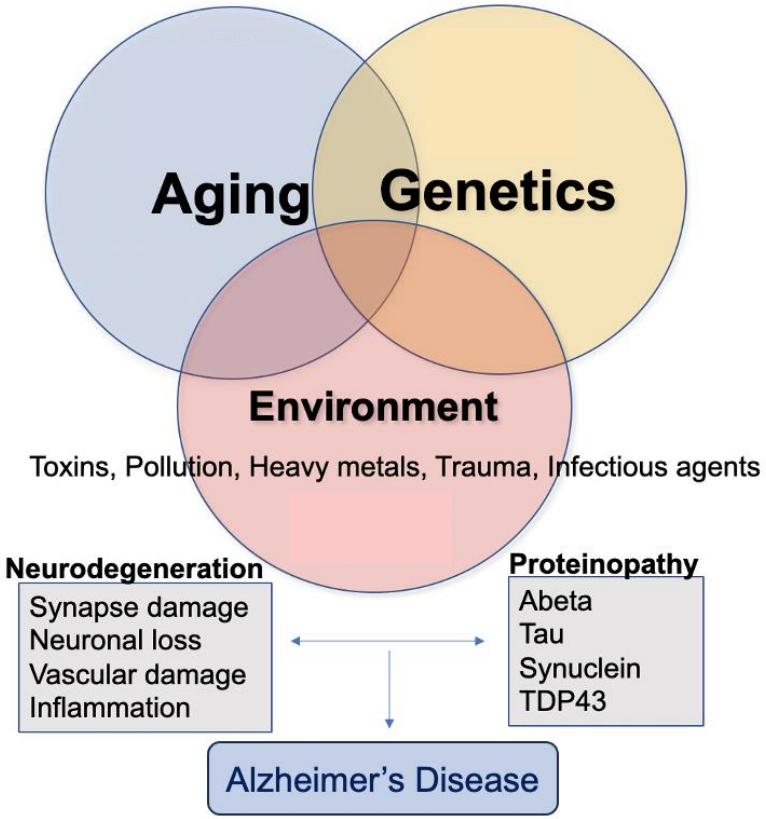
Division of Neuroscience Update

ADRC Spring Meeting
May 6, 2024
Austin, TX

Jennie Larkin, PhD
Deputy Director, DN

Division of Neuroscience



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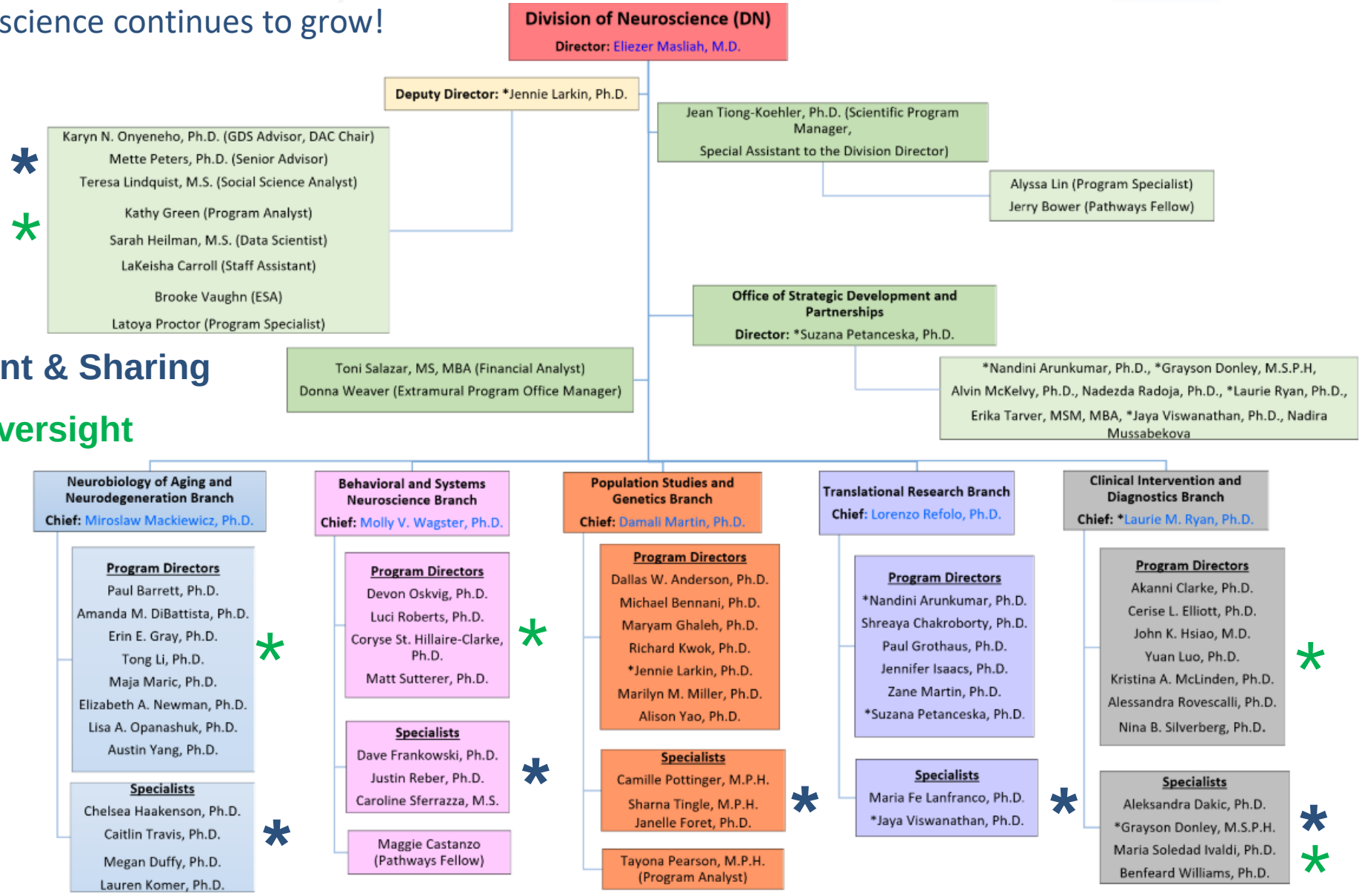
- To **foster extramural and collaborative research and training** to further the understanding of neural and behavioral processes associated with the **aging brain**.
- **Research on the dementias of older age** – in particular, **Alzheimer's disease** – is one of the division's highest priorities.
- A core aim is to promote understanding of the aging nervous system **in order to foster the maintenance of health and improve the quality of life of the older population**.

2024 is a big year!

- **NIA 50th** Since 1974, NIA has led **broad scientific efforts** to understand the **nature of aging** and to extend the **healthy, active years** of life.
