



# GLOBAL

DOWN SYNDROME FOUNDATION®

## Supporting Aging Adults with Down Syndrome and Alzheimer's Disease

Global Down Syndrome Foundation's  
Webinar Series

Presenters: Martha Keele, Dr. Huntington Potter,  
Bryn Gelaro

Tuesday, October 30<sup>th</sup>, 2018

# Global Down Syndrome Foundation

## A Unique Affiliate Model!

The Global Down Syndrome Foundation is part of a network of affiliate organizations that work closely together on a daily basis to deliver on our mission, vision, values, and goals:

### Global & Affiliates



❖ Global: was established as a 501(c)3 in 2009 and is "Dedicated to significantly improving the lives of people with Down syndrome through Research, Medical Care, Education, and Advocacy"

❖ Affiliates are:

- Established with a lead gift from Anna & John J. Sie Foundation
- Must work closely together to benefit people with Down syndrome
- Must be self-sustaining financially

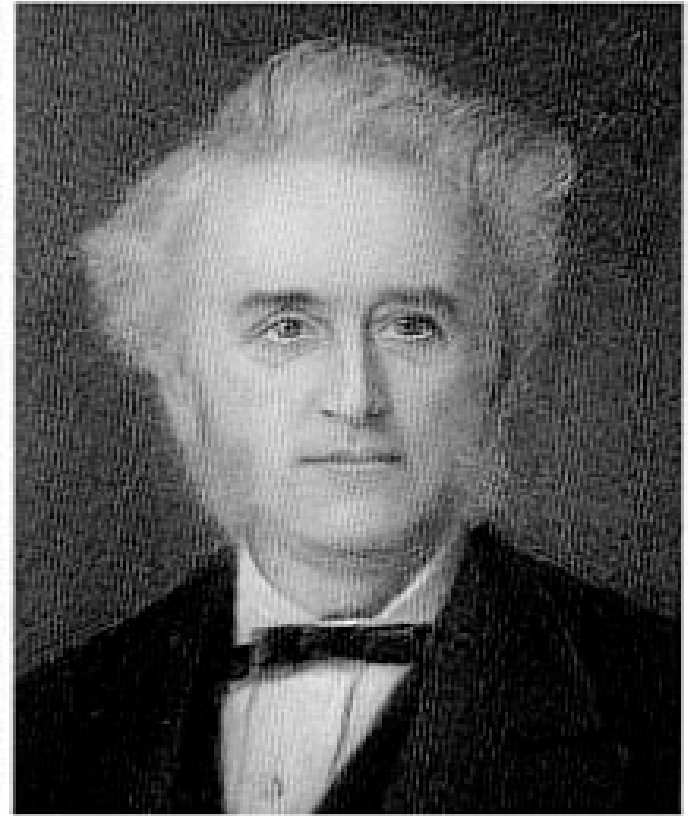


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DOWN SYNDROME FOUNDATION®

# Aging and Alzheimer's Disease In People with Down Syndrome

Huntington Potter, Ph.D.  
Rocky Mountain Alzheimer's Disease Center  
Department of Neurology  
Linda Crnic Institute for Down Syndrome  
CU Denver/AMC

# First Report of Down Syndrome



John Langdon Down, 1866



# First Report of Alzheimer's Disease



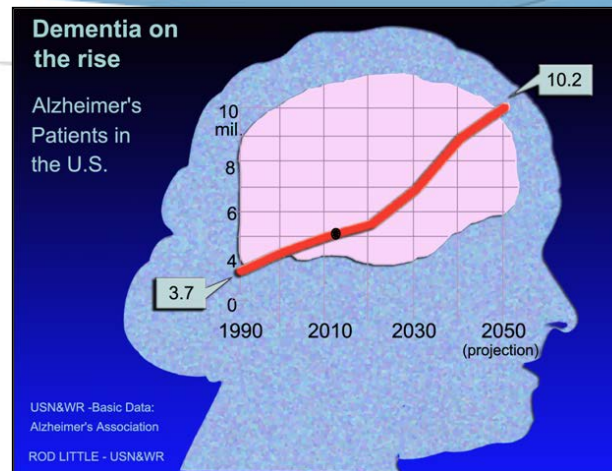
"I have lost myself."



Alois Alzheimer, 1907

# THE PROBLEM:

## Alzheimer's Disease



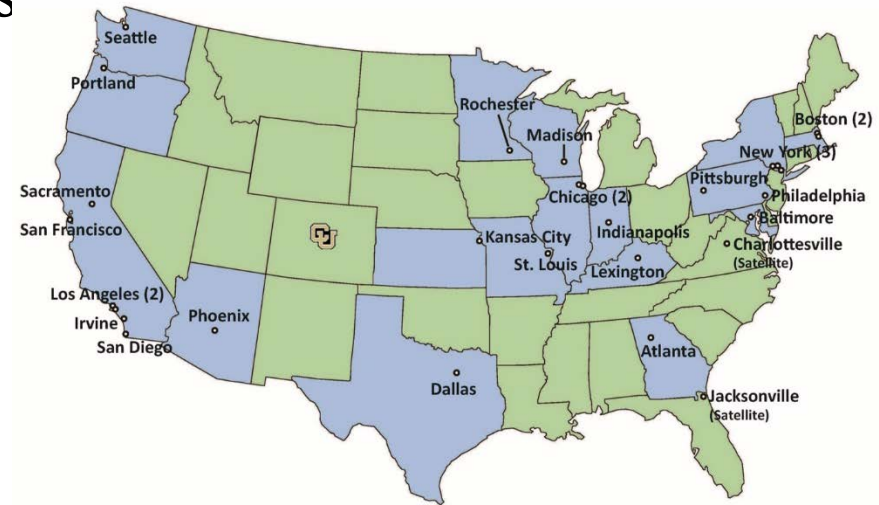
- 5.7 million patients
- \$277 billion annual cost
- \$1.1 trillion by 2050
- 10% of people over age 65
- 40-50% of people over age 85

