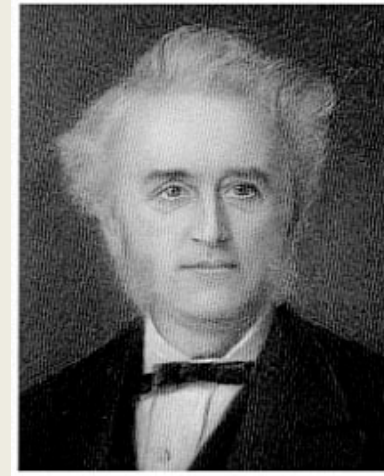


Alzheimer's Disease: Overall State of Research; Advances at the Linda Crnic Institute for Down Syndrome

Huntington Potter, Ph.D.
Kurt N. and Edith von Kaulla Memorial Professor
Department of Neurology
Rocky Mountain Alzheimer's Disease Center
Linda Crnic Institute for Down Syndrome
CU Denver/AMC

First Report of Down Syndrome



John Langdon Down,
1866

First Report of Alzheimer's Disease



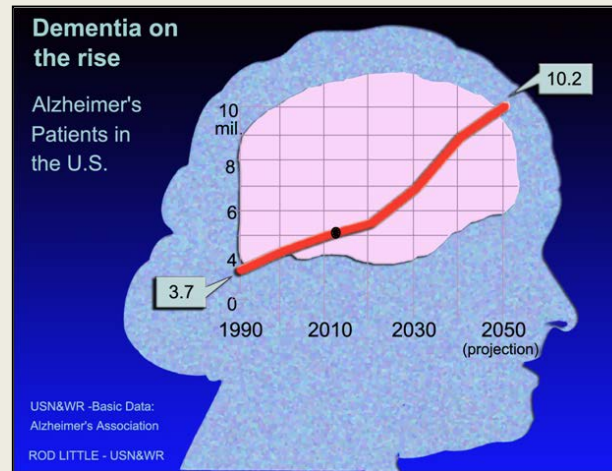
Auguste Deter:
"I have lost myself."



Alois Alzheimer,
1907

The Problem:

Alzheimer's Disease



- 5.7 million patients in U.S.
- \$277 billion annual cost
- \$1.1 trillion by 2050
- 10% of people over age 65
- 40-50% of people over age 85

Down Syndrome

- ~400,000 people in U.S.
- ~\$19 billion annual cost
- 1/700 live births
- 100% develop AD brain pathology

The SOLUTION

A Team Pulling Together

Providing:

Ideas
Funding
Translational Research
Care
Education

Affiliates:

Global DS Foundation
Crnic Institute for DS
Sie Center for DS
Adult DS Clinic
RMADC



TEAM SCIENCE: RESEARCH TODAY, MEMORIES FOREVER

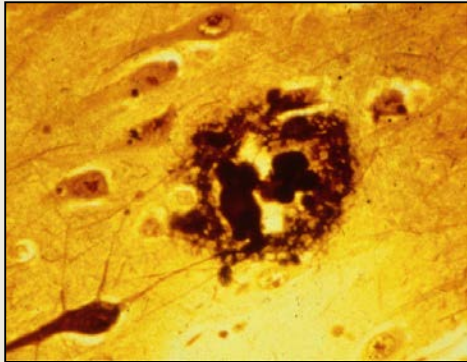
RMADC Memory Disorders Clinic: CARE

- **Academic Medical Center**
 - 7 behavioral neurologists
 - 1 neuropsychologist
 - 1 fellow
 - 2 advanced practice providers
 - 3,000+ patients/year
- **World-Class Memory Care**
 - Accurate diagnosis
 - Latest treatments
- **Opportunities to Participate in Research**
 - Clinical trials
 - Longitudinal studies