- **ARDC 40th** Since 1984, ADRCs have served as a national resource for research on AD/ADRD and development of more effective approaches to prevention, diagnosis, care, and therapy.
- **NACC 25th** NACC (established in 1999) is the largest AD/ADRD relational database of standardized clinical and neuropathological research data.

Division of Neuroscience Staffing Updates

Division of Neuroscience continues to grow!



*** Data Management & Sharing**

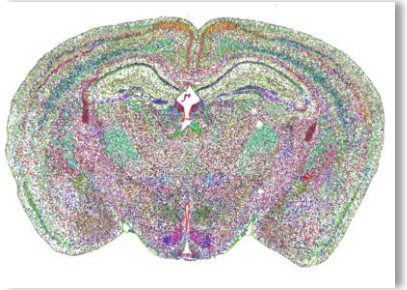
*** Clinical Trials Oversight**

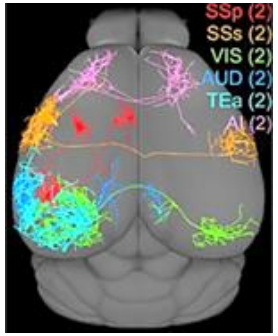
Science Highlights

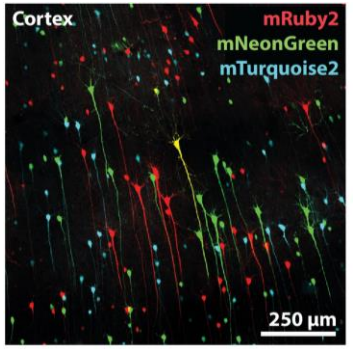
Cell and Connectivity Atlases for Aging and AD

- NIA-supported efforts are generating comprehensive multimodal atlases and brain-wide connectomes to discover cell types and circuits that are altered in aging and AD/ADRD.

