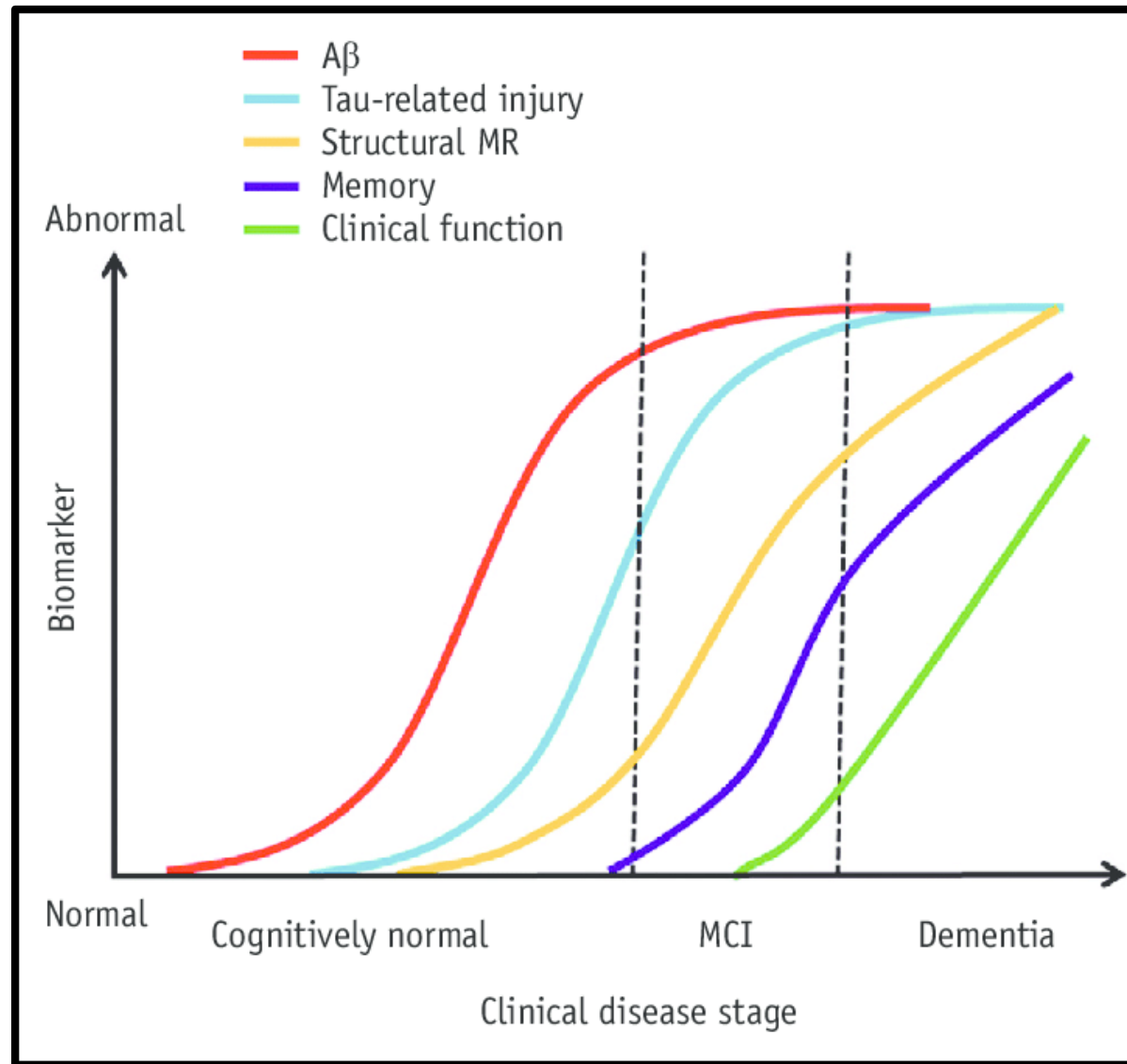


# Amyloid Precursor Protein and Mitochondria

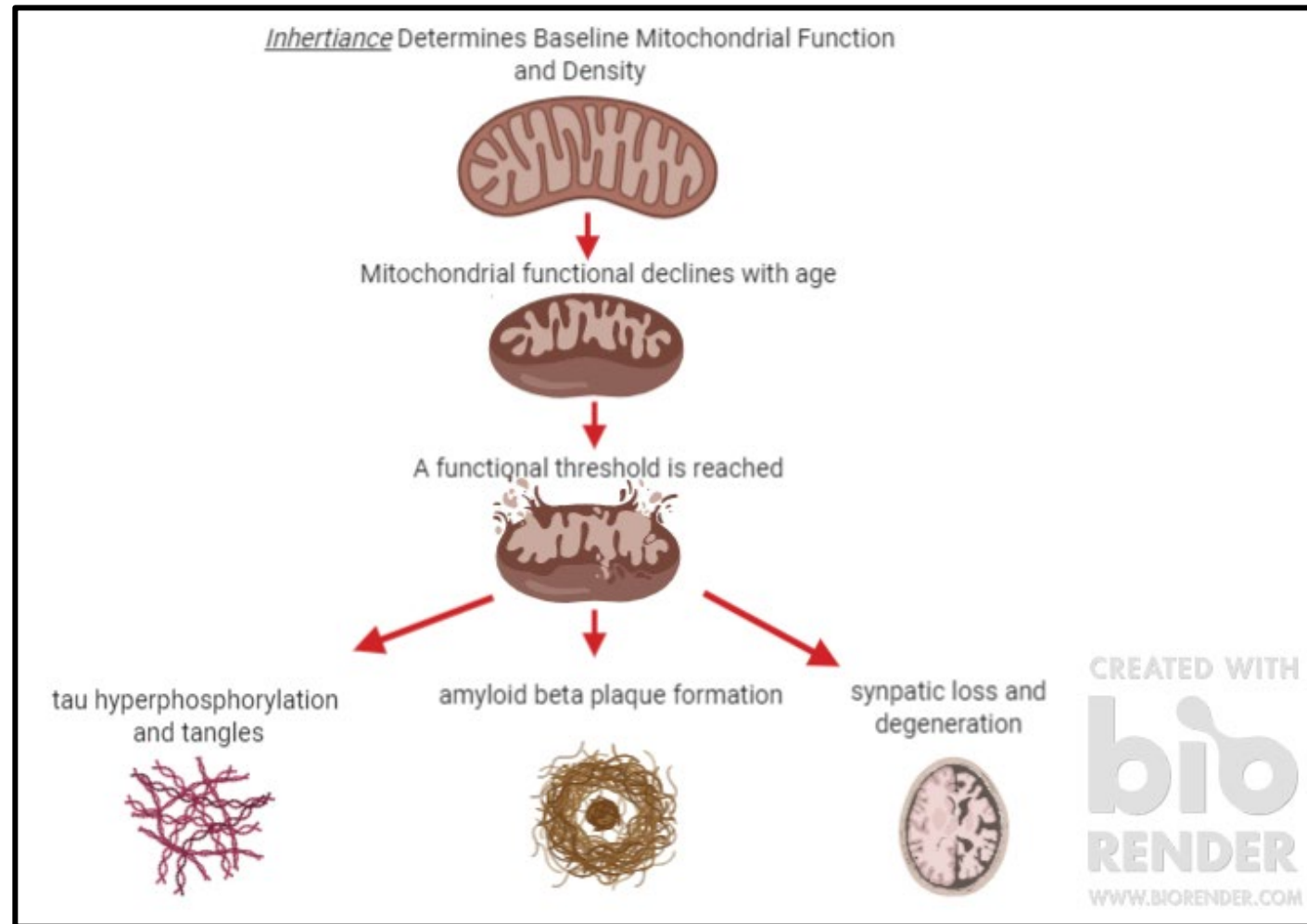


**Heather Wilkins, PhD**  
**Department of Neurology**  
**University of Kansas Alzheimer's Disease Research