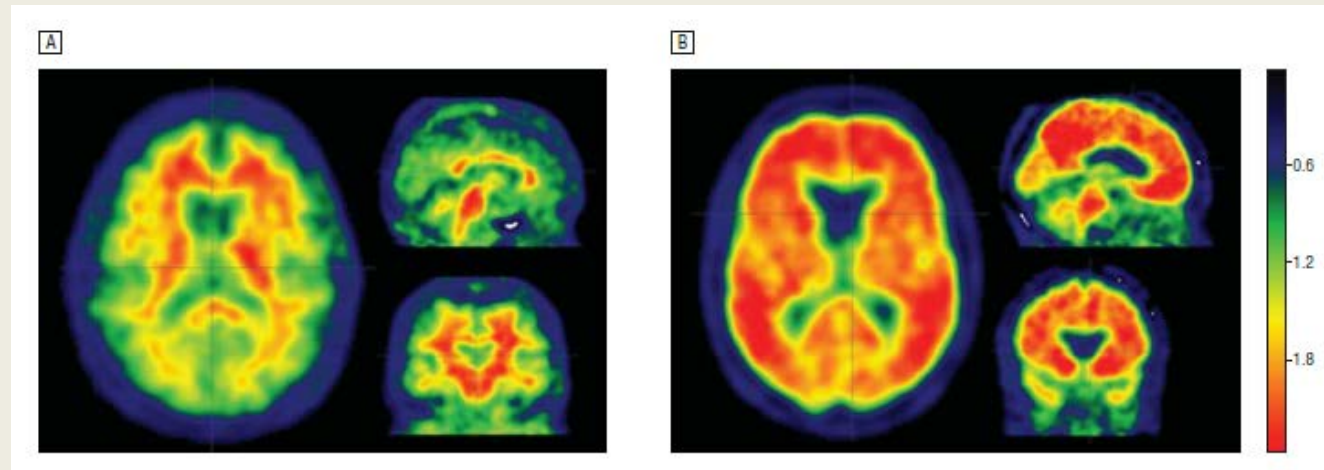


Brain Amyloid in AD and DS

Autopsy



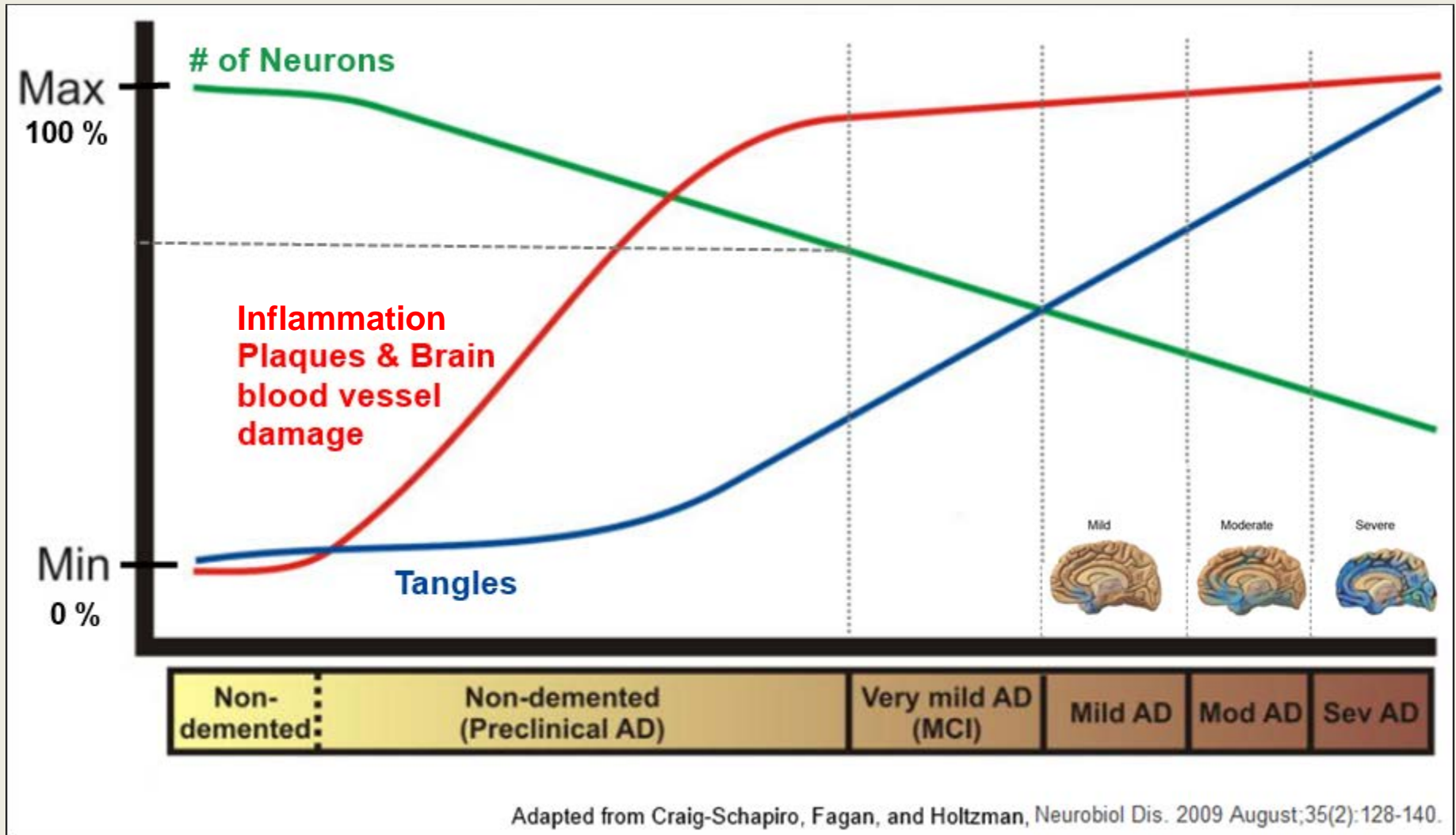
Brain Imaging **RED**=Amyloid



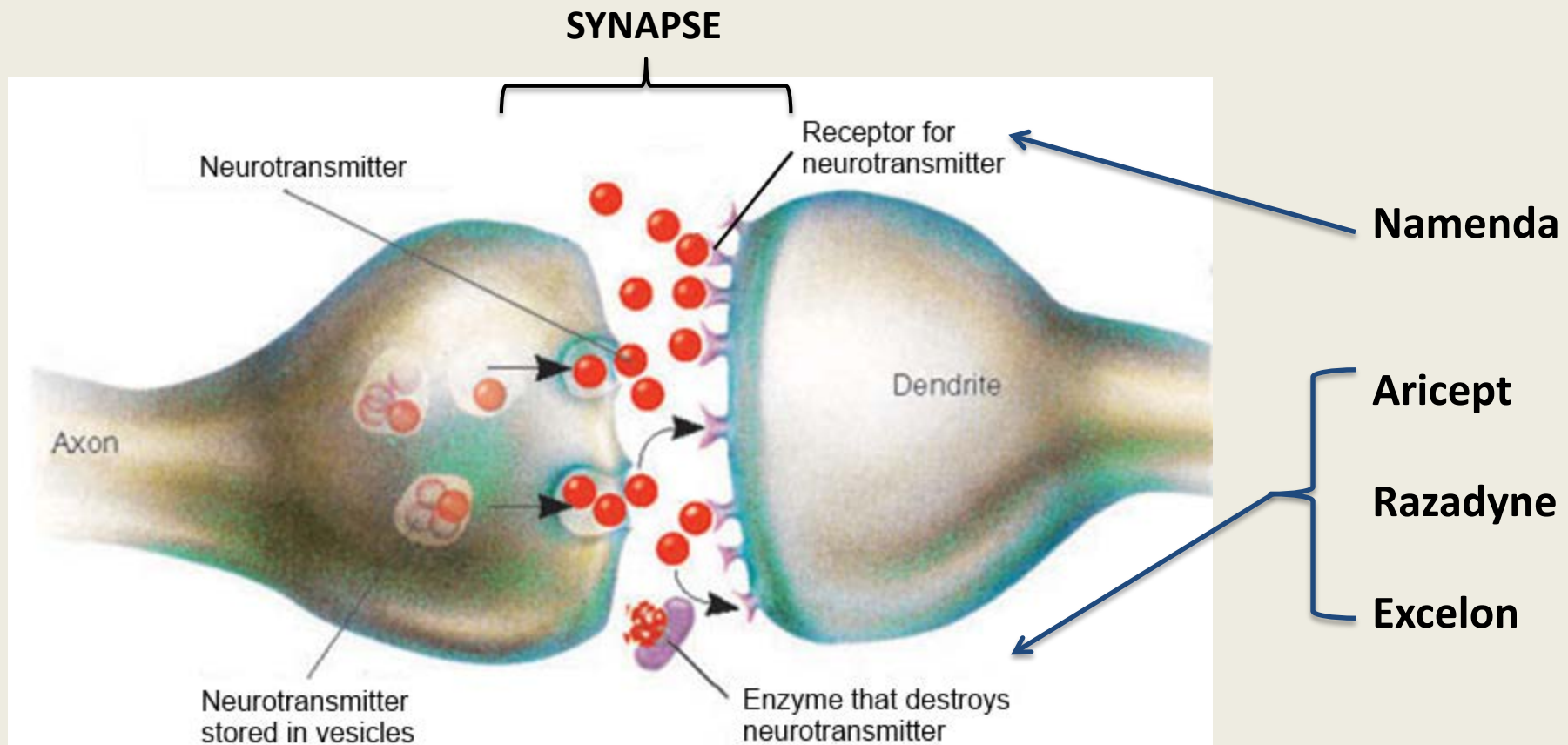
Normal

AD or DS