- RFA-AG-19-027: A Census of Cells and Circuits in the Aging Brain (R01)
- RFA-AG-22-008: Cellular Scale Connectome in Aging and Alzheimer's Disease (U01)
- RFA-AG-23-028: Neuronal Vulnerability to Proteinopathies in Alzheimer's Disease and Alzheimer's Disease-Related Dementias (R01)
- NOT-AG-21-040: Selective Cell and Network Vulnerability in Aging and Alzheimer's Disease (R01/R21)





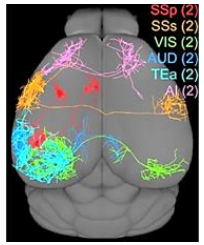


AD Multimodal Atlasing Projects (AD-MAPs)

Goal: Generate high resolution multimodal atlases and connectomes across species as a platform to discover cellular and circuit-level changes underlying aging and Alzheimer's Disease.

U19: Aging Adult Brain Connectome (AABC)

Human



U01AG077227 Kwanghun Chung (MIT)

U01AG076804 Hongwei Dong (UCLA)

U01AG076805 Kuo-Fen Lee (Salk)

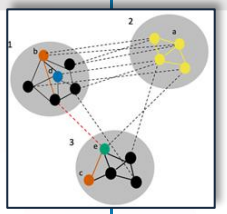
U01AG076791 Xiangmin Xu (UC Irvine)

Mouse

CONNECTOMES

ATLASES

SECONDARY ANALYSIS



RF1AG063153 Calhoun (Georgia State)

RF1AG072056 Augustinack (MGH)

RF1AG068399 Wu (UNC -CH)

RF1AG054409 Davatzikos (Penn)

R01AG064027 Fischl (MGH)

Human

U19: Seattle Alzheimer's Disease Brain Cell Atlas (SEA-AD)

Mouse

R01AG066028 Long Cai (Caltech)

R01AG066018 Joe Ecker (Salk)

R01AG066027 Hongkui Zeng (Allen Institute)

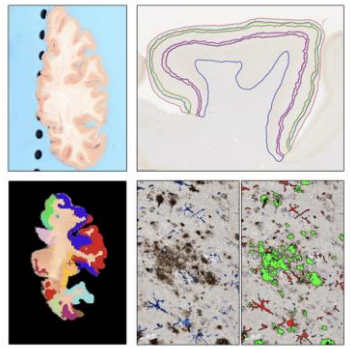
R01AG082127 Xiangmin Xu (UC Irvine)

R01AG082151 Kuo-Fen Lee (Salk)

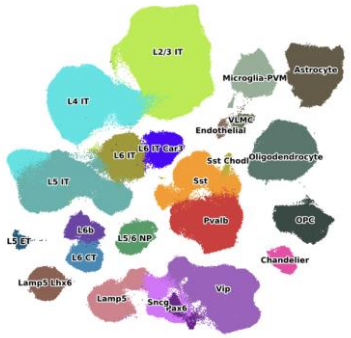
Seattle Alzheimer's Disease Brain Cell Atlas

Strives to gain a deep molecular and cellular understanding of the early pathogenesis of Alzheimer's disease

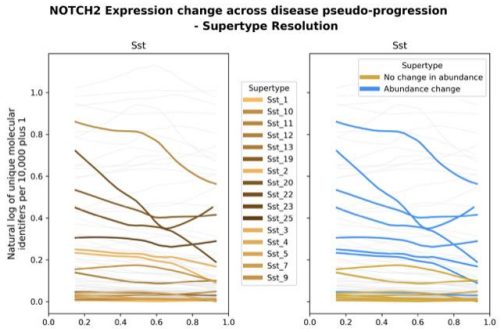
- Collaboration with the Allen Institute, the University of Washington Alzheimer's Disease Research Center (ADRC), and Kaiser Permanente Washington Health Research Institute (KPWHRI)
- Integrating single-cell profiling technologies with quantitative neuropathology and deep clinical phenotyping
- Explore the multifaceted open data resource at [SEA-AD.org](SEA-AD.org)