## Down Syndrome

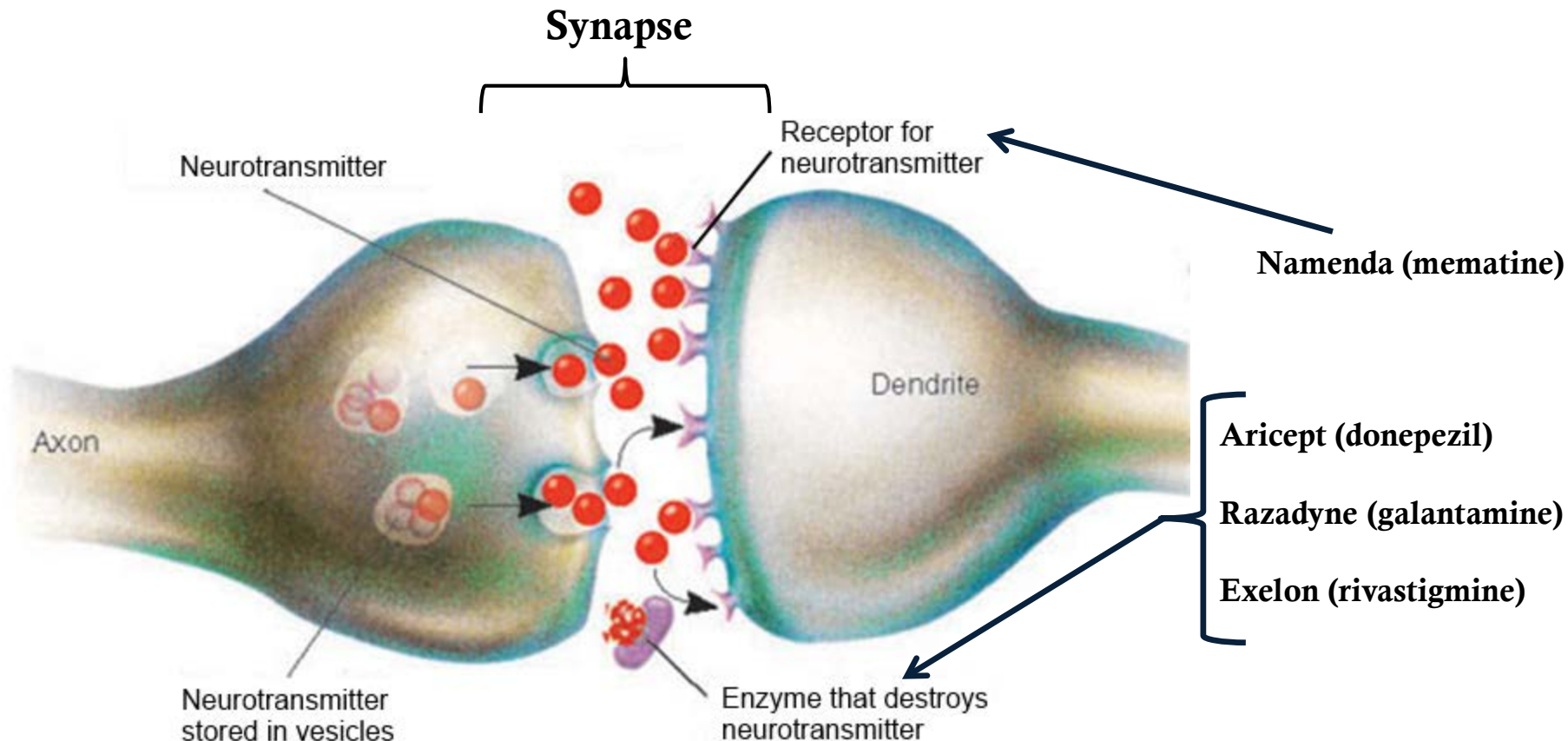
- ~400,000 patients
- ~\$19 billion annual cost
- 1/700 live births
- 100 % acquire features of AD

# Care: Memory Disorders Clinic

- Academic medical center (new clinic location!)
  - 6 Behavioral Neurologists
  - 1 Neuropsychologist
  - 2 Advanced Practice Providers
  - 1 Fellow
  - 3,500 patient visits/year
- World-class memory care
  - Accurate diagnosis
  - Latest treatments
- Opportunities to participate in research
  - Clinical Trials
  - Longitudinal Studies



# Current Alzheimer's Drugs Only Enhance the Way Neurons Communicate with Each Other





# Long-Term Solution: MORE RESEARCH



RESEARCH TODAY, MEMORIES FOREVER

# First Molecular Advance in Alzheimer's Disease and Down Syndrome

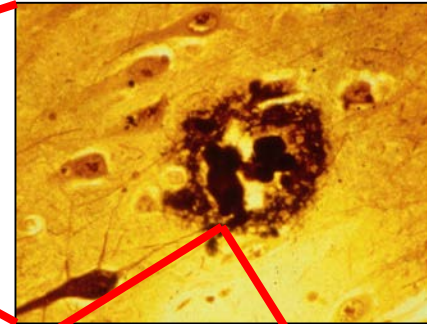
Normal Brain



Alzheimer



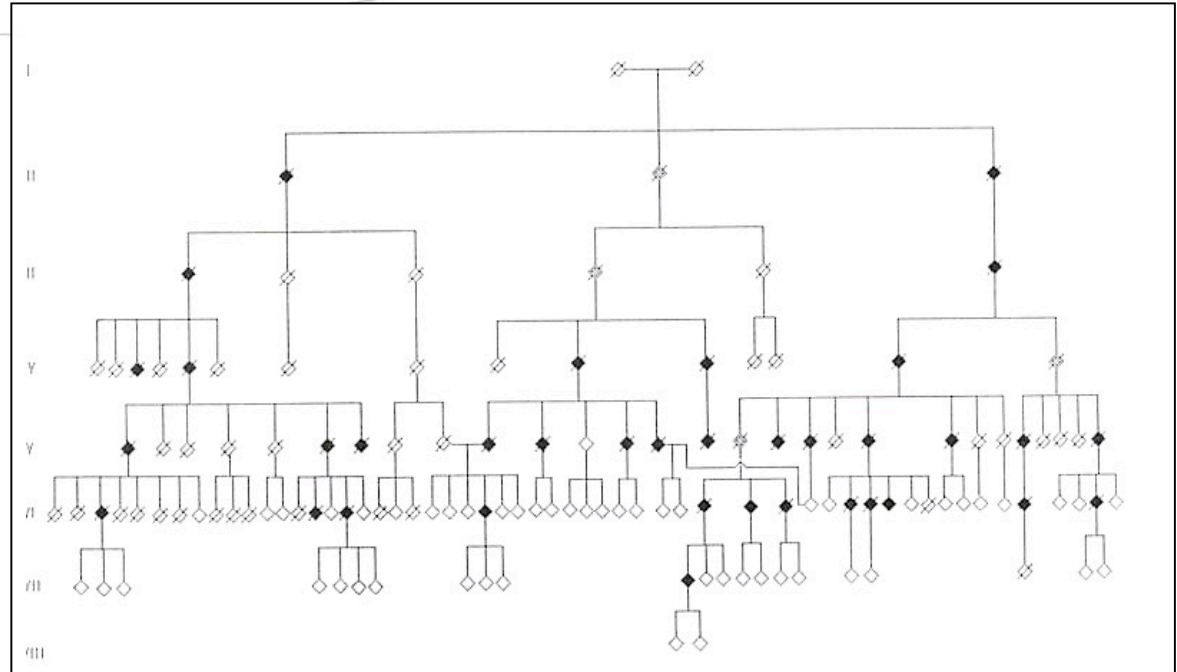
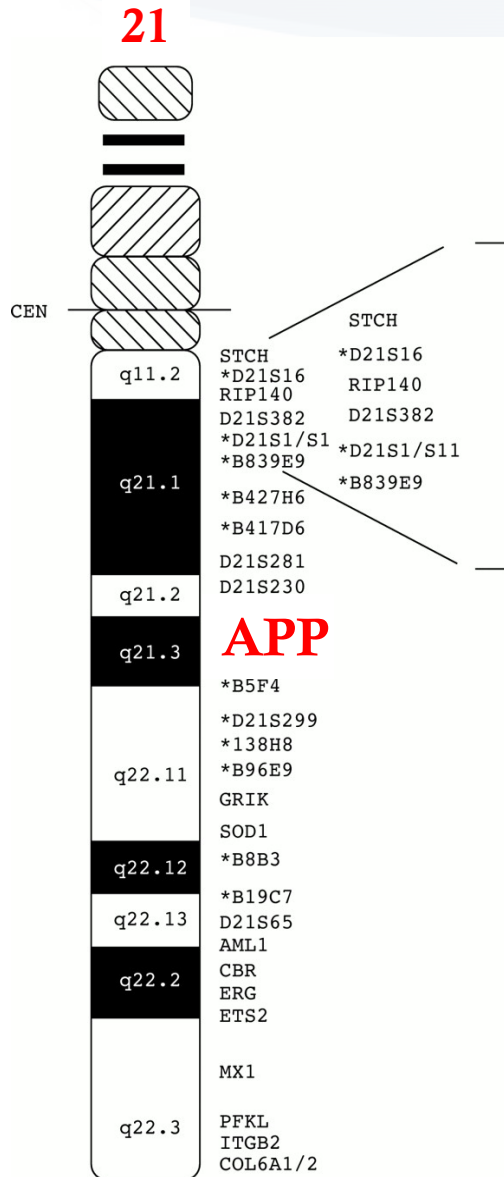
Plaques and tangles



