



Neurotechnology for Aging Brain - Funding and Resources from the National Institute on Aging (NIA), USA

Yuan Luo, Ph.D.
Program Director
Division of Neuroscience
National Institute on Aging, NIH, USA

December 5th, 2020

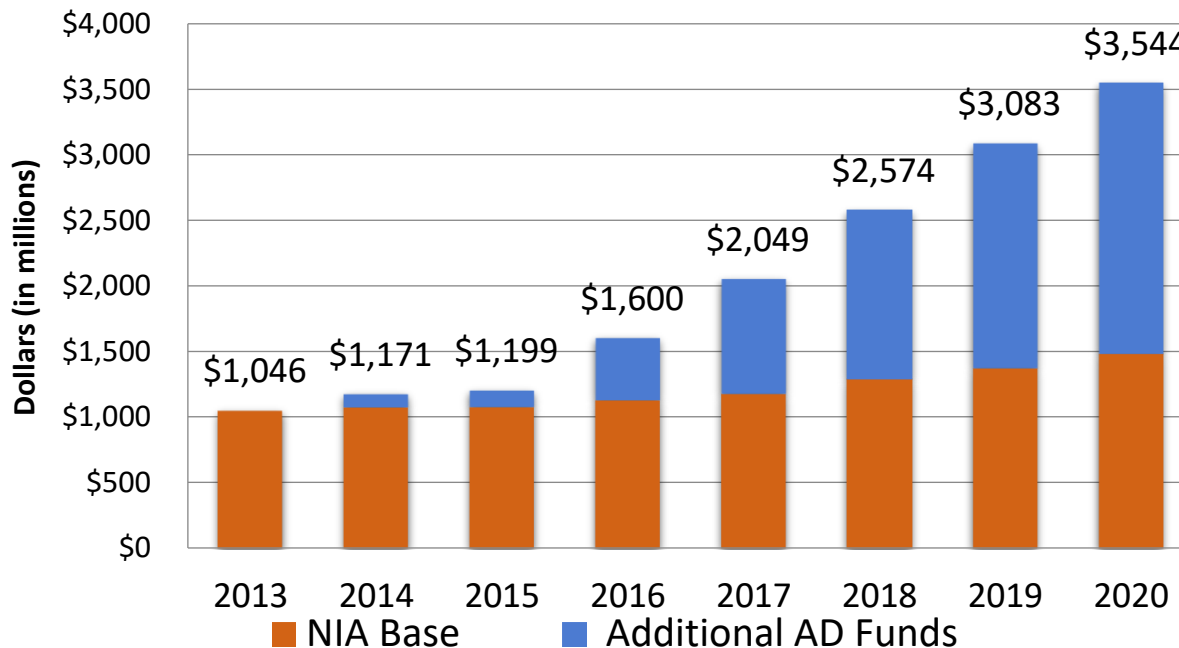
Outline

- 1. NAPA Goal, NIA Budget for Alzheimer's disease & related dementias (AD/ADRD)**
- 2. AD/ADRD Research Milestones**
- 3. NIA Funded Assistive Technologies for Aging**
- 4. NIA Initiative - Enabling Technology for Aging and ADRD**
- 5. Current Funding Opportunities and Resources**

1. NAPA and NIA Budget for AD/ADRD

- The National Alzheimer's Project Act (NAPA) signed into law 2011.
- The primary goal of the NAPA is to prevent and develop effective treatments for AD and related dementias (ADRD) by 2025.

NIA Appropriations
Fiscal Years 2013-2020



2. AD Research Implementation Milestones

9. Biomarkers

Develop and validate translatable biomarkers for their use in preclinical and clinical drug development.