Center**

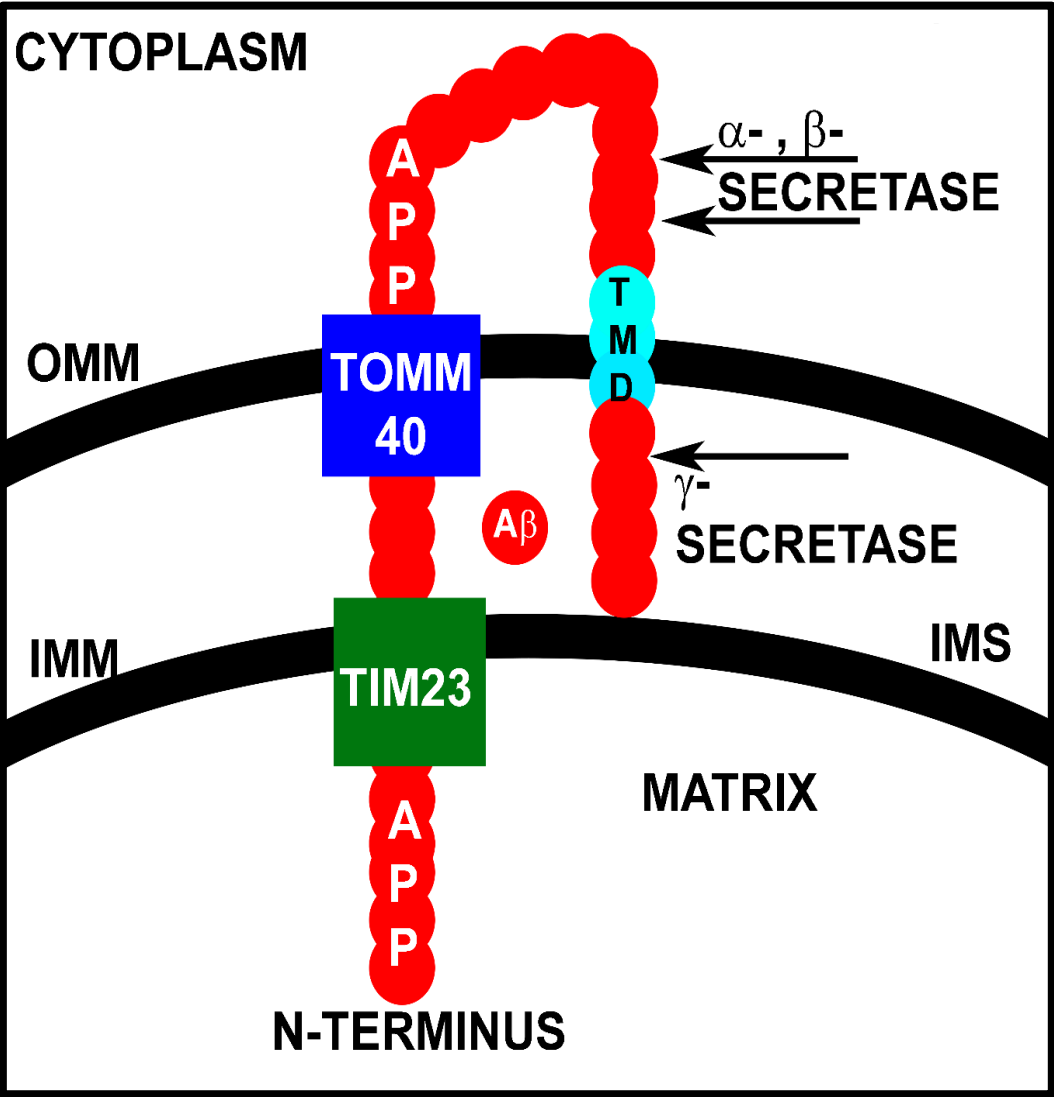
# Amyloid Pathology: 20-year prodrome



# Hypotheses of Alzheimer's Disease: *Mitochondria*

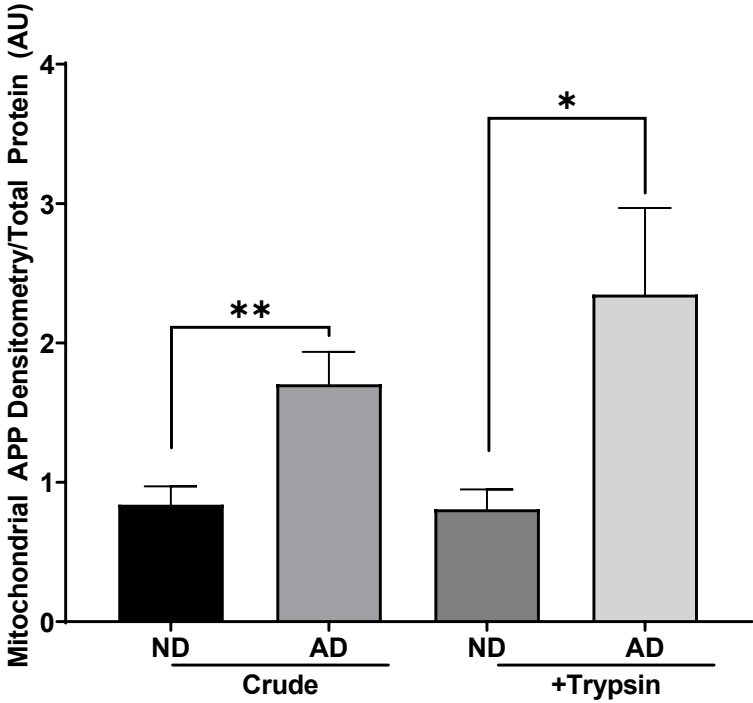
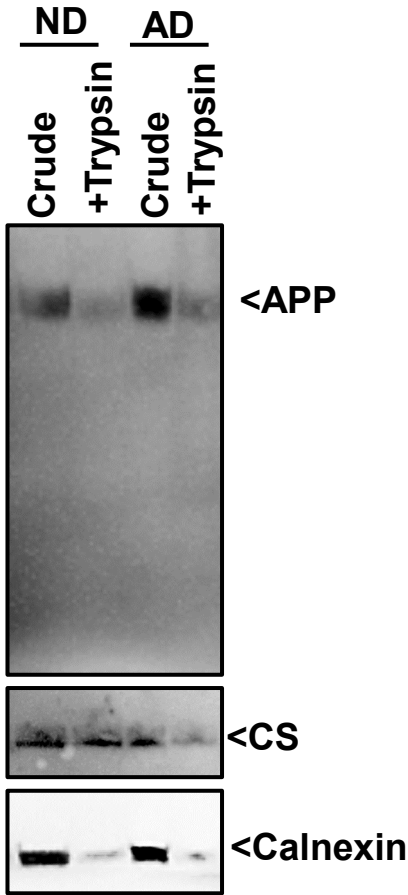


