Neuroinflammation is a well-characterized hallmark for Parkinson’s disease (PD) and recent evidence from our lab suggests its involvement in L-Dopa induced dyskinesia (LID), a side effect of L-Dopa treatment in PD. Furthermore, we and others have evidence that synapse loss also contributes to PD and LID. The current project will try to understand if microglia and astrocytes actively contribute to synapse loss in this disease and if anti-inflammatory treatments have anti-dyskinetic potential and protect synapses. For this project we have pharmacological (PLX3397) and genetic (CD11bDTR – all microglia; CD86DTR – proinflammatory microglia) tools to eliminate microglia or microglia subtypes, respectively. Furthermore, we have genetically modified mice with fluorescently labeled synapses that we will utilize to assess synaptic loss via superresolution microscopy in various PD and LID phenotypes with / without treatment.

Models and Techniques that you will use

- Genetically modified mice with fluorescently labeled synapses
- L-Dopa injections to induce LID and behavioral scoring to see effect of treatment
- Microglia elimination using either a pharmacological (PLX3397) or genetic approach (DTR mice)
- Tissue collection and processing - Perfusions - Sectioning - IHC
- Analysis: Superresolution microscopy to quantify synapse loss
- Stereology to quantify cell population

Our Team – 4 Postdocs – 2 Research Assistants – 5 PhD students – 1 Honours student – 2 Internship students