

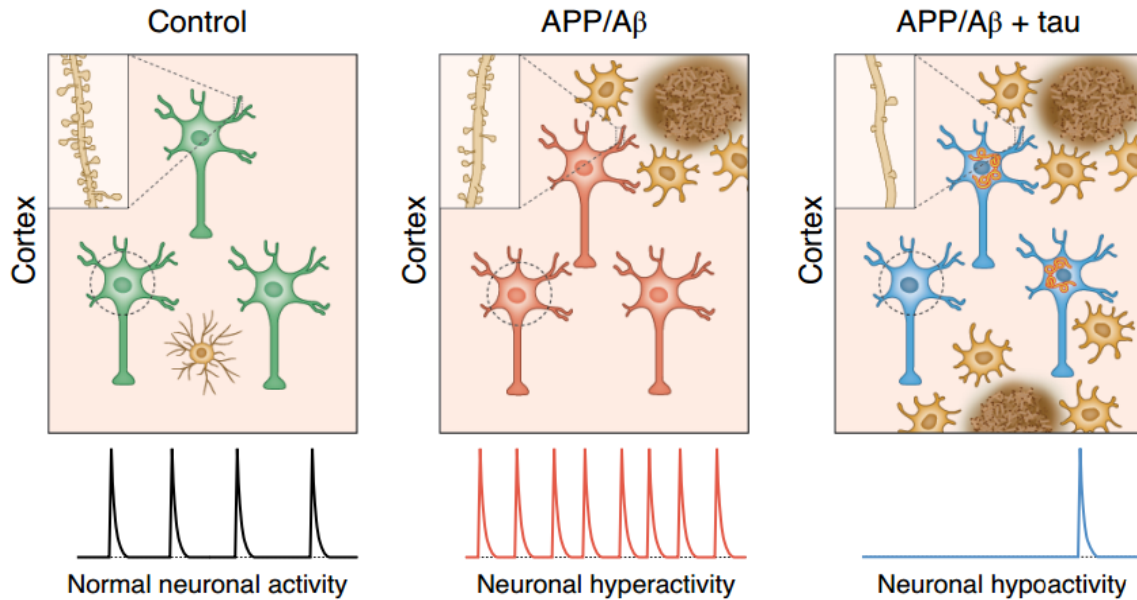
Electrophysiological markers of early Alzheimer's Disease proteinopathy in the human brain

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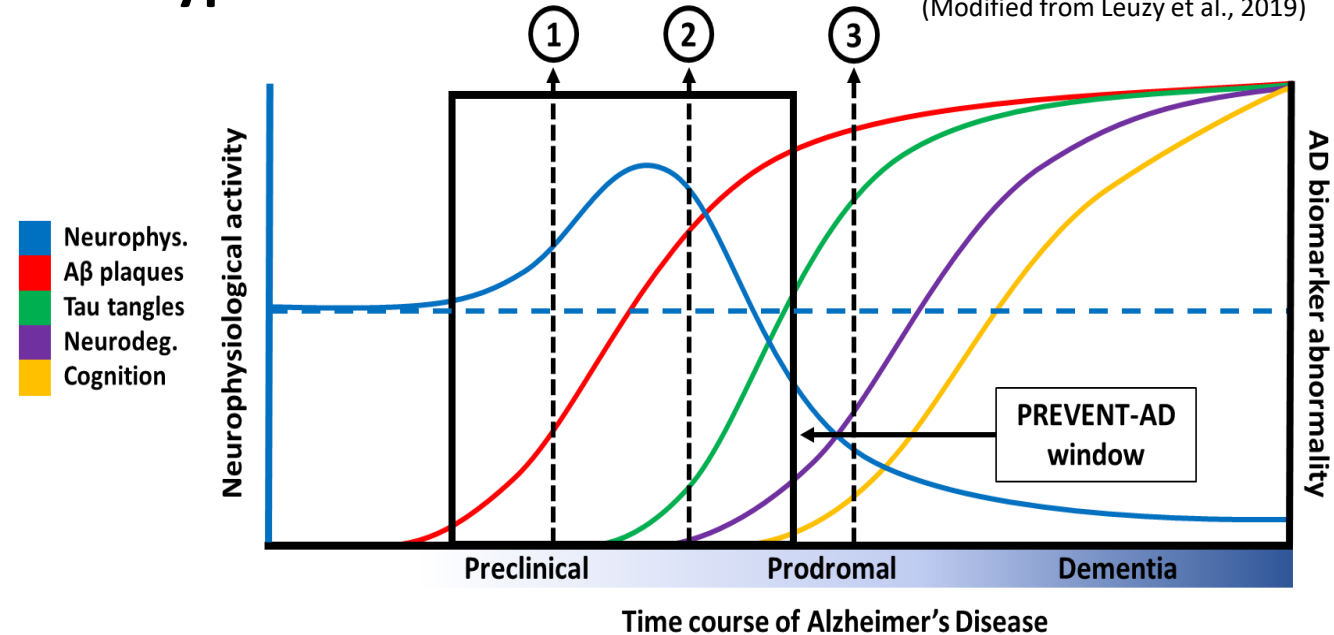
Background