# APP targeting to Mitochondria



# APP localizes to Mitochondria

*Human Brain (postmortem)*

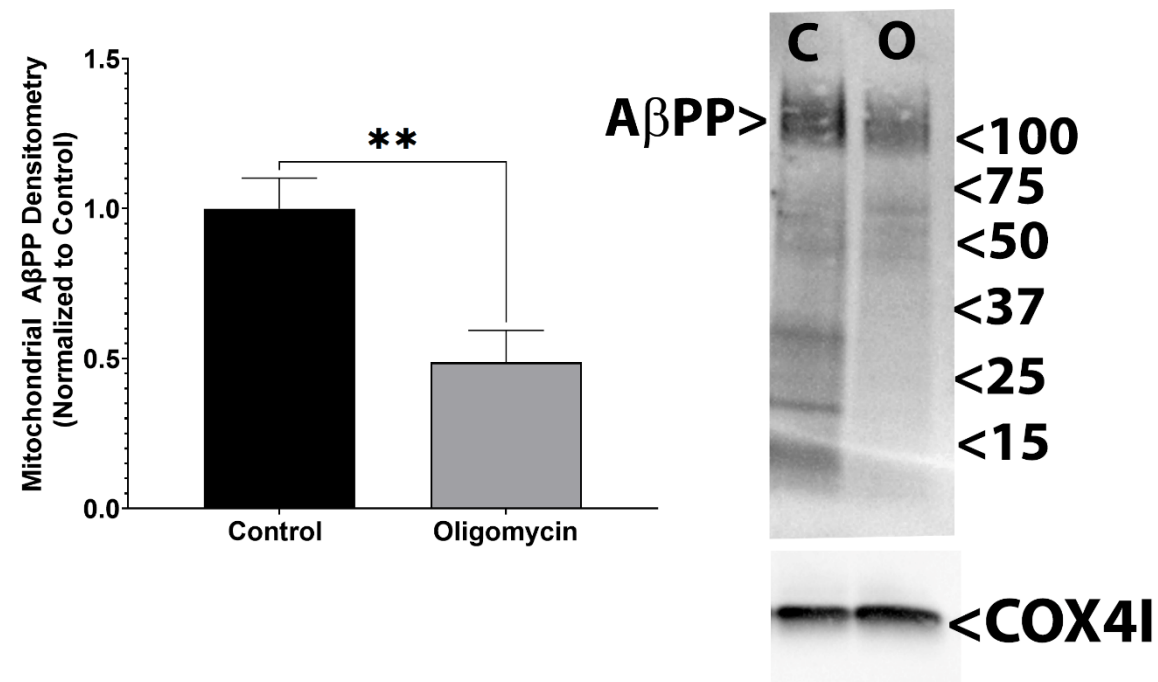


*ND/AD diagnosis via ADNI*

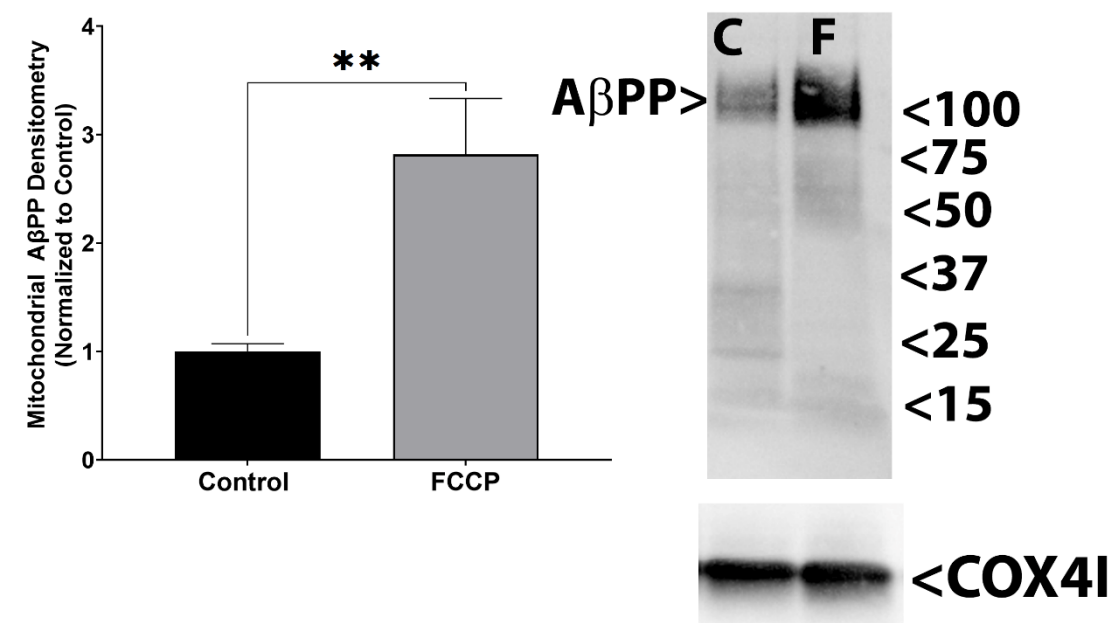
# Mitochondrial activity modulates APP localization

