

*Supplemental Analysis of Arterial Spin Labeling Data:*

*Methods:* Pseudo-continuous arterial spin labeling data were acquired during the same session as the T807 experiment. 45 tag-control pairs were acquired at resolution of 3.5 x 3.5 x 5mm over 25 slices (TR=5s, TE=11ms, post-label delay=1s, label duration =1.5 s). A proton-density weighted calibration scan was collected as well (TR=8s). Data were motion-corrected and a brain mask was applied. The program *oxford\_asl* from FSL was used to calculate a calibrated perfusion map.<sup>2</sup> Perfusion was averaged within the cortical parcellations defined by Freesurfer, and averaged over left and right hemispheres, then compared to tracer binding in the isthmus cingulate reference region, Factor scores from head trauma, and component scores from the ICA analysis.

<sup>2</sup> Alsop, David C., et al. "Recommended implementation of arterial spin-labeled perfusion MRI for clinical applications: A consensus of the ISMRM perfusion study group and the European consortium for ASL in dementia." *Magnetic resonance in medicine* 73.1 (2015): 102-116.

*Results:* Perfusion data from one subject was not of sufficient quality to process, and so 16 subjects are included in the analysis. Perfusion and T807 Uptake in the isthmus cingulate were not correlated ( $r = -0.17$ ;  $p > 0.55$ ), although perfusion in 16 other regions were correlated to uptake in the reference region at  $p < 0.05$ . Of these regions, 8 overlapped with regions where SUVR was correlated to Factor 1 – Blast Exposure. Regional perfusion was not correlated to any head trauma factor score. Regional perfusion in one region (supramarginal gyrus) was correlated to Component 1, and in 11 regions was correlated to Component 2.

Thus we find that, although perfusion is likely playing a (expected) contributing role to some aspects of T807 uptake, it is not associated with uptake in the reference region, head trauma, or the ICA component of primary interest. It further appears that the ICA analysis is capturing variance related to differences in perfusion, but that this is not contributing to our primary findings.