(Busche et al., 2020)



Hypothesis

(Modified from Leuzy et al., 2019)



Aim

In this work we studied the electrophysiological changes associated with the early deposition of A β and tau in asymptomatic older adults with elevated familial risk for AD.

- 1) Early A β deposition leads to neural hyperactivity
- 2) High A β plus early tau accumulation leads to a shift towards neural hypoactivity
- 3) High levels of A β and tau induce neural slowing and cognitive decline

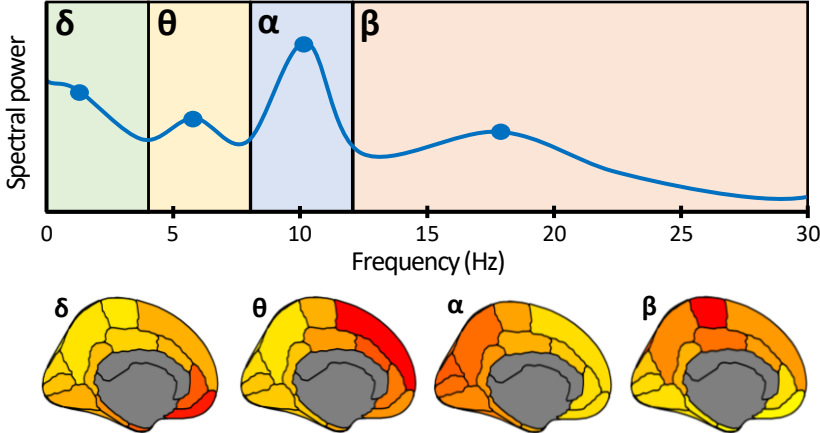
Methods

PREVENT-AD demographics

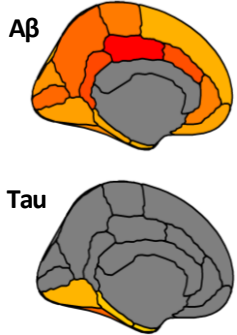
Sample size	104
Mean age (\pm SD)	67.4 (4.9)
Female % (n)	71.1 (74)
Mean education (\pm SD)	15 (3.1)