## Cell Culture

*Increased Activity=Reduced mitochondrial APP*

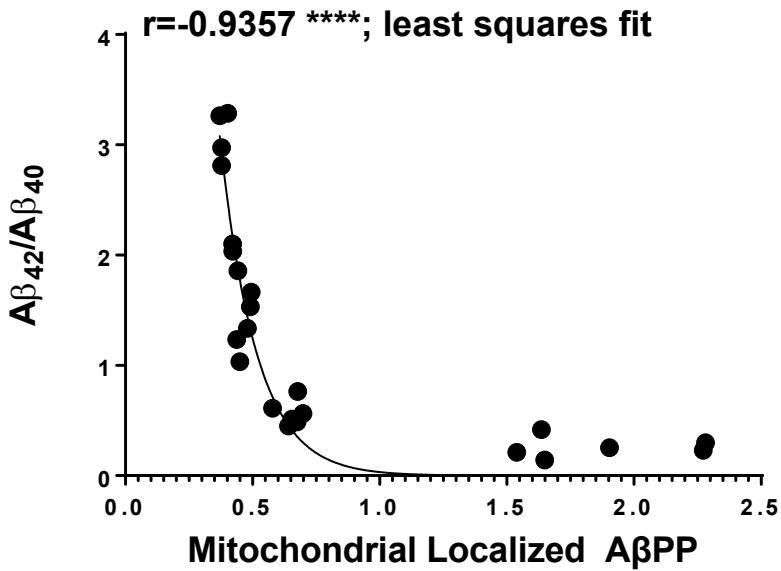
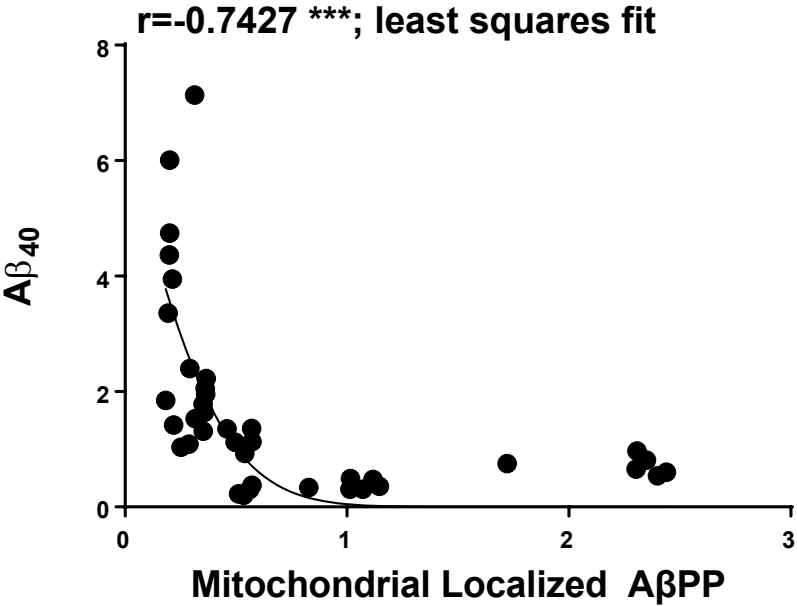
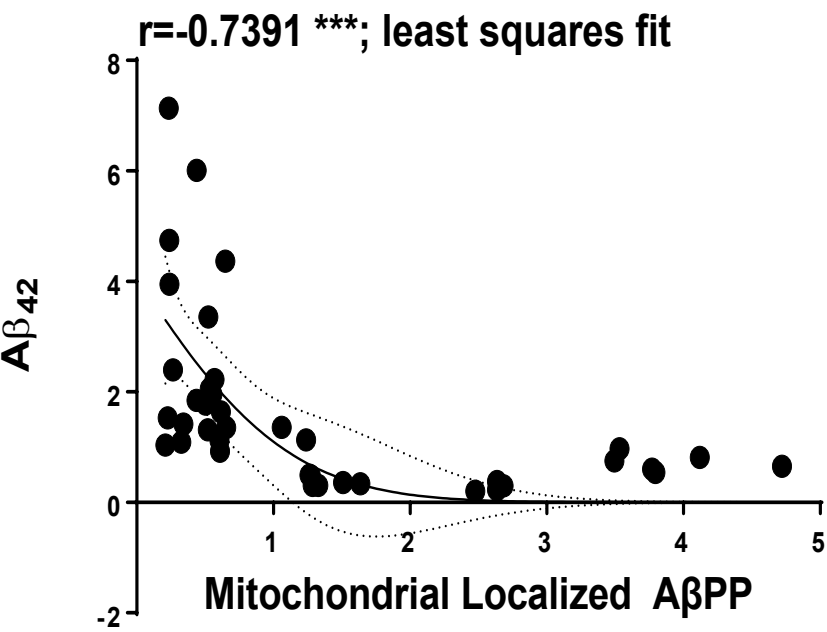


