

## **A Primate fMRI Primer, or So You Want to Scan a Monkey...**

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The use of fMRI to study the non-human primate brain has been developed over the past decade. Primate fMRI has many attractive features: it allows validation of previous homology assumptions between humans and monkeys, provides a model to combine imaging with invasive techniques to directly manipulate the brain, and can guide other modalities, such as electrophysiology, to new areas of interest. Specifically, in our lab we apply fMRI to the visual nervous system, with interest both in specific visual results and broader scale insight into neural processes and functional imaging.

The frontal eye field (FEF) is a well-studied node in the oculomotor network, involved in visual target selection and saccade planning. Recent evidence has implicated FEF as a possible source of feedback signals that modulate visually-driven activity in posterior cortical areas, such as during the deployment of spatial attention. The goals of my Ph.D. work were to extend the unique aspects of primate fMRI by combining it with simultaneous, intracortical microstimulation, and to use these methods to measure how local, artificially-increased FEF output could modulate visually-driven fMRI activity in earlier cortical regions.

I will first give a brief overview of the different types of imaging experiments that our group conducts which uniquely require a primate model. I will then focus on the outcomes of my Ph.D. dissertation combining awake monkey fMRI and microstimulation. These outcomes include a form of functional connectography, a demonstration that increased FEF output modulates incoming visual information and a characterization of some of the factors that affect this modulation.