

Supplementary Online Content

Gomperts SN, Locascio JJ, Makaretz SJ, et al. Tau positron emission tomographic imaging in the Lewy body diseases. *JAMA Neurol*. Published online September 19, 2016. doi:10.1001/jamaneurol.2016.3338.

eAppendix. Findings Without Partial Volume Correction (PVC) of [^{18}F]AV-1451 Retention

eTable. [^{18}F]AV-1451 Binding and [^{11}C]PiB Binding in Select ROIs Across the Diagnostic Groups

eFigure 1. Partial Volume Uncorrected Estimates of Tau Deposition in the Inferior Temporal Gyrus

eFigure 2. Scatterplot of PV Corrected [^{18}F]AV-1451 Binding in the ITG and [^{11}C]PiB Binding Across Subjects

eFigure 3. Tau Deposition in Lewy Body Disease Subjects With Low Amyloid Burden

This supplementary material has been provided by the authors to give readers additional information about their work.

eAppendix. Findings Without Partial Volume Correction (PVC) of [¹⁸F]AV-1451 Retention
Group comparisons of PV uncorrected tau burden

Without PVC, tau accumulation in the ITG continued to differ among the diagnostic groups ($p=0.013$, Kruskal-Wallis test for a main effect of group; **eTable 1; eFigure 1**). [¹⁸F]AV-1451 binding in DLB remained higher than in NC ($p=0.005$, Wilcoxin rank sum test) and PD-normal ($p=0.030$) groups, and showed the greatest variance (significantly greater than that of each of the other groups ($p<0.05$, F test), which did not differ among themselves). In addition, [¹⁸F]AV-1451 binding in the PD-impaired group was higher than NC at a marginal statistical significance ($p=0.05$), but did not differ from the PD-normal group ($p=0.2$) or the DLB group ($p=0.3$).

In addition, tau deposition in the precuneus still differed across the diagnostic groups ($p=0.006$, Kruskal-Wallis test). [¹⁸F]AV-1451 binding in both DLB and PD-impaired groups was higher than in NC (DLB, $p=0.004$; PD-impaired, $p=0.024$), but was similar to the PD-normal group ($p>0.05$, for each contrast).

Relation of amyloid burden to ITG tau deposition measured without PVC

Without PVC, [¹¹C]PiB retention and [¹⁸F]AV-1451 binding in the ITG remained uncorrelated (across groups, $r=-0.12$, $p=0.4$; within groups, $p>0.05$ for all). Furthermore, 7/17 (41%) of LBD cases with low [¹¹C]PiB had [¹⁸F]AV-1451 binding in the ITG exceeding the highest [¹⁸F]AV-1451 binding observed in NC subjects and >1.3 SUVR. These results are consistent with the PVC observation that high levels of cortical [¹¹C]PiB retention were not necessary for high [¹⁸F]AV-1451 binding in the LBD groups.

eTable. [¹⁸F]AV-1451 Binding and [¹¹C]PiB Binding in Select ROIs Across the Diagnostic Groups

Group	PV uncorrected [¹⁸ F]AV-1451 ITG (SUVR)	PV corrected [¹⁸ F]AV-1451 ITG (SUVR)	PV uncorrected [¹⁸ F]AV-1451 Precuneus (SUVR)	PV corrected [¹⁸ F]AV-1451 Precuneus (SUVR)	[¹¹ C]PiB FLR (DVR)
NC	1.20 ± 0.01 ^a	1.34 ± 0.02 ^{a,b}	1.10 ± 0.01 ^{a,b}	1.22 ± 0.03 ^{a,b}	1.06 ± 0.01 (0.96-1.14)
PD-normal	1.23 ± 0.01 ^a	1.37 ± 0.02 ^{a,b}	1.13 ± 0.02	1.28 ± 0.05 ^a	1.07 ± 0.02 (1.00-1.15)
PD-impaired	1.28 ± 0.03	1.52 ± 0.06 ^{c,d}	1.18 ± 0.03 ^c	1.44 ± 0.07 ^c	1.08 ± 0.03 (0.93-1.22)
DLB	1.39 ± 0.07 ^{c,d}	1.78 ± 0.17 ^{c,d}	1.23 ± 0.05 ^c	1.58 ± 0.12 ^{c,d}	1.14 ± 0.08 (1.01-1.51)