*Decreased Activity=Increased mitochondrial APP*



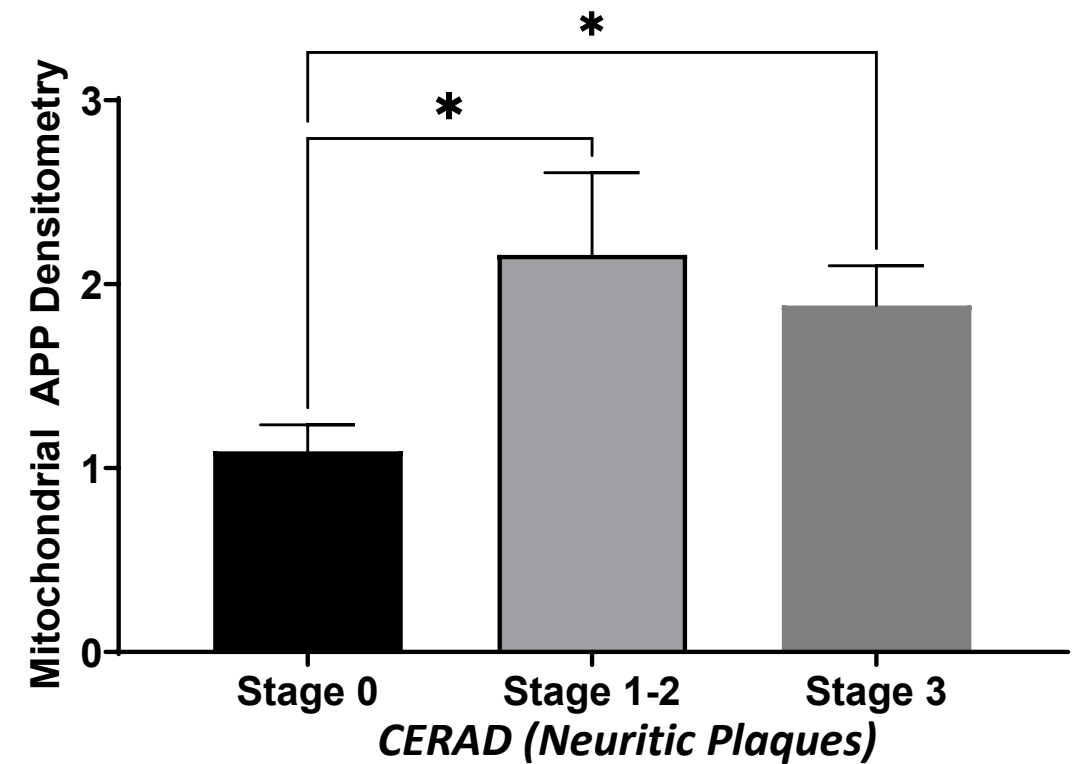
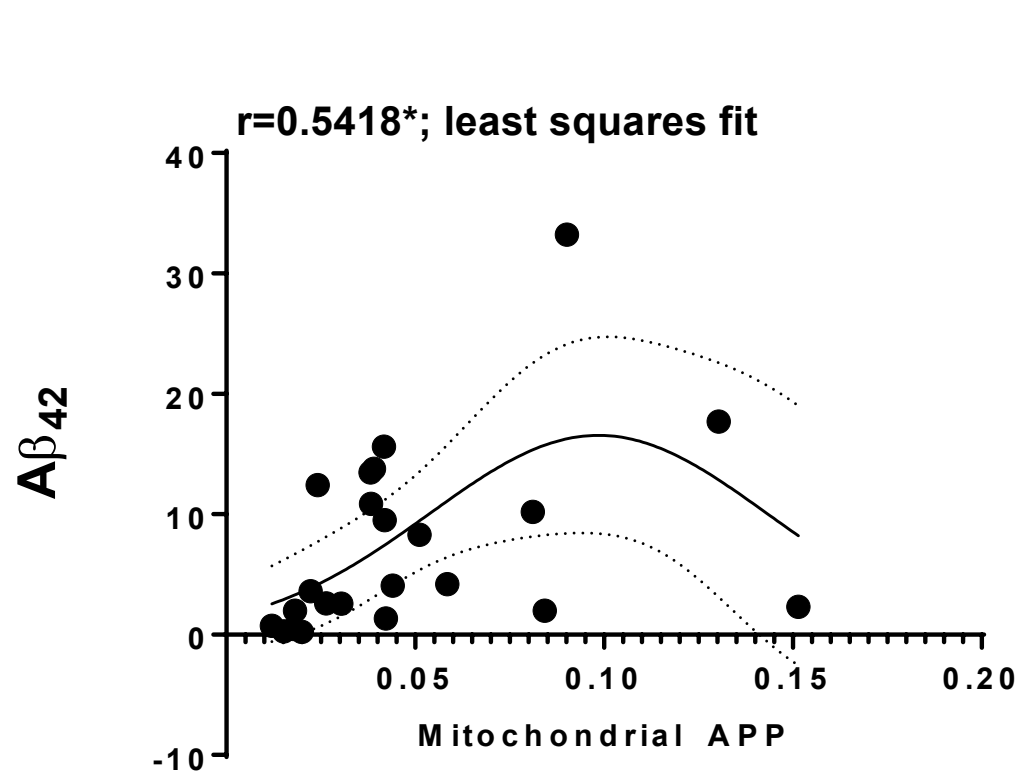
# Mitochondrial APP localization affects A $\beta$ secretion

## Cell Culture



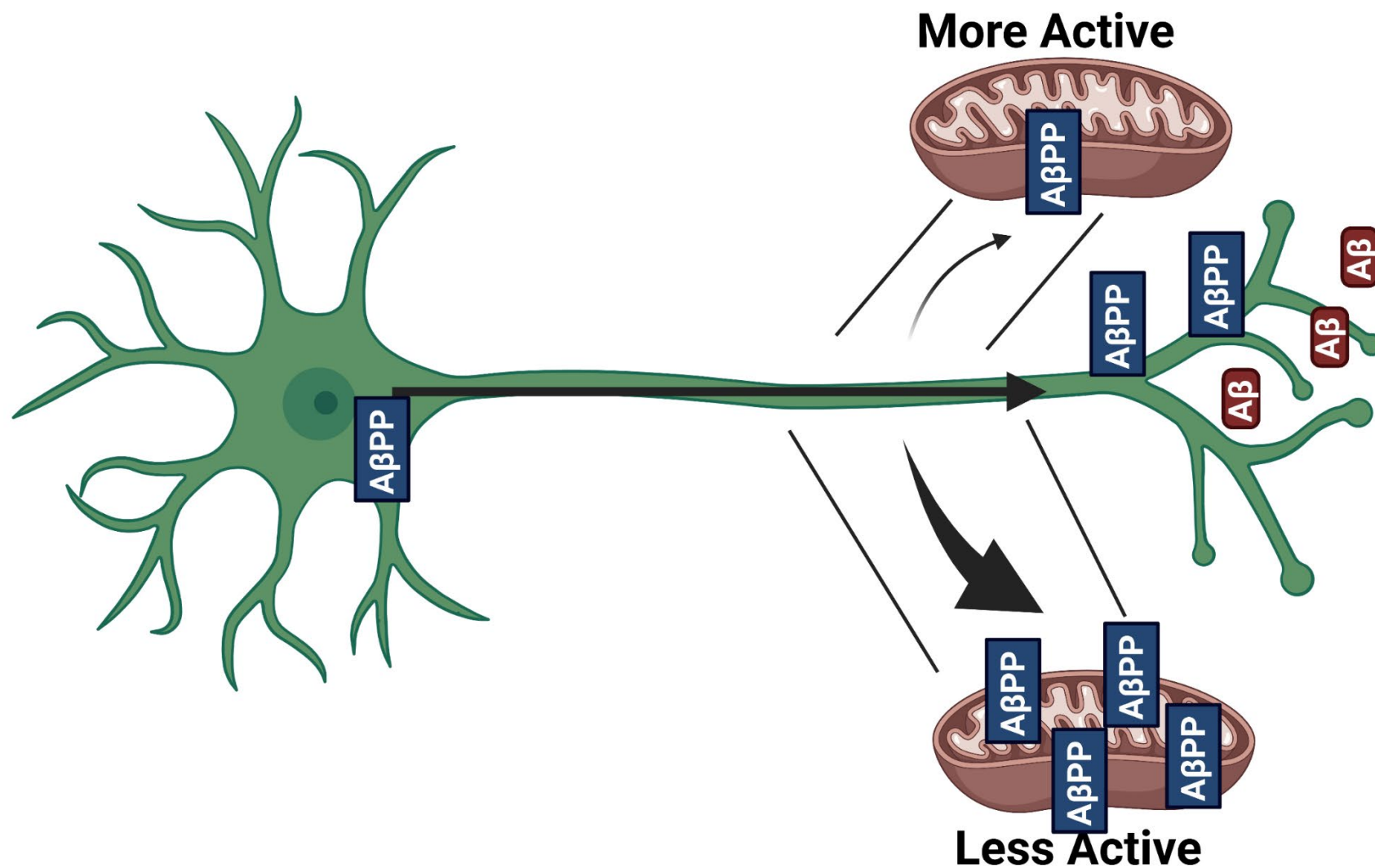
# Mitochondrial APP localization affects A $\beta$ secretion

