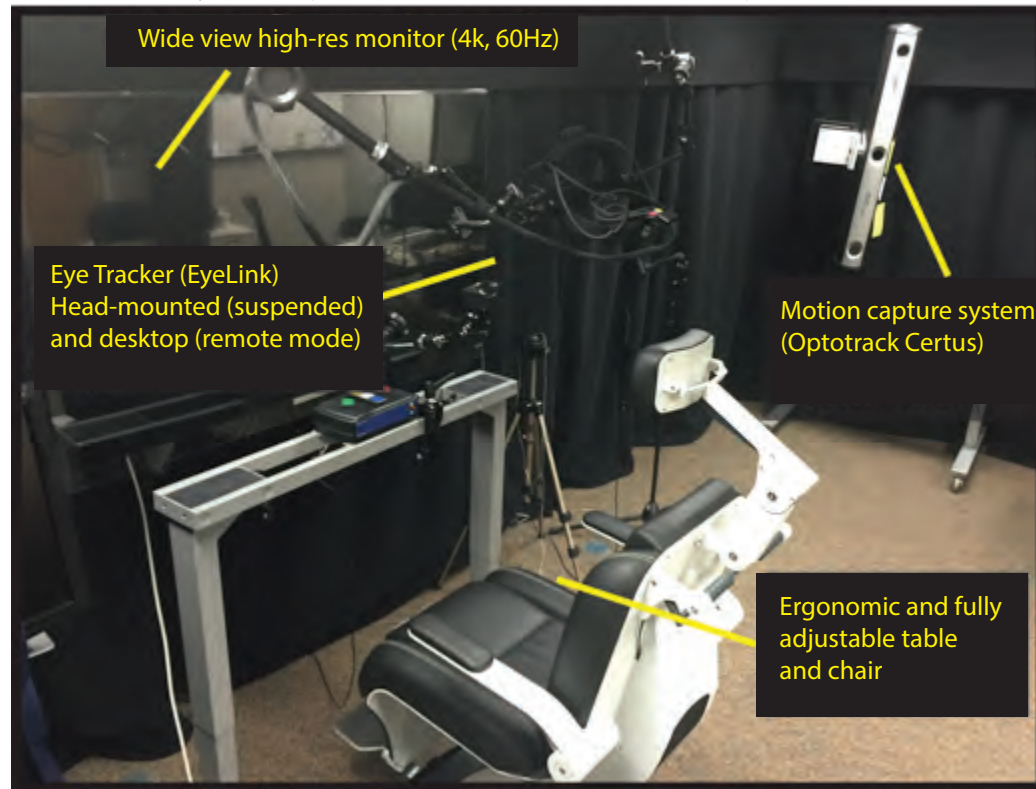
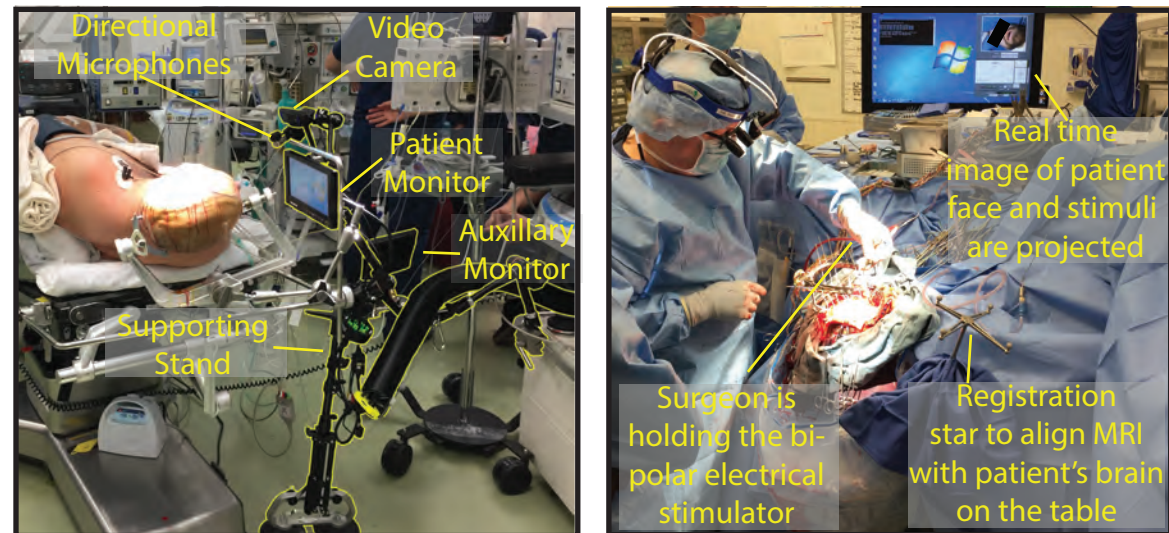


