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# SUMMER UNDERGRADUATE RESEARCH PROGRAM 2023
# Supervisor/Project Information Form

## PART 1 – Personal Information

| | |
|---|---|
| **First Name: Stephanie** | **Last Name: Ameis** |
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| **Telephone (Lab): 416-535-8501 ext 36472** | **E-mail: Stephanie.Ameis@camh.ca** |

## PART 2 – Administrative Assistant's Information

| | |
|---|---|
| **First Name: Coleen or Jovanka** | **Last Name: Coyle or Skocic** |
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| **Telephone (Lab): 416-535-8501 ext 36472** | **E-mail: Coleen.Coyle@camh.ca or Jovanka.Skocic@camh.ca** |

## PART 3 – Project Information

**Project Title:**

Neuroimaging-based biomarkers in youth mental health

**Keywords (min 6):**

neuroimaging, mental illness, brain stimulation, autism spectrum disorders, depression, interventional research

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Dr. Ameis' lab is part of a large, multidisciplinary research lab at the Centre for Addiction and Mental Health, which is affiliated with the University of Toronto. The lab combines brain imaging, brain stimulation, and clinical trials to identify brain-based biomarkers of mental illness. Dr. Ameis is especially interested in developing evidence-based interventions to address depression in autistic youth.

The successful candidate will be part of a dynamic team of psychiatrists, engineers, and clinical researchers interested in understanding brain function and dysfunction. They will have an opportunity to gain world-class experience in neuroimaging data analysis from a large, integrated, and collaborative team. The project will focus on analyzing neuroimaging data from existing datasets, including functional MRI, structural MRI, and diffusion MRI. Familiarity with neuroimaging, programming (e.g., bash, Python, R), linux, and statistics is an asset; as is a basic knowledge of neuroscience, psychology, and/or biology. Training will be provided.

The successful candidate will support a healthy workplace that embraces diversity, encourages teamwork, and complies with all applicable CAMH policies, as well as all regulatory and legislative requirements. This position is located at 250 College Street.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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|---|---|
| **First Name:**<br>Samantha | **Last Name:**<br>Anthony |
| **Telephone (Office):**<br>(416) 813-7654 ext. 303126 | **Address:**<br>SickKids PGCRL, 686 Bay St, Toronto ON, M5G 0A4 |
| **Telephone (Lab):** | **E-mail:**<br>samantha.anthony@sickkids.ca |

## PART 2 – Administrative Assistant's Information

| | |
|---|---|
| **First Name:**<br>Deana | **Last Name:**<br>DeRango Aquino |
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## PART 3 – Project Information

**Project Title:**

Implementation and Evaluation of an Electronic Patient-Reported Outcome Measure Platform in Pediatric Transplantation

**Keywords (min 6):**

Transplantation, pediatrics, patient-reported outcome measures, eHealth, ePROMs, implementation science

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Patient-reported outcome measures (PROMs) play a vital role in addressing the burden of disease and/or treatment from patient perspective. PROMs are defined as: "any report of the patient's health condition that comes directly from the patient, without interpretation of the patient's response by a clinician or anyone else". The goal of this project is to transform the delivery of care and improve the health outcomes of Canadian pediatric transplant patients by integrating PROMs into clinical practice.

Current objectives are to: (1) develop an electronic PROM (ePROM) platform, (2) conduct usability testing to refine the platform, (3) perform professional training and education for health care providers to use the ePROM platform, and (4) evaluate the implementation of the platform and identify factors for optimal integration into practice.

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## PART 1 – Personal Information

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|---|---|
| **First Name: Brian** | **Last Name: Ballios** |
| **Telephone (Office): 416-603-5800 x2565** | **Address: 60 Leonard Ave, 7KD414<br>Toronto, Ontario, M5T 0S8<br>Krembil Research Institute** |
| **Telephone (Lab): 416-219-1330** | **E-mail: brian.ballios@mail.utoronto.ca** |

## PART 3 – Project Information

**Project Title:**

**Retinal organoids to study donor-host cell interactions in cell therapy for inherited retinal degenerative disease**

**Keywords (min 6):**

**stem cells; inherited retinal disease; retinal organoids; regenerative medicine; retinal degeneration; ocular genomics**

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

**Our lab is focused on using human retinal organoid culture to develop in vitro model system of rare and genetic retinal disease, and to test the potential to stem cell-based therapies for disease rescue and regeneration. These organoids will provide a platform to study retinal donor-host cell interaction in a fully "humanized" model of cell therapy for rare retinal disease, for which mouse models do not exist. The student will be responsible for cellular and molecular analysis of experiments related to organoid cultures and co-cultures. Students will learn and assist in molecular techniques such as immunofluorescence assays to detect common retinal cell markers at various timepoints; RT-PCR gel electrophoresis to demonstrate expression of a panel of genes in matched samples. Some molecular biology experience or immunofluorescence experience is an asset but not required.**