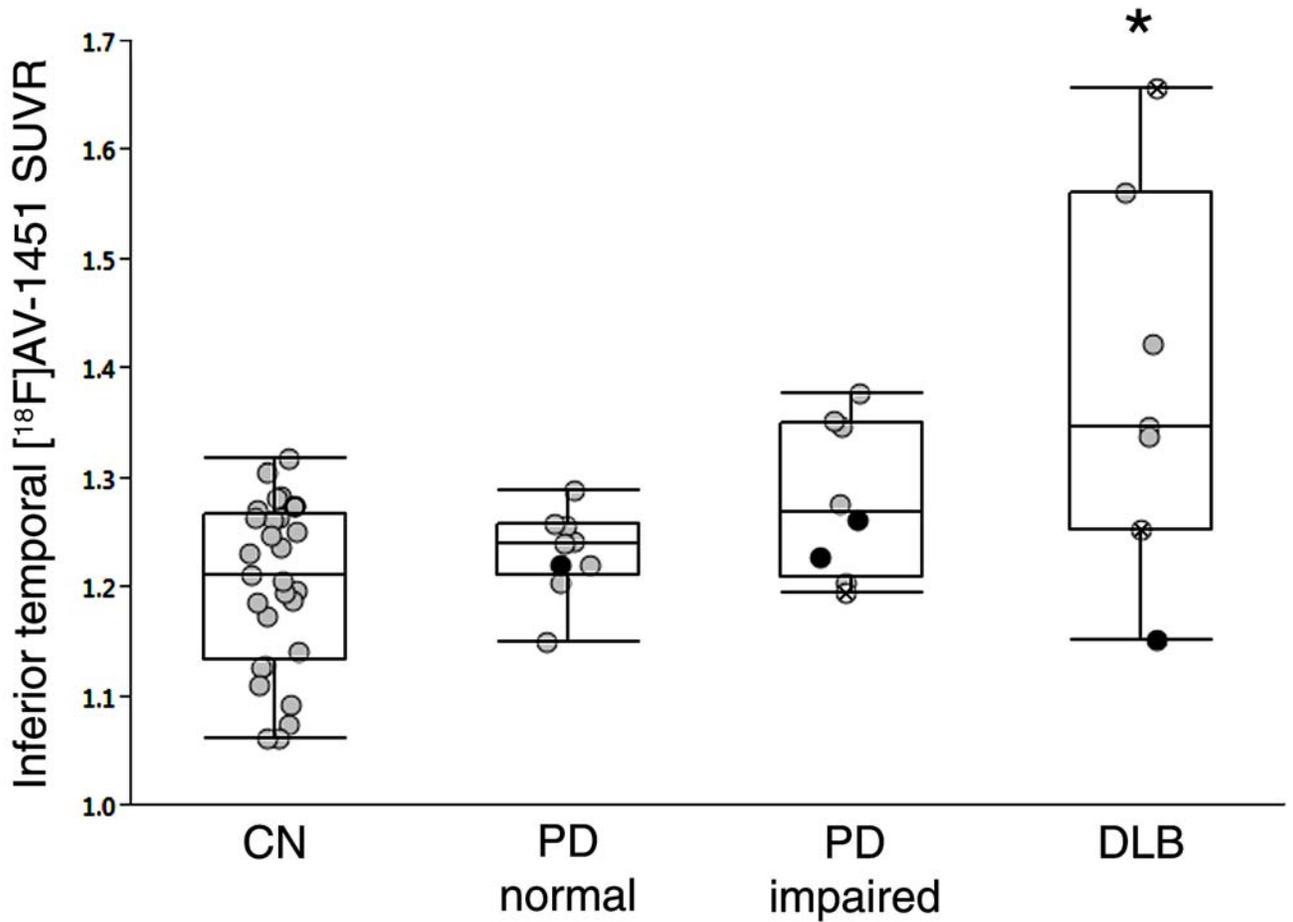
ITG, Inferior temporal gyrus

Error bars reflect standard error. For significance testing, the Kruskal-Wallis test was first used to assess a main effect of group. Where significant (p<0.05), this was followed up with Wilcoxon post-hoc tests, with significance indicated as follows:

- a - significantly different from DLB
- b - significantly different from PD-impaired
- c - significantly different from NC
- d - significantly different from PD-normal