Figure 1. Overview of Equipment used for extra-operative and intra-operative cognitive testing

A. Example setup for high through-put cognitive neuropsychological testing as implemented by the Program for Translational Brain Mapping (Univ. of Rochester Med Ctr)



B. Equipment used during intraoperative mapping



C. Bipolar Stimulator with registration star attached to record locations of intra-operative stimulation in preoperative MRI dicom space

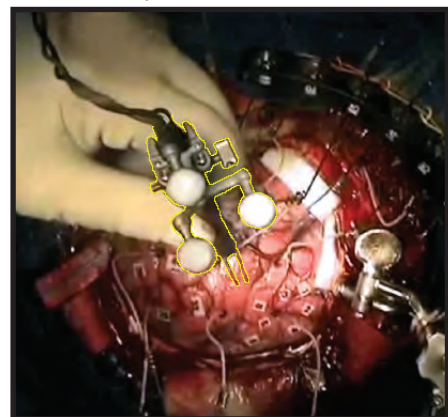
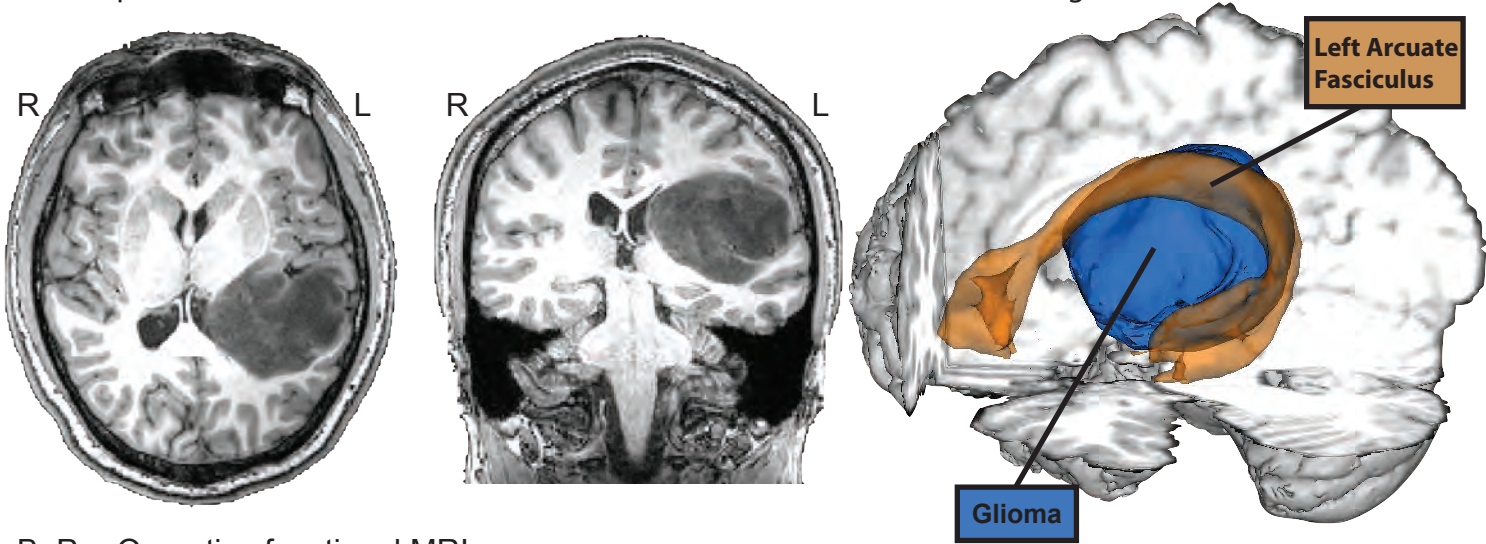