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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| **First Name: Moumita** | **Last Name: Barua** |
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## PART 2 – Administrative Assistant's Information

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|---|---|
| **First Name: Sarah** | **Last Name: Wilson** |
| **Telephone (Office): 416-634-7241** | **Address: 3-305G, TMDT, 3-305G, 101 College Street, M5G 1L7** |
| **Telephone (Lab):** | **E-mail: sarah.wilson@uhnresearch.ca** |

## PART 3 – Project Information

**Project Title:**

Elucidating causes of kidney disease

**Keywords (min 6):**

Kidney disease, genomics, gene expression, proteomics

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

The starting point of our research is to perform genetic studies in adults with kidney disease using patient and population based cohorts. We then use our genetic discoveries to prioritize clinically relevant models, in which we study kidney disease mechanisms. The 3 main projects in the lab are:

1. Genome-wide association studies of kidney traits
2. Pax2 mediates kidney repair/regeneration
3. Mechanisms in Alport syndrome

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The laboratory is seeking a talented summer student who possesses knowledge in computer programming languages such as R or Python to assist the PI and/or graduate student in analysis of our large datasets including genomics, gene expression and proteomic data generated from patient samples and mouse models.

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# Supervisor/Project Information Form

## PART 1 – Personal Information

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| **First Name: Anne** | **Last Name: Bassett** |
| **Telephone (Office): 416-535-8501 x32734 or 416-340-5145** | **Address: Centre for Addiction and Mental Health 33 Ursula Franklin (formerly Russell) Street, Main Building, 1/F, Toronto, ON M5S 2S1 or The Dalglish Family 22q Clinic, Toronto General Hospital, University Health Network 200 Elizabeth Street, 8NU, Room 802, Toronto, ON M5G 2C4** |
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## PART 2 – Administrative Assistant's Information

| | |
|---|---|
| **First Name: Gladys** | **Last Name: Wong** |
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| **Telephone (Lab): same as above** | **E-mail: gladys.wong@camh.ca** |

## PART 3 – Project Information

**Project Title:**

Genetic architecture and outcome of neurodevelopmental disorders, congenital cardiac disease, and related conditions

**Keywords (min 6):**

Genetics; Brain; Heart; Developmental; Sequencing; Congenital defects; Schizophrenia; Bioinformatics

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Ours is a clinical research lab. We study the genetic architecture that underlies developmental conditions, focusing on those involving the heart and the brain, but also other systems. The

identification of clinical and genetic markers for these diseases allows for earlier diagnosis and the potential for improved outcomes. We pursue this pioneering research of human genetic diseases at the Centre for Addiction and Mental Health, at the Toronto General Hospital, and with colleagues at The Centre for Applied Genomics (SickKids). Our extensive genetic and clinical data offer the opportunity to discover new pathways to fundamental disease mechanisms and to improve clinical outcomes. We also study the burden of illness on patients, families and the healthcare system. Resources include whole genome sequencing and microarray data, comprehensive clinical and long-term outcome data, and patient populations with congenital cardiac disease, schizophrenia, endocrine/metabolic disorders, intellectual disability, early-onset Parkinson's disease, and multi-system disease. Together with the student, we will choose a feasible study that fits the student's interests and skill set. Examples of recent projects include mortality in adults with tetralogy of Fallot, and diabetes in adults with 22q11.2 deletion syndrome. Students likeliest to succeed are those with a background, skills and interest in genetics, clinical phenotypes and mechanisms, bioinformatics, biostatistics and/or programming (e.g., in R). Our research results demonstrate the potential to be translated into clinical practice, and/or have public health implications.

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## PART 1 – Personal Information

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| **First Name: Vinod** | **Last Name: Chandran** |
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## PART 2 – Administrative Assistant's Information

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| **Telephone (Lab):** | **E-mail:** anne.mackinnon@uhnresearch.ca |

## PART 3 – Project Information

**Project Title:**

Prognosis and Biomarker Studies in Psoriasis and Psoriatic Arthritis

**Keywords (min 6):**

Rheumatology, Genetic Epidemiology, Biomarkers, Molecular, Metabolomics

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

The student will participate in one of a number of ongoing and proposed investigations of the role of biomarkers in susceptibility to and expression of psoriatic arthritis.
The student will be learning molecular techniques such as genotyping, proteomic and metabolomic analyses and will be exposed to research methodology. The student may also be involved in collection and analysis of clinical data and will be exposed to clinical features, assessment and management of patients with rheumatic diseases.

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## PART 1 – Personal Information

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| **First Name: Kenneth** | **Last Name: Chapman** |
| **Telephone (Office):416-603-5499** | **Address: Rm. 7-451 EW, 399 Bathurst St. Toronto** |
| **Telephone (Lab): 416-944-9602** | **E-mail: ken.chapman.airways@gmail.com** |

## PART 2 – Administrative Assistant's Information

| | |
|---|---|
| **First Name: Trisha** | **Last Name: Cardoso** |
| **Telephone (Office): 416-603-5499** | **Address: Asthma & Airway Centre, UHN** |
| **Telephone (Lab):** | **E-mail: Trisha.Cardoso@uhn.ca** |

## PART 3 – Project Information

**Project Title:**

The use of exhaled nitric oxide measurements in suspected asthma.