*Human Brain (postmortem)*



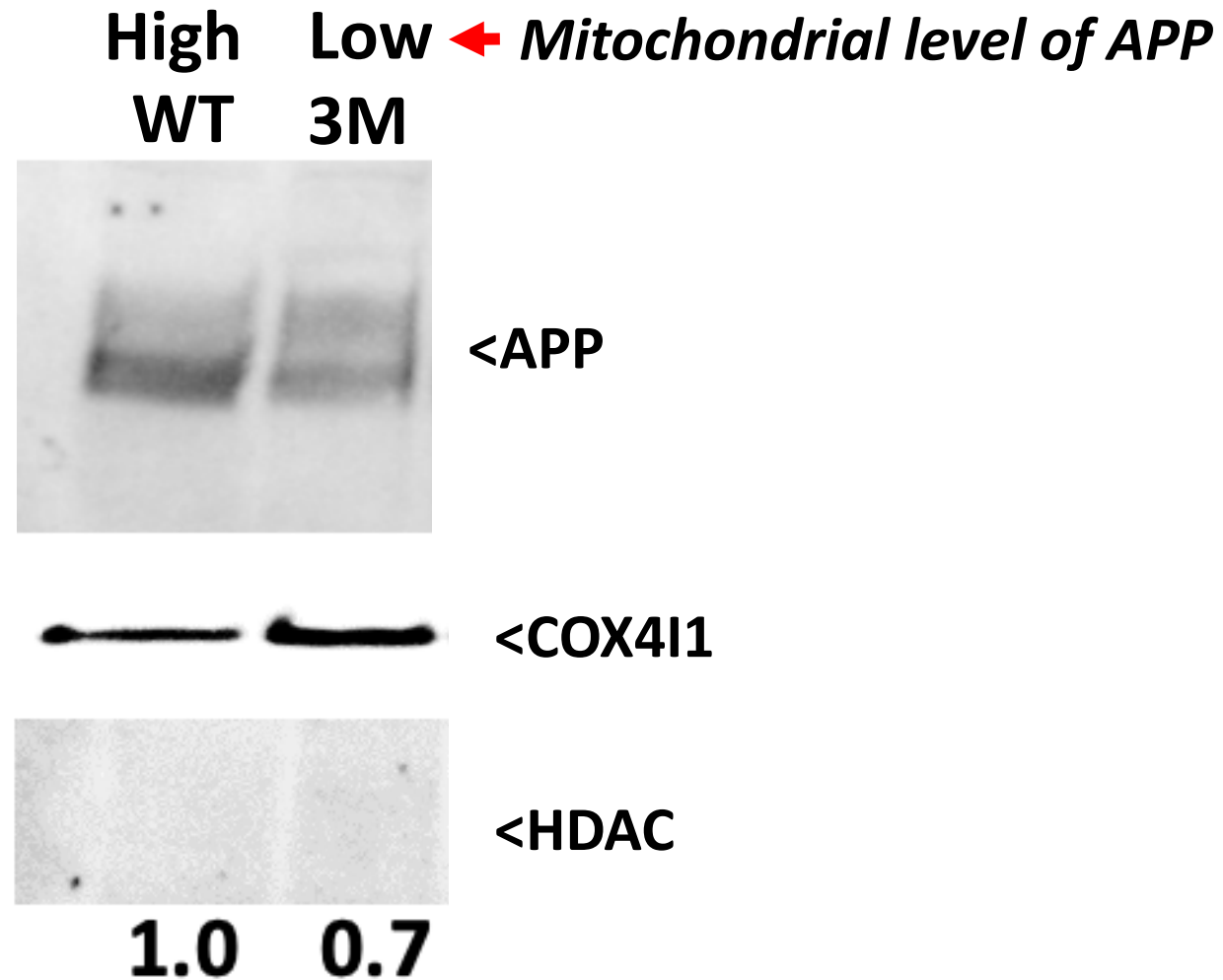


# How do mitochondria affect APP and A $\beta$ ?



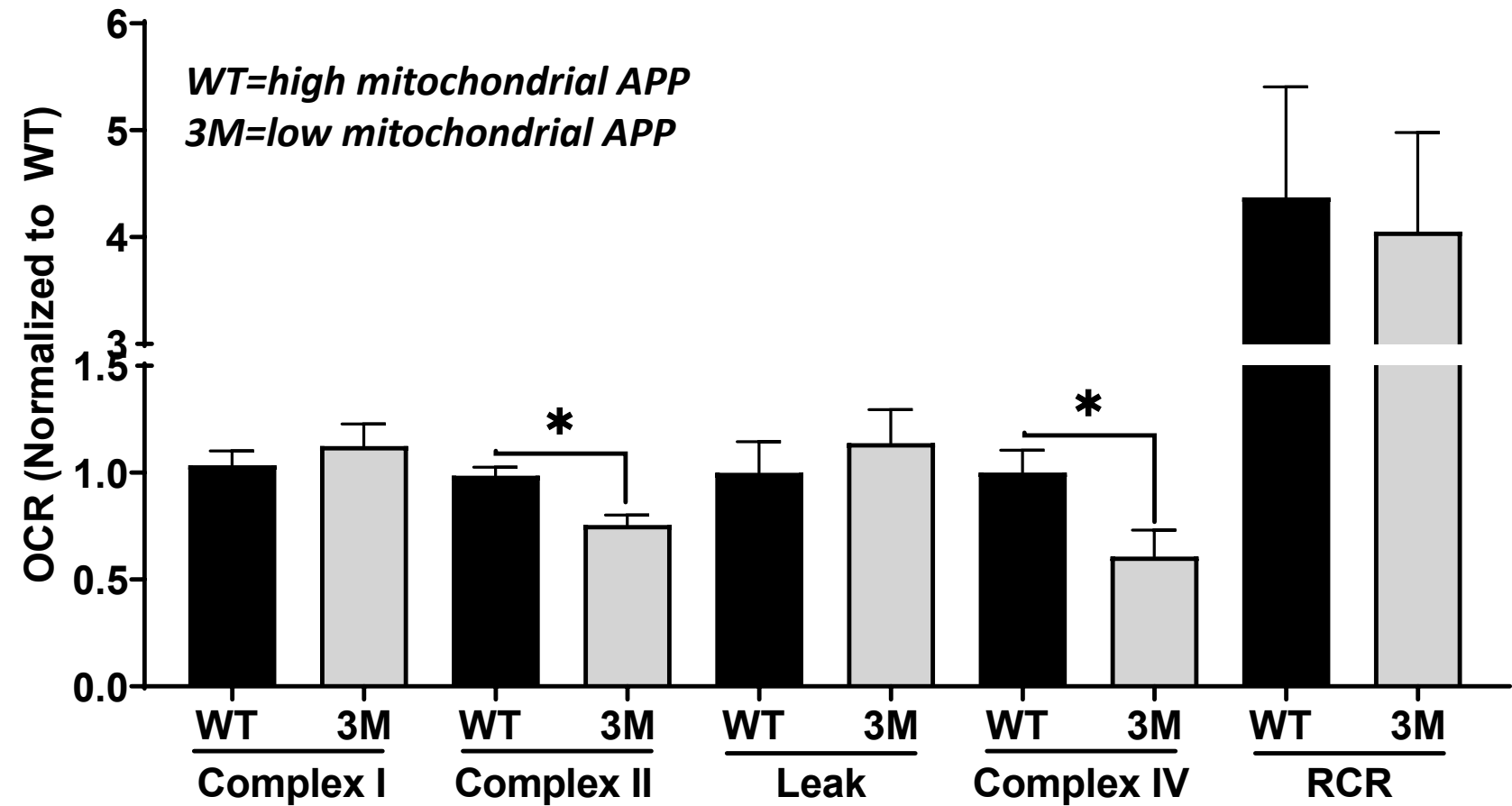
