Defeating dementia: progress and challenges on the road to 2025

Are we on Track?

#DefeatingDementia
Defeating dementia: progress and challenges on the road to 2025

Dr Richard J. Hodes
Director, National Institute on Aging

#DefeatingDementia
AD and Related Dementias (AD/ADRD) Research

How Much Are We Spending?

NIH Funding to AD/ADRD Has Increased Three Fold!
NIH Research Implementation Milestones drive progress and are Based on Broad Input

The National Alzheimer’s Project Act (NAPA) was signed into law in January – updated annually.

Newest sources of milestone input

https://www.nia.nih.gov/alzheimers/milestones
Translational Programs and Infrastructure for AD and ADRD

Drug Discovery R21/R01 → AD-Drug Development Program (U01) → Blueprint Neurotherapeutics (UH2/UH3) → SBIR (R43/44) → Clinical Trials (R01)

Discovery and Preclinical Drug Development:
- Basic Research
- Target ID Early Validation
- Compounds Screening
- Proof of Concept Lead Optimization
- Candidate Selection

Clinical Development:
- Safety/Tox IND
- Clinical Trial Phase I
- Clinical Trial Phase II
- Clinical Trial Phase III

Enabling Infrastructure:
- ADSP AMP-AD/M²OVE-AD Resilience-AD
- MODEL-AD AlzPED
- ACTC ADNI ADCs
Progress over 4 years:

- Centralized data resource established - AMP-AD portal
- All data sharing deliverables met
- Over 100 candidate targets nominated; currently undergoing data-driven prioritization for further preclinical validation
- A variety of experimental validation models developed
- Novel biomarker discovery initiated

AMP-AD Teams
Candidate Targets: preliminary list

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Ongoing NIA AD/ADRD and Related Intervention and Prevention Trials (~140)

29 Early-stage Clinical Drug Development (Phase I and Phase II Clinical Trials)

- Amyloid (8)
- Neurotransmitter Receptors (3)
- Metabolism and Bioenergetics (4)
- Vasculature (3)
- Growth Factors and Hormones (1)
- Multi-target (6)
- Oxidative Stress (1)
- Other (1)

8 Late-stage Clinical Drug Development (Phase II/III and Phase III Clinical Trials)

- Amyloid (6)
- Vasculature (2)

58 Non-Pharmacological Interventions

- Exercise (14)
- Diet (5)
- Cognitive Training (14)
- Combination Therapy (7)
- Other (18)

7 Clinical Therapy Development for the Neuropsychiatric Symptoms of AD/ADRD

- Pharmacological (5)
- Non-Pharmacological (2)

34 Care and Caregiver Interventions

3 Delirium/Post-Operative Cognitive Decline Trials

- Amyloid (6)
- Vasculature (3)
- Neurotransmitter Receptors (3)
- Metabolism and Bioenergetics (4)
- Growth Factors and Hormones (1)
- Multi-target (6)
- Oxidative Stress (1)
- Other (1)
Recruitment to a growing AD/ADRD workforce

*Over 1/4* of NIA’s Alzheimer’s and related dementias awardees from Fiscal Year 2015-2018 were either *new or early stage* investigators

*Over 1/3* of NIA’s Alzheimer’s and related dementias awardees were *new to the field*
NIA SBIR/STTR Obligations

Dollars in Millions

*estimates

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New IADRP Database Highlights

- Search research by specific related dementias
- Integrate new codes/changes to CADRO
- Link research to related clinical trials, patents and data repositories
- Visualize search results with dynamic charts and graphs

Contacts

- Dr. Charlene Liggins – NIA (ligginsc@mail.nih.gov)
- Dr. Jordan Gladman – NINDS (Jordan.Gladman@nih.gov)
- Dr. Heather Snyder – Alzheimer’s Association (hsnyder@alz.org)
What do we need moving forward?

Data sharing – open science framework, target sharing, etc.

New ideas and a larger workforce – interdisciplinary teams, junior investigators

Interventions to test earlier plus hope for later stage disease – recruitment is key

Better understanding of the biology and overlap with other dementias – improved animal models, risk assessment, disease detection, progression, prediction, resilience, etc.

