



# AD/PD™ 2023

ADVANCES IN SCIENCE & THERAPY

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Das Deutsche Zentrum für  
Neurodegenerative Erkrankungen

Beneficial Effect of ACI-24 Vaccination  
on A $\beta$  Plaque Pathology and Microglial  
Phenotypes in an Amyloidosis Mouse Model

Sabina Tahirovic / Juvenile Neurodegeneration

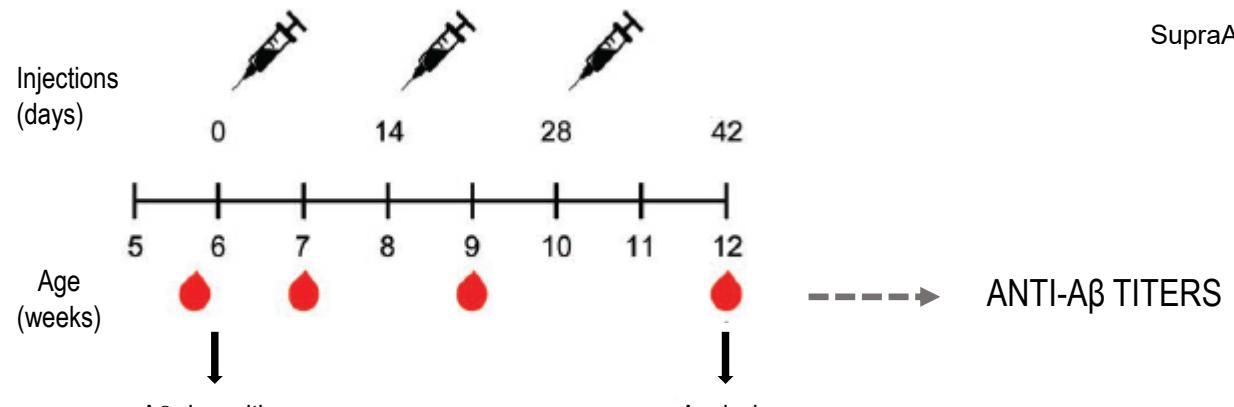
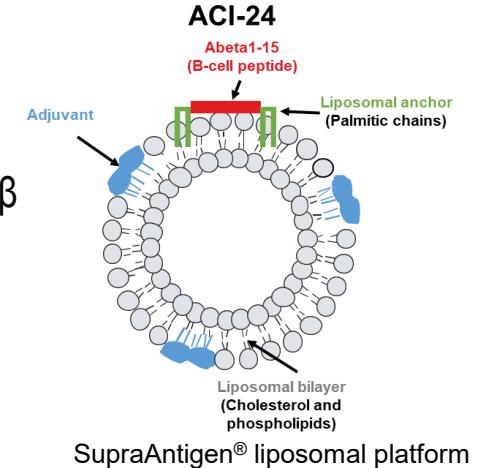
# Anti-A $\beta$ vaccination study in amyloidosis mouse model

