Supervisor Name: Dr. Daniel Mueller

Project Title: The gut-brain axis in onset of major depressive disorder and the potential benefits of probiotic treatment

Hospital/Research Institution: Centre for Addiction and Mental Health

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Field of Research (2 keywords): Depression, gut-brain-axis

Department: Psychiatry

School of Graduate Studies Appointment (IMS, LMP, IHPME etc)? Yes/No: YES
If YES, please name: IMS (Full Member)
**Brief Project Description (<300 words):**

There has been a growing appreciation for research in the field of the “gut-brain axis”, which consists of bidirectional biochemical signaling between the Gastrointestinal (GI) tract and the brain. By being able to shape brain physiology and therefore behavior through gut-brain axis communication, gut bacteria may be a vital trigger in the development of neuropsychiatric conditions including Major Depressive Disorder (MDD) (Cryan and Dinan, 2015). MDD is characterized by persistent depressed mood and loss of interest/pleasure in surroundings and a variety of symptoms that cause clinically significant distress or impairment frequently leading to suicidal ideation. Given that disturbances to the gut microbiome can increase the susceptibility to depression, repopulating the gut microbiome may allow for the improvement in mood and anxiety symptoms.

Microbial Ecosystem Therapeutics (MET) is a new treatment approach for repopulating the gut with healthy microbiota that has been developed as an alternative to fecal transplantation. This is a biological compound comprised of live microbes that normally reside in the human gut of a healthy individual. Our group at CAMH is starting a trial using a product derived from healthy donor stool, referred to as Microbial Ecosystem Therapeutic-2 (MET-2), a probiotic developed by NuBiyota LLC. It is assumed that the product can be used to alleviate symptoms of depression and anxiety by restoring a normal gut flora. Eighty Patients with MDD will be prospectively followed-up over eight weeks and treated with the product or receiving placebo. **The CREMS participant will receive close supervision to publish a review article on the use of probiotics in MDD for a peer-reviewed journal in psychiatry or neuroscience. In addition, the student will have the opportunity to attend study visits and to collect hands-on experiences in an important clinical trial and potentially become co-author of the resulting publication in a higher impact-factor journal.**