Correlating AD Pathology with Dementia



Current Alzheimer Drugs Only Enhance The Way Neurons Communicate With Each Other



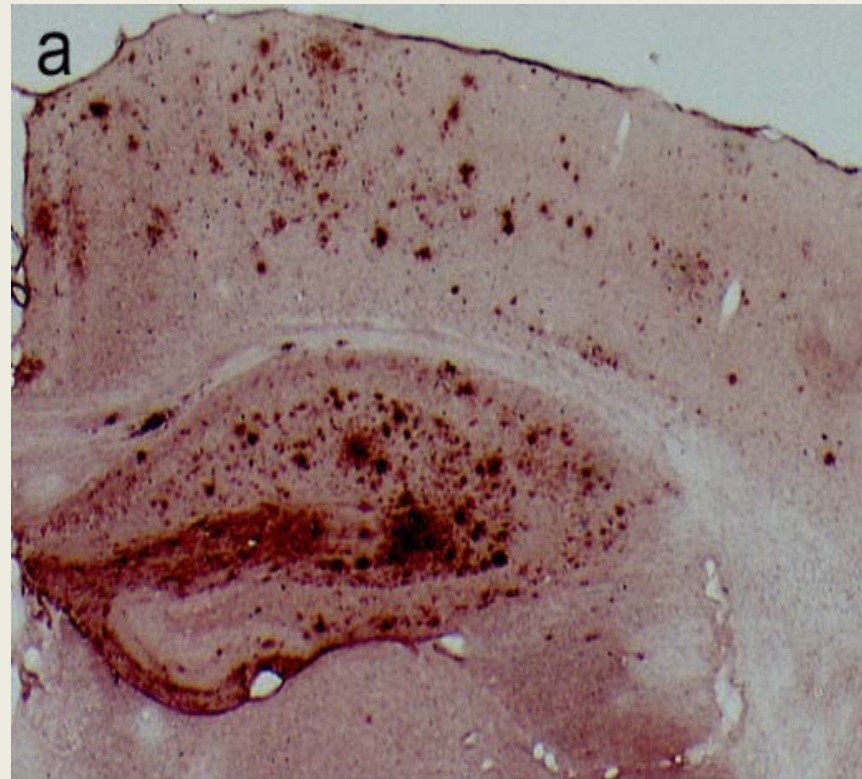
Long-Term Solution: MORE RESEARCH