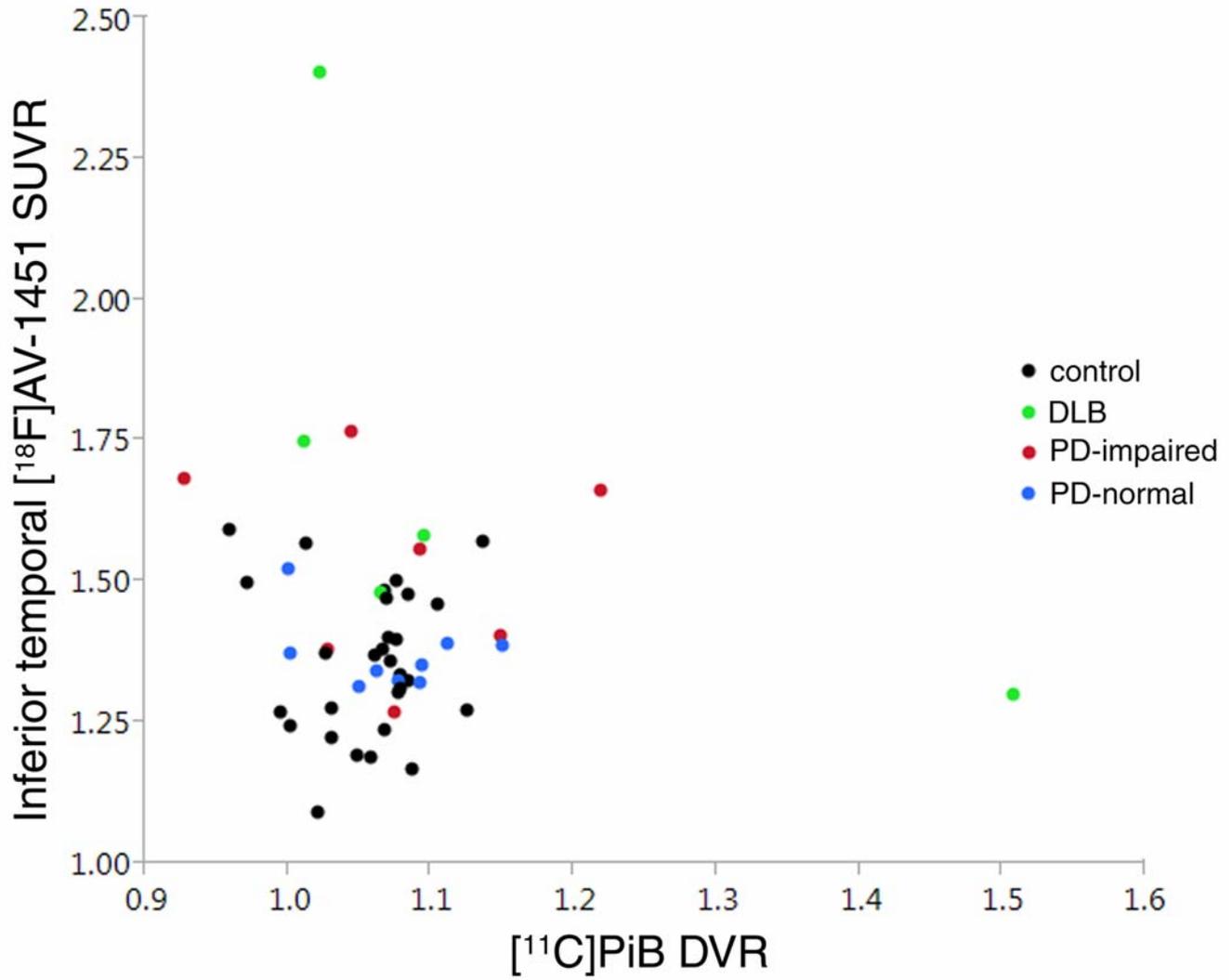
eFigure 1. Partial Volume Uncorrected Estimates of Tau Deposition in the Inferior Temporal Gyrus.

