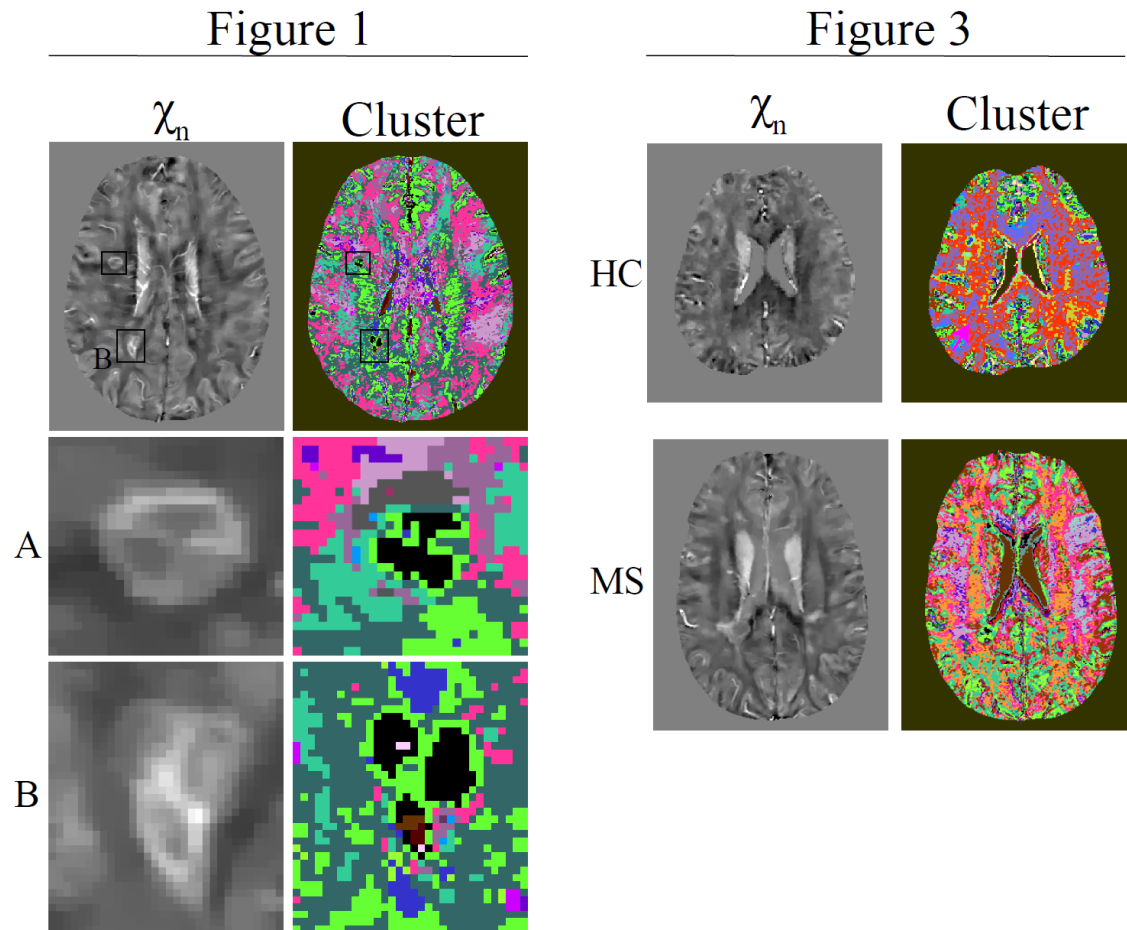


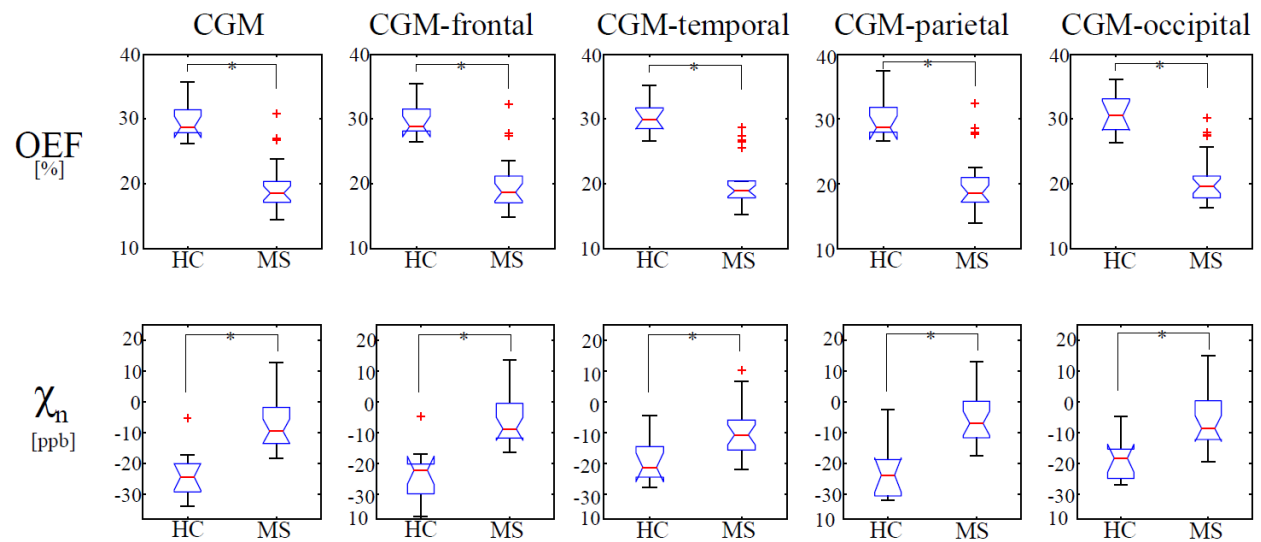
Supporting Information Figures

Supporting Information Figure S1. Cluster maps of the subjects shown in Figure 1 and 3.

Different colors indicate different clusters.