TEAM SCIENCE: RESEARCH TODAY, MEMORIES FOREVER

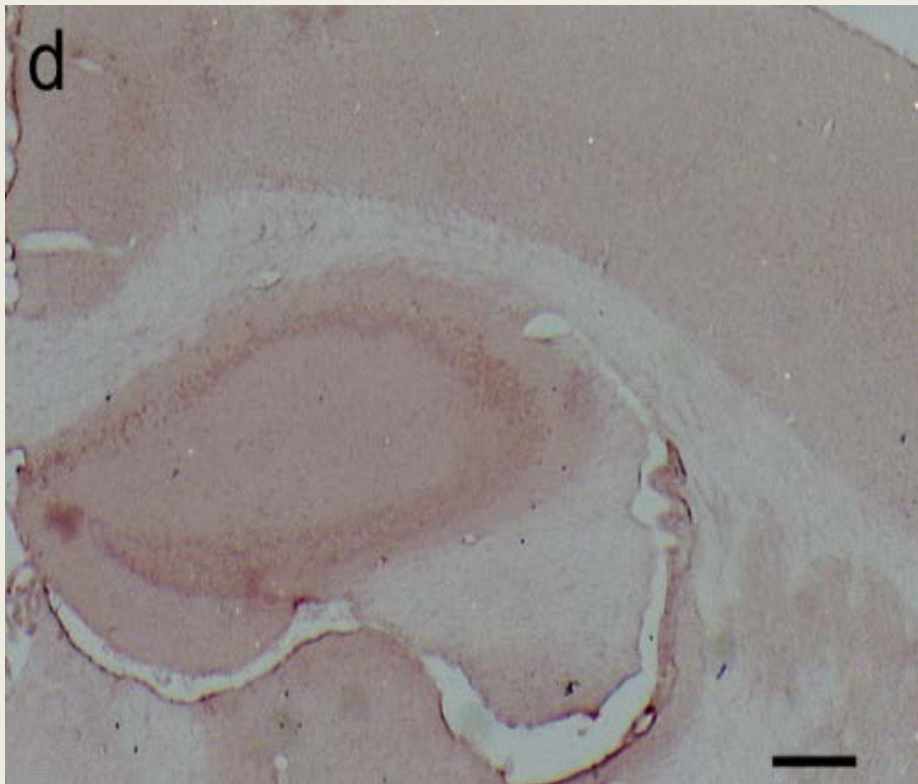
Essential Tools: Transgenic Mice

Mouse Brain with Mutant Human AD Gene



ApoE is an Essential Amyloid Catalyst

Mouse Brain with Mutant Human AD