George Glenner and Caine Wong 1984

DAEFRHDSGYEVHHQKLVFFAEDVGSNKGAIIG  
LMVGGVVIA      A $\beta$  Peptide

# The Amyloid Precursor Protein Gene Is Encoded on Chromosome 21

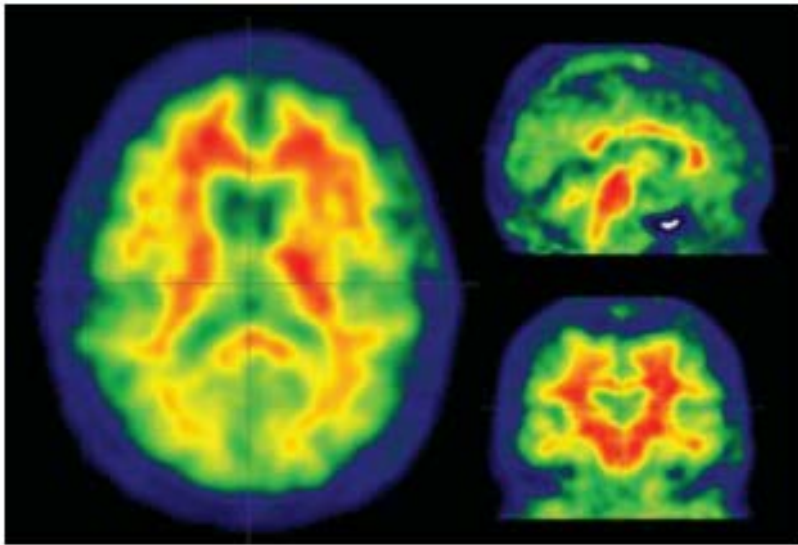


**The 'Swedish' Alzheimer's disease family  
inherits a mutant APP gene**



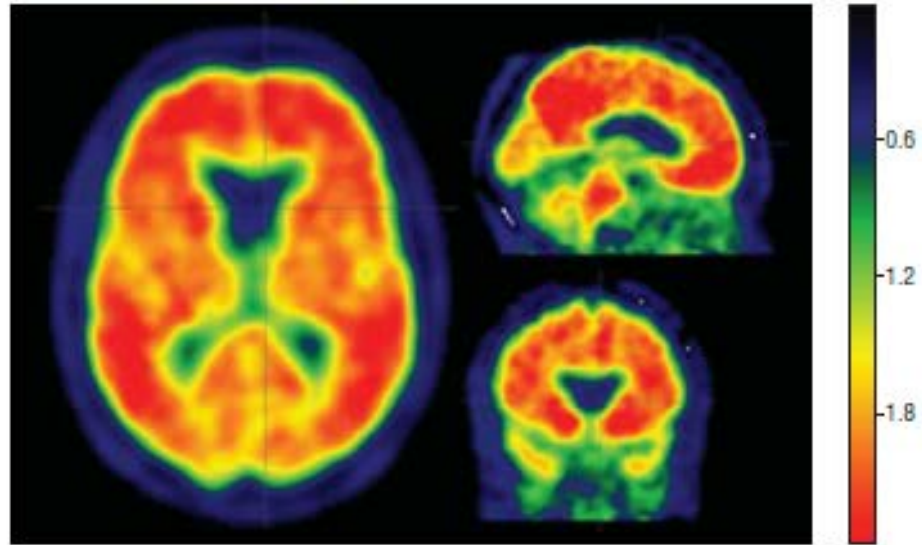
# PiB-PET: Amyloid Imaging in Alzheimer's