**Keywords (min 6):**

Asthma; airway inflammation; exhaled nitric oxide; diagnosis; spirometry; lung volumes

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

We and others have shown that primary practitioners struggle to diagnose asthma correctly. Objective measures of lung function are underused and are frequently misinterpreted. Many individuals with mild asthma will have normal resting lung function and their variable airflow limitation is demonstrable only with challenge tests. These tests are seldom requested. We believe that patients with rapid measurement of exhaled nitric oxide can be prioritized for such testing based on the results obtained. Such testing requires a 10 second maneuver and provides a simple numerical output. Challenge studies require a separate visit to the lab, an additional step that likely discourages this second and necessary

diagnostic step. We believe that the reporting of abnormally elevated nitric oxide values to practitioners will encourage them to take this step.

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## PART 1 – Personal Information

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| **First Name: Dr. Jennifer** | **Last Name: Chung** |
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## PART 2 – Administrative Assistant's Information

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| **First Name: Liza** | **Last Name: Fabian** |
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| **Telephone (Lab):** | **E-mail: Cronieliza.fabian@uhn.ca** |

## PART 3 – Project Information

**Project Title:**

Biomechanics of the thoracic aorta: A study in normal aortas, aneurysms and dissections.

**Keywords (min 6):**

Biomechanics; aortic aneurysms; aortic dissection; cardiac surgery

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

The project is about aorta which is the largest vessel in the human body. It is prone to get enlarged in some, which is called aortic aneurysm. It may lead to complications such as dissection or rupture which often deadly. Therefore aneurysms are treated with surgery. The prediction of who is at the risk remain imprecise, and aortic diameter as a risk discriminator has been shown to be a crude tool. Therefore, the study of aortic biomechanics can illuminate the pathophysiology of aortic dissection and rupture. Previously it was proven that relationship between biomechanics and underlying structure of aortic wall is proportional. These findings works as an evidence that biomechanics may be useful in risk assessment and therefore clinical decision-making. Study based on objective to compare the in-vivo and ex-vivo

biomechanics of normal, acutely dissected, and aneurysmal aortic tissue. Another objective is to validate in-vivo biomechanical measurements with MRI against ex-vivo biomechanical testing, and also to investigate the role of the margins of resection during aortic surgery in prediction future aneurysmal degeneration.

The student taking on this project must be detail-oriented, an excellent collaborator and communicator with developed skills for using the database and Knowledge of aortic disease. Student with some proficiency in biomechanical lab work will be an asset.

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## PART 1 – Personal Information

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| **First Name: Tulin** | **Last Name: Cil** |
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| **Telephone (Lab): n/a** | **E-mail: Tulin.Cil@uhn.ca** |

## PART 2 – Administrative Assistant's Information

***Research Coordinator's contact provided**

| | |
|---|---|
| **First Name: Emma** | **Last Name: Reel** |
| **Telephone (Office): n/a** | **Address: 700 University Ave** |
| **Telephone (Lab): n/a** | **E-mail: Emma.Reel@uhnresearch.ca** |

## PART 3 – Project Information

**Project Title:**

THE EMPRESS TRIAL: the Effect of Mental Practice and Rehearsal on Emotion, Stress & Surgery

**Keywords (min 6):**

Surgery, Mental Practice, Stress, Surgical Trainees, Anxiety, Mental Rehearsal, Performance Psychology

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

The objective of this project is to conduct a pilot study using a randomized-controlled trial design to evaluate the impact of mental practice on stress and intra-operative technical performance of surgical residents. Participants in the control group will be provided with standard learning materials for a laparoscopic cholecystectomy including readings and video instruction. Participants in the experimental group will be taught how to perform verbally guided mental practice by a sport psychologist in addition to the standard learning materials. All participants will be assessed at three time points within a two-

month period during surgeries set early, in the middle, and near the end of a rotation. Their biometrics will be recorded via Hexoskin. The outcomes for analysis include the ability to perform mental practice, stress/anxiety levels, cardiac and respiratory parameters, and an objective assessment of technical skills. Using this data, we will model and compare changes in stress/anxiety and improvement in surgical performance over time between the two groups. Our hypothesis is that mental practice will result in decreased stress and improved technical performance among surgical trainees.

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## PART 1 – Personal Information

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| **First Name: Andrew** | **Last Name: Dimitrijevic** |
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| **Telephone (Lab): 416-480-6100 x 7771** | **E-mail: Andrew.dimitrijevic@sunnybrook.ca** |

## PART 3 – Project Information

**Project Title:**

Resting state EEG (electroencephalography) in patients with hearing loss and cochlear implants: relationships to clinical outcomes.

