about Benten Technologies, a small business using NIA funding to develop a smart artificial intelligent companion for caregivers of family members living with dementia.

**CareBand, Inc.**
Read about CareBand, a small business using NIA funding to develop a wearable sensor that monitors activity and location and that can detect falls.

**Care Daily**
Read about Care Daily, a small business using NIA funding to make home care affordable with a solution called Caregiver, designed to help seniors age more safely at home and bring peace of mind to families.

**CareVirtue**
Read about CareVirtue, a small business using NIA funding to develop an online social network and care platform that helps families share information from one centralized account.

**care.coach Corporation**
Read about care.coach, a small business using NIA funding to further the development of a digital platform using virtual pet avatars to engage older adults.

**Generation Connect**
Read about Generation Connect, a small business using NIA funding to develop a mobile app that will improve ability to age in place, allowing home care services to be a long-term care solution for dementia.

**LifeBio**
Read about LifeBio, Inc., a small business using NIA funding to develop a life story application that captures a person’s voice to make short summaries used in direct care delivery.

**MapHabit, Inc.**
Read about MapHabit, a small business using NIA funding to develop mobile applications that help memory-impaired individuals and their caregivers accomplish activities and improve function.
NIA iCare AD/ADRD Eureka Challenge
Improving Care for People with AD/ADRD Using Technology

First Place Winner

Title: Development of mobile software that uses visual mapping techniques to preserve independent function and improve quality-of-life for individuals with AD/ADRD

Team leader: Stuart Zola, PhD, MapHabit Inc.

Team members: Matt Golden, Sidney Law, MD, Jennifer Jin, and Yedarm Kim of MapHabit

Award: $250,000

Second Place Winner

Title: Dementia care software system

Team leader: David B. Reuben, MD, David Geffen School of Medicine at UCLA

Team member: Lei Ditch, MS, High5LA

Award: $100,000

Third Place Winner

Title: Caregiver411

Team leader: Kristen Naney, PhD, Center for Outreach in Alzheimer’s, Aging and Community Health (COACH) at North Carolina Agricultural and Technical State University

Team members: Grace Byfield, PhD, Christopher Doss, PhD, and Janetta Brown of North Carolina A&T State University

Award: $50,000
NIH-NSF Partnership(s) on Digital Health

Smart and Connected Communities (S&CC)
Healthcare for older adults is increasingly patient/family participatory. The success/effectiveness of digital health technologies depends in part on the participants’ health literacy.

Research and practice in this area must remain vigilant about privacy, security and potential exploitation.

Should Alexa diagnose Alzheimer’s?: Legal and ethical issues with at-home consumer devices (Simon, Evans, Shachar & Cohen[2022] Cell Reports Medicine)

Health disparities must be explicitly addressed.

Technology has unlimited potential for Aging In Place
Thank You!
Alzheimer’s disease Research Centers (ARDC)

https://naccdata.org/

RFA-AG-21-019 - funding for developmental projects between $50,000 and $100,000. And, annual New Investigator Awards to support career development and advance research on AD/ADRD. The maximum total funding for each New Investigator Award is $135,000. Additional information available here.
RFA-AG-23-017 – Pilot/Exploratory Studies Core (PESC)
Up to $300,000 in first-year direct costs may be requested for the PESC. Each Pilot/Exploratory Study (PES) is limited to $100,000 in direct annual costs and 3 years in duration.
Nathan Shock Centers of Excellence
In the Basic Biology of Aging

https://nathanshockcenters.org/

- 2023 Oklahoma Nathan Shock Center Pilot Project Awards - Deadline: October 10, 2022
- UAB NSC Pilot/Feasibility Project Awards - Deadline: October 25, 2022
- USC-Buck Nathan Shock Center Pilot Research Projects and Vouchers for Core Services - Rolling deadline
- Einstein’s Nathan Shock Center in the Basic Biology of Aging 2022 Pilot & Feasibility Project Awards for Core Use - Rolling deadline
- 2022 University of Washington Nathan Shock Center and Healthy Aging and Longevity Research Institute Pilot Project Awards - Rolling deadline
Centers on the Demography and Economics of Aging

https://agingcenters.org/

The Coordinating Center fosters communication and collaboration for the NIA Centers on the Demography and Economics of Aging and Alzheimer’s Disease and Alzheimer’s Related Dementias

Data Training Workshop Tuition Awards for Early Career Investigators

The Coordinating Center is offering awards that cover the tuition cost for data training workshops for data resources of high value in population aging research. An important goal of the Centers on the Demography and Economics of Aging and Centers on the Demography and Economics of Alzheimer’s Disease/Alzheimer’s Disease and Related Dementias (AD/ADRD) is to attract and develop new scholars. Learning about new data resources can be an important point of entrance into aging research or can greatly enhance opportunities for early career aging researchers. Awards will cover the cost of tuition for the workshop. If interested, please send a statement of interest in either one or both of the training opportunities listed below (limit 200 words) and a current C.V. to Amanda Sonnega (asonnega@umich.edu). Priority will be given to early career scholars (doctoral students, post-docs, and those within 6 years of terminal graduate work) and those interested in building a career in population aging research. Please include Data Training Tuition Award in the subject line.

