

The Discovery Fund – Talent Development 2018/19

Through the **Talent Development** competition, the Discovery Fund will support trainees pursuing research to better identify, diagnose and treat mental illnesses. Their projects fall across six main themes: brain and/or behaviour interventions; clinical measure and/or biomarker identification; health services and epidemiological research; implementation science; translating and extending clinical neuroscience into clinical research; and basic and preclinical neuroscience.

A total of 25 trainees are being funded, launching the next generation of inspired and inspiring mental health researchers.

Read more about these exciting projects below.

Ali Bani-Fatemi

Genetic and Epigenetic alterations of Serotonin Genes predicting risk for Suicidal Behavior in schizophrenia

Supervisor: Vincenzo DeLuca

Schizophrenia increases the risk for suicide, already one of the leading causes of death from adolescence to middle-age adults. Ali Bani-Fatemi is examining the association between suicide attempt history and alterations in DNA in specific genes in the brain in hopes of ultimately developing better suicide preventions. Click [here](#) for more information about this study.

Anne-Christin Hauschild

Computational Longitudinal Modeling of Disease Co-Progression and Genetic Network Analyses in Depression and Dementia

Supervisor: Daniel Mueller

Late-life depression is associated with dementia. Anne-Christin Hauschild will use advanced data mining and systems biology technologies in hopes of better understanding the molecular background of depression, dementia and treatment response. The study could lead to more personalized treatments. Click [here](#) for more information about this study.

Cameron Isaacs-Trepanier

The Effects of Sex Differences in Brain Codeine Metabolism on Drug Response

Supervisor: Rachel Tyndale

Those who develop tolerance to opioids are at greater risk for developing dependence. Cameron Isaacs-Trepanier will look at how males and females convert codeine to morphine in their brains and livers. By better understanding the differences in opioid response, it's hoped those at risk for therapeutic failure and opioid dependence can be predicted. Click [here](#) for more information about this study.

Chantel Kowalchuk

Disruptions in hypothalamic fuel sensing as a mechanism of antipsychotic-induced glucose dysregulation

Supervisor: Margaret Hahn

Antipsychotics can cause serious metabolic side-effects that lead to a reduced lifespan of up to 20 years. To better understand why, Chantel Kowalchuk will study how antipsychotics block the brain's ability to respond to insulin. This study could lead to effective medications without metabolic side-effects and a better quality of life for our patients. Click [here](#) for more information about this study.

Corey Fee

Somatostatin cell deficits as a contributing pathology in depression: bridging consequences from molecules to symptoms.

Supervisor: Etienne Sibille

Major depressive disorder affects 1.8 million Canadians a year, but current antidepressants are ineffective in half of patients. Corey Fee hopes to identify the links between low SST cell function and depression. This study is expected to lead to more targeted treatments for depression, bipolar disorder, schizophrenia, Alzheimer's disease, Parkinson's disease and other illnesses. Click [here](#) for more information about this study.

Edward Oh



The origins of schizophrenia: uncovering the role of genetic and epigenetic interactions

Supervisor: Arturas Petronis

Schizophrenia affects 300,000 Canadians and millions worldwide. While it is partially genetic, there are instances in which only one of two identical twins is affected. By analyzing genetic and epigenetic – or environmental – risk factors together, Edward Oh expects to develop a simple way to better understand risks for develop a full-blown psychiatric illness. Click [here](#) for more information about this study.

Hera Schlagintweit

The impact of nicotine metabolite ratio and nicotine expectancy on risk of relapse following nicotine replacement therapy use: A laboratory study

Supervisor: Christian Hendershot

While nicotine replacement therapies double the odds of quitting smoking over unaided attempts, the majority of smokers still relapse. The likelihood of quitting may be impacted by genetic and psychological differences. **Hera Schlagintweit** will examine how genetic and psychological differences impact smoking cessation in hopes of ultimately developing tailored strategies. Click [here](#) for more information about this study.

Jeanette Hui

Effects of Theta Burst Stimulation on Plasticity in the Dorsolateral Prefrontal Cortex in Treatment Resistant Depression

Supervisor: Jeff Daskalakis

Depression is one of the leading causes of disability worldwide, but as many as a third of patients do not respond to antidepressants. Jeanette Hui will test whether intermittent theta burst stimulation – a form of repetitive transcranial magnetic stimulation – can aid plasticity in the brain region linked to depression. Click [here](#) for information about this study.