Gene But *Lacking* the ApoE Gene

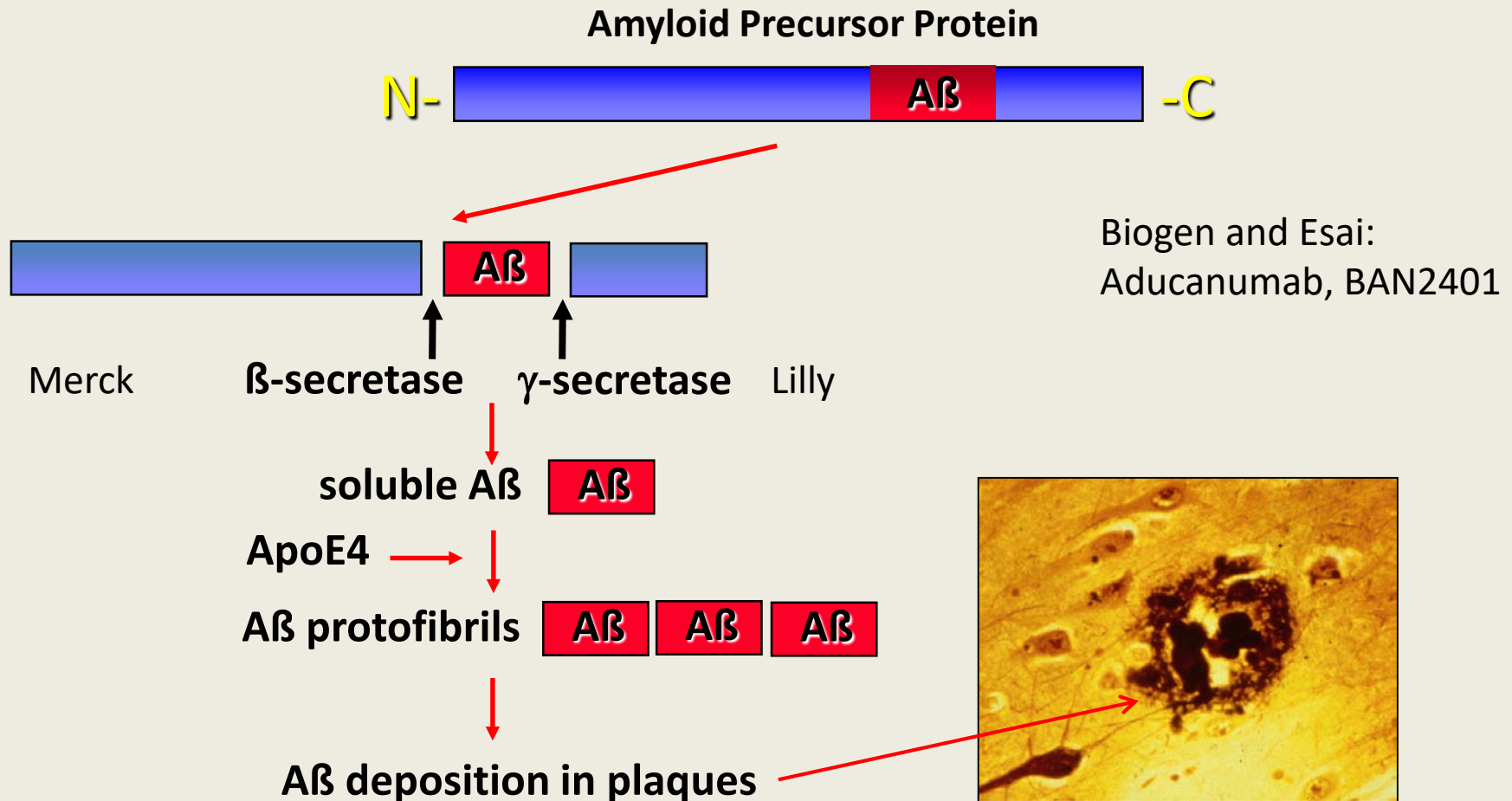


Measuring Short-Term Memory in AD Mice

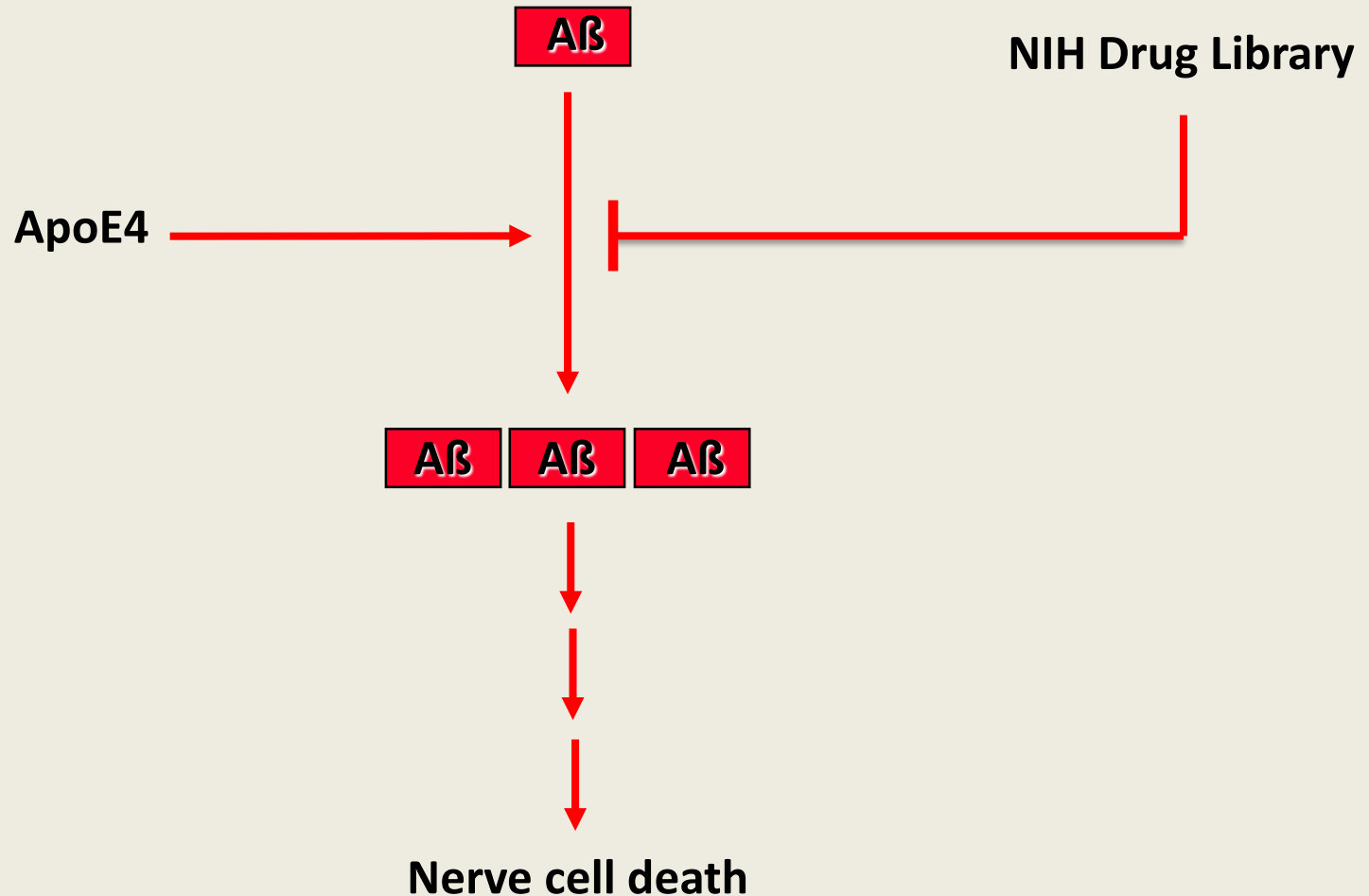


Radial Arm Water Maze

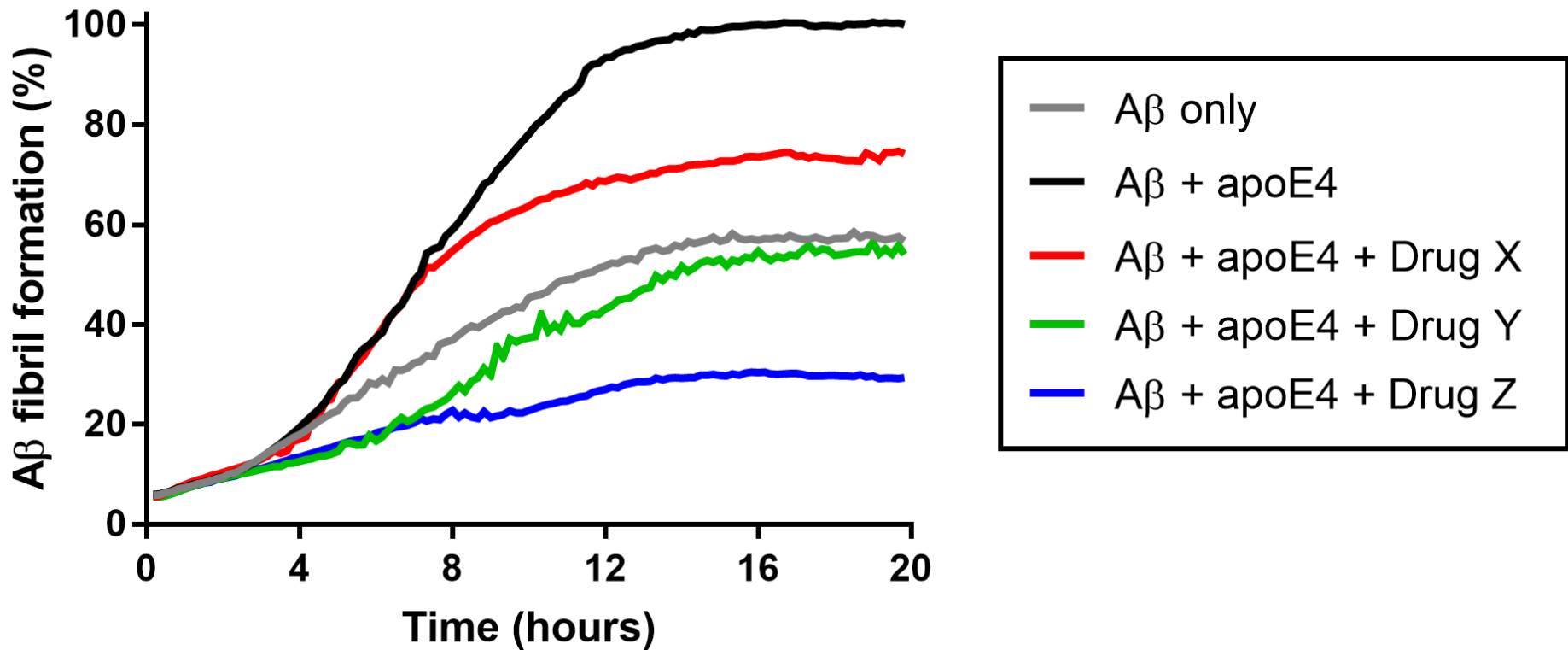