A



Normal

B

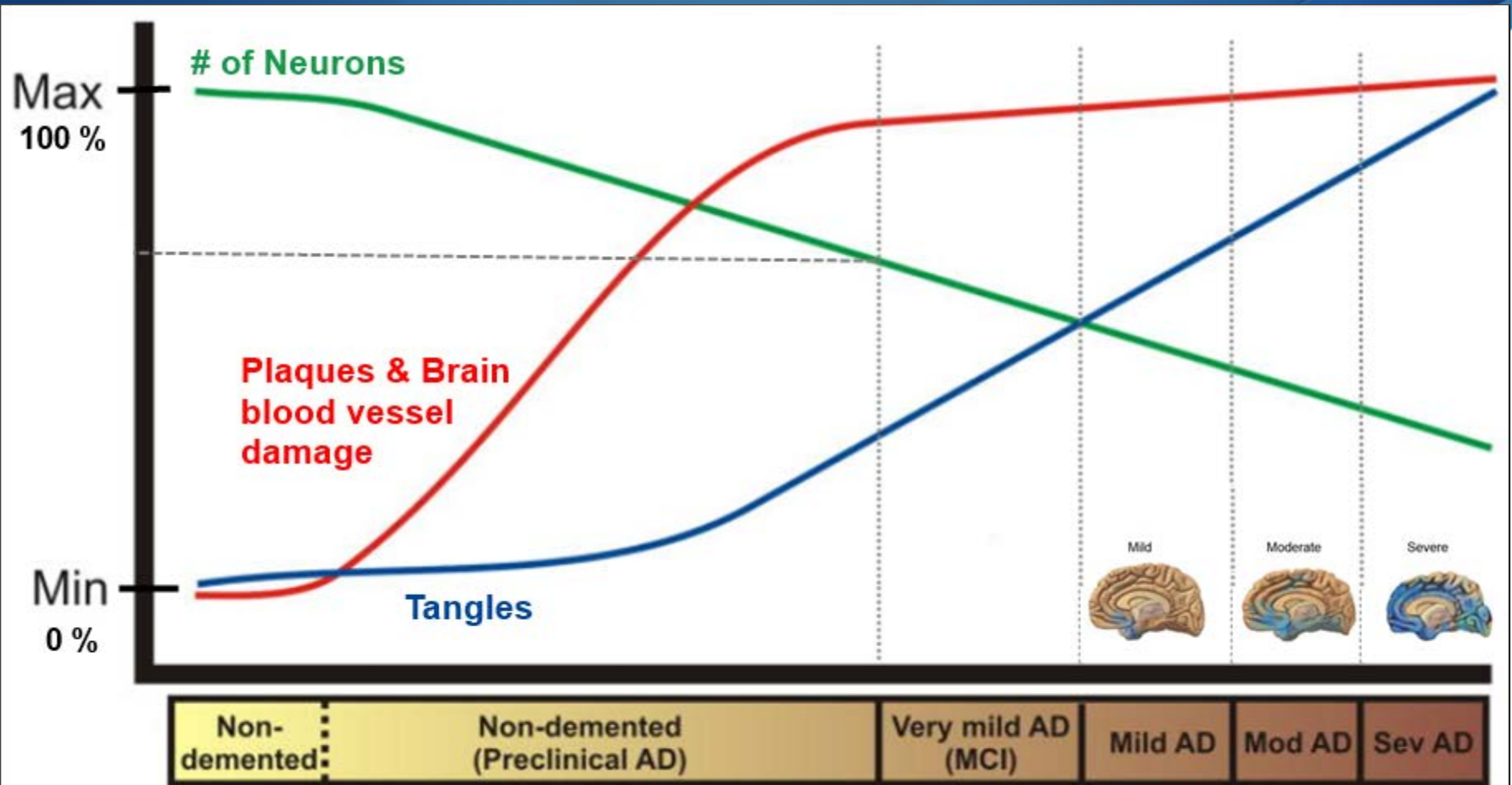


Amyloid-Positive

Provenzano, JAMA Neurol, 201

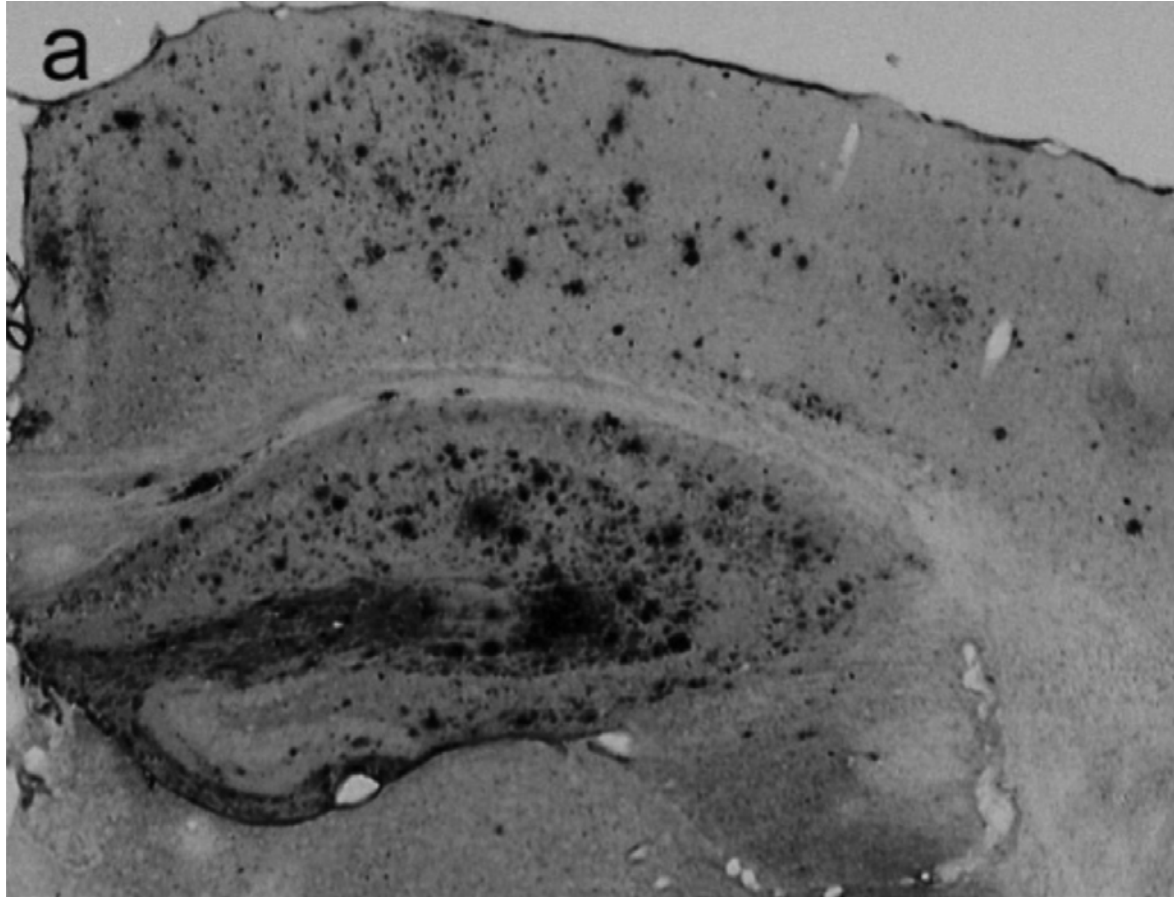


# Correlating Pathology with Dementia



Adapted from Craig-Schapiro, Fagan, and Holtzman, Neurobiol Dis. 2009 August;35(2):128-140.

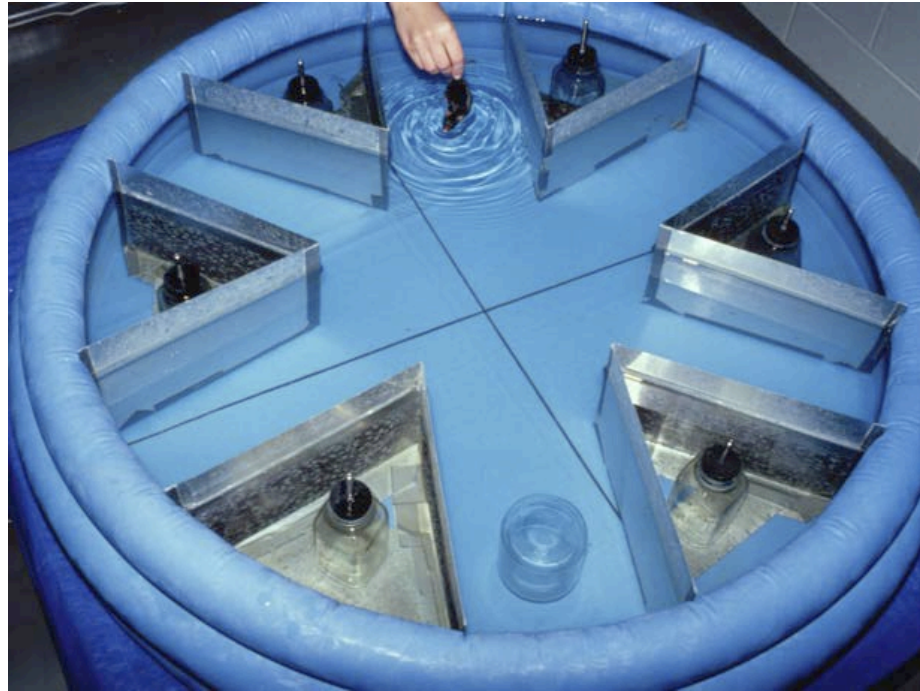
# Transgenic Mice: Essential AD and DS Tools