# How does APP affect mitochondria?

*Cell Culture*



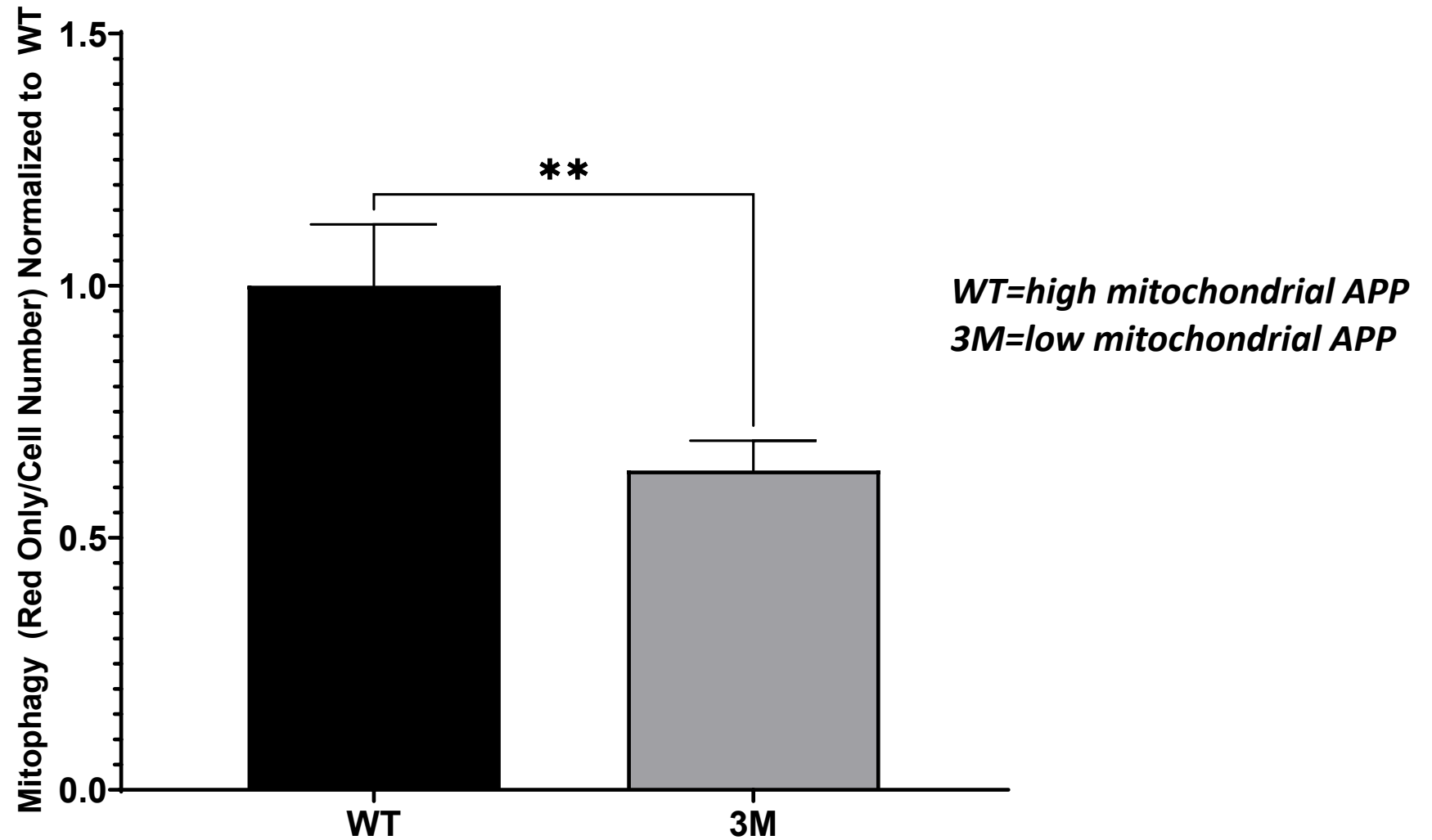
# How does APP affect Mitochondria?