Amyloid Cascade in AD and DS



Searching for ApoE4-Blocking Alzheimer Drugs



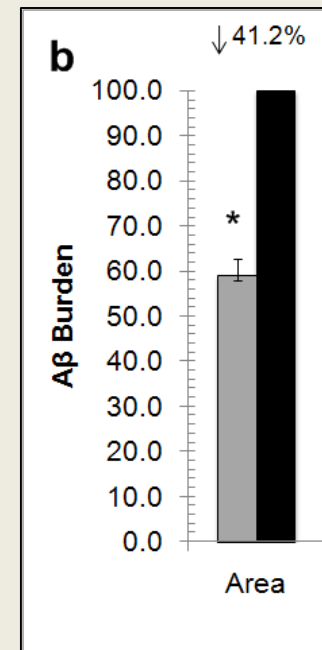
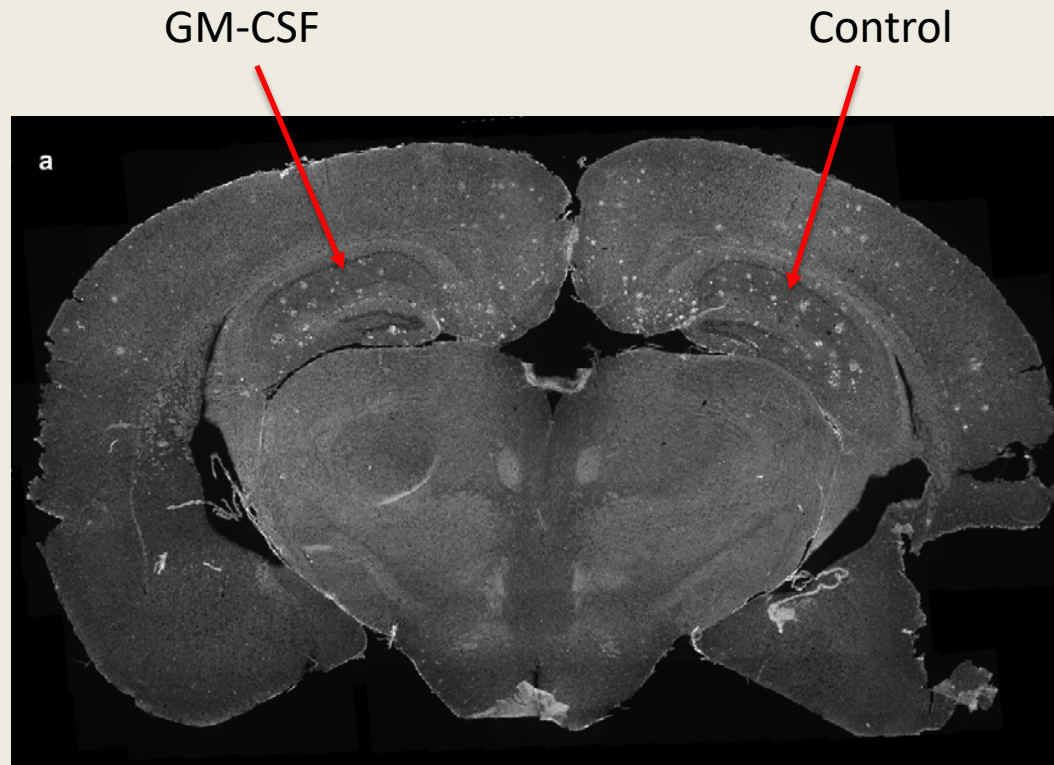
Searching for ApoE4-Blocking AD Drugs



