

Supervisor & Project Information Form

Please complete and return via email ONLY to gdip.hres@utoronto.ca by **Monday September 30, 2019**

Supervisor Information

MUST have unrestricted SGS appointment (appointment to supervise graduate students)

Name: Margaret Hahn	Email: Margaret.hahn@camh.ca
SGS Department: Institute of Medical Sciences	Field of Research: Psychiatry, neuroendocrinology, pharmacology, imaging
Research Institution affiliation (if applicable): Centre for Addiction and Mental Health	Location of Work: Centre for Addiction and Mental Health and Toronto General Hospital
Student contact time (number of hours per week YOU are available to the student for any concerns or to review progress): 2-3 hours/week	

Project Information (will be posted on GDipHR website for student access)

TITLE: Neural effects of antipsychotics on central insulin action in relation to metabolism and cognition.

DESCRIPTION (MAX 500 WORDS):

Patients with schizophrenia spectrum illnesses have exceedingly high rates of obesity and type 2 diabetes. Antipsychotic medications, the cornerstone of treatment for psychosis, are associated with serious metabolic adverse effects, contributing to early cardiovascular mortality (by 15-20 years). Importantly, metabolic abnormalities are also associated with poorer cognitive functioning and might worsen preexisting cognitive dysfunction in schizophrenia. In turn, brain insulin resistance has been posited to sit at the cross-roads of cognitive and metabolic disorders. This, the possibility exists that central insulin resistance can explain why antipsychotic drugs fail to improve cognitive deficits in schizophrenia, and induce metabolic side-effects. Furthermore, insulin in the brain has been shown to cross-talk with glutamate in regions important to cognition and metabolism. The present CIHR-funded study will explore in healthy humans:

- 1) (i) whether intranasal insulin increases glutamate levels in striatum and dorsolateral prefrontal cortex (DLPFC); (ii) improves visuospatial task performance; and (iii) changes cerebral blood flow (in the above brain regions and hypothalamus) compared to intranasal placebo;
- 2) (i) whether the antipsychotic olanzapine acutely inhibits intranasal insulin associated changes in glutamate levels, visuospatial task performance, and cerebral blood flow; (ii) how this relates to whole body insulin sensitivity measured by gold standard pancreatic euglycemic clamps (collaboration with Toronto General Hospital, Division of Endocrinology and Metabolism).

If human subjects are involved, have the appropriate Research Ethics Board approvals been obtained?

Yes No Application Submitted (Date: _____)

Do you expect this work will be published within the 20 months?

Yes No Uncertain / Other

Student Roles & Responsibilities (please be as specific as possible)

Please indicate who will serve as the student's direct report for daily oversight (PI, PhD student, technician, etc...)

Daily oversight will be provided by two study assigned Research Analysts, one who has a PhD in related work. The student will have the support of a full-time undergraduate co-op research student, to help with study related tasks. The student will have weekly meetings with study PI.

The student will :

- 1) Help with participant recruitment
- 2) Learn to administer of cognitive tasks, and gain experience with state of the art neuroimaging techniques
- 3) Gain experience in physiology of human glucose metabolism (pancreatic euglycemic clamps)
- 4) Help with data entry, and analyses
- 5) Be encouraged to present study protocol and data at local, national/international conferences