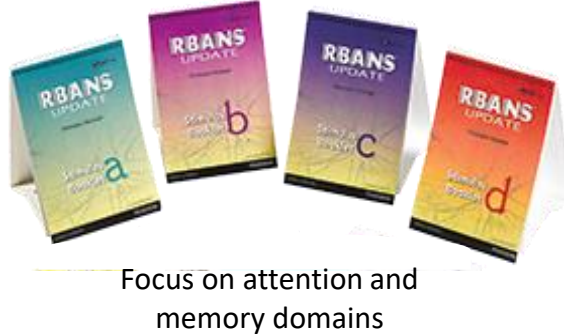
MEG band-specific power maps



A β /Tau meta-ROI SUVR maps

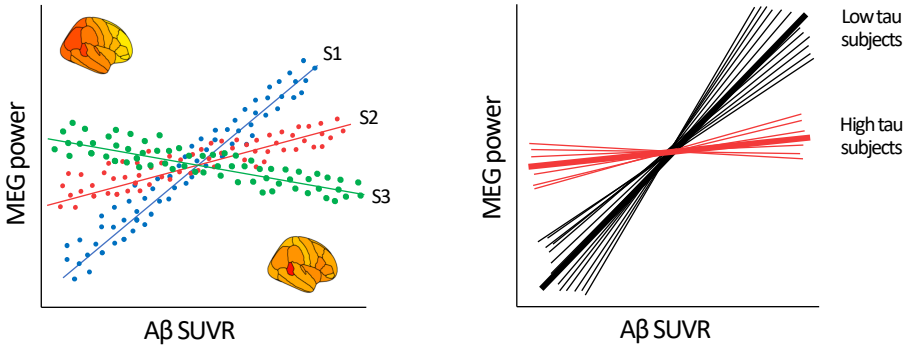


Longitudinal cognitive assessment



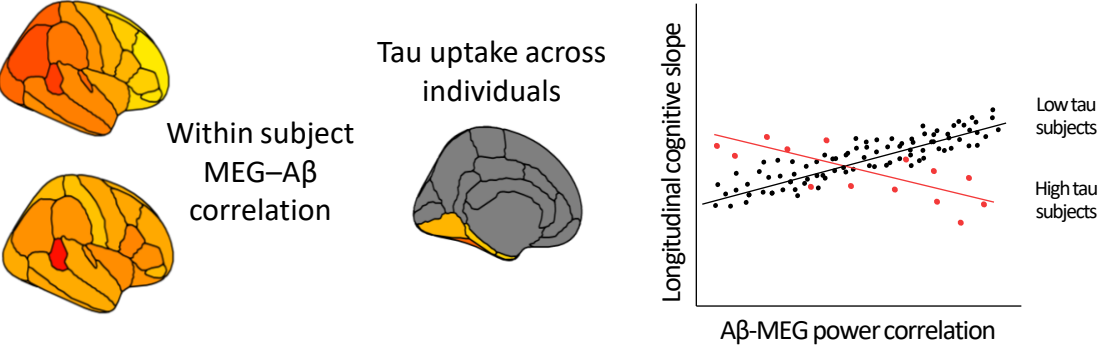
A β and tau on MEG spectral power

Nested linear mixed effects models: MEG power \sim A β * Tau + age + sex + education



