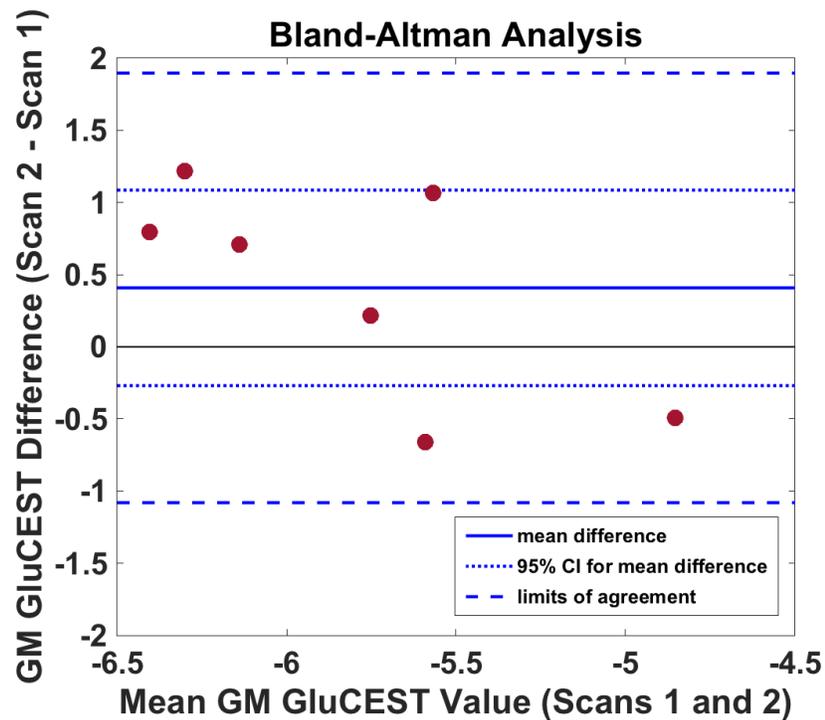


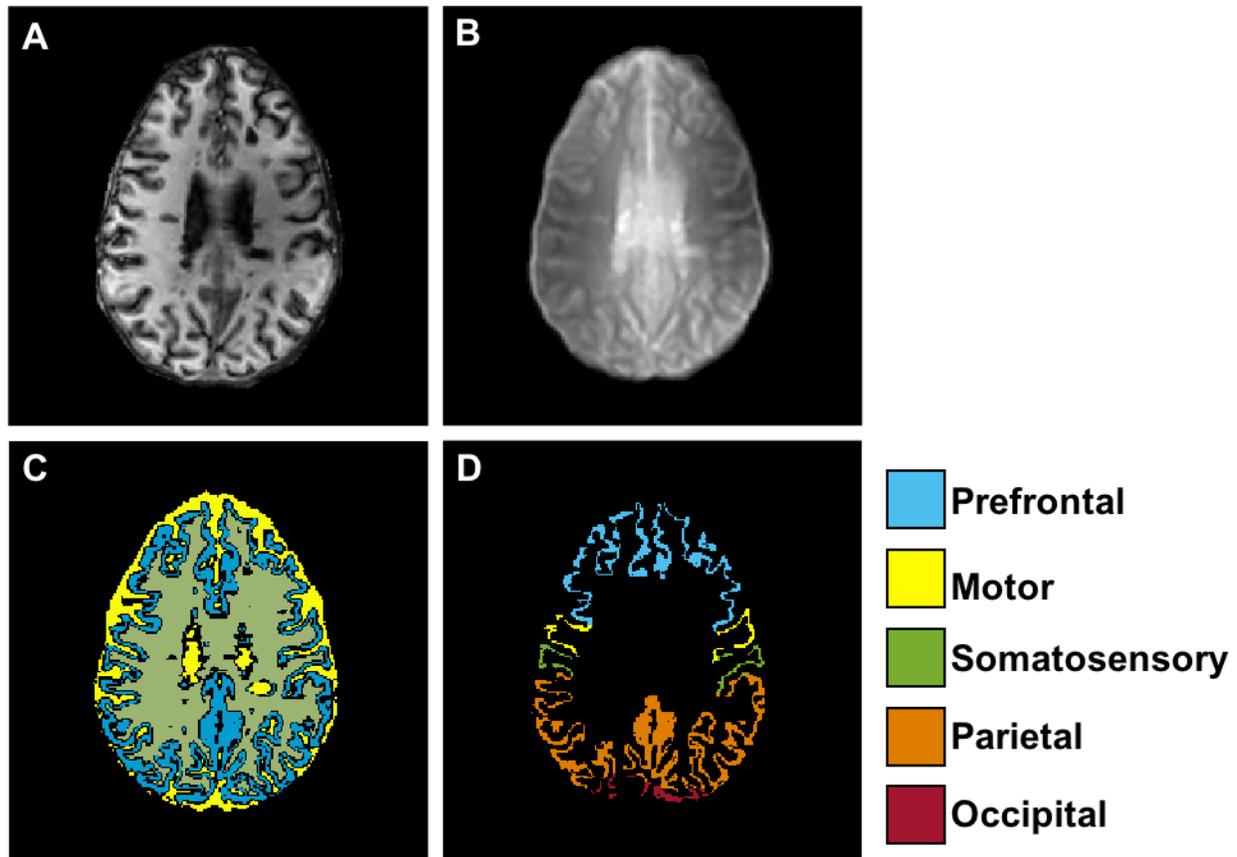
# Glutamate Sensitive Imaging and Evaluation of Cognitive Impairment in Multiple Sclerosis