**Keywords (min 6):**

EEG, brain source analysis, hearing loss, cochlear implant, aging, speech perception, brain waves

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

In this project the student will analyze high-density electroencephalography (EEG) (aka Brain waves) resting state data in patients with hearing loss who have a cochlear implant. Resting state data can give an indication of the activity in neural networks that includes degrees of brain connectivity and neural plasticity. This EEG activity will be related to clinical outcomes to determine mechanisms of patient variability. Knowledge of Matlab is desired, but not required. The student will analyze existing data and collect new data. More info at CIBrainLab.com.

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## PART 1 – Personal Information

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| **First Name:** Michael | **Last Name:** Fehlings |
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## PART 2 – Administrative Assistant's Information

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|---|---|
| **First Name:** Libertad | **Last Name:** Puy |
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| **Telephone (Lab):** | **E-mail:** libertad.puy@uhnresearch.ca |

## PART 3 – Project Information

**Project Title:**

Novel classification models to enhance predictions of neurological outcomes in spinal cord injury

**Keywords (min 6):**

Spinal cord injury, trauma, machine learning, epidemiology, degenerative cervical myelopathy, neurosurgery

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Traumatic and non-traumatic spinal cord injury (SCI) such as degenerative cervical myelopathy (DCM) cause a significant burden on the patient, their families, and the health care system. Predicting outcomes is not only important in expectation setting of patients and their families, but also for clinical trial design. With emerging neuroprotective agents, it is essential to have prediction of outcomes based on initial presentation to limit type 2 errors stemming from unbalanced randomization.

Our lab has access to the largest dataset on traumatic spinal cord injury from a culmination of previous international registries and clinical trials, and data on DCM. The novelty of this project is not only with the data and the analytical techniques. We will be exploring machine learning and trajectory-based approaches in predicting outcomes. The student will have access to the data and resources to learn and practice conventional and machine learning statistical approaches to clinical data. The student will also learn about clinical trial designs through analyses of previous trail data.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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|---|---|
| **First Name:** Michael | **Last Name:** Fehlings |
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## PART 2 – Administrative Assistant's Information

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| **First Name:** Libertad | **Last Name:** Puy |
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| **Telephone (Lab):** | **E-mail:** libertad.puy@uhnresearch.ca |

## PART 3 – Project Information

**Project Title:**

Repair and regeneration of the injured spinal cord

**Keywords (min 6):**

Spinal cord injury, stem cells, neural regeneration, cervical spinal cord, tissue engineering, restoration of function, neuroprotection

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

The Fehlings Laboratory is using clinically relevant murine and rodent models of spinal cord injury to understand the pathophysiology and treatment of CNS injury. The strategies being examined include neuroprotective approaches to attenuate programmed cell death, bioengineered strategies to bridge regions of CNS disconnection and neural stem cell-based regenerative strategies. The techniques used incorporate the full breadth of cutting edge molecular, imaging, behavioural and functional analyses.
Research interests:

1) Neuroprotection of the injured brain and spinal cord
2) Regenerative medicine for spinal cord injury using stem cell and tissue engineering

Students in the higher years (e.g. 3rd or 4th year) are preferred.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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|---|---|
| **First Name: Brian** | **Last Name: Feldman** |
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| **Telephone (Lab):** | **E-mail: brian.feldman@sickkids.ca** |

## PART 2 – Administrative Assistant's Information

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|---|---|
| **First Name: Felicia** | **Last Name: Alli** |
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| **Telephone (Lab):** | **E-mail: felicia.alli@sickkids.ca** |

## PART 3 – Project Information

**Project Title:**

Patient And Caregiver Engagement in Research (PACER): Opinions on co-enrollment in studies

**Keywords (min 6):**

Co-enrollment, research, patient, caregiver, opinion, participation

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Our team previously identified themes which influence patients' and caregivers' decision on enrolling into studies. We would like to quantify the opinions of the patients and caregivers in our rheumatology clinic at SickKids to see if these themes resonate with our clinic's population.
The student will be responsible for the distribution of a survey amongst our clinic's population, data analysis, and assisting with the dissemination of the results.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

| | |
|---|---|
| **First Name: Daniel** | **Last Name: Felsky** |
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| **Telephone (Lab):** | **E-mail: daniel.felsky@camh.ca** |

## PART 2 – Administrative Assistant's Information

| | |
|---|---|
| **First Name: Sophie** | **Last Name: Lafaille** |
| **Telephone (Office):** | **Address: 250 College Street** |
| **Telephone (Lab):** | **E-mail: sophie.lafaille@camh.ca** |

## PART 3 – Project Information

**Project Title:**

Computational integration of neuroimaging and genetic summary statistics to map psychiatric illness to genes and cell types

**Keywords (min 6):**

Bioinformatics, mental health, neuroimaging, genetics, computational, biostatistics, virtual histology, integration

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

This cross-disciplinary project will build on a recently developed method called case-control virtual histology (CCVH), which will be published shortly. This cutting-edge method combines results from gene expression analysis of postmortem brain tissue with results from MRI brain imaging studies to identify genes and cell types that are most important in psychiatric and neurological illness. So far, we have used CCVH to identify specific neuron and glial cells that are implicated Alzheimer's disease.

