

CBI Featured Image – Fall, 2022

Courtesy of Daniel Lench, PhD, Revuelta Lab, Department of Neurology

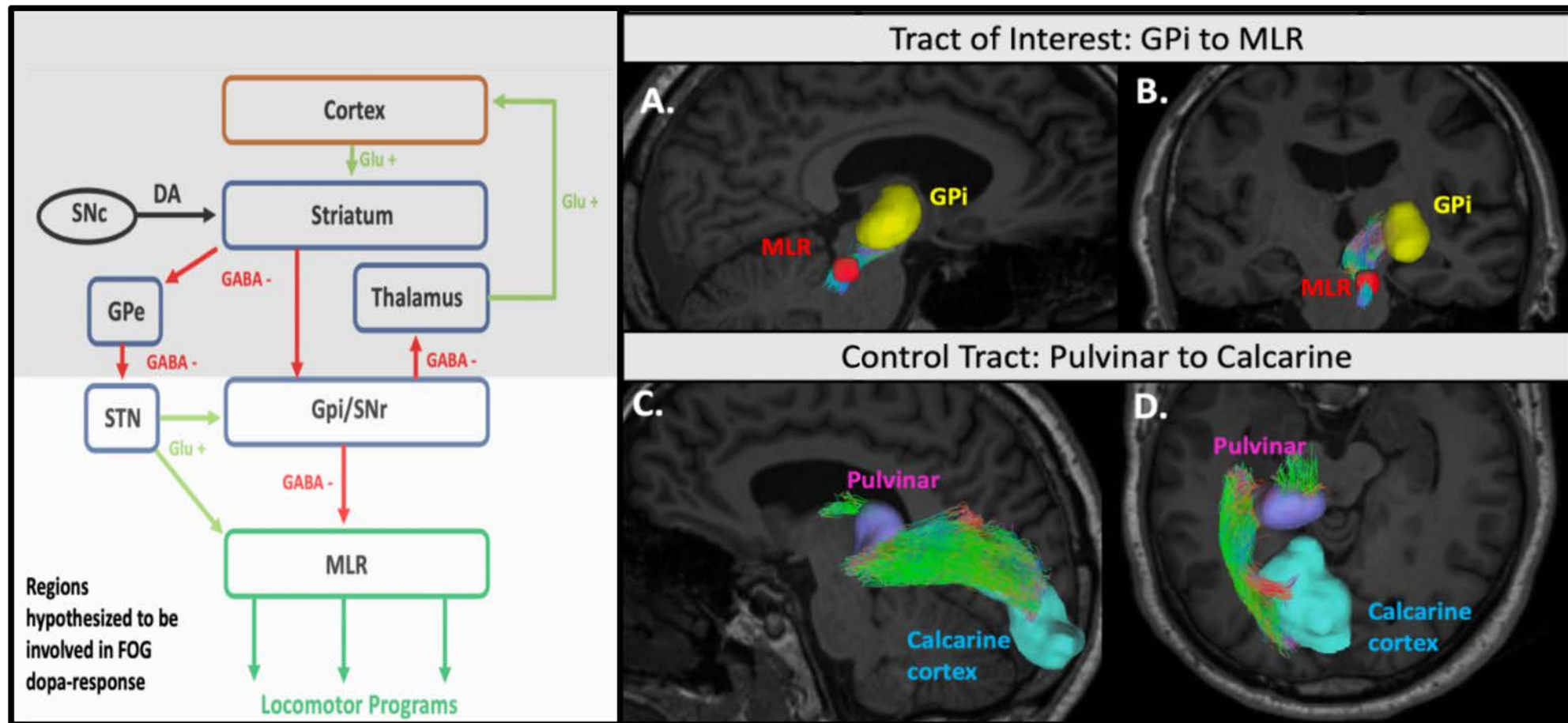


Figure: Neurodegeneration of the Globus Pallidus internus as a neural correlate to Dopa-Response in Freezing of Gait: In this observational study of thirty-six participants with Parkinson's Disease and Freezing of Gait (FOG), we investigated the relationship between brain structural changes in regions critical for locomotion and FOG response to a dopaminergic medication challenge. Using diffusion kurtosis imaging and CSD tractography, we observed that participants with DOPA unresponsive FOG had marked decreases in mean kurtosis of the globus pallidus internus and its connection to the mesencephalic locomotor region, but not in control tracts. **Left:** Conceptual model demonstrating the connection between dopamine centers and locomotor programs hypothesized to be involved in freezing of Gait (FOG). **Right:** An example of the GPI-PPN streamlines (A. sagittal view, B. coronal view) and the control pulvinal-calcarine streamlines (C. sagittal view, D. axial view) generated by CSD iFOD2 probabilistic tractography overlaid in a participant's T1 anatomical scan. ROIs are shown in solid colors: GPI (yellow), PPN (red), Pulvinal (purple), and Calcarine cortex (blue). This study was led by Dr. Gonzalo Revuelta and performed in collaboration with CBI staff including Dr. Jens Jensen, Dr. Leo Bonilha and Dr. Andreana Benitez.

Citation: Lench DH, Keith K, Wilson S, Padgett L, Benitez A, Ramakrishnan V, Jensen JH, Bonilha L, Revuelta GJ. Neurodegeneration of the Globus Pallidus Internus as a Neural Correlate to Dopa-Response in Freezing of Gait. *J Parkinsons Dis.* 2022;12(4):1241-1250. doi: 10.3233/JPD-213062. PMID: 35367969.