**Aggressive amyloidosis mouse model APPPS1**  
APP-Swe/PS1-L166P (Radde et al., 2006)



**ACI-24 vaccine (AC Immune)**

Inducing antibodies against pathological forms of A $\beta$

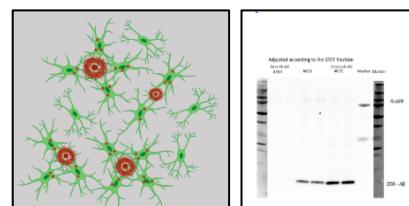


**Vaccination paradigm**  
(Females, n=10)  
ACI-24 (80  $\mu$ g, s.c.)

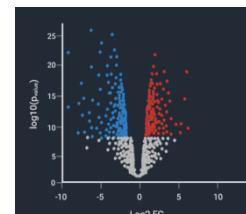
Jasenka Rudan Njavro



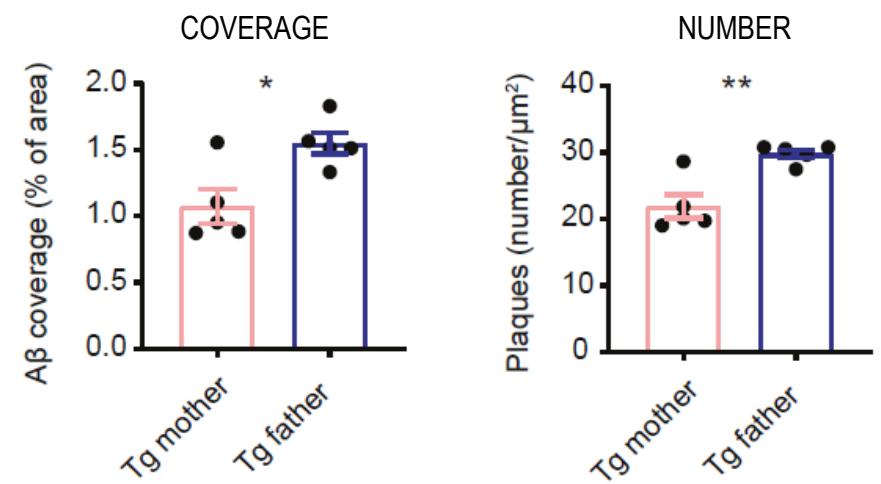
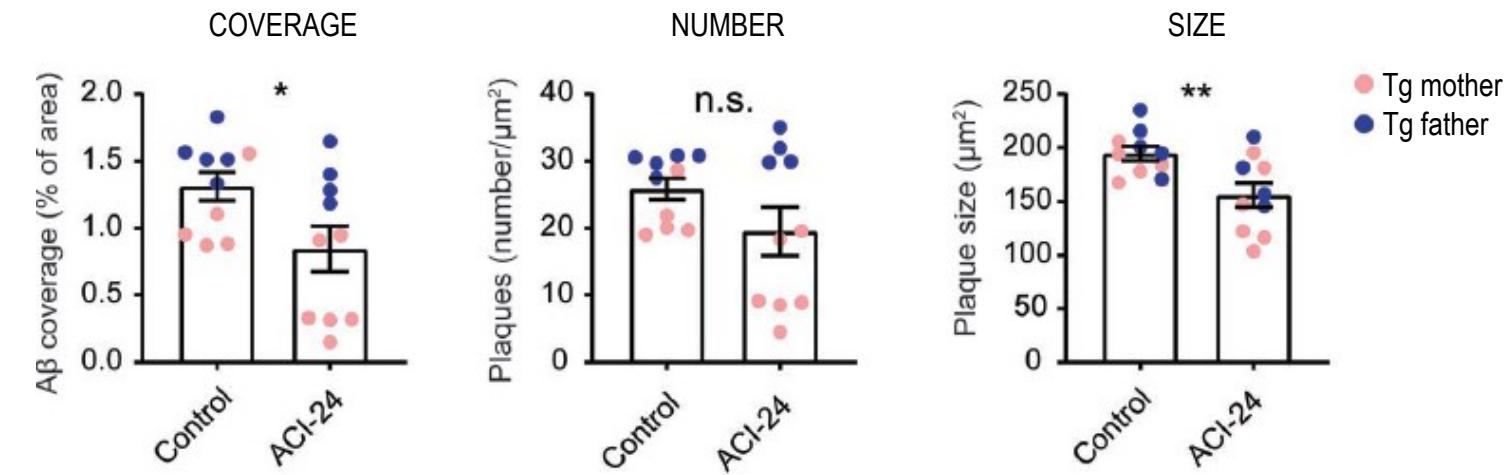
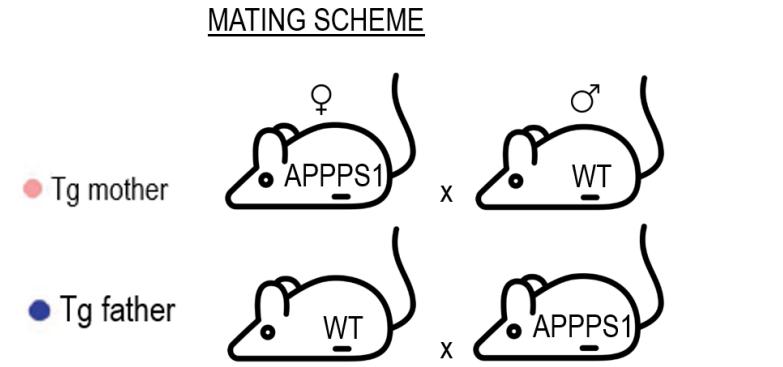
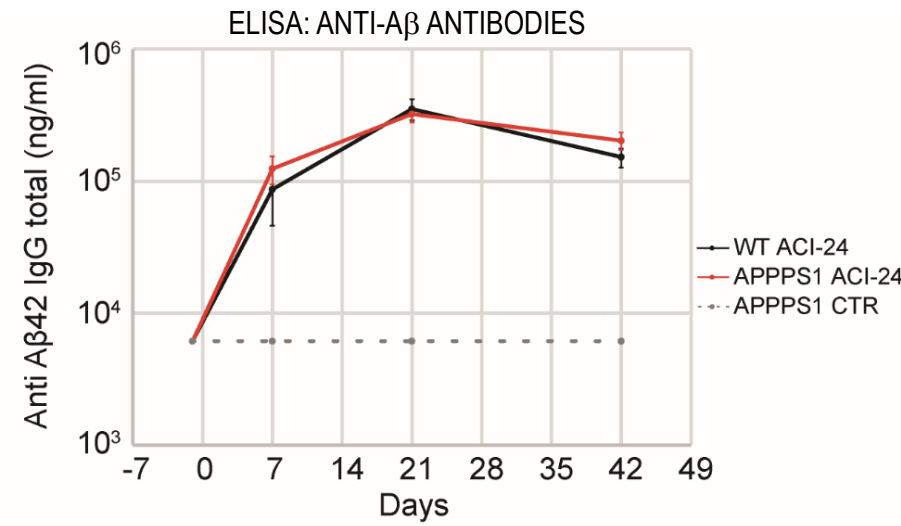
AD PATHOLOGY  
IMMUNOHISTOCHEMISTRY  
BIOCHEMISTRY