This summer project will be an extension of the CCVH method, using publicly available summary statistics from genome-wide association studies and neuroimaging studies to build a map of the molecular basis of a wider set of psychiatric illnesses. Estimation of gene-level effects on psychiatric illnesses across brain regions will be performed using the metaXcan method. MRI-level effects will be collected from international consortia and leading literature (e.g. ENIGMA). Effects will then be correlated across all regions for each illness according to the CCVH pipeline.

Some prior experience with bash coding / command line will be required. Some experience with R or python will also be required. Experience with biostatistics, genetics, neuroimaging, or bioinformatics will be very strong assets.

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# Supervisor/Project Information Form

## PART 1 – Personal Information

| | |
|---|---|
| **First Name:** Jason | **Last Name:** Fish |
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| **Telephone (Lab):** | **E-mail:** Jason.fish@utoronto.ca |

## PART 2 – Administrative Assistant's Information

| | |
|---|---|
| **First Name:** Karima | **Last Name:** Bandali |
| **Telephone (Office):** 416-581-7484 | **Address:** 101 College Street, Princess Margaret Cancer Research Tower, 3-308 |
| **Telephone (Lab):** | **E-mail:** karima.bandali@uhnresearch.ca |

## PART 3 – Project Information

**Project Title:**

Cell-cell communication in cancer therapy-related cardiac dysfunction

**Keywords (min 6):**

Endothelial cells, cell culture, mouse model, cancer therapy, cardiac dysfunction, molecular mechanisms

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Cancer therapy is known to have a damaging effect on the cardiovascular system. For example, chemotherapy can result in cancer therapy-related cardiac dysfunction (CTRCD), which can progress to heart failure. The mechanisms responsible are poorly understood. Most research has focused on the effect of chemotherapy on cardiomyocytes, the workhorse of the heart. We have found that the endothelial lining of blood vessels is damaged by chemotherapy and that circulating markers of this damage can be used to predict risk of CTRCD. This project will seek to understand the mechanisms of endothelial cell damage and how this affects cardiomyocyte function through cell-cell communication.

The project will involve molecular studies in cell culture models as well as using animal models of CTRCD. Prior laboratory experience would be beneficial but is not essential.

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## Supervisor/Project Information Form

**POSITION FILLED**

## PART 1 – Personal Information

| | |
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## PART 3 – Project Information

**Project Title:**

The REACH School Network

**Keywords (min 6):**

School Health, Social Inequities, Nutrition, Mental Health, Child Development

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

School-based nutrition programs are accessed by 1 in 5 Canadian children and are especially important for children experiencing low income and social inequities. Nutrition in childhood is critical for normal brain development and suboptimal development could have long-term consequences. The impact of school-based nutrition programs on children's nutrition and growth has not been well established. The objective of this study is to understand the impact of school-based nutrition programs on children's dietary intake, eating behaviours, and growth (zBMI) among a social-economically diverse, multicultural population. We will also explore if social determinants of health and demographic characteristics (child age, sex, gender, ethnicity, family income, and parental employment status) modify this relationship. This study will collect and combine data through two prospective cohorts [TARGet Kids! and The REACH School Network] in the Greater Toronto Area. A better understanding of the associations between school-based nutrition programs and children's dietary intake, eating behaviours, growth, and presence of food insecurity, can support policy recommendations to improve the nutrition and health of at-risk children.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Cost-Utility Analysis of Same-Day Discharge versus Standard Discharge After Transcatheter Aortic Valve Replacement: A Markov Cohort Model

**Keywords (min 6):**

Cardiac surgery; interventional cardiology; transcatheter aortic valve replacement; decision analysis; outcomes research; cost-effectiveness analysis; cost-utility analysis; economic evaluation

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Transcatheter aortic valve replacement (TAVR) is increasingly used as an alternative to surgical aortic valve replacement for patients with moderate-to-severe aortic stenosis. Compared to surgery, TAVR reduce the invasiveness for patients and the time spent by patients in the hospital. In order to meet

health system pressures, shorter hospital lengths-of-stay and reduced healthcare spending with comparable outcomes should be pursued. During the COVID-19 pandemic, same-day discharge after TAVR has been proposed to minimize the risk of in-hospital transmission; recent favourable experiences may facilitate greater future adoption, although long-term clinical and economic outcomes are poorly studied.

