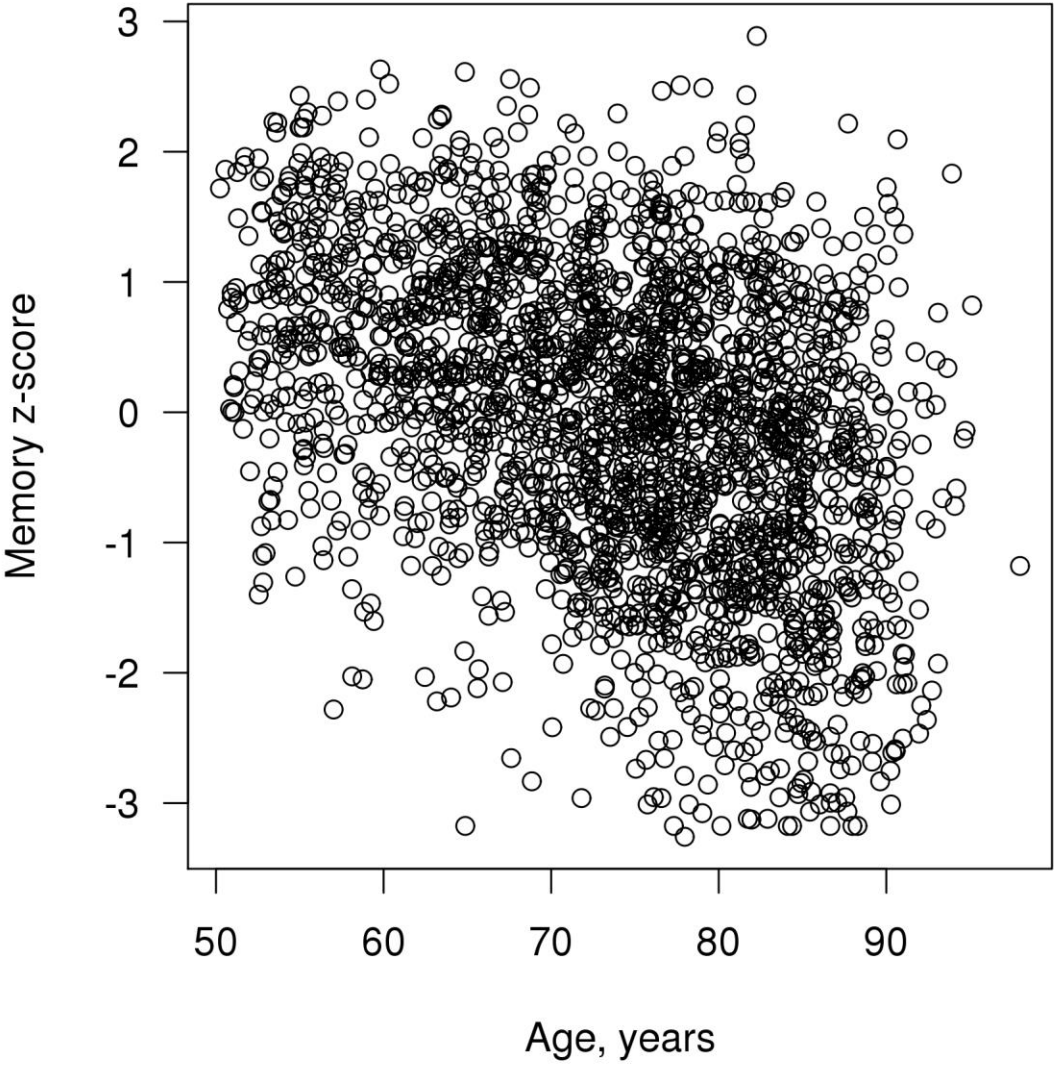**Supplemental Figures**

SFigure 1. Predicted memory z-scores (y-axis) are plotted against age (x-axis) and depict the wide variation in scores as well as the general trend to lower scores at higher ages.

Supplemental Figure 1

SFigure 2. Distribution flortaucipir SUVR by region. Flortaucipir SUVR is shown on the x-axis, and regions are shown on the y-axis. The boxes depict the median and the interquartile range of the distributions.