Figure 2. Pre-operative functional MRI and Diffusion Tensor Imaging (DTI) in patient AH with a left inferior parietal glioma that infiltrated the arcuate fasciculus

A. Pre-operative T1 MRI and 3D reconstruction of the left arcuate fasciculus and glioma



B. Pre-Operative functional MRI

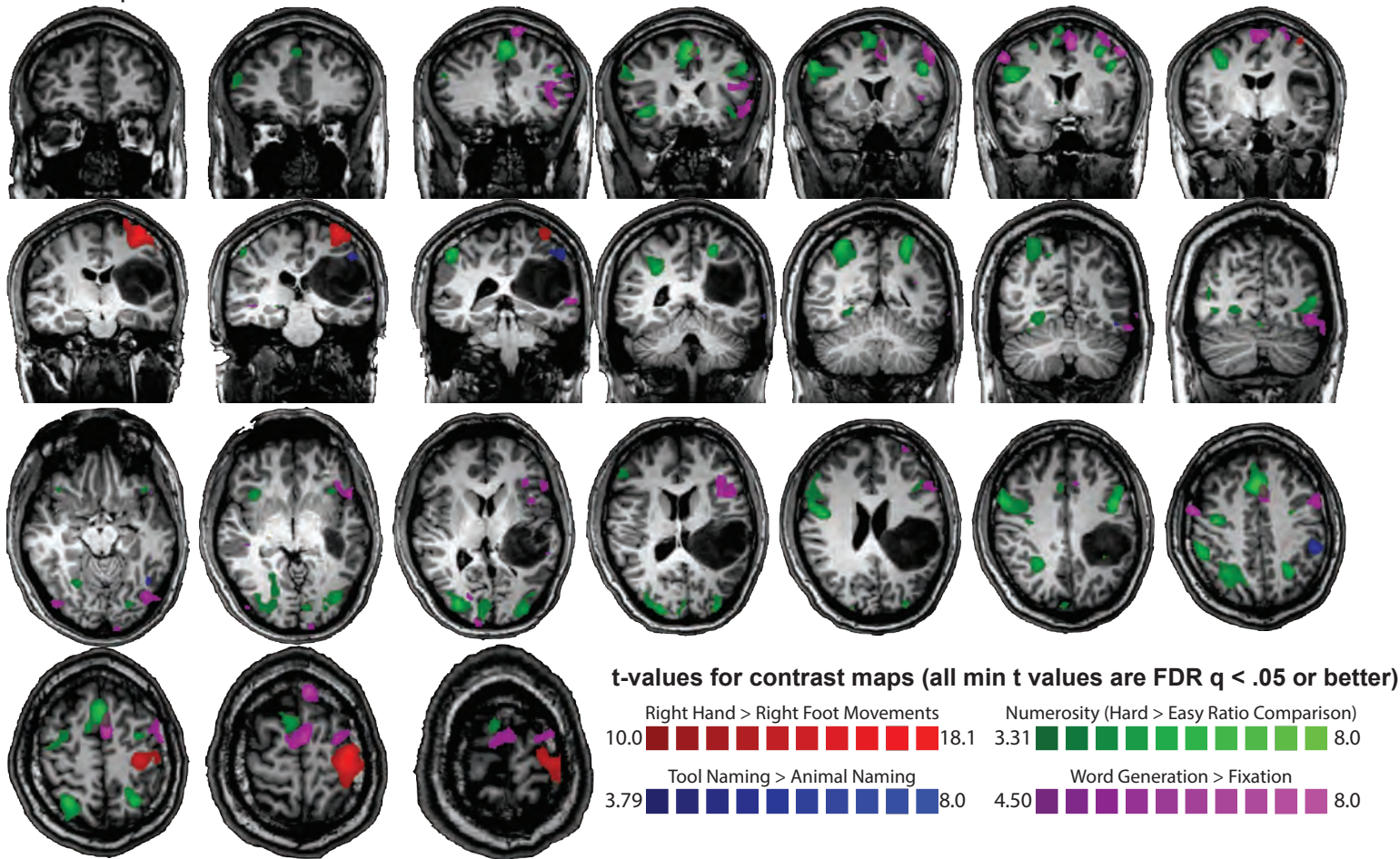
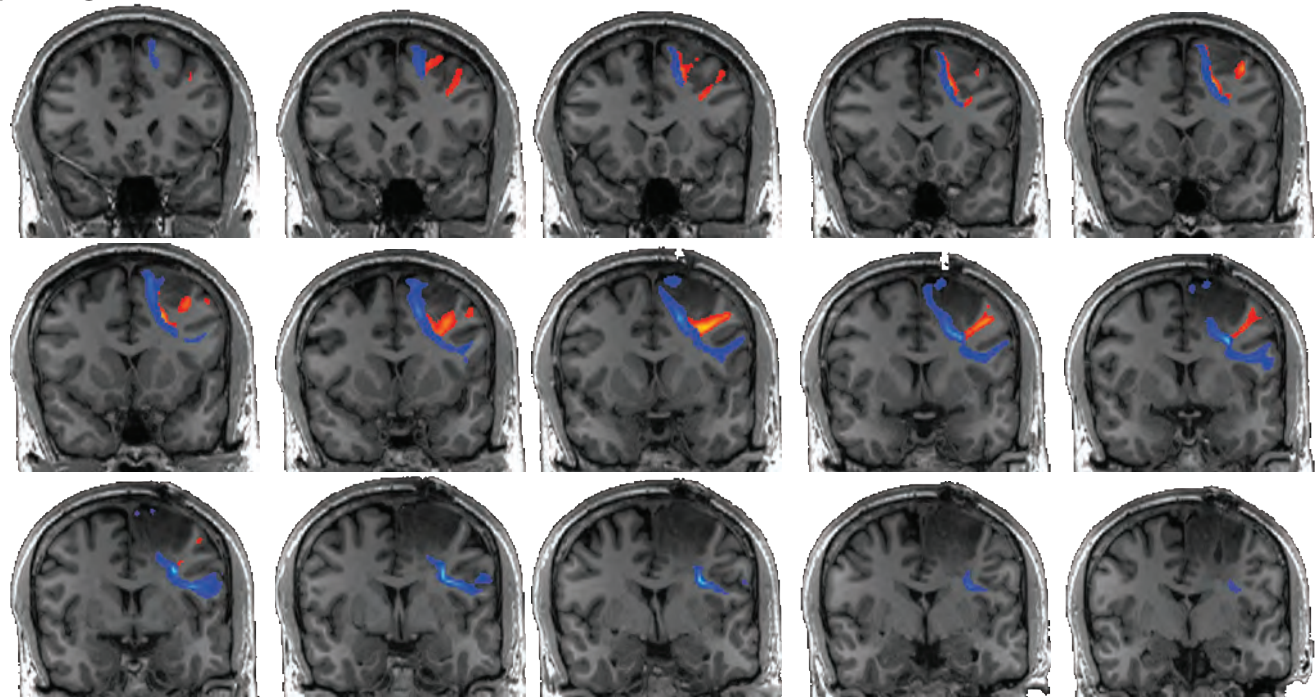
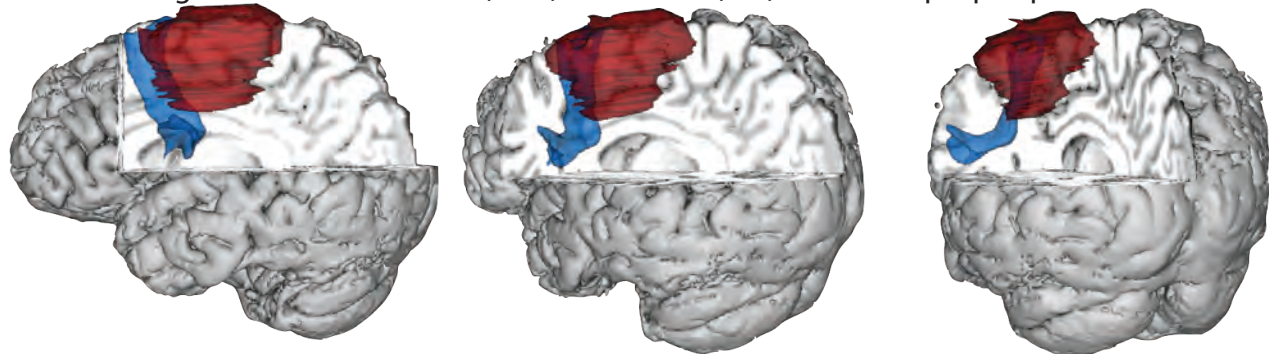