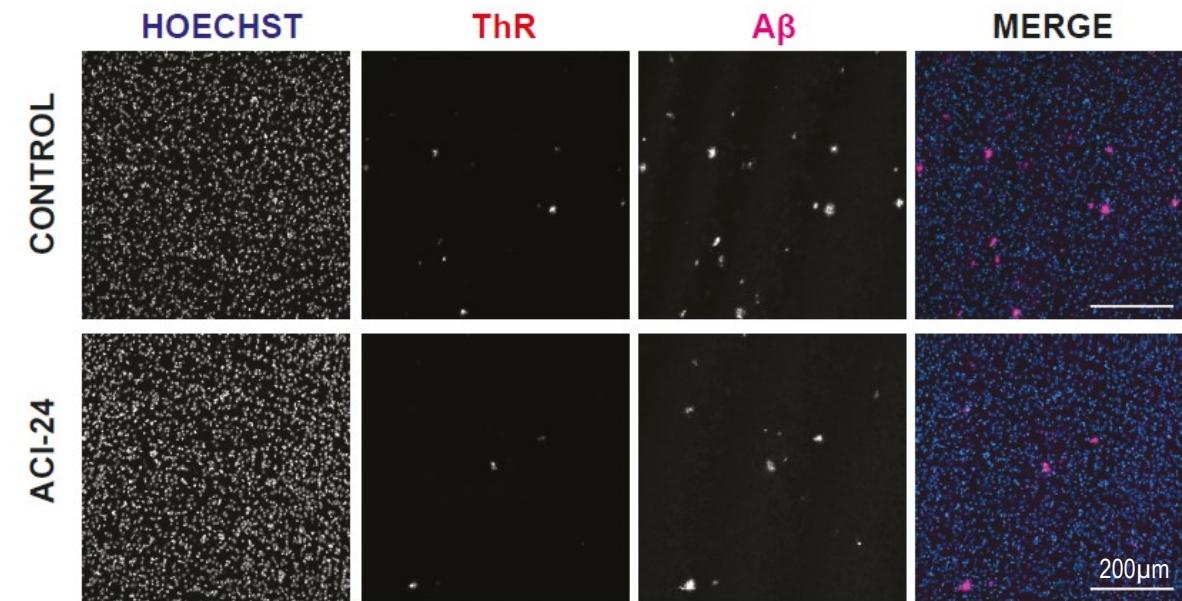
TRANSCRIPTOMICS  
PROTEOMICS



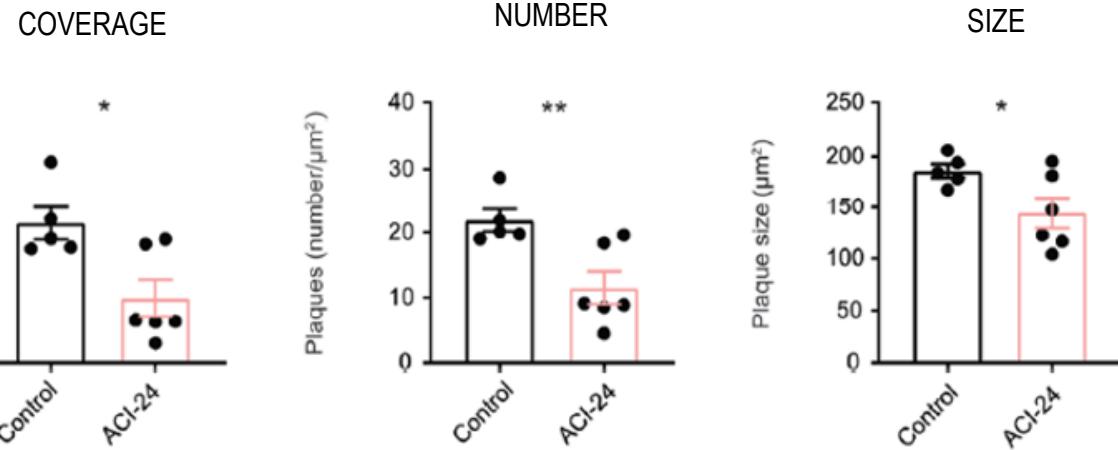
# ACI-24 triggers substantial antibody response and reduces A $\beta$ plaque pathology