Decision analysis is a statistical method to simulate patient outcomes over a long time (e.g., lifetime) while accounting for uncertainty in terms of outcomes and healthcare costs. As a result, decision analysis is often used as an alternative or complement to randomized controlled trials, which are costly and take a long time to complete. During this project, the student will learn how to create a common decision analysis model–a Markov cohort model–to compare same-day discharge versus standard discharge after TAVR for the management of 1) severe and 2) moderate aortic stenosis.

Statistical or programming experience is not required but helpful.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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| **First Name: Tony** | **Last Name: George** |
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## PART 2 – Administrative Assistant's Information

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| **First Name: Emily** | **Last Name: Yule** |
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## PART 3 – Project Information

**Project Title:**

Studies of cannabis in people with serious mental illness

**Keywords (min 6):**

Cannabis, Schizophrenia, rTMS, Mood Disorders, Cognition, Abstinence

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Studies in our laboratory are focused on cannabis, tobacco and other misused substance in people with mental illness, including schizophrenia, mood disorders and Post Traumatic Stress Disorder (PTSD). Two current studies examine the effects of an established cannabis abstinence paradigm using contingent reinforcement (Lucatch, AM et al., 2020. Can J. Addict.; Sorkhou, M et al., 2022. Am. J. Addict.) in major depression and PTSD. Another line of research is developing repetitive transcranial magnetic stimulation (rTMS) as a novel treatment for cannabis addiction in schizophrenia (Kozak-Bidzinski, K et al., 2022. NPJ Schizophrenia). The SURP student would work with the study teams to assist with subject screening and

clinical and neurocognitive assessments, monitoring and data management. In addition, students would participate in weekly meetings and Journal Clubs in CAMH's Centre for Complex Intervention (CCI).

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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| **Telephone (Lab):** | **E-mail:** anne.mackinnon@uhnresearch.ca |

## PART 3 – Project Information

**Project Title:**

Prognosis and Biomarker Studies in Psoriasis and Psoriatic Arthritis and systemic lupus erythematosus.

**Keywords (min 6):**
**Keywords:**

rheumatology, psoriatic arthritis, genetics, systemic lupus, outcomes

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

*Position 1*

The student will participate in one of a number of ongoing and proposed studies related to the prognosis of rheumatic diseases including psoriatic arthritis, and systemic lupus erythematosus. These studies include assessment of outcomes in these patients and the factors related to these outcomes. The student will collect clinical data, administer instruments of health status, collate information and participate in the analysis of the data. The student will be exposed to clinical research methodology as well as learn the clinical features, assessment and management of patients with rheumatic diseases.

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*Position 2*

The student will participate in one of a number of ongoing and proposed investigations of the role of biomarkers in susceptibility to and expression of rheumatic diseases, including systemic lupus erythematosus, psoriatic arthritis. The student will be learning molecular techniques of HLA typing, other genetic markers, soluble biomarkers, will be exposed to research methodology as well as learn the clinical features of patients with rheumatic diseases. Laboratory experience is required. Some knowledge of immunology, molecular biology is required.

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## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Clinical Research Focused on Adolescents with Bipolar Disorder

**Keywords (min 6):**

Adolescent; bipolar disorder; clinical research; comorbidity; neuroscience; therapy

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

The project will be based at the Centre for Youth Bipolar Disorder (CYBD), comprising a large team of research staff, psychiatrists, social workers, graduate students, and post-doctoral fellows. The project will be based on a large clinical research dataset that provides information about a broad range of potential research areas. The dataset includes comprehensive information about psychiatric symptoms, medications, family history, and environmental factors. The student will meet initially with the supervisor and research team members to discuss various options for their specific subject of focus. A graduate student mentor will provide day to day support and direction. Goals of this position are to provide the student with exposure to a multi-disciplinary clinical research team, learn about the unique

aspects of early-onset bipolar disorder, and participate in the writing of a research manuscript that will be submitted for publication. Successful completion of these goals will provide the student an opportunity for co-authorship on a journal publication related to their chosen area of focus. The student will attend general team meetings and smaller team meetings focused on their project, and will have the opportunity to also learn about intervention research and research regarding the biological basis of bipolar disorder.

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## PART 1 – Personal Information

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|---|---|
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## PART 2 – Administrative Assistant's Information

| | |
|---|---|
| **First Name: Nadia** | **Last Name: Swami (CRC)** |
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## PART 3 – Project Information

**Project Title:**

Early palliative care for patients with multiple myeloma

**Keywords (min 6):**

Multiple Myeloma; Palliative Care; Symptom Assessment; Patient Reported Outcome Measures; Quality of Life; Feasibility Studies

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**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Early palliative care (PC) is internationally accepted as beneficial for patients with solid tumours, however PC referrals for patients with hematological malignancies, including multiple myeloma (MM), continue to be late, if at all. Patients with MM experience a myriad of physical and psychosocial symptoms throughout their disease course, including pain related to bone disease and neuropathy; emotional distress; progressive frailty; and delayed advance care planning discussions; and have been identified as a group that could benefit from an integrated early PC approach.