- Plasma biomarkers (A, T, N, I)
- Other peripheral tissue and fluid biomarkers
- Digital phenotyping and markers to improve clinical trials and brain health

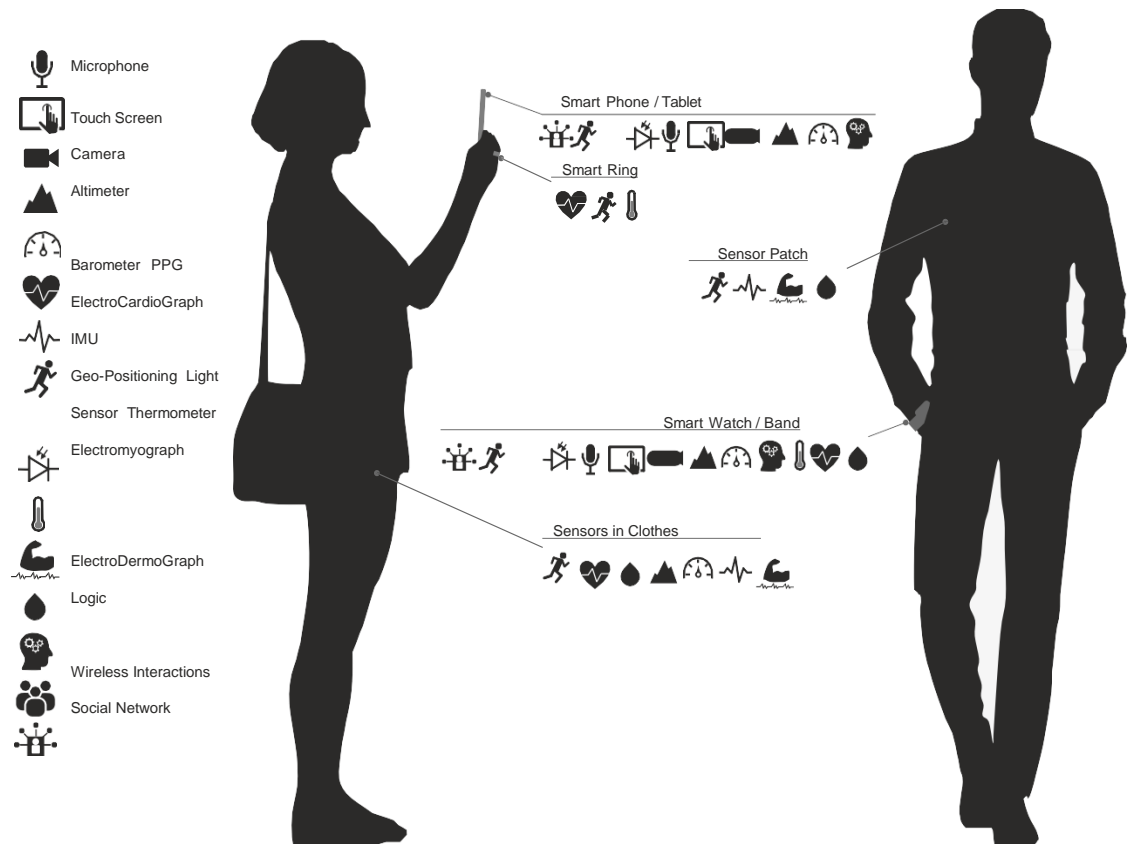
11. Enabling Technologies and Disease Monitoring

Embed wearable technologies as well as pervasive computing approaches in existing and new clinical research, longitudinal cohort studies as well as in clinical trials to enable continuous capture of various types of participant relevant data.



Digital Technology for Aging Brain and ADRD

- >50% MCI/AD are undiagnosed
- Challenges of AD drug clinical trials
- An era of wireless digital devices
- Increasing users of smart phones (75% of >60 years old)
- Innovative data science



Koutis et al., Nature Digital Medicine June 2019

4. NIA Initiative - Enabling Technology for AD

- Cost-Effective Early Detection of Cognitive Decline (2017)
- Applying Digital Technology for Early Diagnosis and Monitoring of Alzheimer's Disease and Related Dementias (2019)
- Big Data and Machine-Learning Techniques to Enhance Social Research in Aging (2019)
- Use of Neurotechnology in Normal Brain Aging and AD/ADRD (2020)