**Mice with mutant human APP gene  
accumulate amyloid deposits**

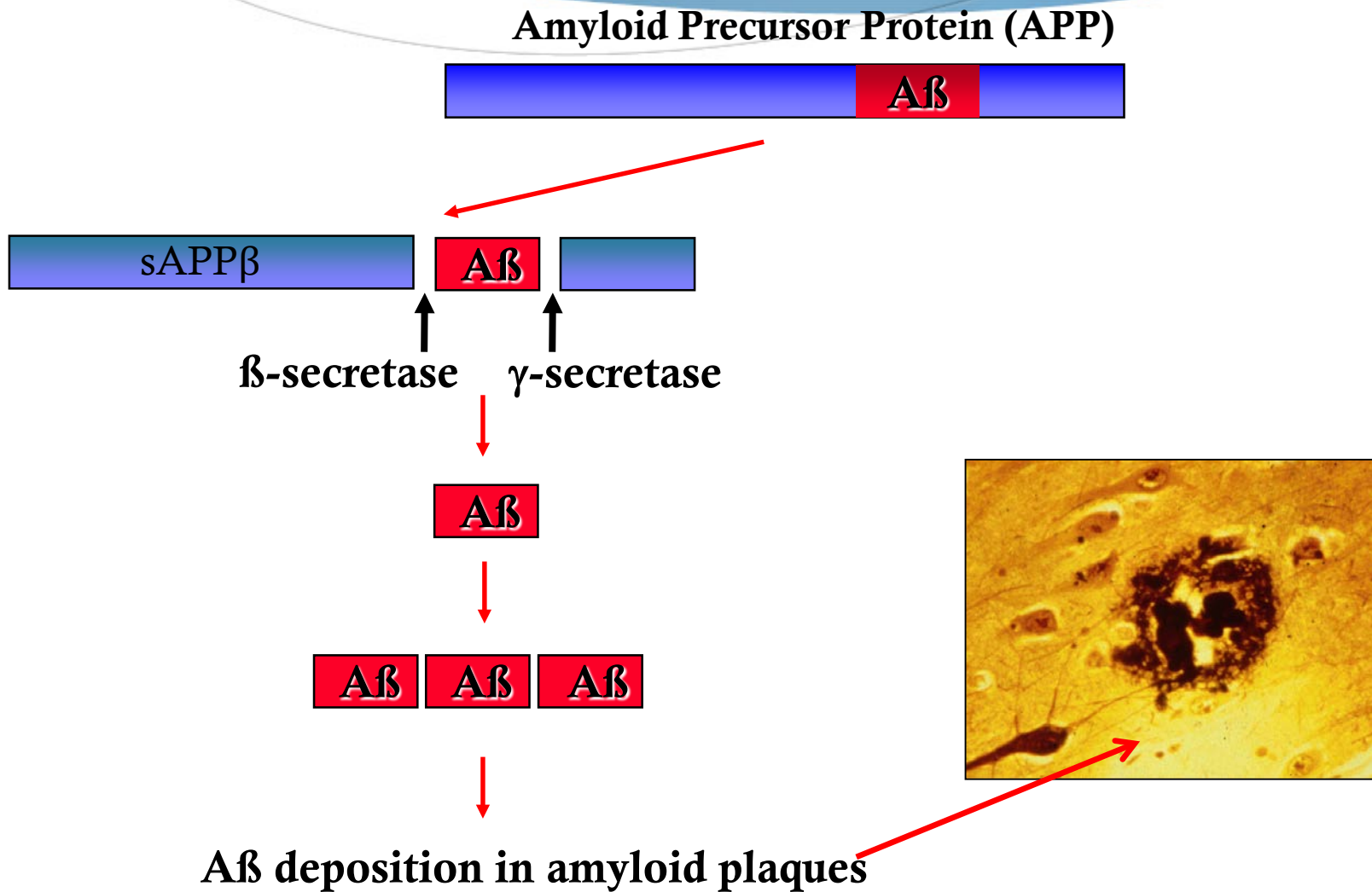
**RESEARCH TODAY, MEMORIES FOREVER**

# Measuring Short-Term Memory in Mice



## The Radial Arm Water Maze

# The Amyloid Cascade in Alzheimer's





# Alzheimer's Clinical Trial Failures

## **Eli Lilly: Solanezumab (LY2062430)**

(Anti-amyloid antibody)

**Phase III study terminated due to unlikely efficacy**

## **Lundbeck: Idalopirdine (Lu AE58054)**

(5HT6 antagonist designed to increase release of acetylcholine)

**Three failed Phase III trials due to lack of efficacy**

## **BACE Inhibitors:**

**Eli Lilly, AstraZeneca, Merck**

# Potential Successes in Alzheimer's Trials

## Anti-Amyloid Antibodies

### **Biogen: Aducanumab (BIIB037)**

- (Recruiting/treating in Phase III trial)
- Currently recruiting for multi-year Phase III trial, including at CU Anschutz

### **Biogen and Esai: BAN2401 (mAb158)**

### **Lilly: LY3002813 (N3pG-A $\beta$ )**

### **Roche: Gantenerumab (RO4909832)**

## BACE Inhibitors

### **Lilly: LY3202626 plus N3pG-A $\beta$**

### **Esai and Biogen: Elenbecestat (E2609)**

# Sleep Disorders Predate Alzheimer's

- ❖ Out of 516 cognitively normal adults (71-78 years old), those with sleep disordered breathing showed greater accumulation of beta-amyloid deposits over a three-year period

Wheaton College

# Previous Stress Is Related to Poorer Cognition/Memory, Especially in African Americans

- ❖ Each stressful event aged the brain 1.5 years in non-Hispanic whites and 4 years in African Americans

University of Wisconsin



# Mediterranean or MIND Diets May Reduce Alzheimer's Risk

- ❖ Reduced risk of dementia by 1/3
- ❖ Diet rich in plants, olive oil, fish, etc.