Improved insights into disease disparities

Expanded caregiver research – benefits to people with dementia as well as their caregivers
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Stéphane Hogan
Head of Sector Neuroscience, European Commission

#DefeatingDementia
EU support for research on dementia

WDC Summit
London, 5 December 2018

Stéphane Hogan
Head of Sector - Neuroscience
Health Directorate
DG Research & Innovation
EU support for research - complementary actions

Collaborative research
Real-life solutions based on joint problem-solving

Public partnerships
Harnessing global expertise to fight poverty-related diseases

Public-private partnerships
Investing together for next generation medicines and treatments

Global co-operation
One world, one team working to solve common health challenges
EU support for research & innovation

- Funding basic research
  - ERC for frontier research
  - Marie Skłodowska-Curie Actions (for mobility, training & career development)

- Funding translational research for large-scale collaborative research, including clinical trials

- Innovative Medicines Initiative (IMI)
  Fostering cooperation between academia and industry (and within industry)
A comprehensive approach

**EU-funded collaborative brain research**

- Genetics
- Brain circuit synaptology
- Taxonomy
- Common mechanisms in co-morbidities

**Molecular pathogenesis**

- Genome-wide association
- Gene-environment interaction
- Networking of cohorts
- Systems biology

**Epidemiology**

- Dietary interventions
- On-line tailored interventions
- At-risk individuals
- Pharmacologic al secondary prevention

**Prevention**

- Fluid biomarkers
- Imaging biomarkers
- Cognitive assessment
- Multimodal biomarkers

**Diagnosis & monitoring**

- Drug discovery
- Preclinical
- Proof-of-concept
- Clinical Trial

**Treatment**

- Quality of life
- Technology assisted care
- Care-giver support
- Sustainability

**Care & support**

**Research and Innovation**

- Epidemiology
- Prevention
- Diagnosis & monitoring
- Treatment
- Care & support
A typical EU-funded collaborative project - profile

- 13 participants
- 83% of projects have private sector participants
- 7% projects create SMEs
- 80 researchers
- 65% of projects file patents
- 37 Articles per project of 9.0 average IF
- EU grant: €5.8 million
- EU grant (per participant): € 450,000
- additional funding: €2.9 million
- 83% of projects have private sector participants
Collaborative R&I projects (FP7 & Horizon 2020)

- **Dementia in Horizon 2020 (2014-2018):** 91 projects/€195 million
  - **INnovative, Midlife INtervention for Dementia Deterrence**
  - Impact of nutritional lipids on neuronal and cognitive performance in aging, Alzheimer’s disease & vascular dementia
    - First randomized controlled trials with 2-year follow-up of patients with prodromal AD
  - Validation of a fast and simple peripheral blood diagnostic biomarker kit for Alzheimer’s disease
  - Prevention of Dementia using mobile phone applications (targeting socio-economically deprived populations)
EC support for research & innovation (1)

- **Supporting research infrastructures**
  - The Human Brain project (HBP)

- **Fostering European collaboration at national level**
  - Joint Programme for Neurodegenerative Disease research (JPND)

- **International cooperation for implementation research**
  - Global Alliance for Chronic Diseases (GACD): 14 member agencies
Public-private partnerships

- IMI: world's largest PPP in life sciences
- To improve development of medicines
- Unprecedented inter-industry collaboration and with academia, patients, regulators...
- IMI Alzheimer’s disease Joint Platform: EC contribution € 58.2 million
  
  • European Prevention of Alzheimer’s Dementia consortium
  
  • Organising mechanistic knowledge of neurodegenerative diseases to improve drug development and therapy
  
  • Investigate value of β-amyloid brain scans as a diagnostic and therapeutic marker for Alzheimer’s disease
Public-Public partnerships

- Foster coordination of research activities of 30 Member States and other countries
- Support and align national strategies
- Develop common R&I agenda
- Co-invest in research - joint calls: €150m
- Develop international collaboration
Coordinating European brain research & developing global initiatives

=> **EBRA project: European Brain Research Area**

- European Brain Council (EBC), JPND, NEURON, Human Brain Project
- Nov. 2018 – Oct. 2021 - EU funding €2 million
- EBRA will coordinate and foster synergies in brain research
  • integrate EU funded initiatives and foster thematic clusters
  • align brain research strategies and initiate new ones
  • develop international collaboration
Global co-operation

- International funders
- Flexible arrangements
- Common goals defined with researchers
- Critical mass
- Sharing tasks, costs, infrastructures & data
- Sharing best practices
Thank you

"Open Science, Open Innovation, Open to the World"