Some NIA Funded Technology-related Projects

- [CART](#) - Collaborative Aging (in Place) Research using Technology
- [Speech recognition](#) for identify older adults with cognitive decline, MCI to AD
- [Driving patterns](#) to monitor cognitive change
- [In-home sleep-wake](#) as a potential marker for progression from pre-clinical to MCI
- [Game-based](#) mobile app to quickly, reliably, and remotely collect cognitive data.
- [Brain Health Registry](#), an online recruitment, assessment and monitoring of brain health over time
- [I-Connect](#) Web-enabled social interaction to delay cognitive decline in seniors
- [Brain safe](#) a digital brain safe mobile APP
- [Accurate WiFi-Based Localization of Dementia Patients for Caregiver Support](#)
- [Socially assistive robot](#) for improving the well-being of elderly with dementia
- [Tailored Lighting intervention \(TLI\)](#) as non-pharmacological approach for AD

<https://projectreporter.nih.gov/reporter.cfm>

Some NIA funded SBIR Projects

Devices

- [Sonica, LLC](#) sensor that can capture respiratory, sleep, movement, swallowing.
- [Bone Health Technologies](#) stimulates the hips and spine to reduce bone loss

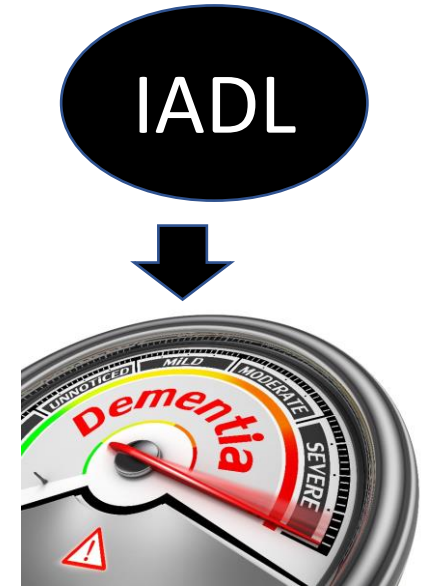
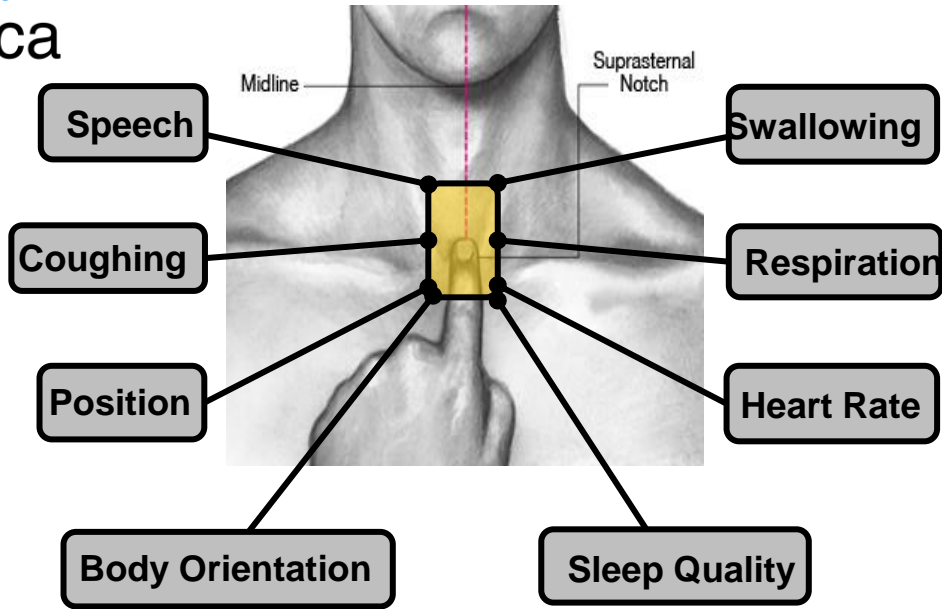
Diagnosis

- [C2N DiamiR](#) blood-based tests for early detection of MCI and AD
- [Vasoptic Medical, Inc.](#) retinal imaging methods to screen glaucoma

Digital health and sensing technologies

- [Healthcare Technologies and Methods, LLC](#) an interactive platform for older adults with hearing impairment.
- [CareBand, Inc.](#) a wearable sensor that monitors activity and detect falls.
- [OneClick.chat \(Potluck, LLC\)](#) a social engagement tech for older adults
- [Blue iris labs](#) personalized circadian-effective light for aging and AD

<https://www.nia.nih.gov/research/osbr/nia-small-business-showcase>



*Najafi, et al.,
Alzheimer's Res Ther. 2015*

Mobile Monitoring of Cognitive Change (M2C2)