Figure 3. Pre-Operative white matter tractography of the Frontal Aslant Tract and adjacent u-fibers
A. Coronal slices showing the frontal aslant tract (blue-light blue) and u-shaped fibers (red-yellow) passing anterior and medial to tumor



B. 3D Rendering of frontal aslant tract (blue) and tumor (red) from multiple perspectives



C. Direct electrical stimulation of the frontal aslant tract disrupts sentence production at grammatical phrase boundaries

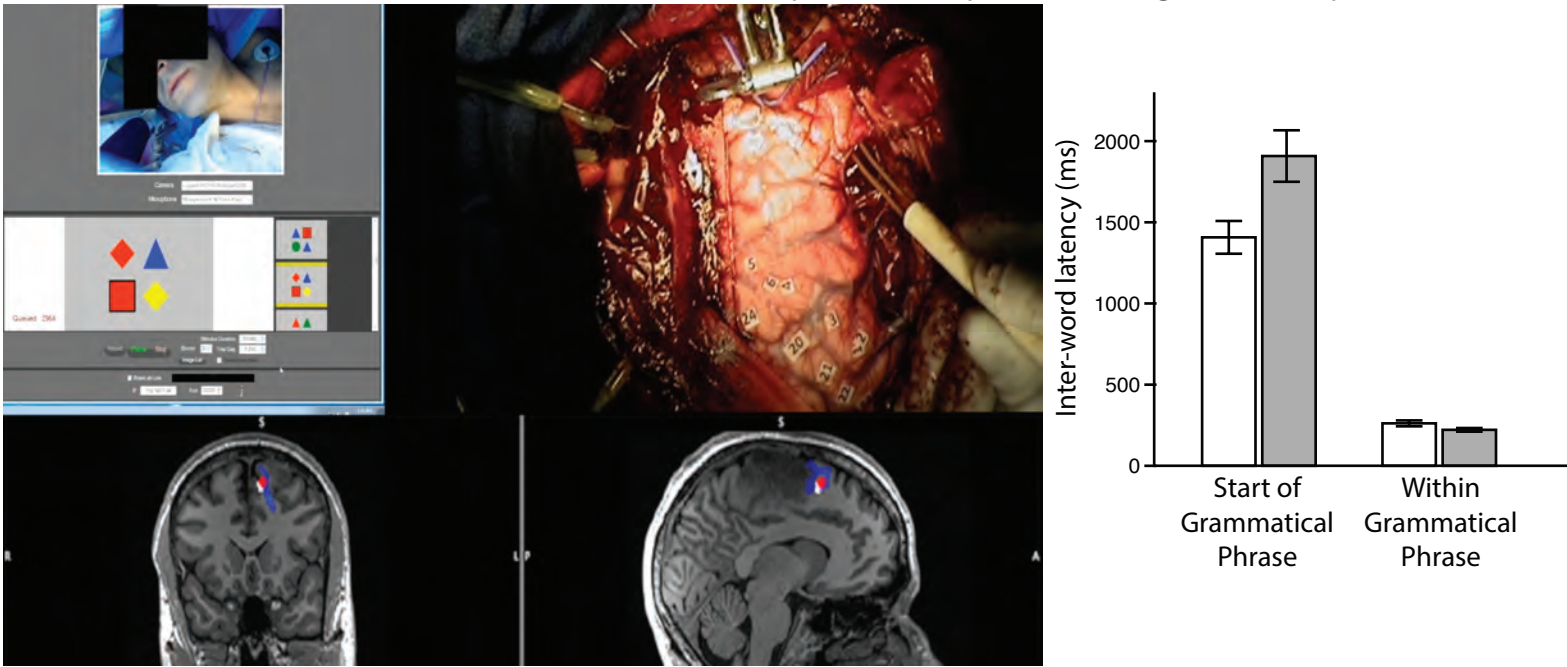
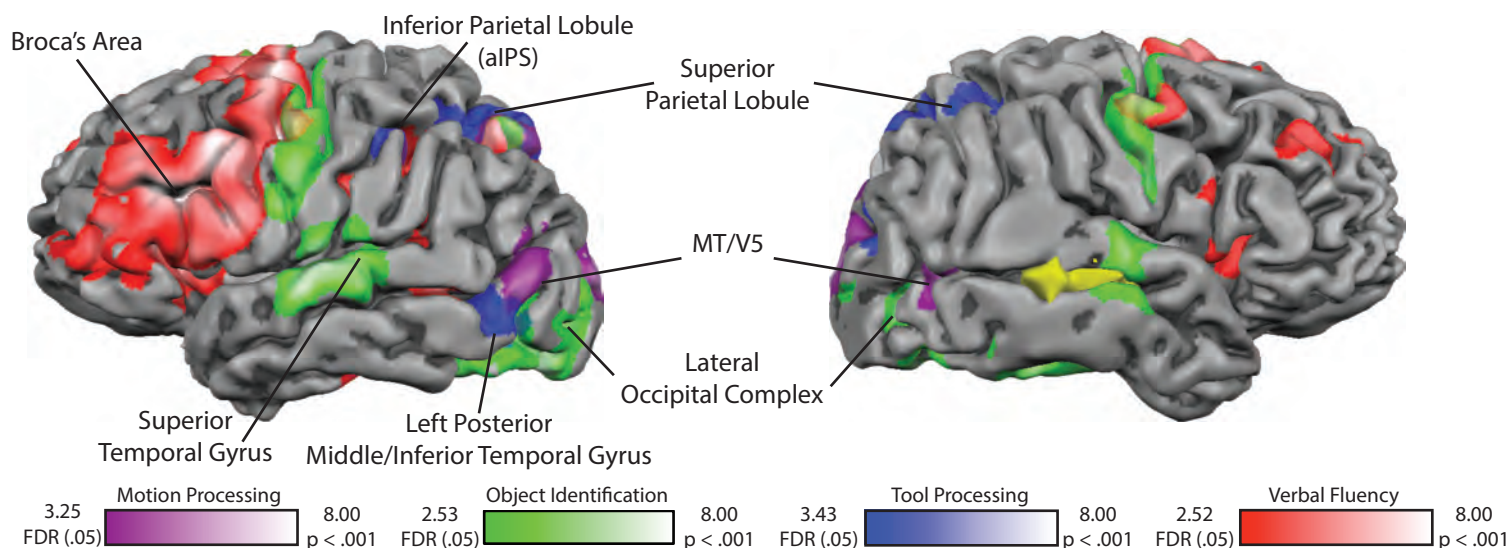
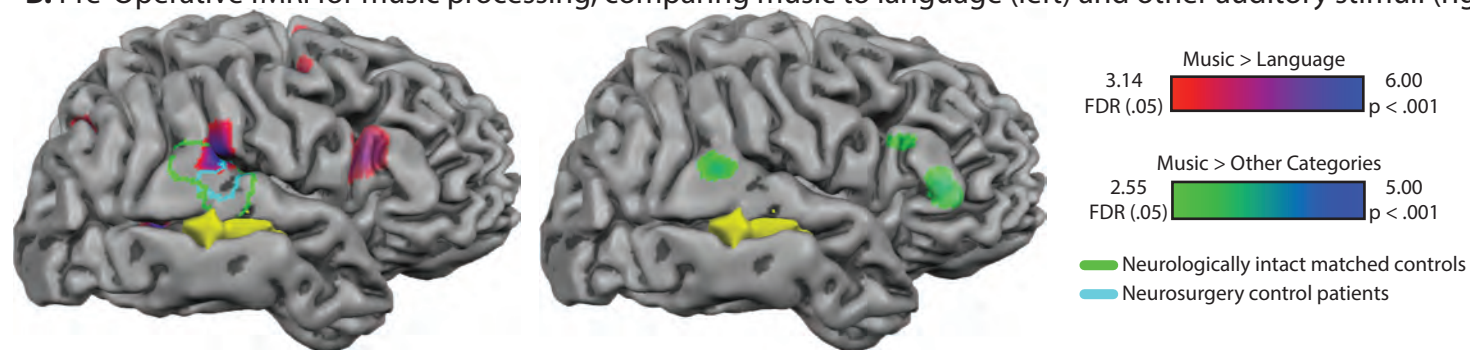


