Welcome
Our Research

We are interested in understanding the cellular and circuit basis of motor control, particularly in the context of movement disorders such as Parkinson’s Disease and Dystonia. In these conditions, the basal ganglia and connected structures, which govern normal motor control, are dysfunctional, leading to loss of normal movements and/or the generation of involuntary movements. We use a combination of mouse models of disease, optogenetics, behavior, and slice and in vivo electrophysiology to identify aberrant synaptic connections or patterns of activity which contribute to disease phenotypes. We hope that by identifying the underlying cellular and synaptic mechanisms, new treatments can be developed for these disorders.

Current Projects

- Optogenetic dissection of striatal pathways in a mouse model of paroxysmal nonkinesigenic dyskinesia (PNKD)
- Role of endocannabinoids in the generation of involuntary movements
- Identification of aberrantly activated neuronal ensembles within striatal pathways in a mouse model of levodopa-induced dyskinesia (LID)
- Role of striatal synaptic plasticity in levodopa-induced dyskinesia
- Understanding the mechanisms of deep brain stimulation in animal models of disease
- Neuromodulation of striatal microcircuitry in health and disease