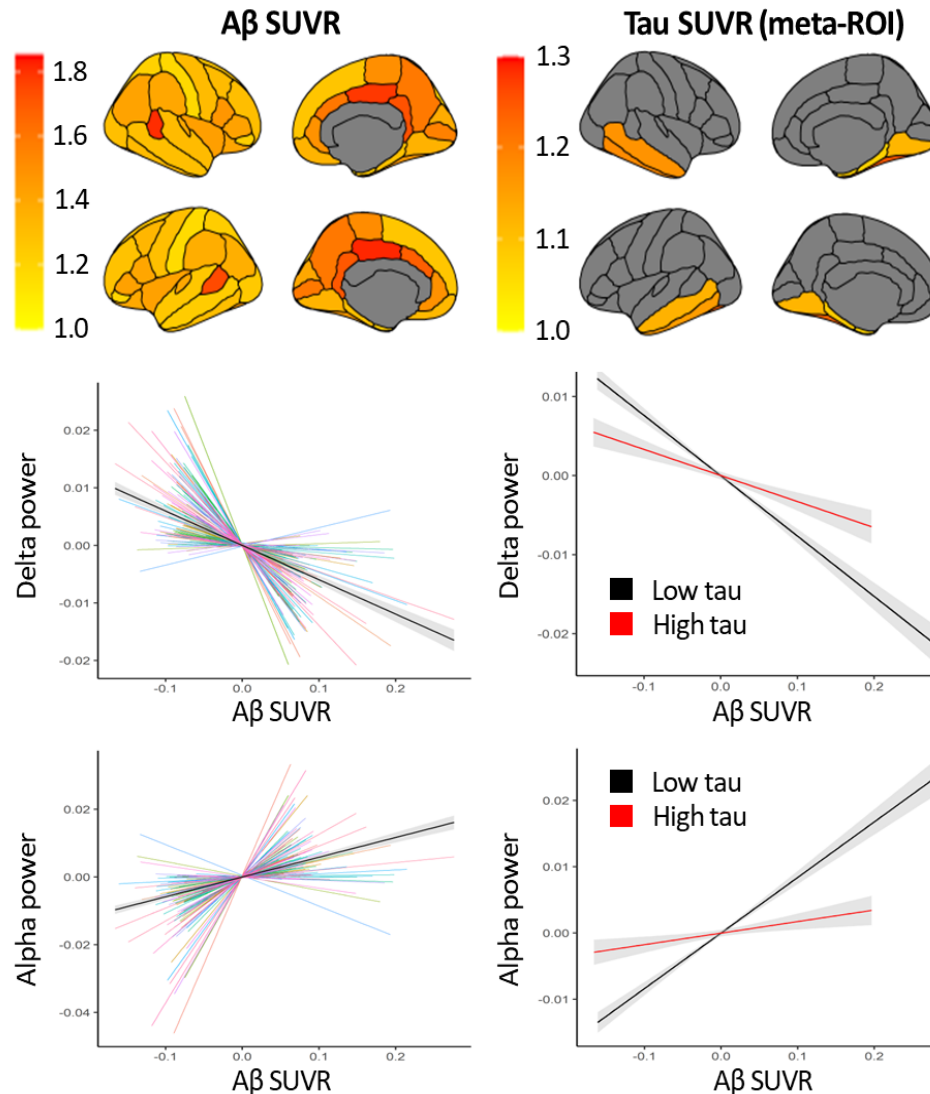
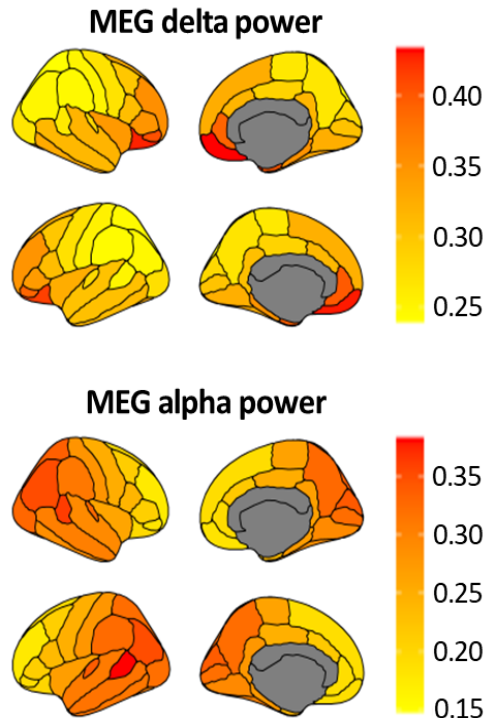
A β -tau related MEG changes and cognition

Linear regression models: Cognition \sim MEG-A β corr. * Tau + age + sex + education

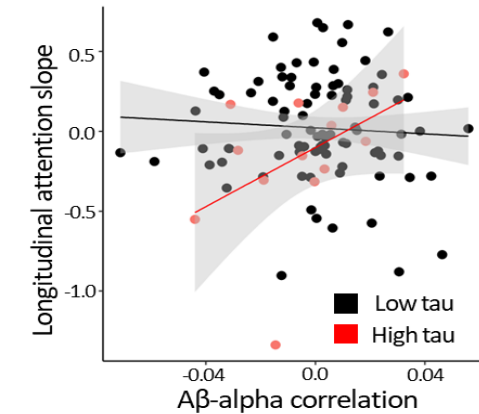


Results

A β and tau on MEG spectral power



Aβ-tau related MEG changes and cognition



Take home message

A β induces neural hyperactivity, while additive effects of A β and tau lead to a shift towards neural slowing that is related to longitudinal decline in attentional scores.