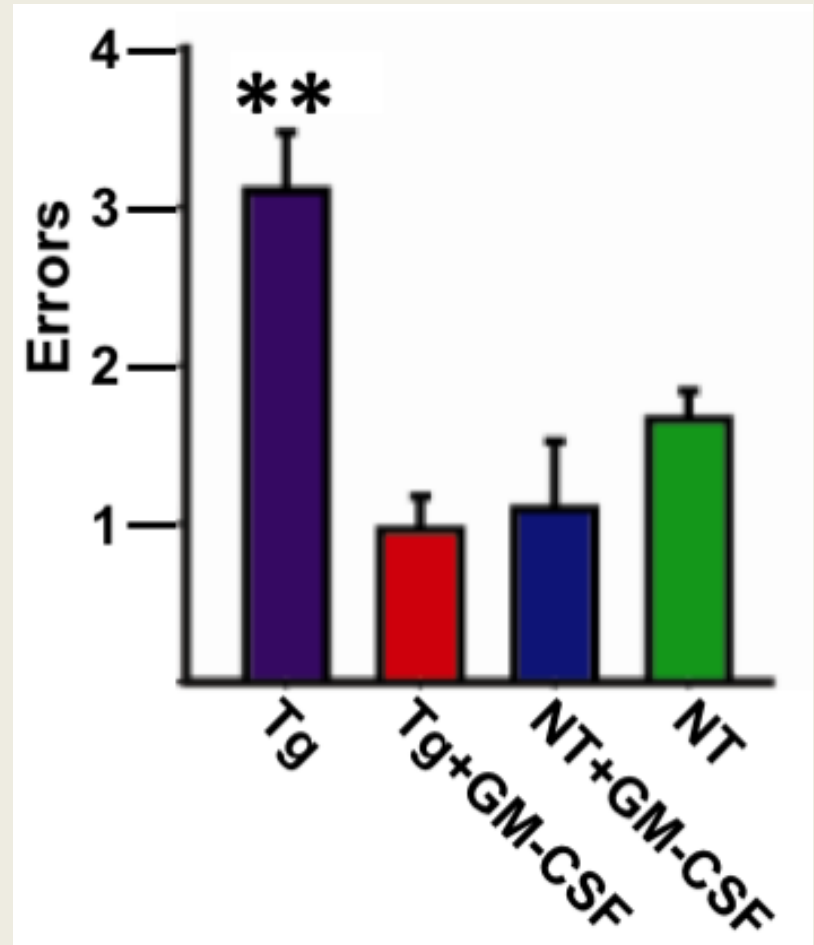
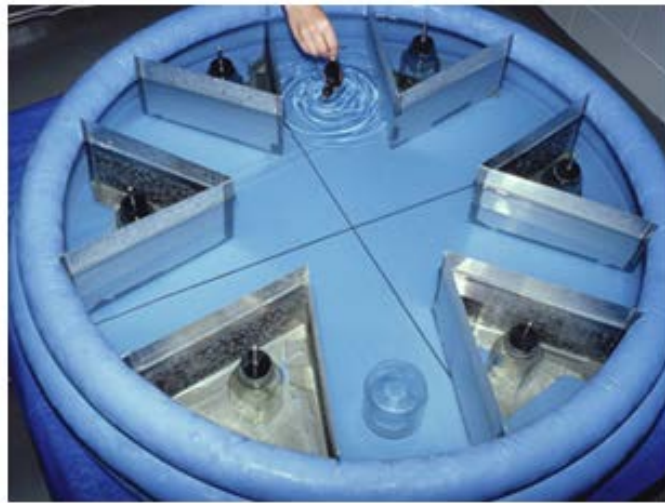
Why are People with Rheumatoid Arthritis Protected Against Alzheimer's Disease?