Jesus Chavarria



Can acute alcohol effects serve as a risk factor for alcohol use disorder and internalizing disorders comorbidities?

Supervisor: Jurgen Rehm

Alcohol use disorders and disorders such as anxiety and depression are associated with significant impairment, poor quality of life and poor treatment outcomes, but there is limited research into why they often co-occur. Jesus Chavarria hopes to determine whether anxiety/ depression symptoms predict increased drinking problems, or vice versa. Click [here](#) for more information about this study.

Jinhee Kim

Anxiety and resting state dynamic functional connectivity in patients with Parkinson's disease

Supervisor: Antonio Strafella

Parkinson's disease is known for its motor symptoms, but the disease can often include non-motor symptoms such as anxiety. Using imaging, Jinhee Kim will examine the brains of Parkinson's patients with anxiety in hopes of identifying biomarkers for anxiety in this population. Click [here](#) for more information about this study.

Julia Kim

The clinical and functional imaging effects of transcranial direct current stimulation on insight in schizophrenia

Supervisor: Philip Gerretsen

Impaired insight — in which people with schizophrenia do not believe they have the illness — is one of the primary reasons for antipsychotic medication non-adherence in this population. Through this study, **Julia Kim** is examining the benefits of tDCS, a form of brain stimulation, in helping people recognize their illness and ultimately becoming more engaged in treatment.

Lindsay Oliver

Identifying dimensional, data-driven brain-behaviour relationships that predict social function in people with schizophrenia spectrum disorders

Supervisor: Aristotle Voineskos

People with schizophrenia often experience impaired social functioning, yet there are no treatments for these symptoms. Lindsay Oliver will examine the range of social impairment seen in people with schizophrenia in hopes of determining whether social brain network activity can predict social performance and functioning across a large sample of patients and healthy individuals. Click [here](#) for more information about this study.

Livia Veselka

Examining the mental-health antecedents and consequences of video gaming among clinical and sub-clinical samples

Supervisor: Tara Elton-Marshall

Video-game play is linked to poor mental health, but it's not yet known how the two are connected. Through this study, Livia Veselka will identify the video game types most linked to problematic gaming behaviours, gaming motivations and immediate and long-term mental health consequences of gaming. Click [here](#) for more information about this study.

Mahavir Agarwal

Effect of antipsychotics on central insulin action in relation to glucose metabolism and cognition in healthy volunteers

Supervisor: Margaret Hahn

Through this study, Mahavir Agarwal will determine whether olanzapine, used to treat schizophrenia, blocks the beneficial effects of insulin. This study will lead to a greater understanding of how antipsychotics cause diabetes and also why they sometimes fail to treat the cognitive symptoms of schizophrenia. Click [here](#) for more information about this research.

Marta Maslej

Assessing the feasibility and efficacy of an online expressive writing intervention: randomized controlled trials in depressed patients with delayed access to psychotherapy

Supervisor: Benoit Mulsant



Most Canadians who could benefit from psychotherapy are unable to access it, creating an urgent need for psychotherapeutic interventions delivered online at a low cost. Through this study, Marta Maslej will evaluate whether an online version of expressive writing, in which people write their deepest thoughts and feelings, can be used to treat depression. Click [here](#) for more information about this research.

Matthew McPhee

Identifying neurocognitive markers of alcohol use disorder risk

Supervisor: Christian Hendershot

Inhibitory control – the ability to stop a planned thought or action – is a predictor for alcohol dependence. Matthew McPhee will examine how activity in a specific region of the brain during alcohol intoxication predicts future alcohol use, and explore whether executive function affects deficits in inhibitory control during intoxication. Click [here](#) for more information about this research.

MengYi Xu

Impact of miR137 point mutation on neural development of the cerebral cortex and hippocampus in a novel transgenic preclinical model for schizophrenia

Supervisor: Albert Wong

Disruptions in how brain cells grow and mature have been shown to be the underlying mechanisms for schizophrenia development. MengYi Xu will use pre-clinical models to better understand the role of a particular microRNA in the development of schizophrenia, and hopefully identify potential treatment targets. Click [here](#) for more information about this study.