Alongside the study team, the SURP student will assist with recruitment and data collection for a funded phase II feasibility trial of an early, outpatient PC intervention for patients with multiple myeloma attending the Princess Margaret Cancer Centre. The intervention will consist of a focused phone assessment by an advanced practice nurse, followed by a one-time comprehensive assessment in the outpatient PC clinic with advice to the myeloma team for ongoing symptom management. Patient-related outcomes will include improvements in symptom burden and depression (primary outcomes), quality of life, and satisfaction with care at six weeks.

No specific experience is required but an interest in clinical research and patient interaction is important.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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|---|---|
| **First Name: Colin** | **Last Name: Hawco** |
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## PART 2 – Administrative Assistant's Information

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| **First Name: Jovanka** | **Last Name: Skocic** |
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## PART 3 – Project Information

**Project Title:**

Using neuroimaging to understand individual variability in people with and without mental illness

**Keywords (min 6):**

neuroimaging, cognition, individual variability, mental illness, schizophrenia, depression, healthy variation

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Dr. Hawco's lab is part of a large, multidisciplinary research lab at the Centre for Addiction and Mental Health, which is affiliated with the University of Toronto. Dr. Hawco's research uses a combination of functional neuroimaging, brain structure, and brain stimulation to understand cognitive functioning and individual variability in people with and without mental illness. Current work utilizes a trans-diagnostic approach to examine the range of variability across psychiatric and non-psychiatric individuals.

The successful candidate will be part of a dynamic team of psychiatrists, engineers, and clinical researchers interested in understanding brain function and dysfunction. They will have an opportunity to gain world-class experience in neuroimaging data analysis from a large, integrated, and collaborative team. The project will focus on analyzing neuroimaging data from existing datasets, including functional MRI, structural MRI, and diffusion MRI. Familiarity with neuroimaging, programming (e.g., bash, Python, R), linux, and statistics is an asset; as is a basic knowledge of neuroscience, psychology, and/or biology. Training will be provided.

The successful candidate will support a healthy workplace that embraces diversity, encourages teamwork, and complies with all applicable CAMH policies, as well as all regulatory and legislative requirements. This position is located at 250 College Street.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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|---|---|
| **First Name: Cindy** | **Last Name: Alves** |
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| **Telephone (Lab):** | **E-mail: tiffany.lagman@sickkids.ca** |

## PART 3 – Project Information

**Project Title:**

Genetics of Lupus: manifestations and outcomes.

**Keywords (min 6):**

Epidemiology, genetics, lupus, outcomes, sex/gender, ethnicity/ancestry, child/adolescent health

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Lupus is a life threatening, chronic, autoimmune disease where the body's immune system mistakenly attacks healthy tissue.
Genes play an important role in determining who will develop lupus.

We have genetic data and clinical longitudinal, repeated measures on thousands or children and adults with lupus. We are interested in exploring the genetics of disease features over time. Students will have the opportunity participate in research examining the genetics of particular SLE features or complications. Students will be part of the Rheumatology and Genetics & Genome Biology (GGB)

research teams at SickKids, attending weekly meetings and participating in rounds. Activities include literature review, data cleaning, data analysis, meta-analysis, presentations and manuscript writing.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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|---|---|
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## PART 3 – Project Information

**Project Title:**

Advanced brain imaging in chronic neuropathic pain

**Keywords (min 6):**

Neuropathic pain, trigeminal neuralgia, MS related trigeminal neuralgia, hippocampus, cognition, accelerated brain aging

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

The Hodaie Lab is a highly translational surgical imaging lab. Our projects use advanced brain imaging techniques to study chronic neuropathic facial pain, with a special focus on trigeminal neuralgia (TN). A variety of imaging methodologies are used including white matter tractography and cortical thickness analysis. Using these methods, we examine the effect of neurosurgical interventions (e.g. microvascular decompression surgery, Gamma Knife radiosurgery) on nerve and brain of TN patients, and aim to find

potential biomarkers for effective treatment. A number of projects are available focusing on the use of advanced statistical and computational approaches, such as machine learning and artificial neural networks.

Requirement: background in neuroscience, biology, neuroanatomy. Previous expertise in coding (Python, R) and MR imaging processing frameworks (Freesurfer, FSL, MRTrix) will be considered an asset.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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|---|---|
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## PART 3 – Project Information

**Project Title:**

Role of the endothelium on efferocytosis

**Keywords (min 6):**

Endothelial biology, vascular disease, atherosclerosis, efferocytosis, macrophage, microRNA, extracellular vesicles

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Lab research project involving cell culture of primary endothelial cells. Experienced student will perform experiments designed to determine if endothelial cells govern a process called efferocytosis. Project involves cell culture, efferocytosis assays, imaging, data analysis and written reports.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Artificial intelligence to determine biomarker status in breast cancer brain metastases

**Keywords (min 6):**

Artificial intelligence, biomarkers, breast cancer, brain metastases

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Background: Patients with certain subtypes of metastatic breast cancer are at high risk of developing brain metastases, which is associated with a poor prognosis. Brain metastases can be treated with local therapies (surgery and/or radiation) and in some cases systemic therapies.
Problem: The choice of systemic therapy for brain metastases depends on expression of biomarkers, which are not typically available in brain metastases because tissue in the brain is challenging to obtain. The expression of these receptors in the brain and outside of the brain do not align in ~15% of cases, so other available tissue is not a reliable substitute for brain metastases tissue.