Supplemental Figure 2
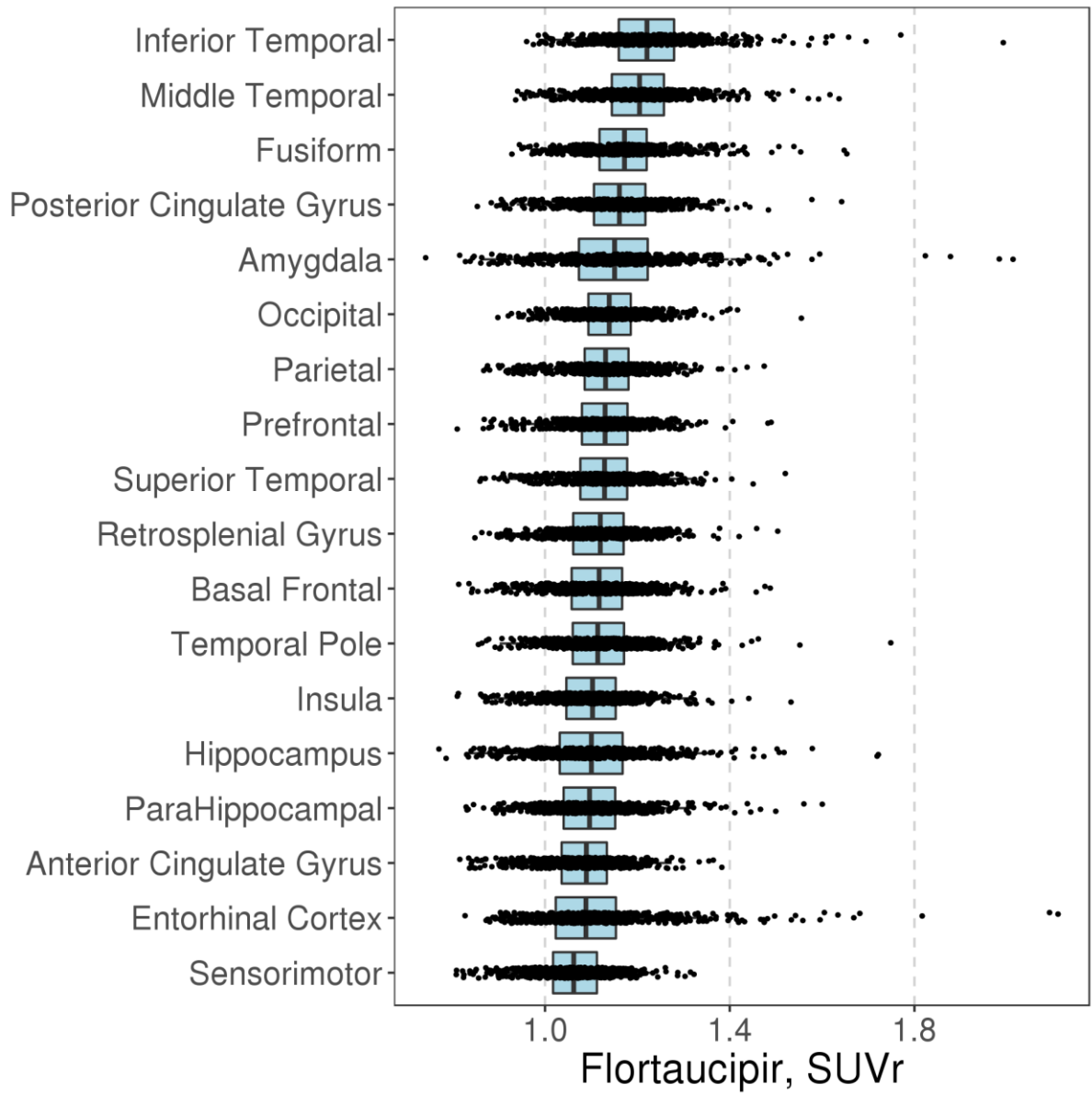
SFigure 3. A. Distributions of PIB SUVR by region (entorhinal cortex, parahippocampal gyrus, inferior temporal gyrus, posterior cingulate gyrus and prefrontal region of interest. B. Distributions of flortaucipir SUVR and C. cortical thickness by region and PIB SUVR category. Shown are the scatterplots plus median value and interquartile range. PIB SUVR categorical status of elevated or not elevated is based on an SUVR of 1.48. Note that there were larger flortaucipir values, but not thinner cortex in the PIB positive group for the temporal lobe regions of interest.