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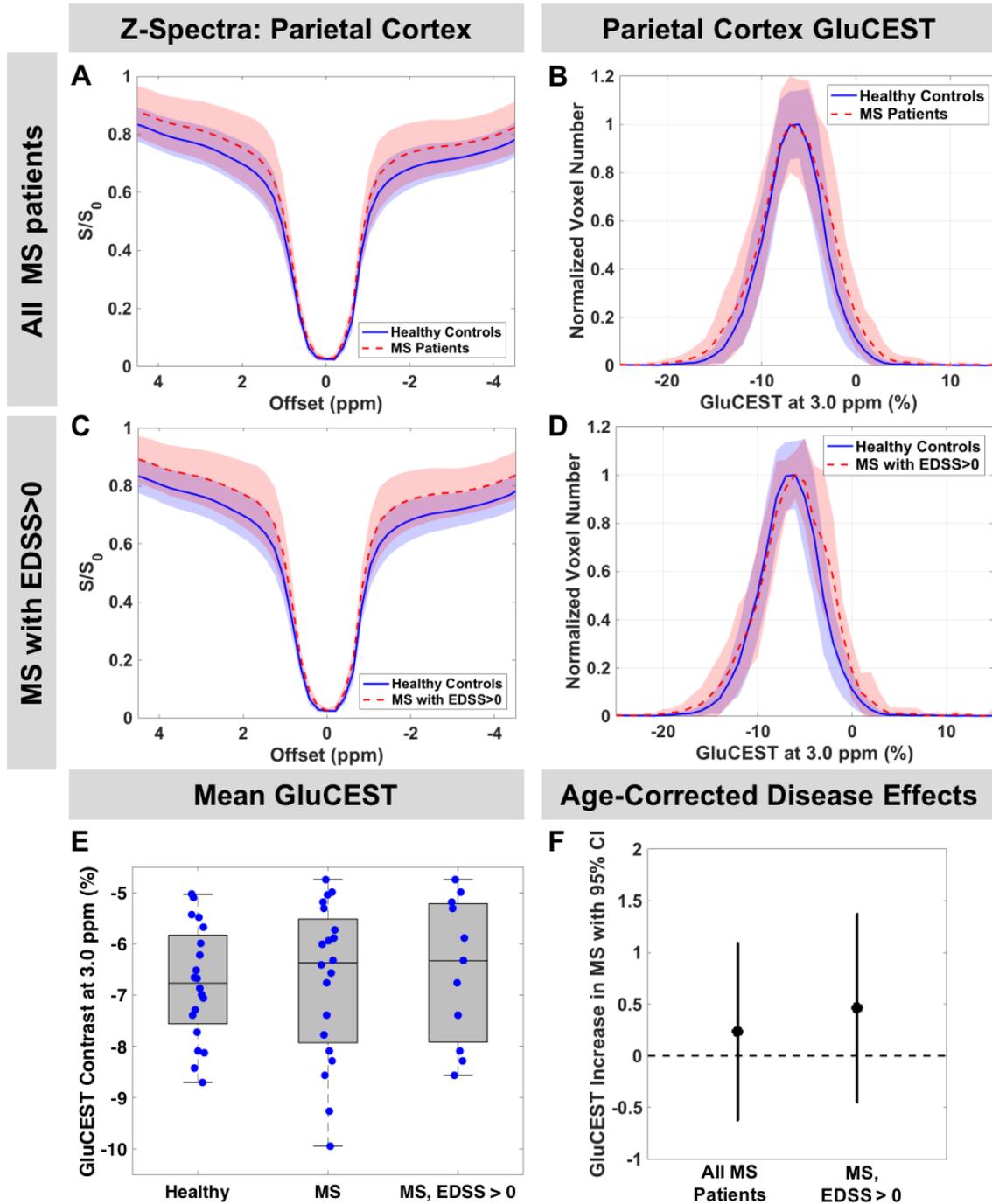
## Supplementary Figures



**Supplementary Figure 1: Bland-Altman analysis of the repeatability of the GM GluCEST measurement in seven healthy subjects.** The absolute difference between any two future measurements is estimated to be no greater than the coefficient of repeatability, 1.57, on 95% of occasions. GM = gray matter.



**Supplementary Figure 2: Segmentation of cortical gray matter.** A) MPRAGE anatomical image for a patient with MS (EDSS=2.5). B) Raw CEST slice (10 mm thickness). C) SPM12-generated masks of gray matter, white matter, and CSF for the slice from the MPRAGE volume corresponding to the CEST slice. D) Cortical gray matter voxels assigned to regions using multi-atlas segmentation of the MPRAGE volume.



**Supplementary Figure 3: GluCEST in parietal cortex.** CEST z-spectra (A, C) and GluCEST for the parietal region of cortical GM (B, D) differ between healthy controls (solid blue line) and patients with multiple sclerosis (dashed red line) for the entire patient cohort (A-B) and for the subset of patients with EDSS scores greater than 0 (C-D). The cohorts differ in terms of inter-

subject variability and z-spectra baseline, but mean GluCEST in the parietal region is similar between cohorts (E) and age-corrected disease effects are not significant (F). Shaded areas represent standard deviation for each cohort. For (A-B), n=20 healthy controls and 20 patients with multiple sclerosis. For (C-D), n = 20 healthy controls and 11 patients with multiple sclerosis. MS = multiple sclerosis, EDSS = Expanded Disability Status Scale.