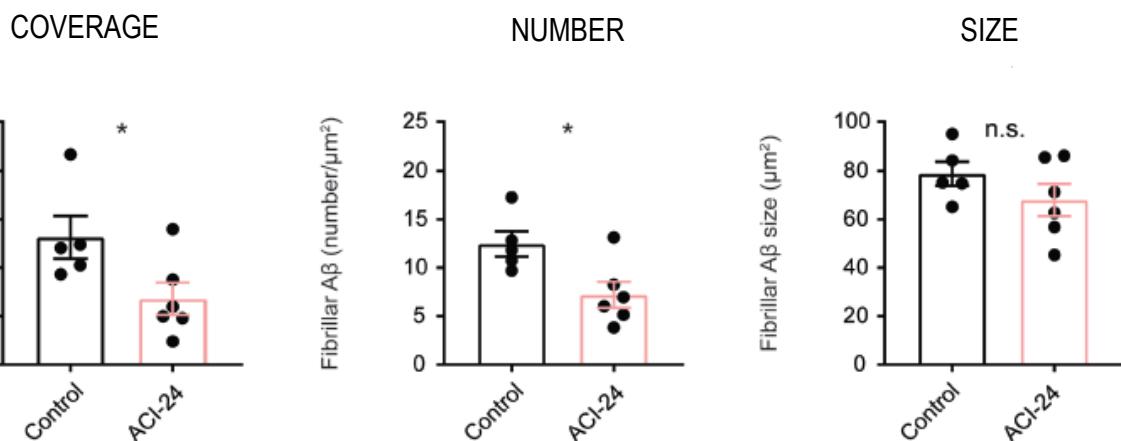
# ACI-24 vaccination reduces soluble and insoluble A $\beta$



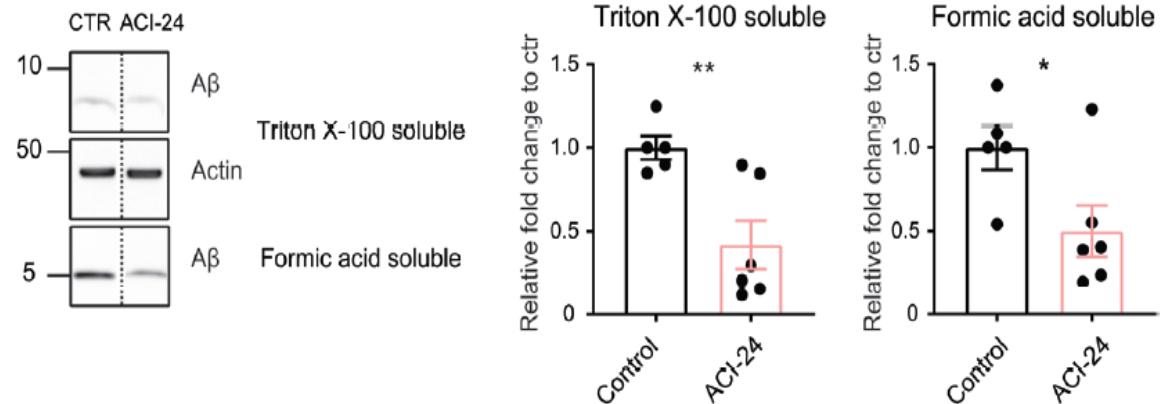
## IHC ANALYSIS: REDUCTION OF TOTAL A $\beta$