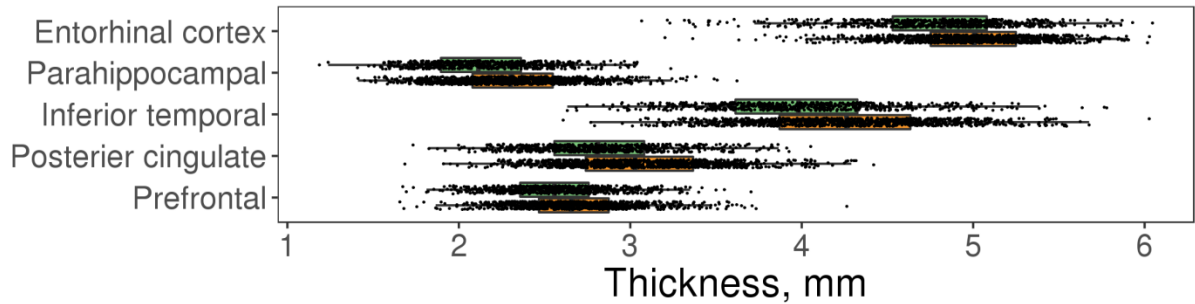**Supplemental Figure 3**


A.
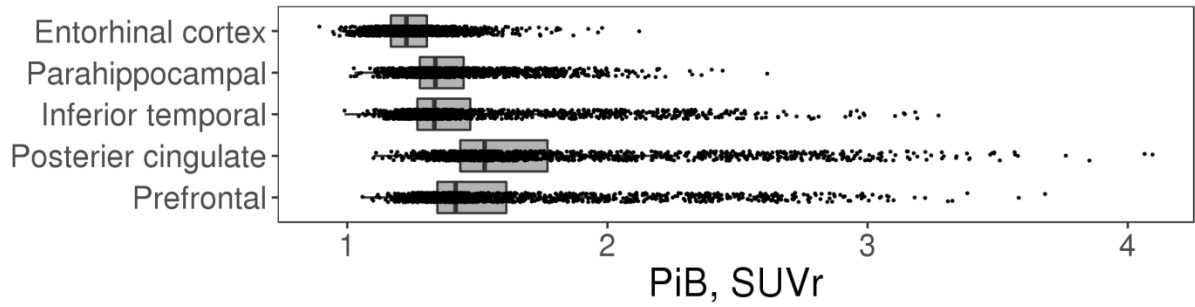
B.
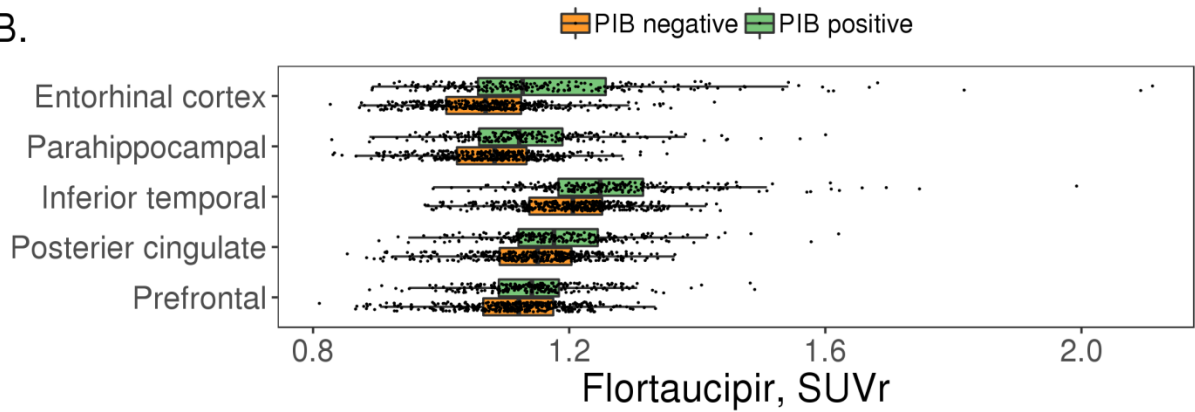
C.

SFigure 4A-D Scatterplot of flortaucipir SUVR by cortical thickness for entorhinal cortex by decade. There was no correlation between flortaucipir and cortical thickness in the 3 younger groups (rho's <0.01) but the two biomarkers were correlated in the oldest decade group (rho=-0.295, P = 0.0022). The median values for each biomarker is depicted in a red dashed line.

Supplemental Figure 4

Entorhinal Cortex: 50-59
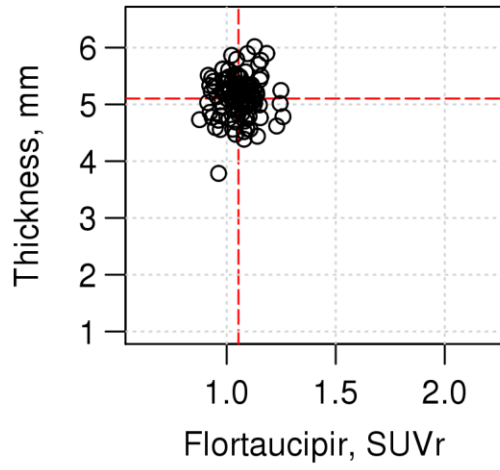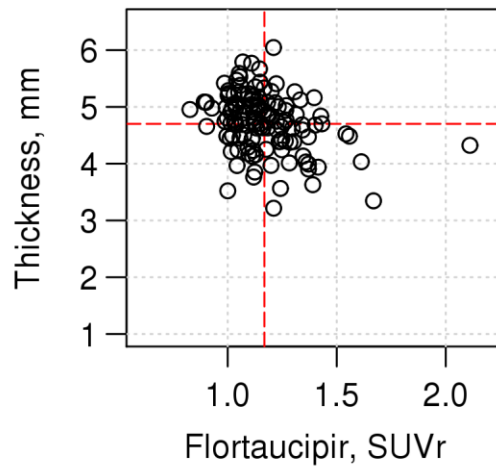

Entorhinal Cortex: 60-69
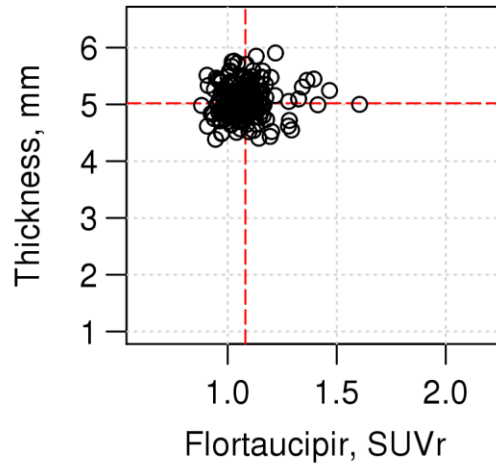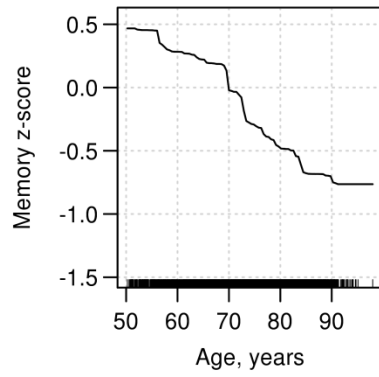

Entorhinal Cortex: 70-79
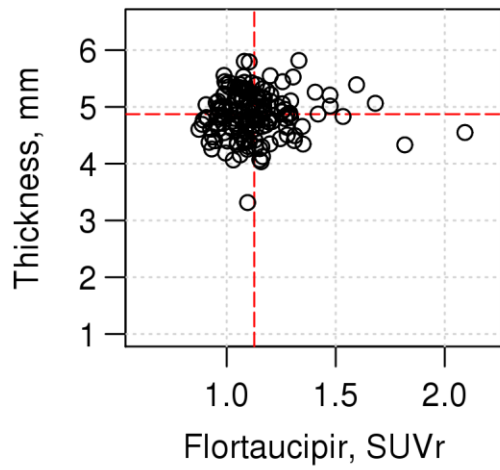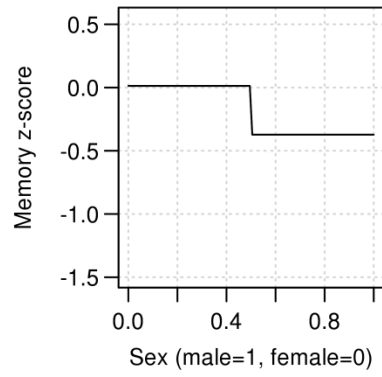

Entorhinal Cortex: 80-89

SFigure 5. Bivariate relationships generated by GBM model between predicted memory z-scores (y-axis) and on x-axis: A) age, B) sex, C) education. The curves reflect the residual effects of the feature with all other variables are accounted for.

Supplemental Figure 5

A.

B.