*Cell Culture ETC function*



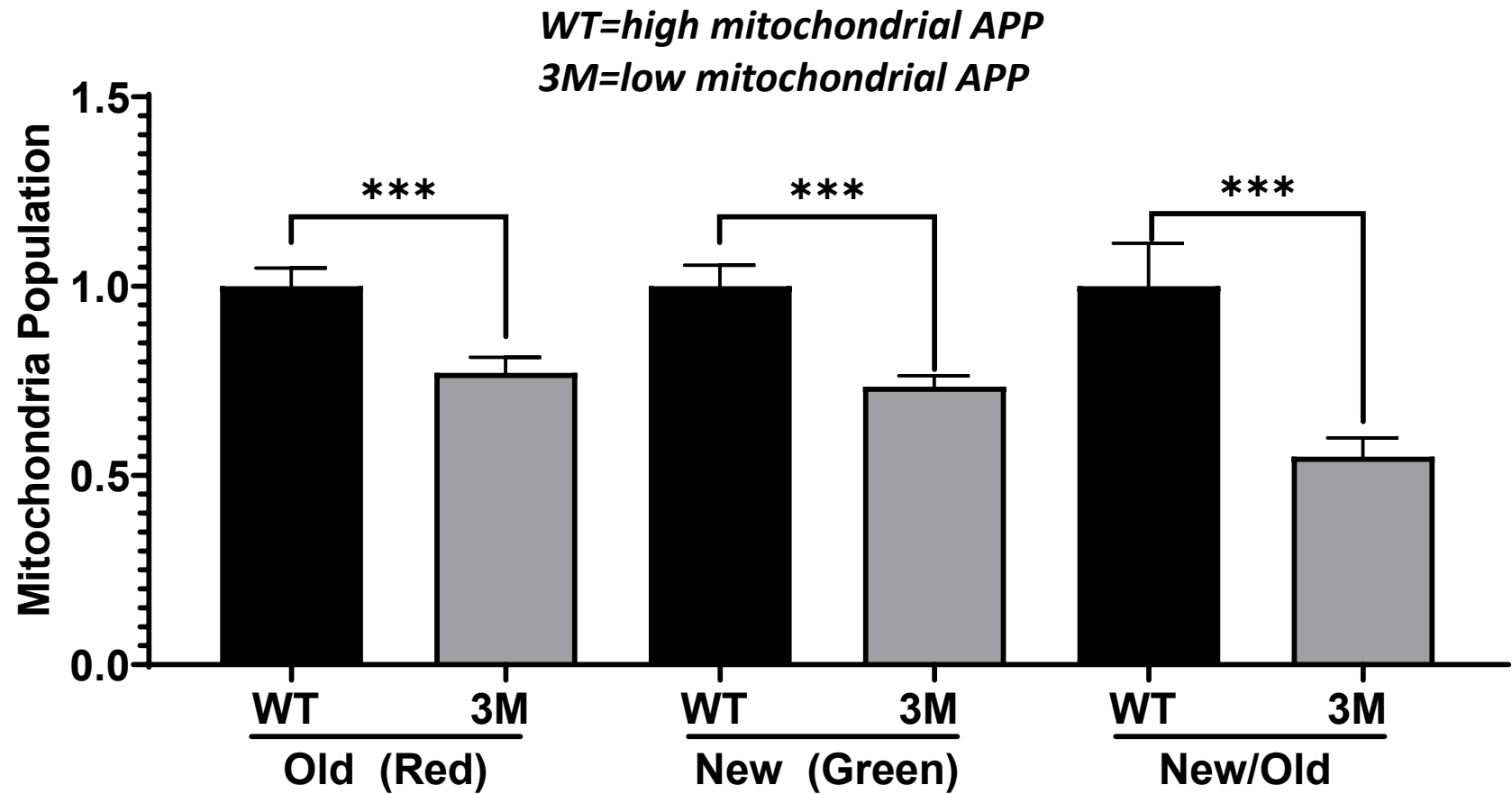
# How does APP affect Mitochondria?

## *Cell Culture-Mitophagy/Mitochondrial Turnover*

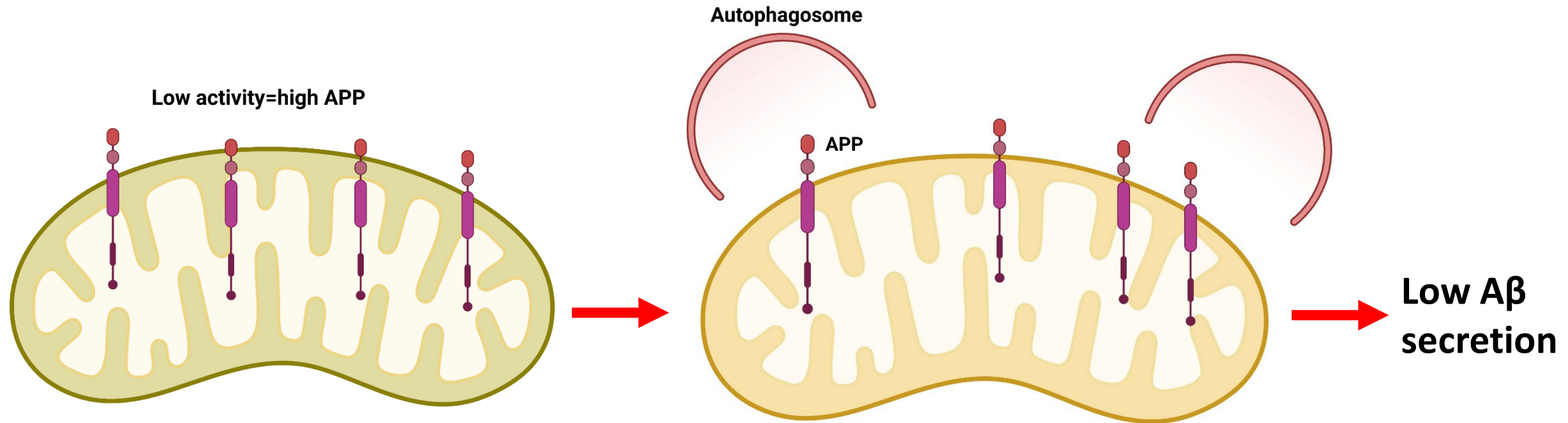


# How does APP affect Mitochondria?

*Cell Culture-Mitochondrial mass/biogenesis*



# APP, A $\beta$ , Mitochondria



# What does the field need?

1. To *understand the function of APP and A $\beta$  at mitochondria*
2. *Better models of AD and increased access to human tissue/samples*
3. Increased *collaboration*
4. Train *the next generation of scientists*



Funding  
KINBRE

KU Alzheimer's disease Center  
Landon Center for Aging  
Neurology Department  
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Peg McLaughlin



# ALZHEIMER'S DISEASE RESEARCH CENTER

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