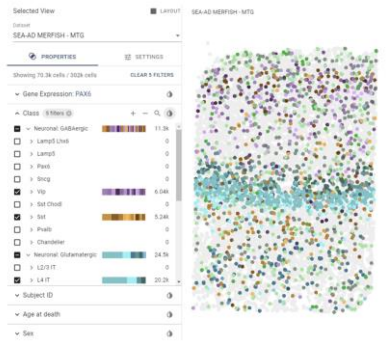
Neuropathology Viewer



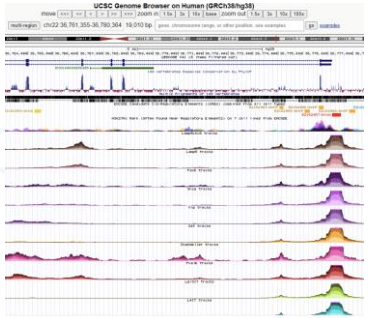
Comparative Viewer



Trajectory Analysis



Spatial Transcriptomics



Epigenomics Browser

Illuminating AD Genome for Precision Genomic Medicine

2020

RFA-AG-21-006
Alzheimer's Disease Sequencing Project Functional Genomics Consortium

- Genes & variants

2021

RFA-AG-22-021
Elucidating the Roles of Transposable Elements in AD/ADRD and Aging

- Mobile DNA elements

2022

RFA-AG-23-010 & RFA-AG-23-011
Noncoding RNAs in Alzheimer's Disease and Related Dementias

- miRNAs, lncRNAs, circRNAs

2023

RFA-AG-24-021
Understanding Gene-Environment Interactions in Brain Aging and AD/ADRD

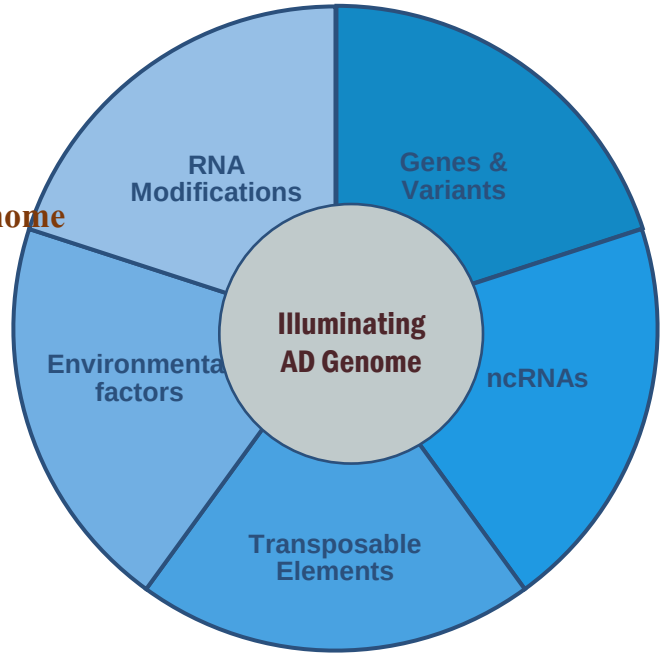
- Well-characterized toxicants

2024

RFA Deciphering Impact of RNA Modifications on Brain Aging and AD/ADRD

- RNA modification and editing

Towards comprehensive characterization of AD genome



Translating genomic discoveries to therapeutic strategies

Building pipelines to enable precision genomic medicine for AD/ADRD

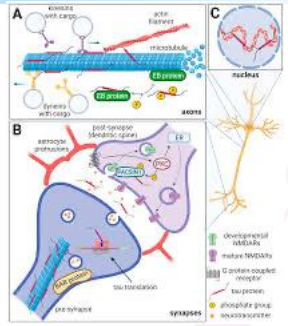
- Understanding the impact of genomic variation on AD pathogenesis & progression.
- Uncovering causal mechanisms to enable target discovery for AD diagnostics and therapeutics.

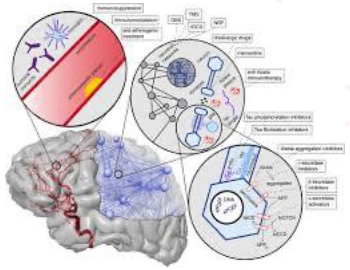
Funding Opportunities

New Funding opportunities FY24

- **RFA-AG-25-002** Consortium for **Palliative Care Research** Across the Lifespan (July 2, 2024)
- **RFA-AG-25-005** Open Measurement Coordinating Network for Non-Pharmacological AD/ADRD Primary Prevention Trials (June 15, 2024)
- **RFA-AG-25-016 Multi-Scale Models Bridging Levels of** Analysis in Aging and AD/ADRD (June 13, 2024)
- **RFA-AG-25-017** Exploring **Proteogenomic Approaches** to Unravel the Mechanisms of Mis-Folded Protein Accumulation **in Tauopathies** (June 10, 2024)
- **PAR-23-083 Pilot Studies for the Spectrum of Alzheimer's** Disease/Alzheimer's Disease-Related Dementias and Age-Related Cognitive Decline (October 18, 2024)