C.
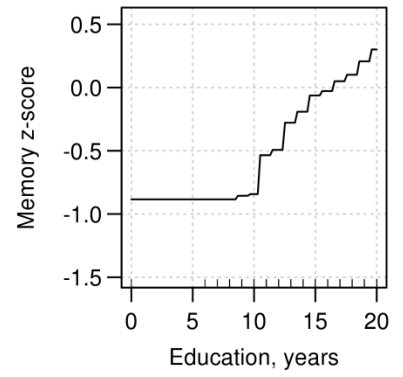
SFigure 6. Three dimensional heat maps generated by GBM for global PIB SUVR versus flortaucipir SUVR(Left Hand column) and global PIB SUVR versus cortical thickness (inverted scale) (Right Hand column) for the 4 other regions of interest A) parahippocampal; B) inferior temporal; C) Posterior cingulate; D) Prefrontal. Predicted memory z-scores are represented on the z-axis as depicted by the color code for each individual graph. For each region and set of biomarkers, 4 age ranges are represented: 50-59, 60-69, 70-79 and 80-89 years.

Supplemental Figure 6

A. Parahippocampal
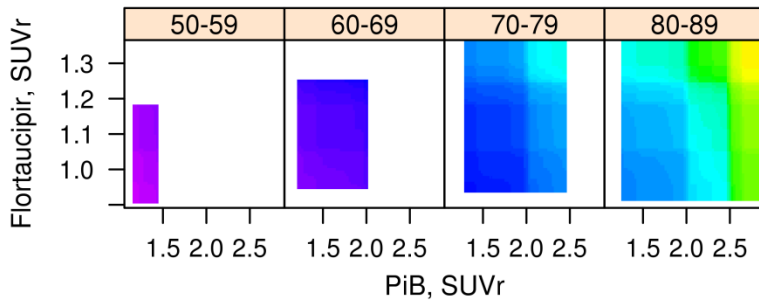
B. Inferior temporal
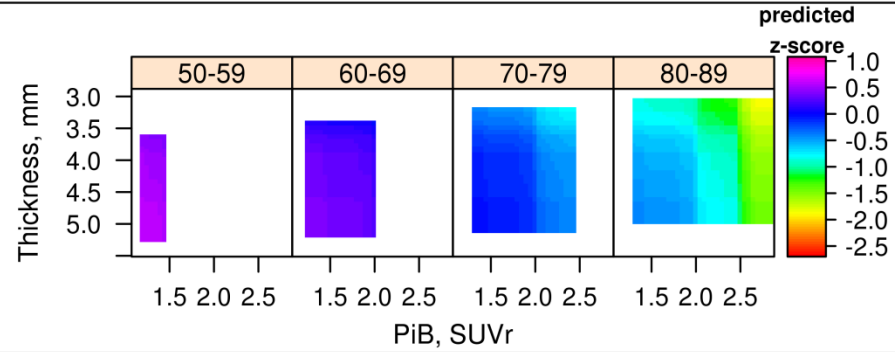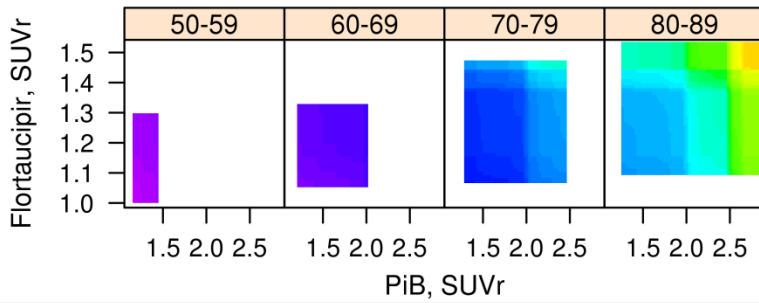
C. Posterior cingulate
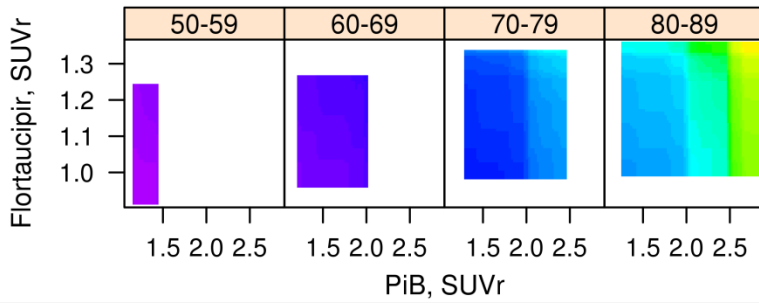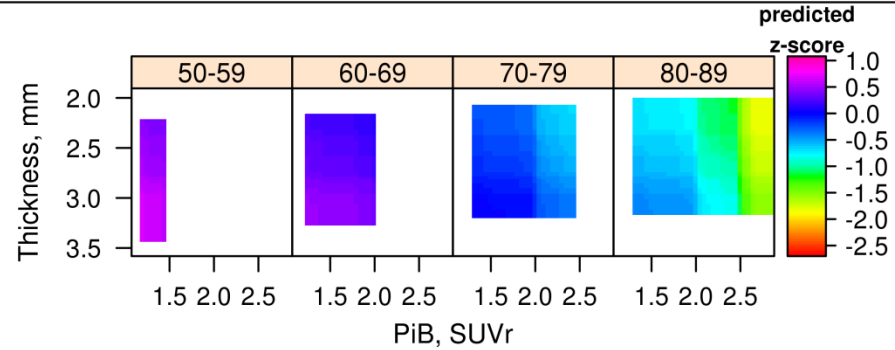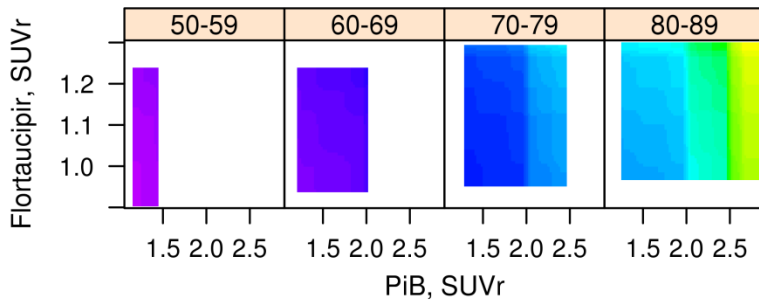
D. Prefrontal