PV uncorrected [¹⁸F]AV-1451 SUVR values are displayed for each of the diagnostic groups, using the box-whiskers convention. Dots represent actual values. As designated by the asterisk, the DLB group had higher [¹⁸F]AV-1451 retention than the PD-normal (p=0.034, Wilcoxin test) and NC groups (p=0.005) and the greatest variance in [¹⁸F]AV-1451 retention (p<0.05 compared to the variance of each of the other groups pairwise, F test; variances for the other groups did not differ significantly). The PD-impaired group's [¹⁸F]AV-1451 retention trended higher than the NC group (p=0.053). Black circles (n=4) designate high [¹¹C]PiB subjects (FLR > 1.15 SUVR). All 7 of the DLB or PD-impaired subjects with AV-1451 values greater than that of any of the controls had low amyloid. Crossed circles (n=3) show cases who did not complete [¹¹C]PiB PET.

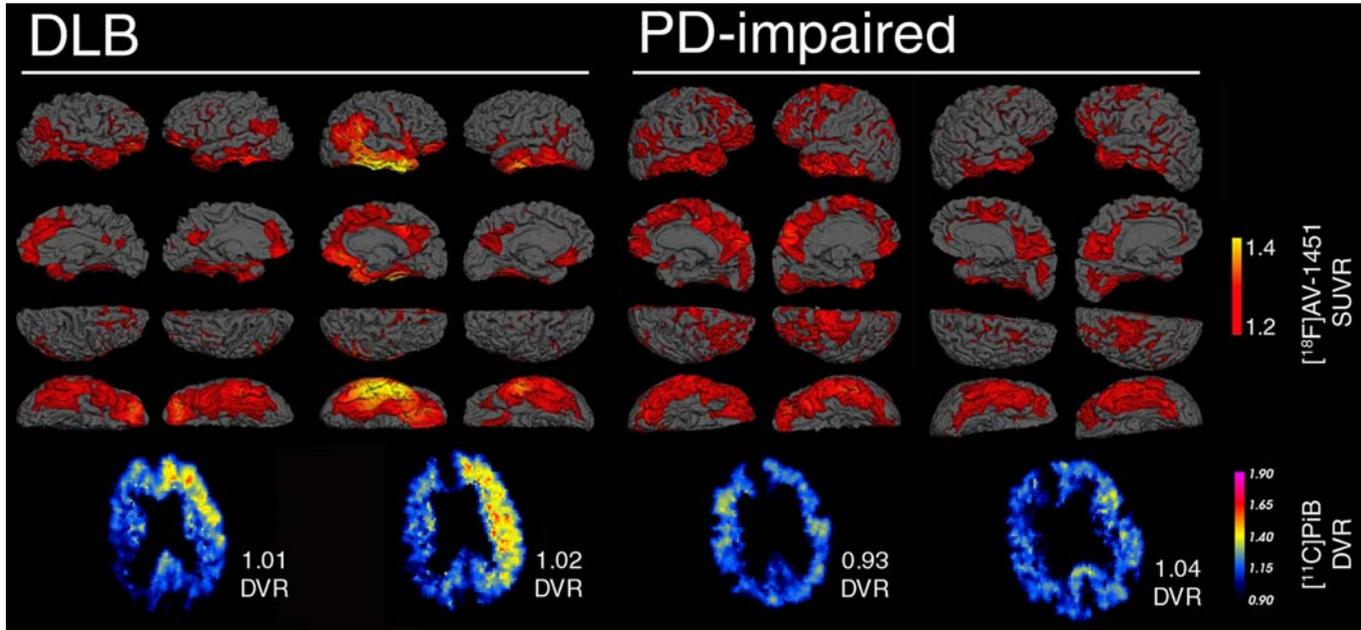


eFigure 2. Scatterplot of PV Corrected [¹⁸F]AV-1451 Binding in the ITG and [¹¹C]PiB Binding Across Subjects.

Across groups, Spearman $r=-0.05$, $p=0.7$; within each group, $p>0.05$.



eFigure 3. Tau Deposition in Lewy Body Disease Subjects With Low Amyloid Burden



Distributions of $[^{18}\text{F}]\text{AV-1451}$ binding and $[^{11}\text{C}]\text{PiB}$ binding in Lewy body disease subjects with elevated inferior temporal gyrus $[^{18}\text{F}]\text{AV-1451}$ binding and low amyloid burden ($[^{11}\text{C}]\text{PiB}$ negative, using threshold, FLR DVR 1.15). $[^{11}\text{C}]\text{PiB}$ DVR values are displayed for each case.