Michael Grossman

Mechanisms of Change in Cognitive Behavioural Therapy for Psychosis (CBTp): Who Benefits Most and Why?

Supervisor: Sean Kidd

Cognitive Behavioural Therapy has proven moderately effective in reducing the distress and impairment associated with the symptoms of psychosis. It's still not known who will



benefit most from this form of CBT, or why. Through this study, Michael Grossman hopes to create a better understanding of what makes it effective so that it can be improved. Click [here](#) for more information about this research.

Michelle Goodman

Rest and active-state EEG dynamics: A mechanism for cognitive decline in mild cognitive impairment

Supervisor: Tarek Rajji

Older adults with mild cognitive impairment experience working memory deficits and are at an increased risk of developing further memory decline and Alzheimer's dementia. In one of the first studies of its kind, Michelle Goodman will examine the relationship between these deficits and neural oscillations in hopes of developing preventions for those at risk for Alzheimer's disease. Click [here](#) for more information about this research.

Mina Nashed

Preclinical Assessment of Novel Targets for Rapid-Acting Antidepressants

Supervisor: Jose Nobrega

Globally, clinical depression is the leading cause of disability. Treatments still show limited effectiveness, unfavourable side-effects, and slow onset of treatment benefits. In this study, Mina Nashed will examine new drug targets in the brain that seem to be a converging point for the antidepressant action of ketamine and scopolamine. Click [here](#) for more information about this research.

Natalie Forde

Multi-modal MRI Investigation of Function and Structural Connectivity Related to Neurodevelopmental Disorders

Supervisor: Stephanie Ameis

Children with neurodevelopmental disorders experience overlapping clinical symptoms, including impaired daily functioning. Natalie Forde will use a large local dataset of children, adolescents and young adults to investigate the relationship between everyday functioning



and the structure of the main wiring connecting left and right sides of the brain in children with neurodevelopmental disorders. Click [here](#) for more information about this research.

Navona Calarco

White matter network circuitry in first episode schizophrenia: Identification of neural correlates and preliminary prediction of persistent negative symptoms

Supervisor: Aristotle Voineskos

Persistent negative symptoms in schizophrenia prevent people from being able to function in daily life, but there are currently no effective treatments for them. Navona Calarco will analyze brain imaging data to characterize differences in brain circuitry patients with first episode schizophrenia in hopes of predicting who will develop persistent negative symptoms. Click [here](#) for more information about this research.

Thomas Prevot

Procognitive properties of a novel series of GABA-A receptor positive modulators with efficacy at alpha-a subunit: potential therapeutics for cognitive decline

Supervisor: Etienne Sibille

Diseases such as depression and Alzheimer's – as well as normal or pathological aging – share a deficit in the brain's main inhibitory neurotransmitter (GABA). Such conditions are often associated with cognitive impairments that are not alleviated by currently available drugs. Thomas Prevot is testing compounds that facilitate $\alpha 5$ -GABAA-R function in hopes of developing new treatments. Click [here](#) for more information about this research.

Thulasi Thiruchselvam

Stress, rumination and reward function: An exploration of the relationships between vulnerability factors for depression recurrence

Supervisor: Lena Quilty

Depression symptoms – including sensitivity to stress, repetitive negative thinking and decreased reward functioning – that remain after recovery may be risk factors for relapse, yet few studies have explored the relationships between these risk factors. Thulasi Thiruchselvam is using well-validated laboratory tasks to better understand the link and



hopefully advance targeted treatment. Click [here](#) for more information about this research.

Waqas Khan

Cognition, Functional Capacity, Metabolic Syndrome Risk, and Healthcare Utilization Trajectories in Older Adults with Schizophrenia: A 10 Year Longitudinal Cohort Study

Supervisor: Tarek Rajji

Worldwide, the number of older adults with schizophrenia is expected to continue to increase in the coming decades. Waqas Khan will examine the cognition, functional capacity, metabolic syndrome risk and health care use in older adults with schizophrenia over 10 years in hopes of better preparing the health care system for this growing population. Click [here](#) for more information about this research.