SFigure 7. Three dimensional heat maps generated by GBM for predicted global z-scores, for the 5 regions of interest: A) entorhinal cortex, B) parahippocampal gyrus, C) inferior temporal cortex, D) posterior cingulate and E) the prefrontal region of interest, all non-demented. Flortaucipir SUVR is on the x-axis and cortical thickness (inverted scale) is on the y-axis. Estimated global z-scores are represented on the z-axis as depicted by the color code. For each region, 4 age ranges are represented: 50-59, 60-69, 70-79 and 80-89 years.

Supplemental figure 7

A. Entorhinal cortex

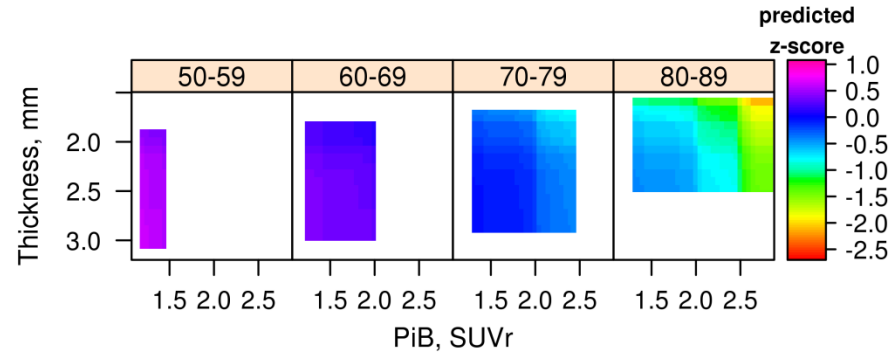B. Parahippocampal

C. Inferior temporal

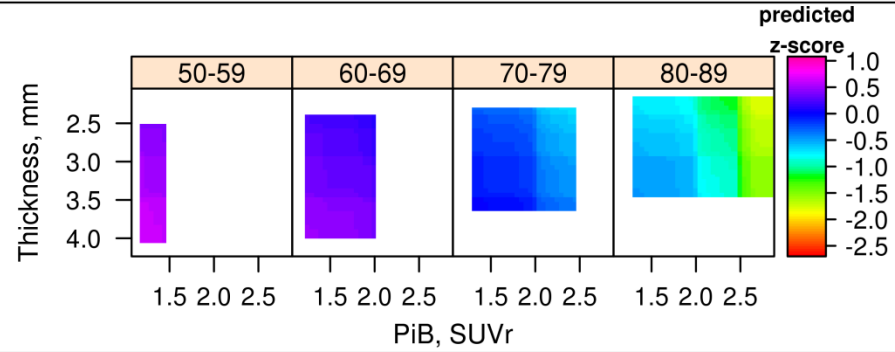D. Posterior cingulate

E. Prefrontal
