Comprehensive Research Experience for Medical Students
Summer Research Program 2021
Supervisor/Project Information Form

Due February 24, 2021 by email to crems.programs@utoronto.ca

**Supervisor Name:** Dr. Krista Lanctôt, Dr. Nathan Herrmann, Dr. Shankar Tumati

**Project Title:** Neural correlates of neuropsychiatric symptoms across neurodegenerative disorders

**Hospital/Research Institution:** Sunnybrook Health Sciences Centre

**Email:** Krista.Lanctot@sunnybrook.ca

**Field of Research (2 keywords):** Neuropsychiatric symptoms, neural correlates

**Department:** Department of Psychiatry

**School of Graduate Studies Appointment (IMS, LMP, IHPME etc)? Yes/No:** Yes

**If YES, please name:** Full member, School of Graduate Studies, Department of Pharmacology
**Brief Project Description (<300 words):**

Neuropsychiatric symptoms are common across neurodegenerative disorders. These symptoms increase the risk of disease progression and need for institutional care. Their relevance is only being recently recognized and their relation to brain changes in these disorders is not well understood. The Neuropsychopharmacology Research Group is interested in determining the neural correlates of neuropsychiatric symptoms. For this purpose, we are analyzing the COMPASS-ND dataset made available by the Canadian Consortium for Neurodegeneration in Aging. This dataset uniquely includes various neurodegenerative disorders including Alzheimer’s disease, Parkinson’s disease, vascular dementia, Lewy body dementia, and frontotemporal dementia from ~1000 deeply-phenotyped, including multi-modal MRI scans (T1, T2, resting state, diffusion, proton density scans) assessing brain structure and function.

In this project, we will use sophisticated, cutting-edge, automated and semi-automated imaging analysis techniques to analyze grey matter atrophy on structural MRI scans, and link these to specific neuropsychiatric symptoms. The aim of the project is to determine common brain changes underlying these symptoms across dementia disorders. Students will learn methods to analyze raw MRI images using voxel-based morphometry and cortical thickness, and advanced statistical methods such as mixed models to test the association between these measures and specific neuropsychiatric symptoms, potentially leading to publications. If required, this project can be completed remotely with virtual supervision.