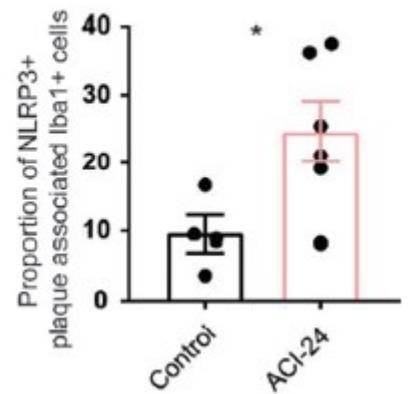
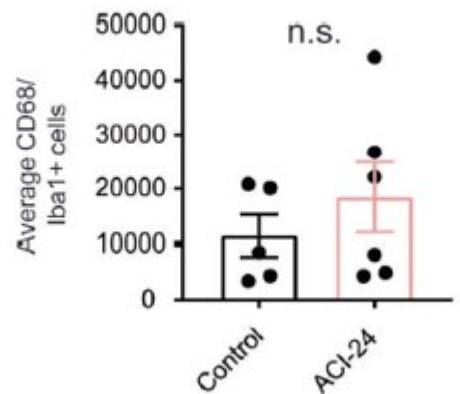
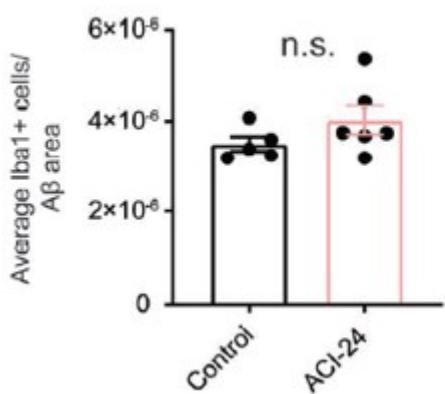
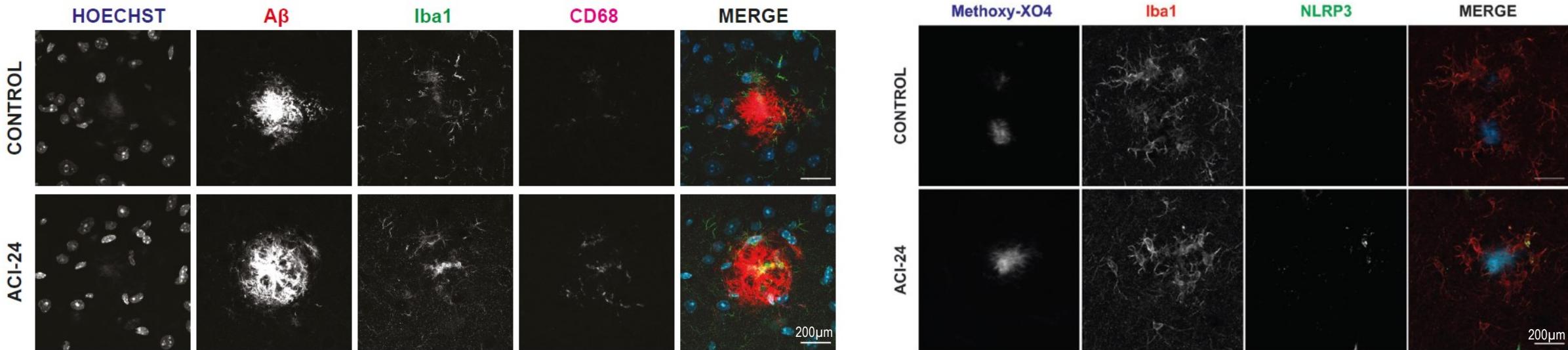
## IHC ANALYSIS: REDUCTION OF FIBRILLAR A $\beta$



## WB ANALYSIS: REDUCTION OF SOLUBLE/INSOLUBLE A $\beta$



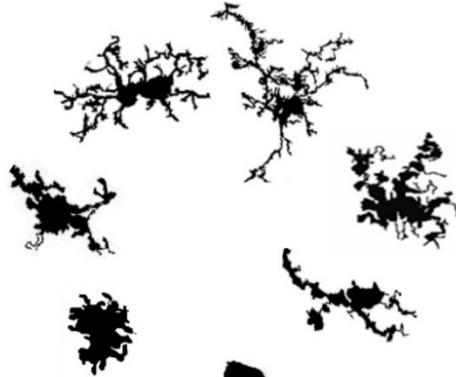
# ACI-24 increases local microglial activation at A $\beta$ plaques