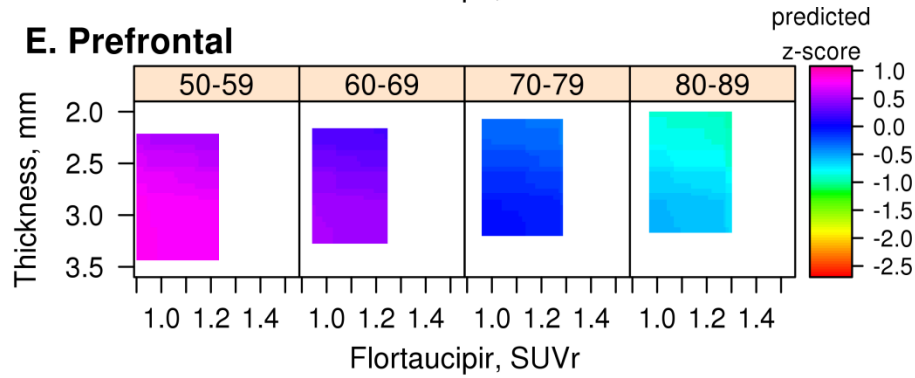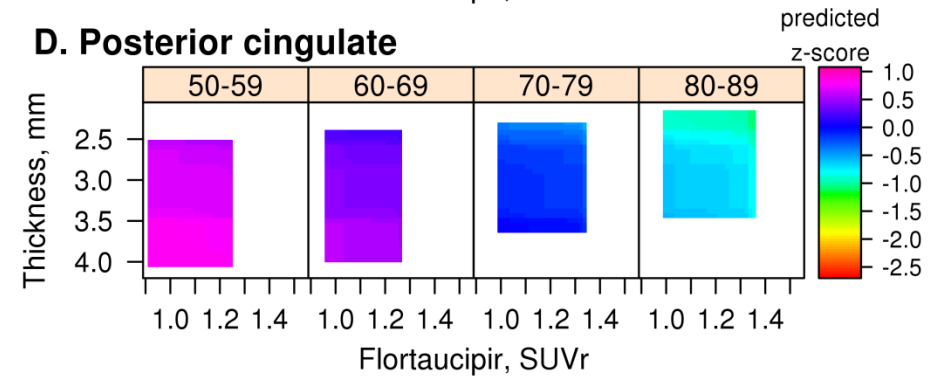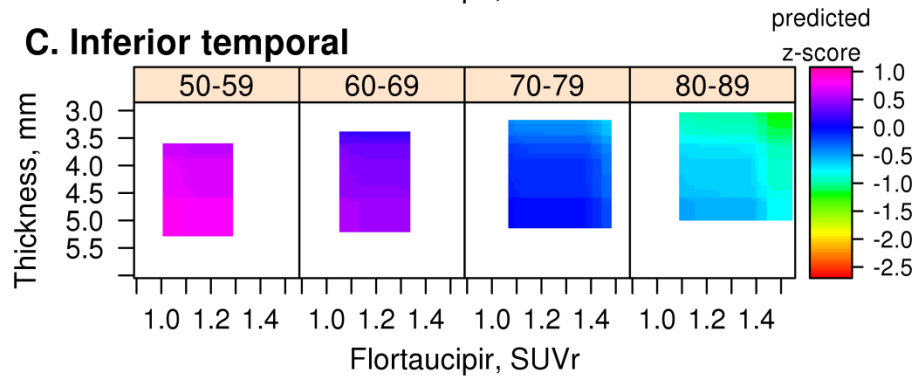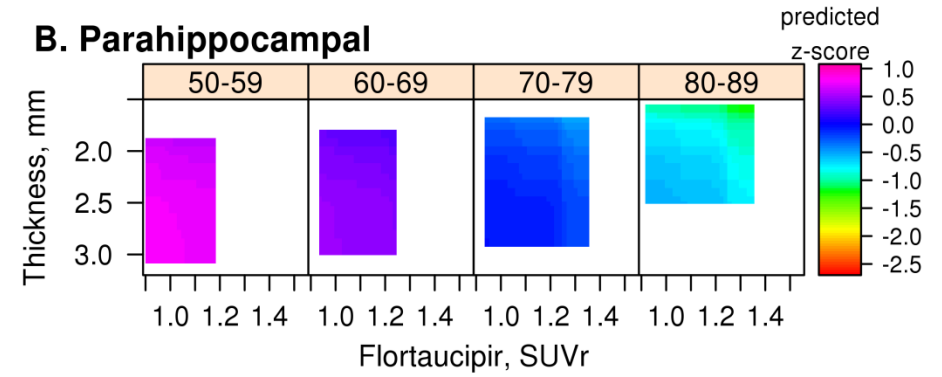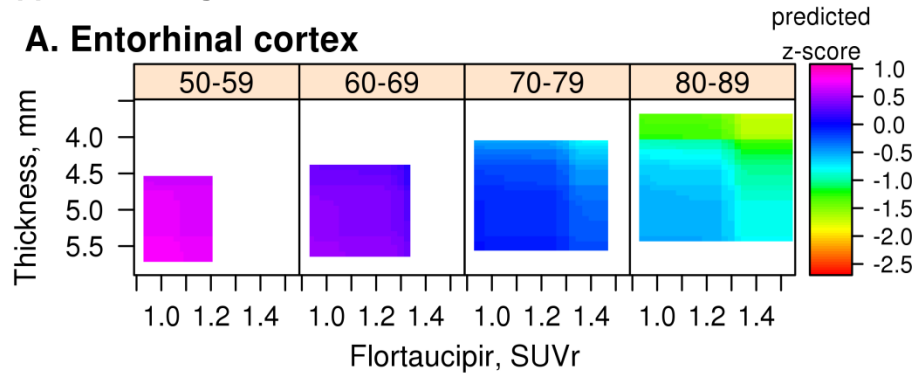
SFigure 8. Three dimensional heat maps generated by GBM for predicted memory z-scores in cognitively unimpaired participants, for the 5 regions of interest: A) entorhinal cortex, B) parahippocampal gyrus, C) inferior temporal cortex, D) posterior cingulate and E) the prefrontal region of interest, all non-demented. Flortaucipir SUVR is on the x-axis and cortical thickness (inverted scale) is on the y-axis. Estimated global z-scores are represented on the z-axis as depicted by the color code. For each region, 4 age ranges are represented: 50-59, 60-69, 70-79 and 80-89 years.