- **RFA-AG-25-009** Research Training in Aging for Medical Students (June 14, 2024)
- **RFA-AG-24-012** NIA Expanding Research in AD/ADRD (ERA) **Postbaccalaureate Research Education Program** (May 24, 2024)
- **RFA-AG-24-013** NIA Expanding Research in AD/ADRD (ERA) **Summer Research Education Program** (May 24, 2024)

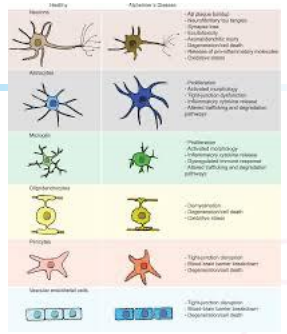


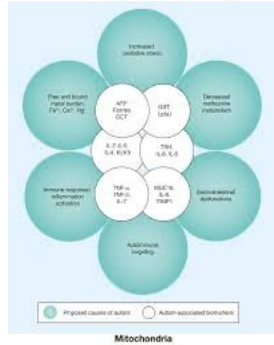


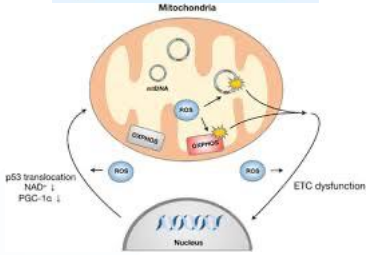
NIA Recently Approved Concepts FY24

- Access And **Manipulation Of Brain Cells Subtypes** In Aging AD/ADRD
- Alzheimer Disease **Drug Development** Program
- Biomarkers Of **Cognitive Decline** And AD/ADRD In Individuals **With Autism Spectrum Disorder**
- Deciphering The Impact Of **RNA Modifications** In AD/ADRD
- Investigating **Mitochondrial-Nuclear** Communication In AD/ADRD

- Grants For **Early Medical Surgical Specialists** Transition To Aging Research (**GEMSSTAR**)
- Summer Research Training In Aging **For Medical Students**
- **Training Programs To Advance Translation** Research In AD/ADRD







Training and Career Development funding opportunities

NIA-specific AD/ADRD training and career development programs include:

- F31 NIA Predoctoral Fellowship Award to Promote Diversity in Translational Research for AD/ADRD
- F32 NIA Postdoctoral Fellowship Award to Promote Diversity in Translational Research AD/ADRD
- K99/R00 NIA Advanced Postdoctoral Career Transition Awards to Promote Diversity in Translational Research for AD/ADRD

In addition to the parent K08, K23, and K24 programs, NIA training and career development opportunities for clinician-scientists include:

- R38 Stimulating Access to Research in Residency (StARR) (R38) (reissuance approved)
- K38 Stimulating Access to Research in Residency Transition Scholar (StARRTS)
- K76 Paul B. Beeson Emerging Leaders Career Development Award in Aging

Keep in touch with NIA training staff

NIATraining@mail.nih.gov

Maria Carranza, Ph.D.

Senior Training Officer
K Awards, Supplements, Research Education Awards

Jamie Lahvic, Ph.D.

Training Officer
Grad Student and Postdoc Awards

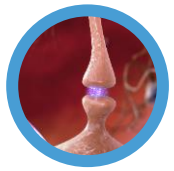
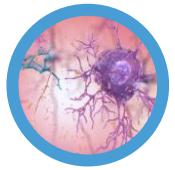
Laura Major, DrPH

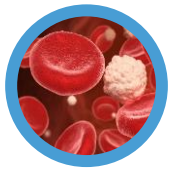
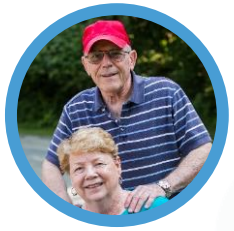
Training Officer
Clinical K Awards, Training Grants, Katz ESI R01

What to do next:

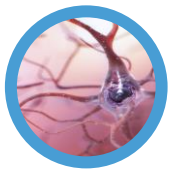
- Email your policy or eligibility questions
- Email specific aims to receive scientific feedback
- Visit the NIA Training website
- Sign up for the NIA Training newsletter

NIH National Institute on Aging





NIA

The Leader in Aging Research