Figure 4. Pre-Operative functional and structural MRI and intraoperative direct electrical stimulation mapping in a professional musician with a glioma in the right posterior temporal lobe

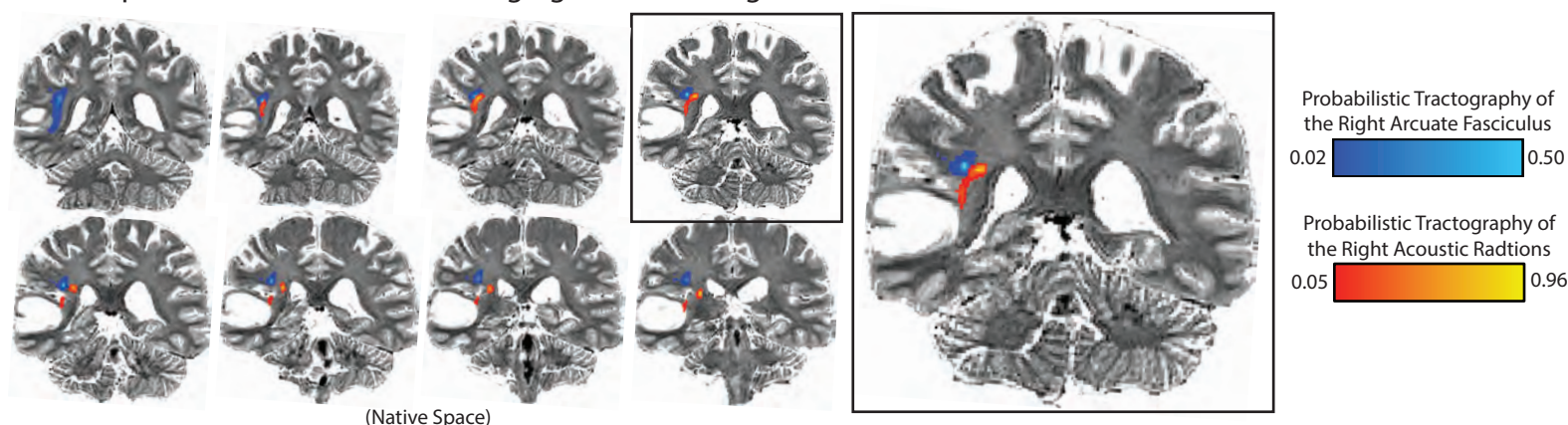
A. Pre-Operative functional MRI for language, visual processing, praxis and language