GM-CSF Reduces A β Deposition in AD Mouse Brain



GM-CSF Reverses Cognitive Impairment



GM-CSF Clinical Trials Summary

Current 3-Week Trial:

- 5 GM-CSF injections/week for 3 weeks; 45- and 90-day follow-ups

Results to Date:

- 30 subjects completed treatment phase plus both follow-ups
- No serious adverse events; **no brain swelling or bleeding**
- Improvement in MMSE at end of treatment

Future 6-Month Trial:

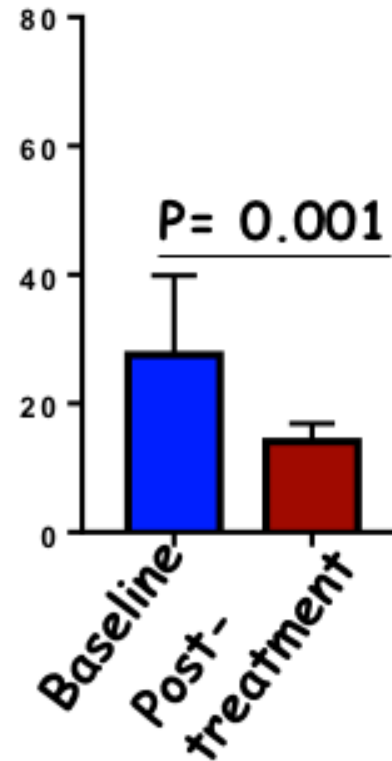
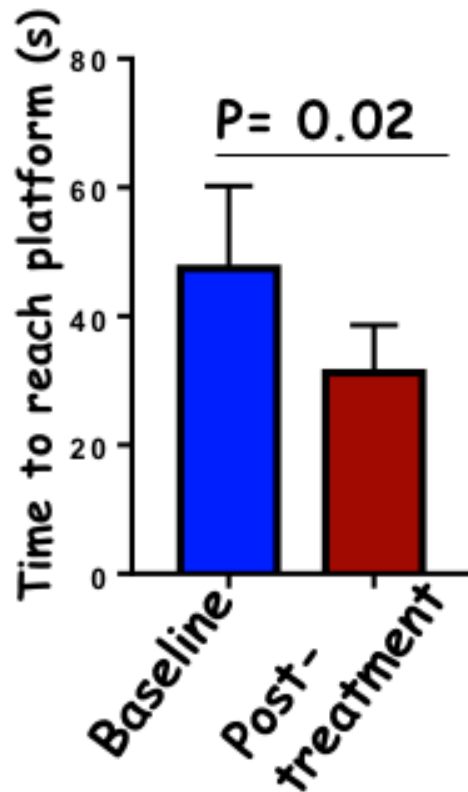
- 5 GM-CSF injections/week for 24 weeks (partially funded by Alz Assn)

Websites:

- [ClinicalTrials.gov](https://clinicaltrials.gov)
- trialmatch.alz.org

GM-CSF Improves Cognition in Aged DS and Normal Mice

Dp16 mice + GM-CSF Control + GM-CSF



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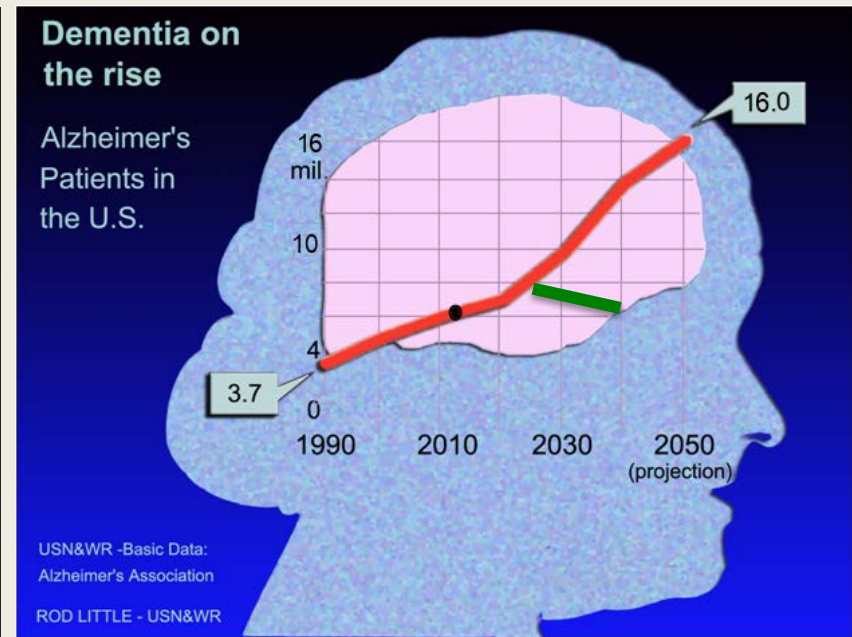
Linda Crnic Institute for Down Syndrome
Global Down Syndrome Foundation
UC Denver SOM; Dept. Neurology; UC Health
National Institute on Aging
National Institute on Neurological Diseases and Stroke
Department of Defense
Dana Foundation

Alzheimer's Association
Bruce and Marcy Benson
Other Philanthropists
Hewitt Family Foundation
MDC Richmond American Homes Fnd
Dake Family Foundation
State of Colorado

Colorado University Results CURE



Anschutz Medical Campus



Hope!