Supplemental Figure 8
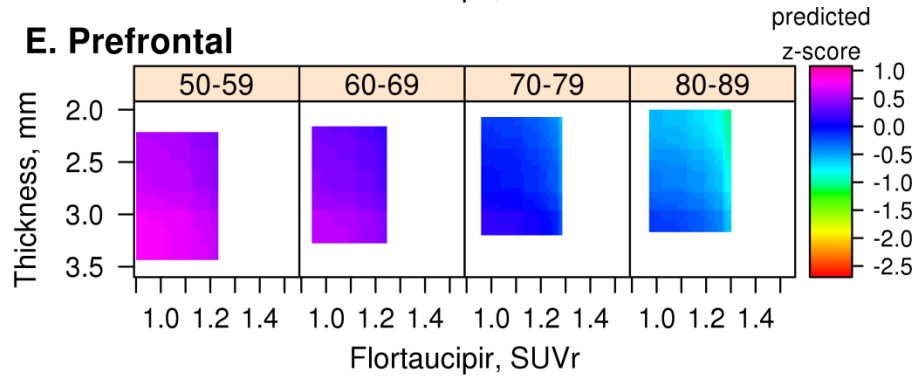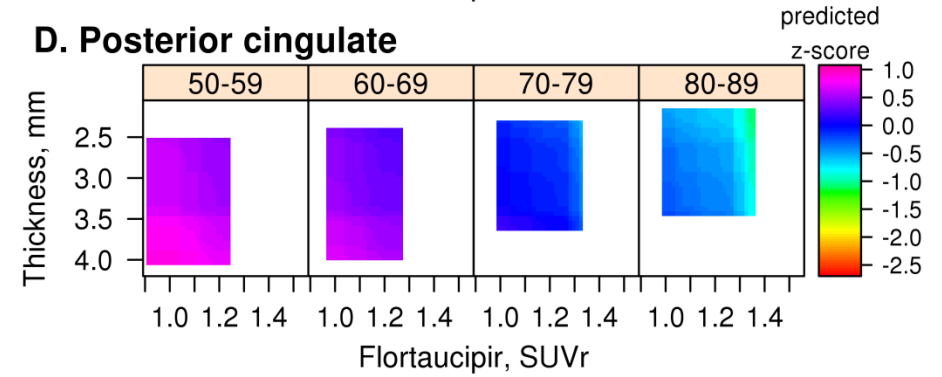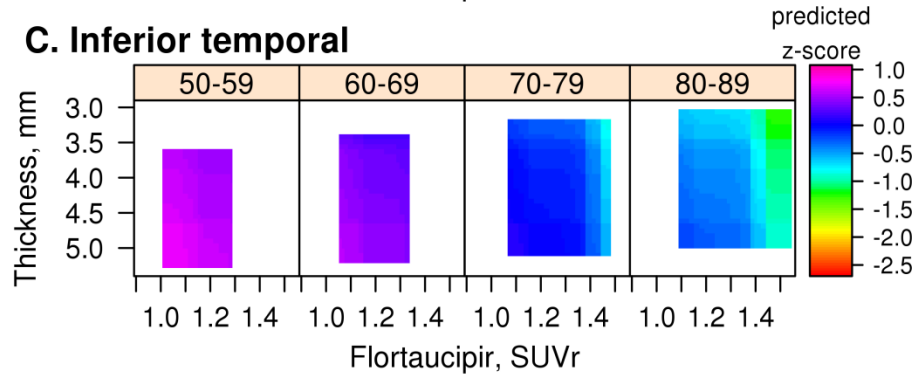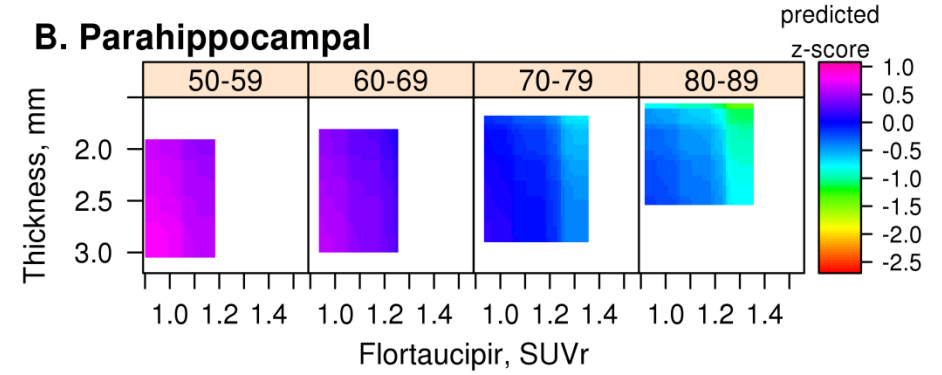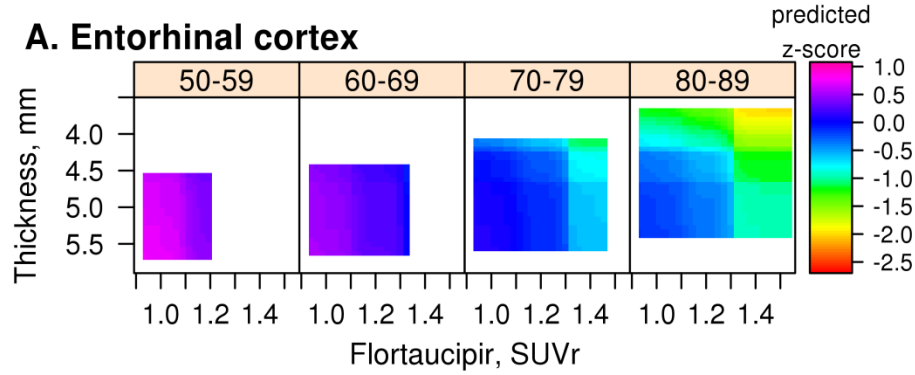
Supplemental Table. Estimates of differences in Tau PET or Thickness values by region and age group, in reference to Figure 2