<https://www.mobiletoolbox.org/>



iPhone X



Galaxy S8

5. AD/ADRD-relevant Funding Opportunities

1. [PAR-19-070](#) (R01) and [PAR-19-071](#) (R21) Research on Current Topics in Alzheimer's Disease and Its Related Dementias
2. [NOT-AG-20-017](#) Notice of Special Interest: Digital Technology for Early Detection of Alzheimer's Disease and Related Dementias
3. [PAR-18-519](#) Sensory and motor system changes as predictors of preclinical Alzheimer's R01
4. [PA-17-088](#) (R01) and [PA-17-089](#) (R21) Secondary Analyses of Existing Cohorts, Data Sets and Stored Biospecimens to Address Clinical Aging Research Question
5. [PAR-19-298](#) (R01) Non-Invasive Neurostimulation in AD/ADRD

<https://www.nia.nih.gov/research/grants-funding/announcements>

NIA SBIR Funding Opportunities

6. [PAS-19-316](#) (SBIR); [PAS-19-317](#) (STTR) Advancing Research on Alzheimer's Disease (AD) and Alzheimer's-Disease-Related Dementias (ADRD) (R43/R44 Clinical Trial Optional)
7. [PAR-18-512](#) (SBIR), [PAR-18-514](#) (STTR) Testing Lifespan/Healthspan-Extension Interventions in the Models of AD
8. [SBIR & STTR PA-20-128](#) CRP Technical Assistance
9. [SBIR & STTR PA-20-129](#) [SBIR & STTR PA-20-130](#) CRP Technical Assistance and Late Stage Development
10. [SBIR PA-18-705](#) SBIR Technology Transfer

<https://www.nia.nih.gov/research/osbr/nia-small-business-funding-opportunities#omnibus>

NIA Other Funding Opportunities (continued)

1. [PAS-19-391](#) [PAS-19-392](#) [PAS-19-393](#) Small Research Grant Program for the Next Generation of Researchers in AD/ADRD Research: Area of Focus: Leveraging Existing Data Sets for Analyses, or Basic research, or system Biology (R03)
2. [PAR-19-304](#) [PAR-19-305](#) Early-Stage T1 Translational Aging Research (Bench to Bedside) for the Development of Novel Therapeutics (R33, R21/R33)
3. [PA-18-824](#) Exploratory Analyses of CALERIE Data and Biospecimens to Elucidate Mechanisms of Caloric Restriction (CR)-Induced Effects in Humans (R21)
4. [R13: Scientific Meeting Grants](#) support national or international meetings, conferences, and workshops.

NIA funded Data Resources & Repository

- The National Centralized Repository for Alzheimer's Disease and Related Dementias ([NCRAD](#))
- Alzheimer's Disease Neuroimaging Initiative ([ADNI](#))
- National Alzheimer's Coordinating Center ([NACC](#))
- National Institute on Aging Genetics of Alzheimer's Disease Data Storage ([NIAGADS](#))
- Alzheimer's Disease Sequencing Project ([ADSP](#))
- Accelerating Medicines Partnership– Alzheimer's Disease ([AMP-AD](#))
- National Archive of Computerized Data on Aging ([NACDA](#))
- The [Gateway to Global Aging Data](#)
- National Health and Aging Trends Study ([NHATS](#))

<https://www.nia.nih.gov/research/data-sharing-resources-researchers>



NIH Data Science Opportunities

- Training Resources:
<https://datascience.nih.gov/workforce-development/training-resources>
- Fellowship Opportunities:
<https://datascience.nih.gov/workforce-development/fellowship-job-opportunities>
- Search for Funding Opportunities and Announcements:
<https://datascience.nih.gov/research-and-training-funding>

Ways to Stay Informed and Connected

➤ Visit: <https://www.nia.nih.gov/research/grants-funding>
to search all active NIA funding opportunities

➤ Subscribe to the NIA blog to stay up to date with the latest news
<https://www.nia.nih.gov/research/blog>

Technology-related contact:

Yuan Luo (Yuan.Luo@nih.gov)

Todd Haim (Todd.Haim@nih.gov)