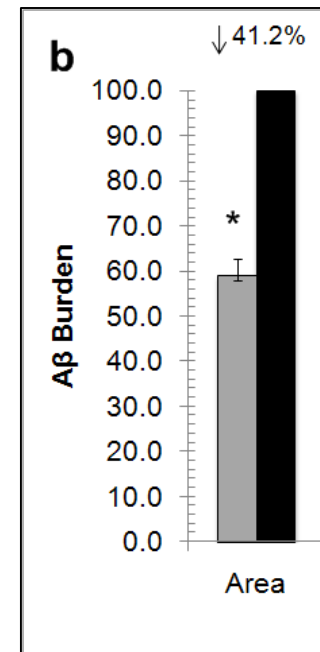
UCSF

- Alzheimer's Association funded **POINTER** trial, which includes aerobic workouts plus the MIND diet

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

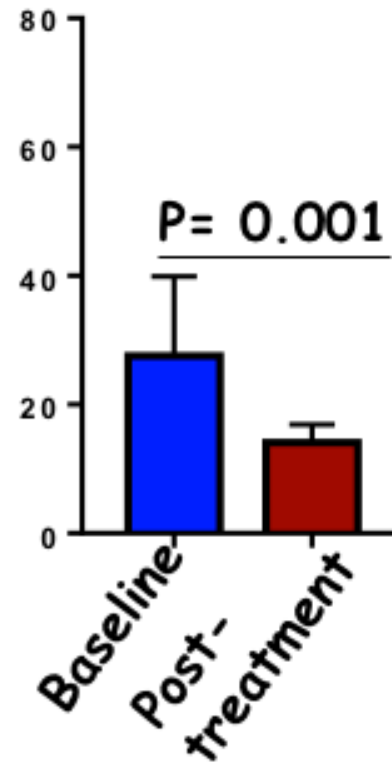
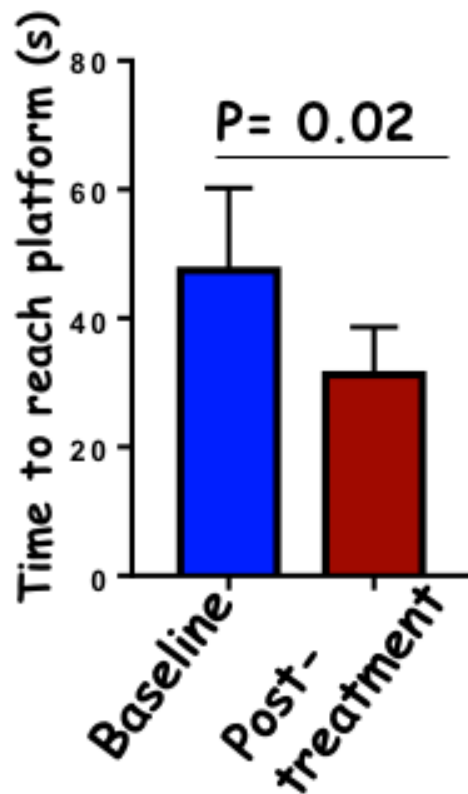


# GM-CSF Reduces A $\beta$ Deposition in AD Mouse Brain



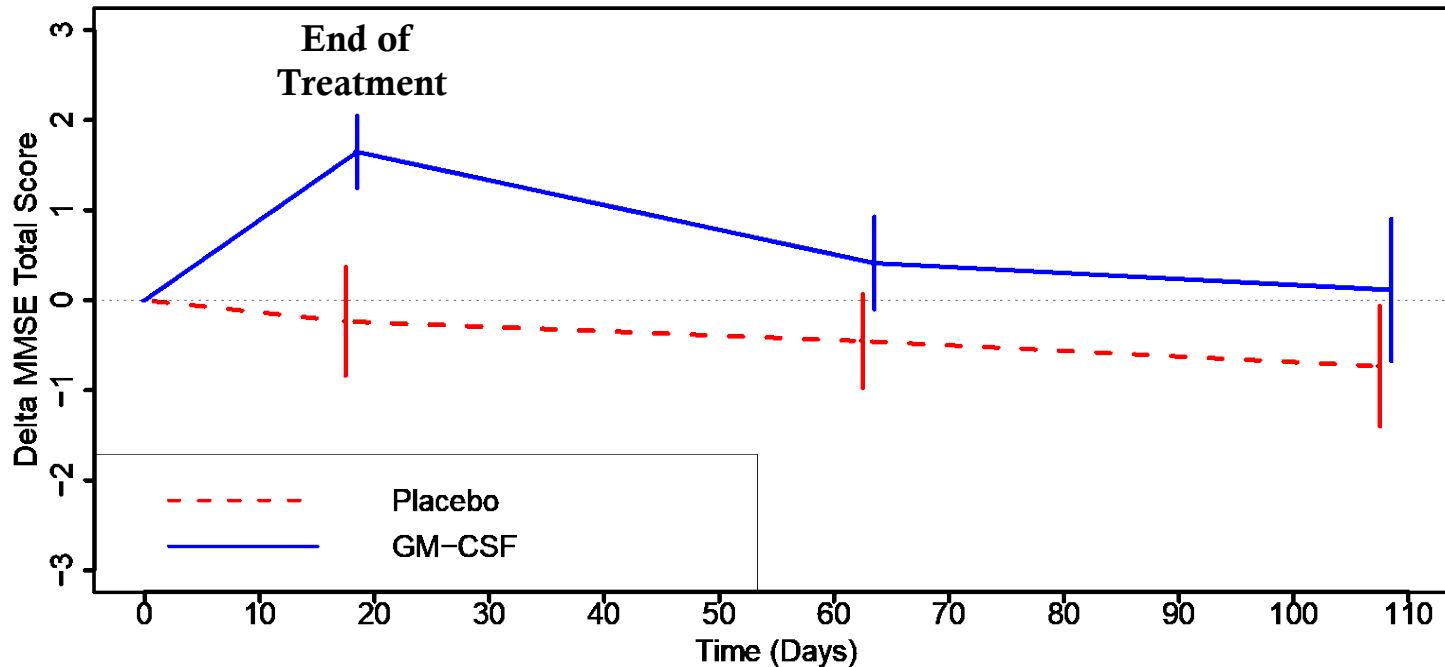
# GM-CSF Improves Cognition in Aged DS and Normal Mice