B. Pre-Operative fMRI for music processing, comparing music to language (left) and other auditory stimuli (right)



C. Pre-Operative Diffusion Tensor Imaging (DTI) of the right arcuate fasciculus and acoustic radiations



D. Errors elicited for melody repetition during intraoperative direct electrical stimulation mapping

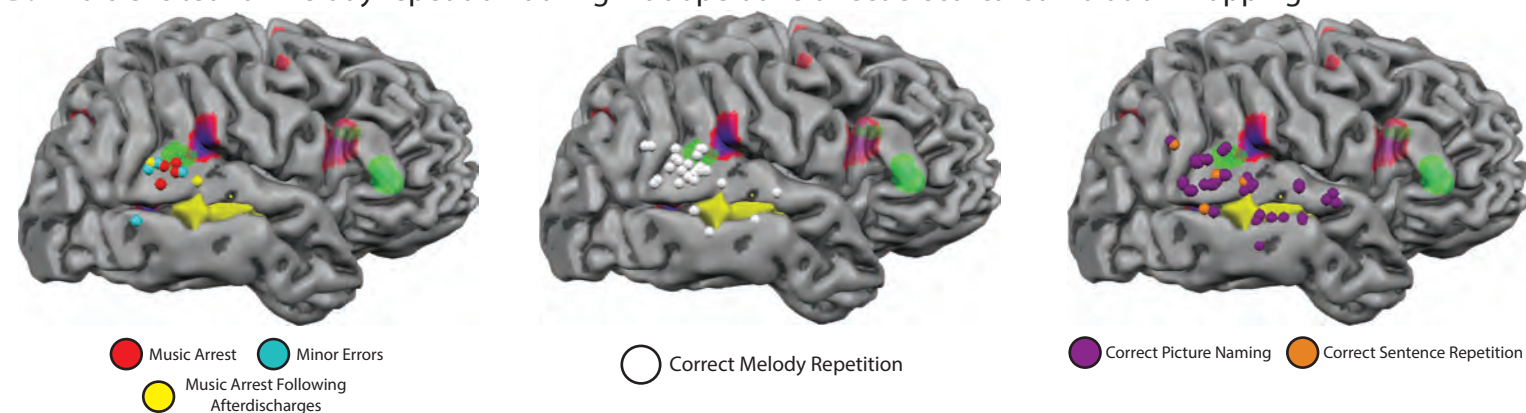
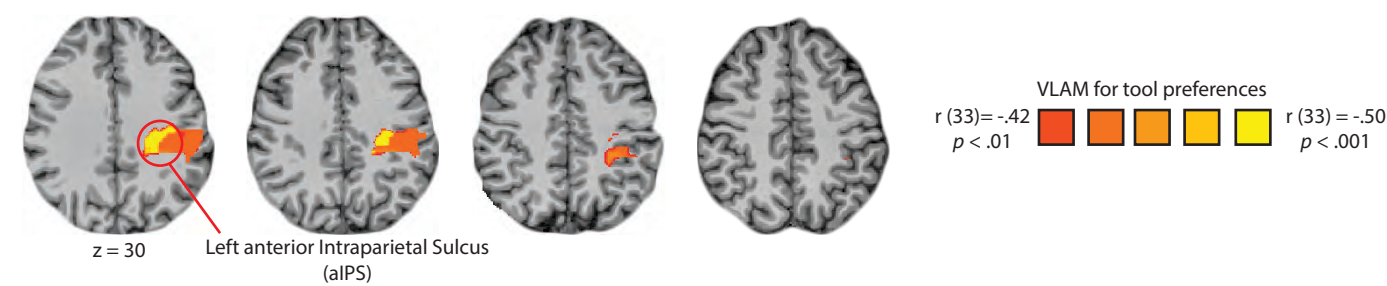


Figure 5. Demonstration of domain-specific diaschesis: Analysis of the relation of lesion location and stimulus-elicited neural activity across a group of glioma patients studied pre-operatively in the Program for Translational Brain Mapping at the University of Rochester Medical Center

A. Voxelwise correlation between neural responses in the temporal lobe (medial fusiform gyrus) when naming 'tools' and lesion location (whole-brain): Lesions to aIPS are predicted by variance across patients in neural responses to tools in the temporal lobe



B. Voxelwise correlation between lesions to aIPS (independently defined) and neural responses (whole brain) when naming 'tools': Neural responses in the medial fusiform gyrus and middle temporal gyrus are predicted by variance across patients in whether lesions involve aIPS