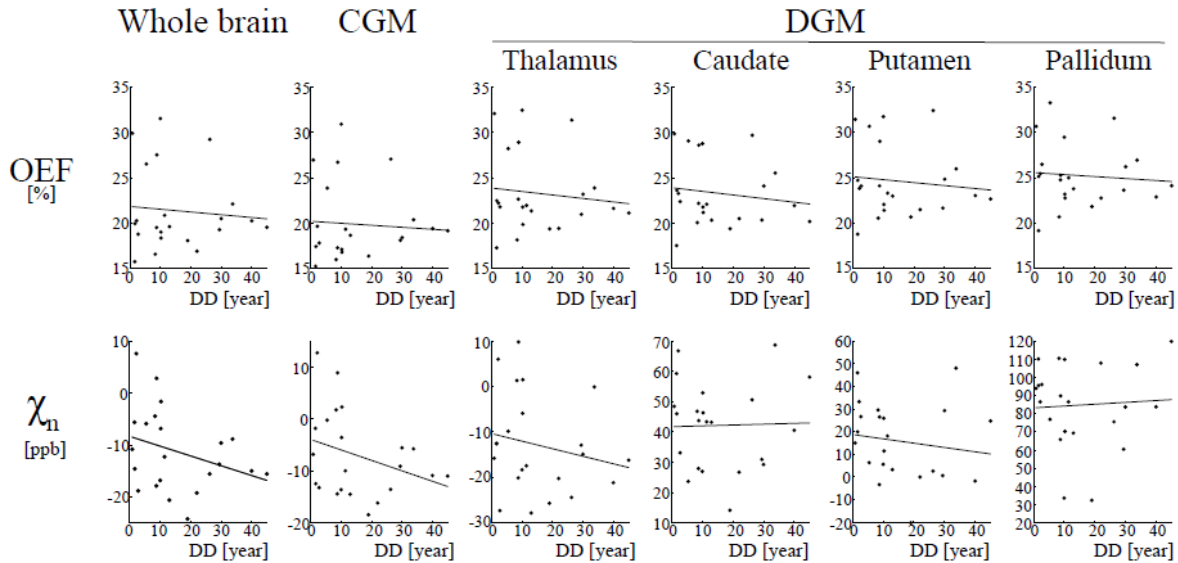


Supporting Information Figure S2. Comparison of average OEF and neural tissue susceptibility (χ_n) in total cortical gray matter (CGM), CGM in frontal (CGM-frontal), temporal (CGM-temporal), parietal (CGM-parietal), and occipital (CGM-occipital) lobe between healthy controls (HC, 34 ± 12 years, $n=11$) and MS patients (37 ± 6 years, $n=22$). Asterisk (*) indicates significant difference ($p < 0.05$, linear regression model). Red line, blue box, black whisker, and red cross indicates median value, interquartile range, the range extending to 1.5 of the interquartile range, and outlier beyond the whisker range, respectively.

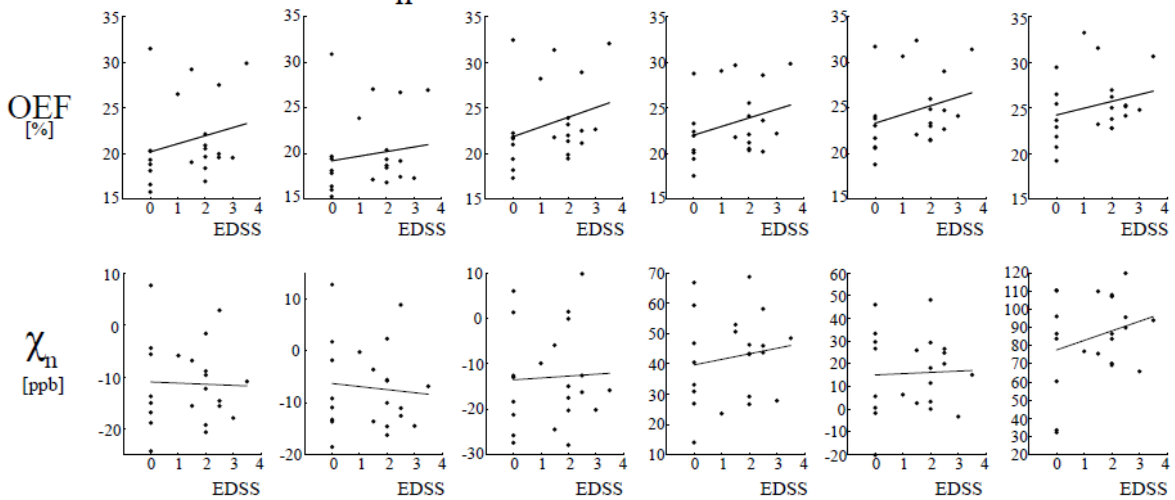


Supporting Information Figure S3. Scatter plots between OEF/ χ_n and disease duration (DD)/Expanded Disability Status Scale (EDSS). Each dot indicates each subject. No significant correlation was found (uncorrected p-values > 0.103, Spearman correlation analysis).

DD vs. OEF/ χ_n



EDSS vs. OEF/ χ_n



Supporting Information Figure S4. Comparison of average OEF and neural tissue susceptibility (χ_n) in whole brain, cortical gray matter (CGM), and select deep gray matter (DGM, thalamus, caudate, putamen, pallidum) between healthy controls (HC, 34 ± 12 years, $n=11$) and MS patients (37 ± 6 years, $n=22$) with processing the MS datasets using a similar coverage of TE set (the first 6 echoes $TE_1/\Delta TE/TE_6 = 4.7/4.8/28.5$ ms) to the TE range of HC ($TE_1/\Delta TE/TE_7 = 2.3/3.9/25.7$ ms). Asterisk (*) indicates significant difference ($p < 0.05$, linear regression model). Red line, blue box, black whisker, and red cross indicates median value, interquartile range, the range extending to 1.5 of the interquartile range, and outlier beyond the whisker range, respectively. Compared to the case of using the entire 11 echoes in the MS patients (Figure 4), the significant comparison results between HC and MS are the same except that MS showed a significantly lower χ_n than HC in Putamen additionally in the case of using the first 6 echoes.