Dp16 mice + GM-CSF Control + GM-CSF





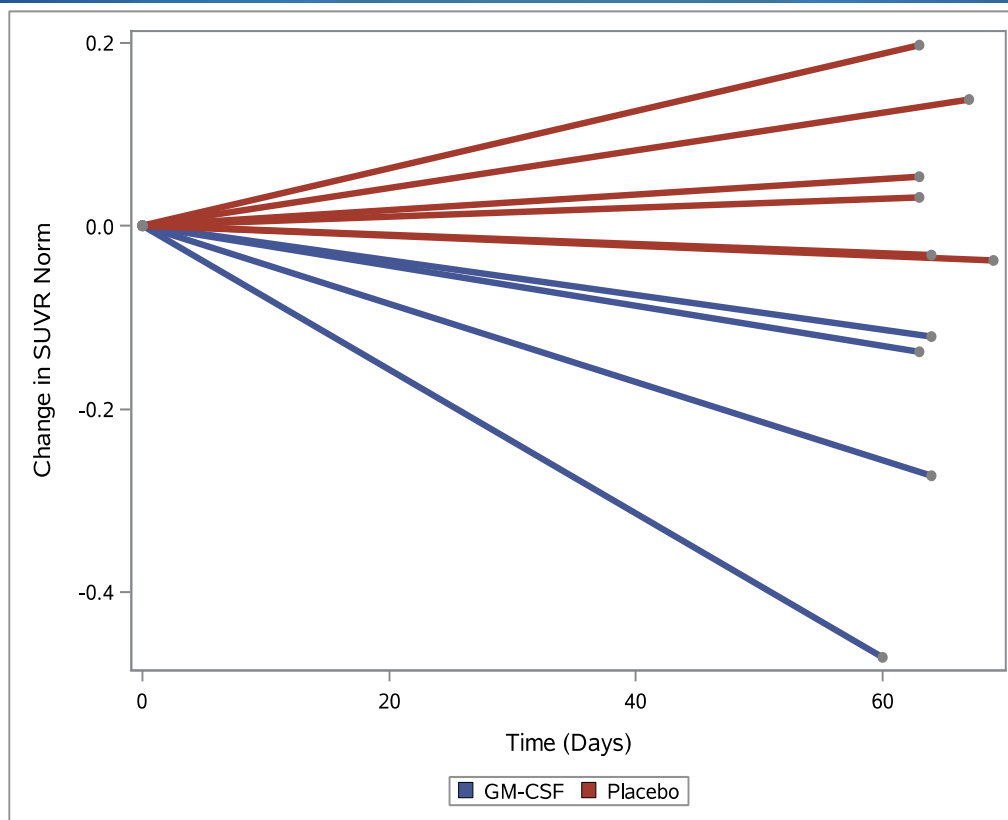
# Improved MMSE in GM-CSF-Treated Subjects Compared to Placebo-Treated Subjects



$P = 0.0008$   
(from baseline)

$P = 0.0135$   
(vs. placebo)

# GM-CSF Treatment May Reduce Amyloid Load



Placebo:  
+3.74%

GM-CSF:  
-14.23%

P = 0.0229

**SUVr normalized to radiation dose:**  
 **$\text{SUVr-N} = \text{SUVr} \times (10\text{mCi}/\text{radiation dose in mCi})$**

# GM-CSF Trial Summary

## **Current 3-Week Trial:**

- 5 GM-CSF injections/week for 3 weeks
- Total 40 subjects; Amyvid® PET for last 20 subjects

## **Results as of Today:**

- 34 subjects finished treatment phase
- No evidence of vasogenic edema or hemorrhage or any other serious adverse events
- Potential improvement in MMSE/cognition at end of treatment
- Possible reduced amyloid load

## **Future 6-Month Trial:**

- 5 GM-CSF injections/week for 6 months; 42 subjects  
\$1,000,000 Part The Cloud grant from the Alzheimer's Association

## **Websites:**

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

# RMADC Team Science

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Department of Defense  
Dana Foundation

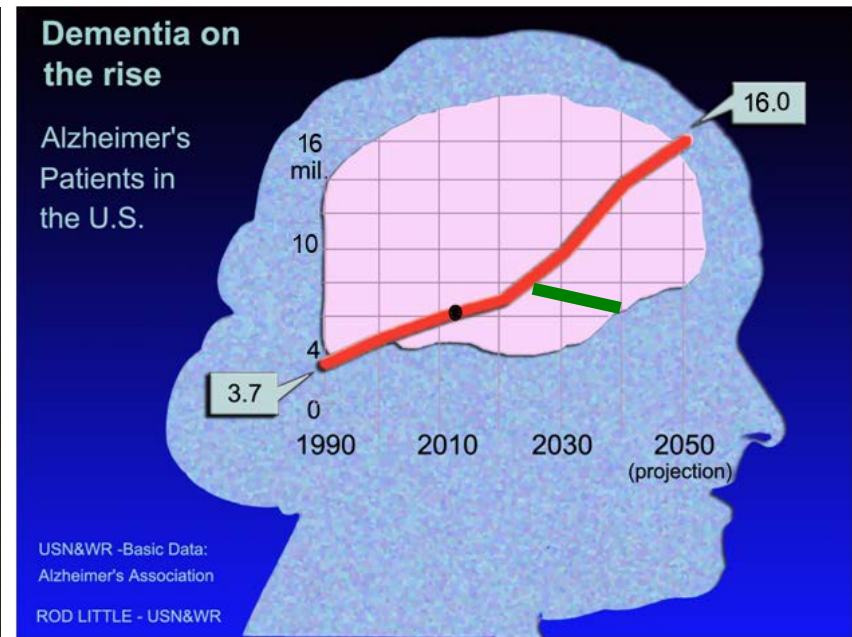
## Research Participants

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!**





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# **Behavior recommendations to support aging adults with Down syndrome and Alzheimer's Disease**

By: Bryn Gelaro, LSW

Director of Adult Initiatives and Special Projects

Global Down Syndrome Foundation

# Supporting Adults with Down syndrome into older age

- ❖ **Some adults will develop symptoms and signs of Alzheimer's disease**
  - ❖ Some will not
- ❖ **Not a simple way to diagnose**
- ❖ **Most families do not have access to medical experts on Down syndrome**
  - ❖ Misdiagnosed
  - ❖ Unable to receive correct diagnosis
- ❖ **Still need to know how to support their adults!**



# On the topic of aging and older adults Down syndrome

- ❖ **Change, loss and decline**
  - ❖ Tend to be the focus of providers seeing aging adults with or without Alzheimer's disease
- ❖ **Understanding change in functioning for the sake of supporting a healthy aging process**
  - ❖ What can they still do?
  - ❖ What do they still enjoy?
- ❖ **Responsive and highly attuned caretaking is key!**
- ❖ **Delicate balance**



# 3 Key Behavior Recommendations for supporting adults with Down syndrome and Alzheimer's Disease

1. Maintaining sense of community and engagement
2. Reducing negative effects of behavior changes
3. Supporting caretaker



# Maintaining sense of community and engagement

- ❖ **As aging or dementia processes occur, people's worlds tend to get smaller**
  - ❖ Both caretaker and self-advocate
- ❖ **Can be helpful towards end of life, but can also negatively impact overall health and mental state**
  - ❖ Depression, Anxiety
  - ❖ 'Use it or lose it' idea
  - ❖ Protective factors: diet, exercise, social engagement
- ❖ **As long as they can tolerate it, change scope of activity or social event instead of quitting it all together**



# Maintaining sense of community and engagement *continued...*

- ❖ **Socialization and connection is so important**
- ❖ **Modify schedule/plans to meet current level of need**
- ❖ **Only push to the degree they can tolerate**
  - ❖ If something is a battle, consider if impact is worth it or if desired outcome can be achieved another way
  - ❖ Example: Want to keep them going to music class but mornings tend to move so slowly and rushing them makes it worse