- Introduction to the Health and Retirement Study
- Introduction to the Panel Study of Income Dynamics

Cross-Center Administrative Supplement Program

NIA administrative supplements provide additional funds to an active grant to support research in the field of aging. The goal of the program is to increase the number of junior scholars making successful applications for supplement funding. The Coordinating Center facilitates this cross-Center collaboration to support post doctoral and early career opportunities in aging research.
Resource Centers for Minority Aging Research

https://rcmar.org/
Roybal Centers for Translational Research

https://www.roybalniaresearchcenters.org/our-network

NIH Stage Model of Intervention Development
Artificial Intelligence and Technology Collaboratories (AITC)

[Link to A2 Collective website]

The A2 Collective represents the National Institute on Aging's (NIA) Artificial Intelligence and Technology Collaboratories (AITC) for Aging Research program, which is dedicated to helping Americans live longer, healthier lives through the application of artificial intelligence (AI) and emerging technologies.

NIA has earmarked $40M over the next 5 years to fund promising AI technology pilot projects that seek to improve care and health outcomes for older Americans, including persons with Alzheimer's disease and related dementias (AD/ReD). Successful projects may be selected for 3-year commitments and be more competitive for follow-on Small Business Innovation Research (SBIR) funding. Pilot awards may also receive access to the study sites, datasets, and resources at each AITC as well as mentorship from industry and university experts, major health care systems, and venture capitalists.
NIA's Division of Behavioral and Social Research (BSR) offers a scientifically energizing and collegial environment with opportunities to engage the scientific community and support innovative social, behavioral, psychological, and economic research in aging and Alzheimer’s disease.

We have nine Program Officer positions available across the division!

https://www.nia.nih.gov/research/dbsr/news
Overview of the Research Centers Collaborative Network (RCCN)

Odette van der Willik
Deputy Executive Director and Director of Grant Programs
American Federation for Aging Research
Research Centers Collaborative Network (RCCN)

**Goal:** Initiate new **cross-disciplinary collaborative networks** that bring together key thought leaders from each of the 6-7 NIA center programs:

- Alzheimer’s Disease Research Centers (ADRCs)
- Centers on the Demography and Economics of Aging (CDEA)
- Older Americans Independence Centers (OAIC/Pepper Centers)
- Nathan Shock Centers of Excellence in the Biology of Aging (NSC)
- Resource Centers for Translational Research on Aging (Roybal)
- Resource Centers for Minority Aging Research (RMAR)
- Artificial Intelligence Technology Collaboratories (AITC)
Research Centers Collaborative Network (RCCN)

• Activities & Resources:
  • [Workshops](#) convene researchers from 6 center programs to discuss a common theme in aging research
  • [Pilot Awards](#) following workshops based on discussion/key topics
  • Travel awards for workshops
  • [Publications](#) based on workshop proceedings
  • [Webinars](#)
  • [Listing of funding opportunities and upcoming events](#)
  • [RCCN Research Compass](#) (publication search tool)
  • [NIA-Funded Centers Interactive Map](#)
NIA Centers Interactive Map

Select and deselect NIA center programs to appear on the map in the Programs menu.

Clusters of centers are represented with bright orange circles, with a number in the middle signifying the number of centers in that area.

Hover over an individual center to see the name of the center and a link to its website.

Zoom in on a section of the map to see more detailed information about centers.
How to find funding opportunities through RCCN

• On rccn-aging.org
  • RCCN Opportunities: rccn-aging.org/opportunities
  • RCCN Pilot Award RFAs: rccn-aging.org/rccn-pilot-awards-request-for-applications

• RCCN monthly newsletter (Sign up here: https://bit.ly/3SLkXOq!)

• Coordinating Center websites:
  • NACC: naccdata.org
  • CDEA: agingcenters.org
  • NSC: nathanshockcenters.org
  • Pepper OAIC: peppercenter.org
  • RCMAR: rcmar.org
  • Roybal: roybalniaresearchcenters.org