Region	Decade	TAU	Thickness	PiB	Estimate (95% CI)	P-value
Entorhinal Cortex	70-79	0.94 v 1.35	continuous	integrated	-0.488 (-0.79, -0.19)	0.001
Entorhinal Cortex	80-89	0.94 v 1.35	continuous	integrated	-0.589 (-0.96, -0.22)	0.002
Entorhinal Cortex	70-79	continuous	4.1 v 5.5	integrated	0.669 (0.41, 0.93)	<0.001
Entorhinal Cortex	80-89	continuous	4.1 v 5.5	integrated	0.747 (0.46, 1.03)	<0.001
Entorhinal Cortex	70-79	integrated	continuous	1.3 v 2.4	-0.381 (-0.59, -0.17)	<0.001
Entorhinal Cortex	80-89	integrated	continuous	1.3 v 2.4	-0.393 (-0.62, -0.17)	<0.001
Entorhinal Cortex	70-79	integrated	4.1 v 5.5	continuous	0.668 (0.40, 0.93)	<0.001
Entorhinal Cortex	80-89	integrated	4.1 v 5.5	continuous	0.75 (0.46, 1.04)	<0.001
Entorhinal Cortex	70-79	0.94 v 1.35	integrated	continuous	-0.481 (-0.77, -0.19)	0.001
Entorhinal Cortex	80-89	0.94 v 1.35	integrated	continuous	-0.584 (-0.95, -0.22)	0.002
Entorhinal Cortex	70-79	continuous	integrated	1.3 v 2.4	-0.366 (-0.56, -0.17)	<0.001
Entorhinal Cortex	80-89	continuous	integrated	1.3 v 2.4	-0.376 (-0.59, -0.16)	<0.001
Parahippocampal	70-79	0.95 v 1.26	continuous	integrated	-0.355 (-0.61, -0.10)	0.006
Parahippocampal	80-89	0.95 v 1.26	continuous	integrated	-0.427 (-0.73, -0.12)	0.006
Parahippocampal	70-79	continuous	1.7 v 2.8	integrated	0.383 (0.20, 0.57)	<0.001
Parahippocampal	80-89	continuous	1.7 v 2.8	integrated	0.396 (0.20, 0.59)	<0.001
Parahippocampal	70-79	integrated	continuous	1.3 v 2.4	-0.411 (-0.63, -0.19)	<0.001
Parahippocampal	80-89	integrated	continuous	1.3 v 2.4	-0.445 (-0.69, -0.20)	<0.001
Parahippocampal	70-79	integrated	1.7 v 2.8	continuous	0.411 (0.19, 0.63)	<0.001
Parahippocampal	80-89	integrated	1.7 v 2.8	continuous	0.436 (0.20, 0.67)	<0.001
Parahippocampal	70-79	0.95 v 1.26	integrated	continuous	-0.379 (-0.64, -0.12)	0.005
Parahippocampal	80-89	0.95 v 1.26	integrated	continuous	-0.447 (-0.76, -0.13)	0.005
Parahippocampal	70-79	continuous	integrated	1.3 v 2.4	-0.426 (-0.64, -0.21)	<0.001
Parahippocampal	80-89	continuous	integrated	1.3 v 2.4	-0.443 (-0.68, -0.21)	<0.001
Temporal Inferior	70-79	1.07 v 1.4	continuous	integrated	-0.238 (-0.46, -0.01)	0.04
Temporal Inferior	80-89	1.07 v 1.4	continuous	integrated	-0.266 (-0.51, -0.02)	0.03
Temporal Inferior	70-79	continuous	3.3 v 5	integrated	0.351 (0.19, 0.51)	<0.001
Temporal Inferior	80-89	continuous	3.3 v 5	integrated	0.395 (0.21, 0.58)	<0.001
Temporal Inferior	70-79	integrated	continuous	1.3 v 2.4	-0.413 (-0.62, -0.21)	<0.001
Temporal Inferior	80-89	integrated	continuous	1.3 v 2.4	-0.44 (-0.67, -0.21)	<0.001
Temporal Inferior	70-79	integrated	3.3 v 5	continuous	0.336 (0.17, 0.50)	<0.001
Temporal Inferior	80-89	integrated	3.3 v 5	continuous	0.378 (0.19, 0.57)	<0.001
Temporal Inferior	70-79	1.07 v 1.4	integrated	continuous	-0.248 (-0.48, -0.02)	0.03
Temporal Inferior	80-89	1.07 v 1.4	integrated	continuous	-0.277 (-0.53, -0.03)	0.03
Temporal Inferior	70-79	continuous	integrated	1.3 v 2.4	-0.415 (-0.62, -0.21)	<0.001
Temporal Inferior	80-89	continuous	integrated	1.3 v 2.4	-0.447 (-0.68, -0.21)	<0.001
Cingulum Post	70-79	0.98 v 1.31	continuous	integrated	-0.188 (-0.35, -0.02)	0.03
Cingulum Post	80-89	0.98 v 1.31	continuous	integrated	-0.218 (-0.41, -0.03)	0.02
Cingulum Post	70-79	continuous	2.3 v 3.7	integrated	0.331 (0.17, 0.49)	<0.001
Cingulum Post	80-89	continuous	2.3 v 3.7	integrated	0.354 (0.18, 0.53)	<0.001
Cingulum Post	70-79	integrated	continuous	1.3 v 2.4	-0.421 (-0.63, -0.21)	<0.001
Cingulum Post	80-89	integrated	continuous	1.3 v 2.4	-0.454 (-0.69, -0.22)	<0.001
Cingulum Post	70-79	integrated	2.3 v 3.7	continuous	0.333 (0.17, 0.50)	<0.001
Cingulum Post	80-89	integrated	2.3 v 3.7	continuous	0.358 (0.18, 0.54)	<0.001
Cingulum Post	70-79	0.98 v 1.31	integrated	continuous	-0.21 (-0.39, -0.03)	0.03

Cingulum Post	80-89	0.98 v 1.31	integrated	continuous	-0.24 (-0.45, -0.04)	0.02
Cingulum Post	70-79	continuous	integrated	1.3 v 2.4	-0.428 (-0.64, -0.21)	<0.001
Cingulum Post	80-89	continuous	integrated	1.3 v 2.4	-0.455 (-0.70, -0.21)	<0.001
Prefrontal	70-79	0.97 v 1.27	continuous	integrated	-0.192 (-0.36, -0.02)	0.03
Prefrontal	80-89	0.97 v 1.27	continuous	integrated	-0.215 (-0.40, -0.03)	0.02
Prefrontal	70-79	continuous	2.1 v 3.2	integrated	0.319 (0.18, 0.46)	<0.001
Prefrontal	80-89	continuous	2.1 v 3.2	integrated	0.338 (0.18, 0.49)	<0.001
Prefrontal	70-79	integrated	continuous	1.3 v 2.4	-0.441 (-0.65, -0.23)	<0.001
Prefrontal	80-89	integrated	continuous	1.3 v 2.4	-0.475 (-0.71, -0.24)	<0.001
Prefrontal	70-79	integrated	2.1 v 3.2	continuous	0.328 (0.18, 0.48)	<0.001
Prefrontal	80-89	integrated	2.1 v 3.2	continuous	0.351 (0.18, 0.52)	<0.001
Prefrontal	70-79	0.97 v 1.27	integrated	continuous	-0.202 (-0.38, -0.03)	0.02
Prefrontal	80-89	0.97 v 1.27	integrated	continuous	-0.226 (-0.42, -0.03)	0.02
Prefrontal	70-79	continuous	integrated	1.3 v 2.4	-0.445 (-0.65, -0.24)	<0.001
Prefrontal	80-89	continuous	integrated	1.3 v 2.4	-0.476 (-0.71, -0.24)	<0.001