# Maintaining sense of community and engagement: Examples

- ❖ **Activities that are still stimulating but are less physically demanding:** car rides, puzzles, cards, painting and photobooks
- ❖ **Volunteering—especially involving animals!**
- ❖ **Join them in activity or fantasy play!**
  - ❖ Example: If stuck in self talk, roleplay with them
  - ❖ Example: Activities that involve minimal verbal/quick on your feet exchange
- ❖ **May have an easier time with recalling things from a long time ago than learning new things**
  - ❖ Encourage them to keep doing things they've always enjoyed

# Reducing negative effects of behavior changes

- ❖ **Changes we see typically involve:**
  - ❖ Mood, interests, speech, mobility (slowing/fearfulness), visual/hearing, completing ADLs, dropped routines
- ❖ **Consistency is so important now more than ever**
- ❖ **Making their world smaller if become fearful or confused**
  - ❖ Goal provide safety
  - ❖ Fewer new people and new places
  - ❖ Reminders, verbal prompts, and visual aids!
    - ❖ Example: Photobooks of family/staff/friends



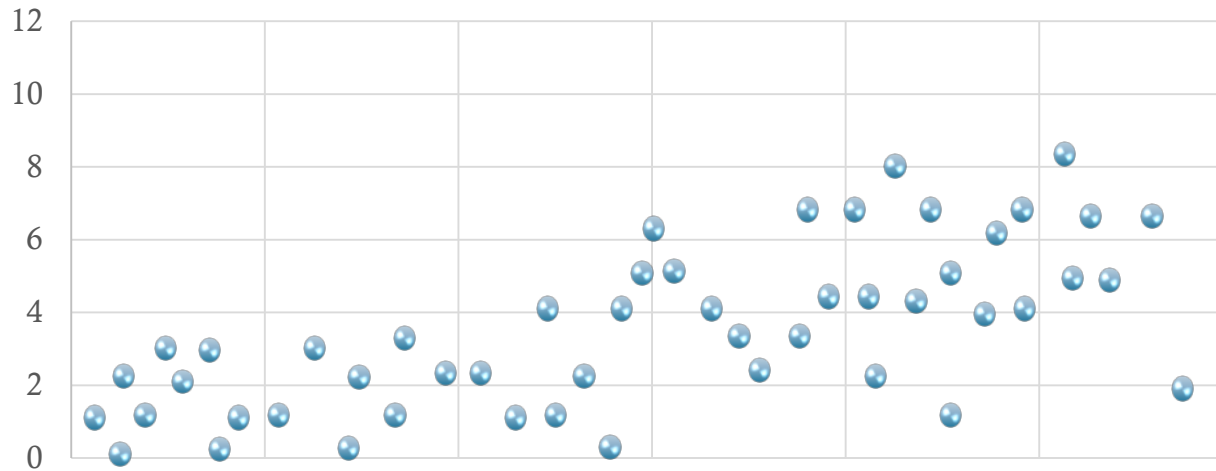
# Reducing negative effects of behavior changes

## *continued...*

- ❖ **Talk to your aging adult about what's going on and what they are feeling!**
  - ❖ These changes are scary for them, too!
  - ❖ Involve them in conversations
  - ❖ Empathy and safety, even when you don't have answers
  
- ❖ **Maximize autonomy and skill**
  - ❖ Focus on what they can do, not the things that are becoming challenging
  - ❖ An aging adult is losing skills and may feel out of control
  - ❖ Find ways to increase/maintain involvement
  
- ❖ **Do not assume everything is *just* Alzheimer's Disease!**

# Reducing negative effects of behavior changes *continued...*

Verbal Prompts needed to get changed in evenings



## ❖ **Keep track of changes you notice:**

- ❖ Create a baseline for reference
- ❖ Change and decline is uneven and sometimes plateau
- ❖ These will help you and your adult's providers understand changes and anticipate potential supports

# Reducing negative effects of behavior changes *continued...*

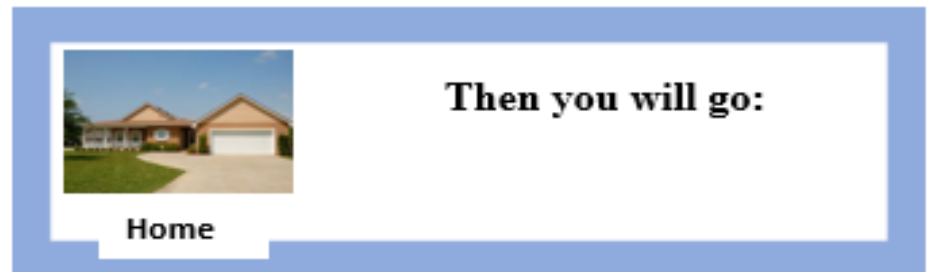
## ❖ Repetition & forgetting

- ❖ Where am I, am I going to work now, where is\_\_\_\_?



## ❖ Safety

- ❖ Stairs
- ❖ Eating/Choking
- ❖ Depth Perception (toileting, transferring in cars)
- ❖ Eloping/walking out
- ❖ Bathing



# Maximizing comfort and safety in home environment

- ❖ **Perception and visual depth tends to weaken with age and in adults with Alzheimer's disease Dementia**
  - ❖ Can increase fearfulness, confusion, mistrust of environment, withdraw socially
- ❖ **Inability to judge and perceive the situation can impact ability to feel comfortable and safe**
- ❖ **Tips- Especially important for spaces where physical transitions occur!**
  - ❖ Contrasting colors
  - ❖ Dark surfaces look like a hole
  - ❖ Avoid highly patterned flooring





# Loss of Control



- ❖ **Families report: “Stubbornness” or “unresponsiveness” increases**
  - ❖ Saying “no” to activities
  - ❖ Slowing down pace
  - ❖ Not listening
- ❖ **Awareness of confusion, notice they can’t do as much for themselves**
- ❖ **They are grasping for things they can control**

# Supporting the caretaker

- ❖ **Caring for a person can be exhausting, frustrating, saddening, depressing**
  - ❖ Don't underestimate the toll this takes on yourself as a caretaker or family member
  - ❖ Does not make you a bad parent or caretaker
  - ❖ With AD you are experiencing a loss and you may begin to grieve while your family member is still alive
- ❖ **Respite care supports**
- ❖ **Use your resources and build in breaks**
  - ❖ You will be more patient, tolerant, and healthy in the long run



# Supporting the caretaker

- ❖ **Be aware of “Parallel Decline”**
- ❖ **Life planning prior to aging, involving adult with Down syndrome**
- ❖ **Support Groups**
  - ❖ Attendees or organizers: Be aware of the many stages of aging/illness/grief!



# References and Resources

- ❖ *Mental Wellness in Adults with Down Syndrome* by Dr. Brian Chicoine and Dr. Dennis McGuire
- ❖ *Let's Talk about Dementia- Workbook* by Down's Syndrome Scotland (Downloadable)
- ❖ Chicago Adult Down Syndrome Center
  - ❖ Online Resources for Families & Caregivers

# Thank You!



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&

*Dr. Huntington Potter*