

Supplementary material

ADNI study

Data used in the preparation of this article were obtained from the Alzheimer's Disease Neuroimaging Initiative (ADNI) database (adni.loni.usc.edu). The ADNI was launched in 2003 as a public-private partnership, led by Principal Investigator Michael W. Weiner, MD. The primary goal of ADNI has been to test whether serial magnetic resonance imaging (MRI), positron emission tomography (PET), other biological markers, and clinical and neuropsychological assessment can be combined to measure the progression of mild cognitive impairment and early Alzheimer's disease. For up-to-date information, see www.adni-info.org.

ADNI PET and MRI data acquisition

Following is the basic information regarding data acquisition from ADNI.

¹⁸F-AV-1451 PET: 30 minutes PET brain scan (6 frames of 5 minutes duration) was performed 75 minutes after the injection of approximately 10 mCi of ¹⁸F-AV-1451 tracer. The pre-processed images available on the ADNI database (file description: "AV1451 Coreg, Avg, Std Img and Vox Siz, Uniform Resolution")

were used for analyses. Details of the PET pre-processing pipeline can be found at <http://adni.loni.usc.edu/methods/pet-analysis/pre-processing>.

Florbetapir PET: Images were acquired in a 20 minutes PET brain scan session (4 frames of 5 minutes duration). 10 mCi tracer was injected followed by a 50 minutes uptake phase before imaging. Similarly, we used the pre-processed images (“AV45 Coreg, Avg, Std Img and Vox Siz, Uniform Resolution”).

T1-weighted MRI: The T1w ADNI MRI protocol was previously described in Jack et al. [S1] and Leow et al. [S2]. Interpolation was performed to resample raw data (192x192x166 matrix, 1.25x1.25x1.2 mm³ resolution) to a 256x256x166 matrix (0.9375x0.9375x1.2mm³ resolution).

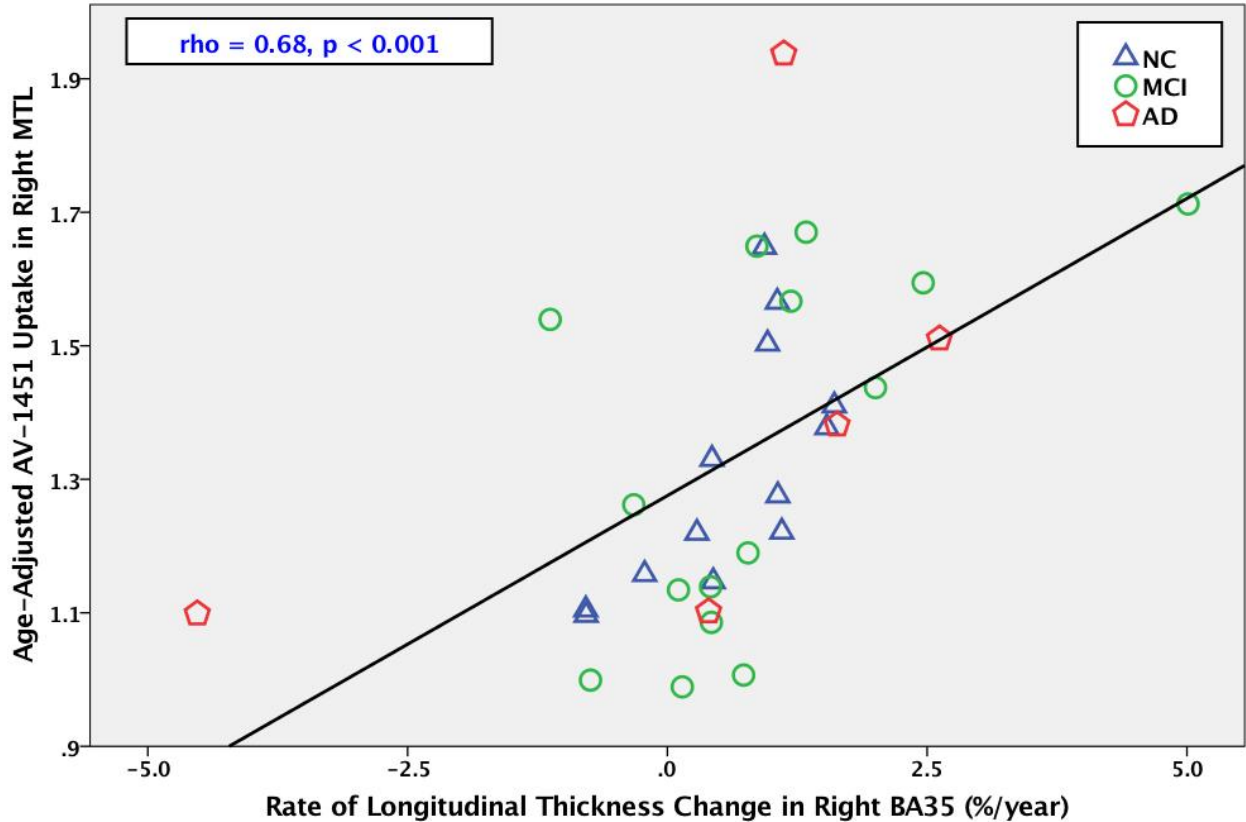


Figure S1. Scatter plots of age-adjusted ^{18}F -AV-1451 uptake in right medial temporal lobe (MTL) vs. rate of longitudinal thickness change in right BA35 within $\text{A}\beta^+$ subjects ($N = 33$) from Alzheimer's Disease Neuroimaging Initiative (ADNI). Due to the potential influence of outliers, Spearman correlation was used. The correlation remained significant after removing the potential outliers ($\rho = 0.63$, $p < 0.001$). Positive correlation indicates higher MTL tau burden correlates with faster structural atrophy rate. NC = normal controls; MCI = mild cognitive impairment; AD = Alzheimer's disease; BA35 = Brodmann area 35.

References:

- S1. Jack CR, Bernstein MA, Fox NC, et al. The Alzheimer's Disease Neuroimaging Initiative (ADNI): MRI methods. *J. Magn. Reson. Imaging* 2008;27(4):685–91.
- S2. Leow AD, Klunder AD, Jack CR, et al. Longitudinal stability of MRI for mapping brain change using tensor-based morphometry. *Neuroimage* 2006;31(2):627–640.