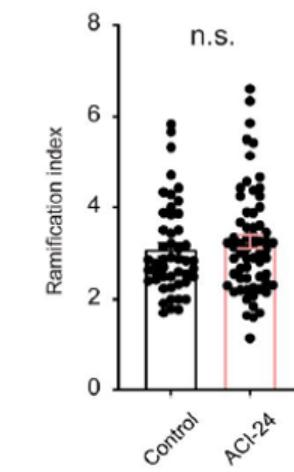
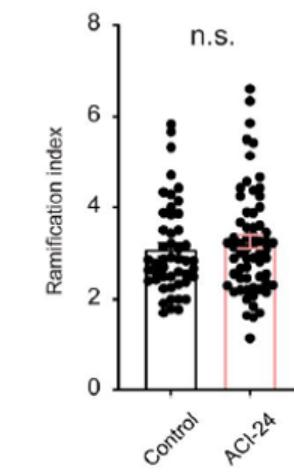
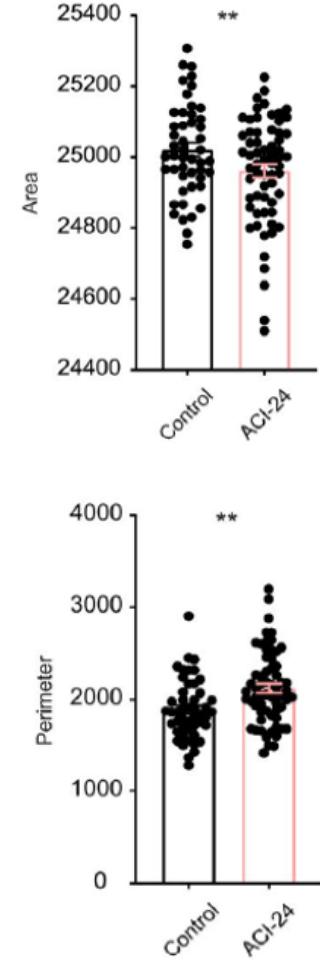
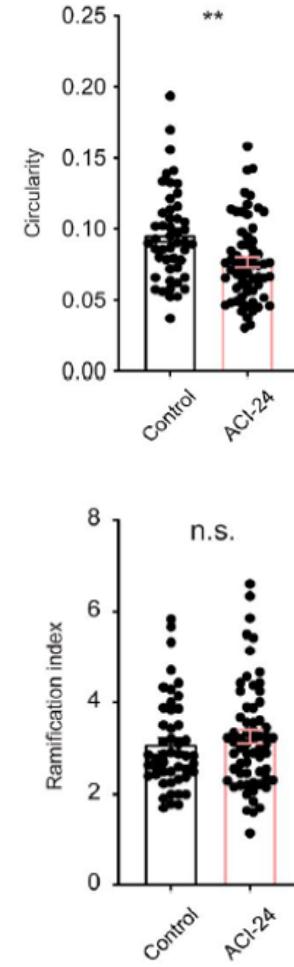
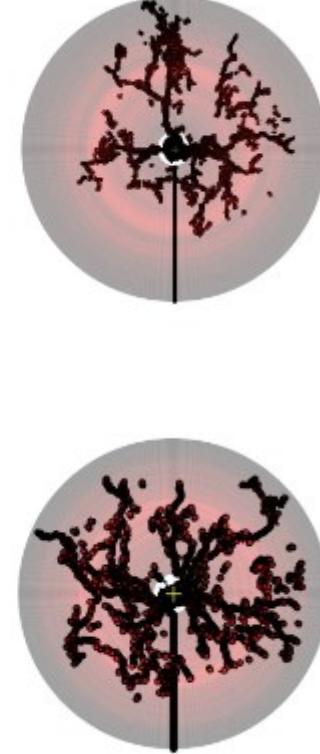
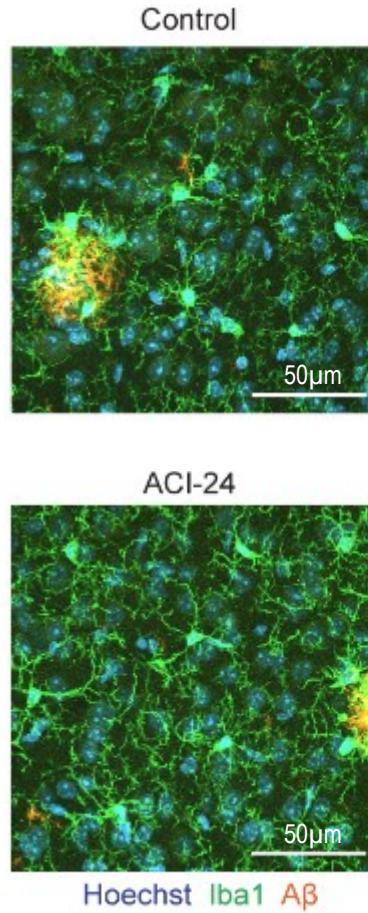
# ACI-24 reduces activation of plaque-distant microglia

MICROGLIAL MORPHOLOGY (Karperien et al., 2011)

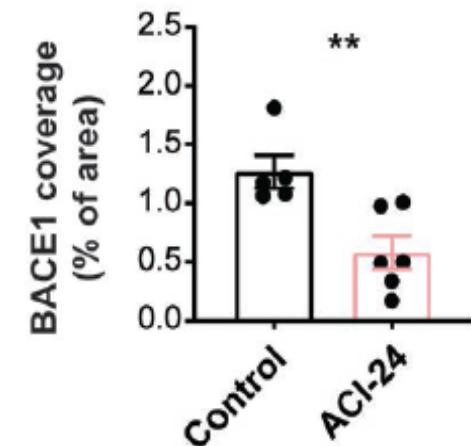
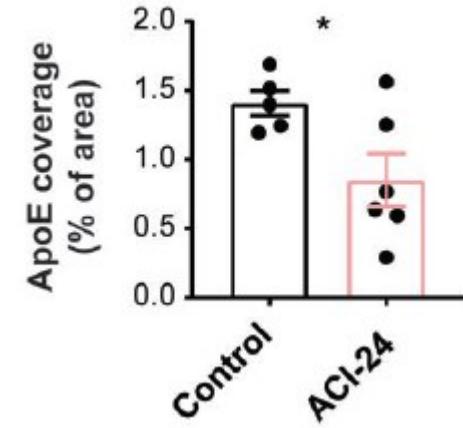
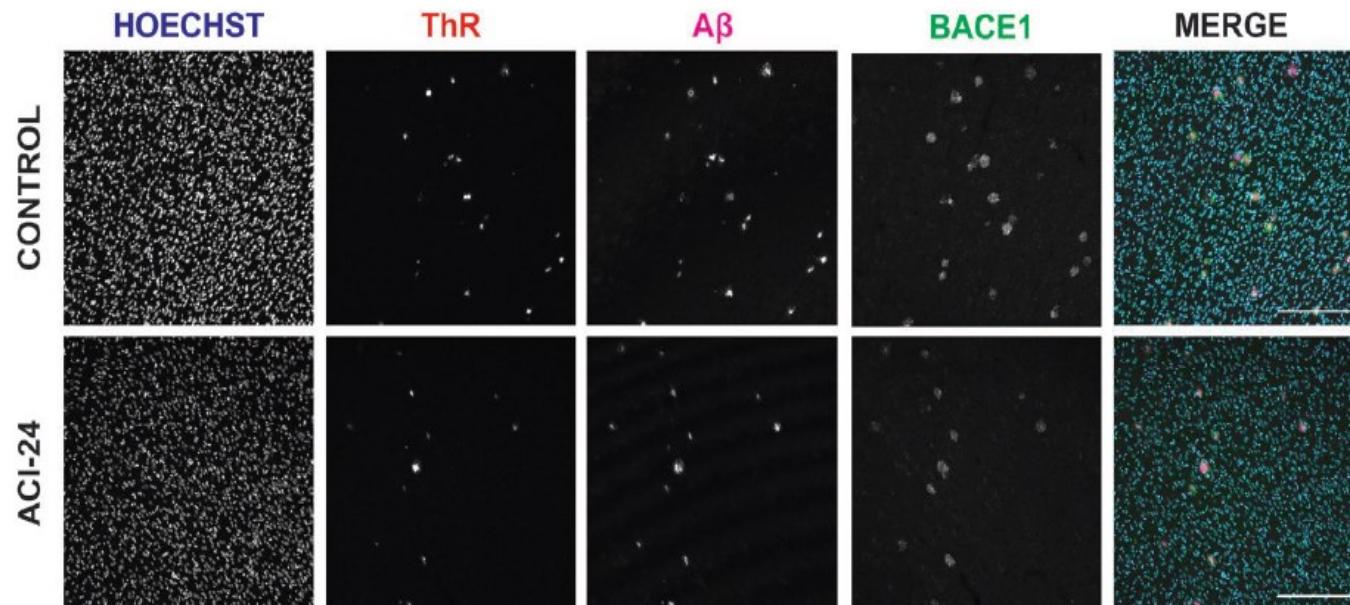
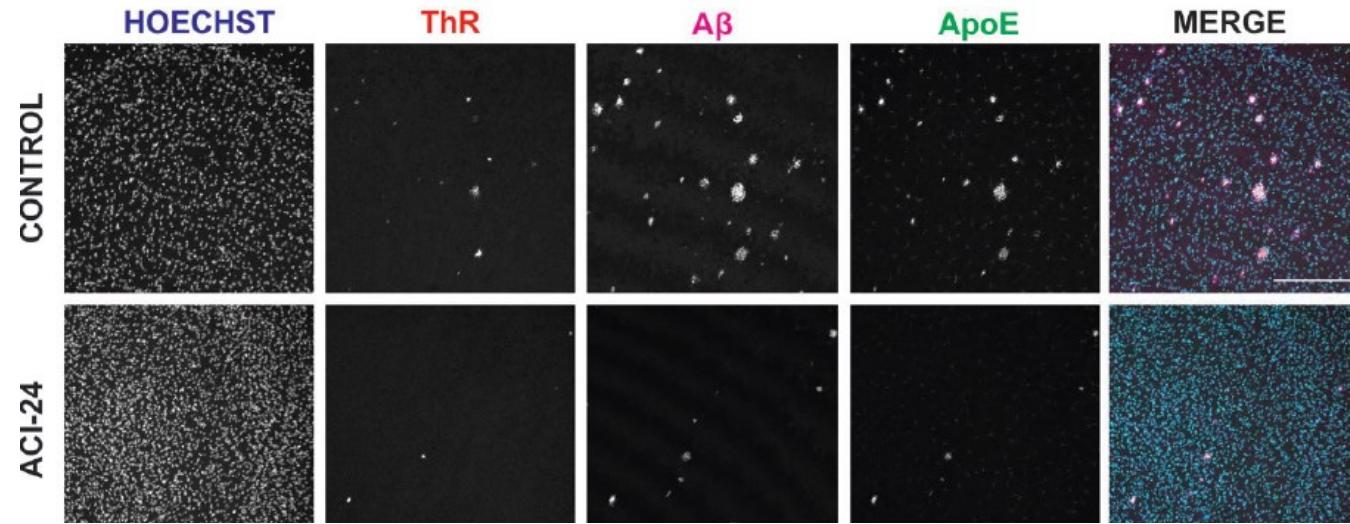
RAMIFIED



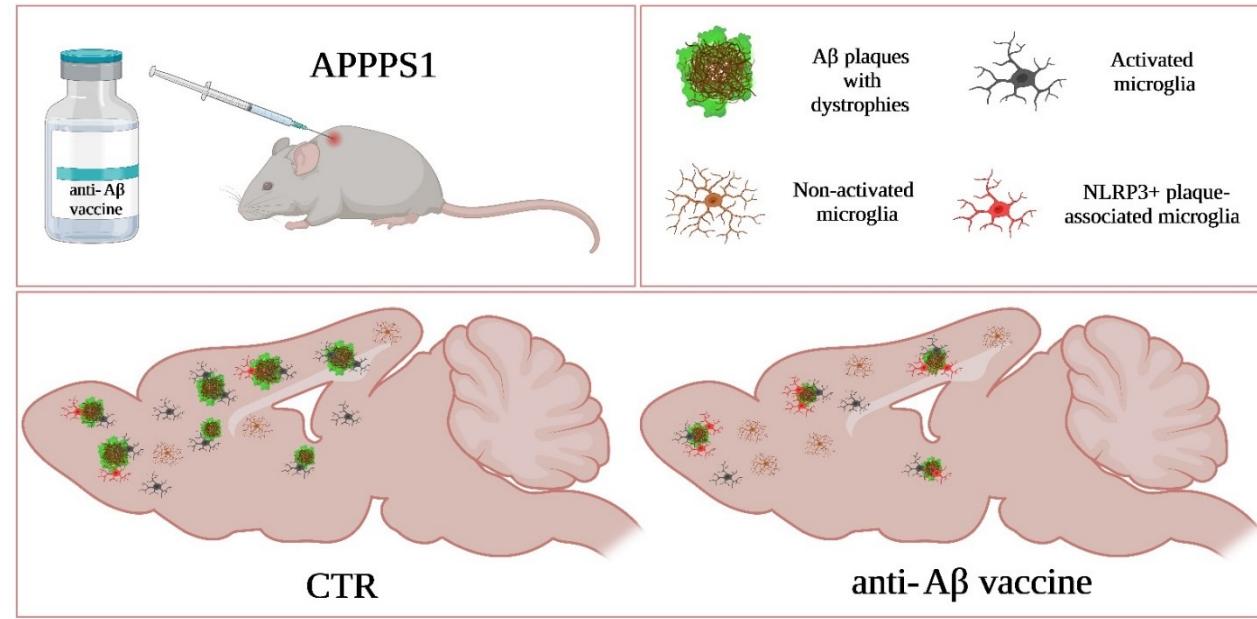
UNRAMIFIED/AMOEBOID/ACTIVATED



# ACI-24 vaccination reduces ApoE and BACE1 coverage



# Summary



Following vaccination with ACI-24 we observed:

- A robust and sustained antibody response
- Reduced A $\beta$  plaque load, plaque-associated ApoE and dystrophic neurites
- Link between efficacy of the vaccination and the A $\beta$  plaque load

=> Our study is highlighting early and even preventive therapeutic use of anti-A $\beta$  vaccine to modify AD pathology

# Acknowledgements



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