Hypothesis: The expression of targetable receptors in brain metastases can be predicted using artificial intelligence (AI).
Methods: In collaboration with Dr. Anne Martel (imaging scientist) we will use an established institutional database of patients with metastatic breast cancer and brain metastases; a subset of patients have both brain metastases tissue and brain MRI imaging available. AI methods with a training and validation set will be employed to predict the expression of various receptors in the brain, with a focus on the human epidermal growth factor receptor (HER2), for which targeted systemic therapies are available.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 3 – Project Information

**Project Title:**

Cancer Rehabilitation and Survivorship

**Keywords (min 6):**

Oncology, cancer rehabilitation, wellness, knowledge translation, health systems

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Despite the increasing incidence of cancer, mortality rates have dropped significantly over the past three decades. For the majority, cancer can now be viewed as a curable or chronic disease and as advances continue in cancer control, the numbers of people surviving cancer will continue to rise. In response, there has been a recent surge of attention paid to the field of cancer survivorship leading to efforts to manage treatment related sequelae, enhance quality of life and improve the overall functioning of people who are receiving long-term follow-up care after cancer treatment.
IMS SURP student will have the opportunity to work with the Princess Margaret Cancer Rehabilitation and Survivorship Program and participate in one of a number of ongoing studies related to the detection, prevention and treatment of cancer treatment related sequelae as well as knowledge translation and health systems research. The goal is to provide the student with a broad research training experience with the direct support of the experienced research team and supervisor.

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# Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

| | |
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## PART 3 – Project Information

**Project Title:**

Probing the fate of a memory trace in mice

**Keywords (min 6):**

Mice, memory, brain, fear learning, optogenetics, imaging

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Memory may be defined as the retention over time of internal representations gained through experience, and the capacity to reconstruct these representations at later times (Dudai 2007). These internal representations are thought to be encoded by long-lasting physical brain changes (memory traces or "engrams") (Josselyn, Kohler & Frankland 2015, 2017; Tonegawa et al. 2015; Schacter 2001). Memory is adaptive; it helps one make future choices based on past experience. For instance, after being burnt by a hot stove, one may approach hot stoves with (appropriate) caution. It may be beneficial to generalize this fearful response to other hot kitchen appliances (e.g., a toaster). However, excessive fear generalization or treating no-longer threatening stimuli as dangerous may be

maladaptive. Excessive generalization, for instance, could produce a fear of all appliances. Furthermore, it may be disadvantageous to remain fearful when circumstances change (e.g., when the stove is no longer hot). Indeed, recurrent or inappropriately expressed fearful memories are a major component of several psychiatric disorders, including post-traumatic stress disorder (PTSD) and anxiety. Therefore, understanding how engrams supporting memories of fearful events are formed, change over time, under what conditions they remain specific or generalize, and the impact of behavioral extinction are critical questions to not only understanding how the brain uses information, but also for informing the development of new treatment/prevention strategies for disorders characterized by inappropriate fear memories. Here we will probe the fate of an engram.

The student will work closely with advanced graduate students and post-doctoral fellows and learn a combination of mouse behavior, molecular skills and microscopy skills.

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# Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Features of high functioning vascular surgical research teams

**Keywords (min 6):**

Vascular surgery research; high-functioning teams

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

We will be exploring the qualities and features of high-functioning vascular research teams. The project will involve a literature review to identify the top most productive vascular research programs within North America. Members of the top 10 most productive teams will be invited to participate in qualitative interviews to explore the nature of their teamwork, the organization, structure, and culture that the team believes drives their productivity. Survey data will be collected from the top most productive teams to explore their team structures, and features of their research including their funding sources, their study types, patient recruitment strategies, and reimbursement frameworks. The goal of

this work will be to explore and describe the nature, organization, and function of the most productive vascular surgical research teams.
The summer student will be involved in conducting this research, including in conducting the literature search and analyzing the results, and in recruiting participants from among the top performing teams. The student will prepare study documents, collect and analyze data, and participate in manuscript preparation and presentation of the project and results to varied audiences.

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# SUMMER UNDERGRADUATE RESEARCH PROGRAM 2023
# Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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| **First Name: Julie** | **Last Name: Owen** |
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## PART 3 – Project Information

**Project Title:**

Innate immunity activation due to redox perturbation in pancreatic cancer

**Keywords (min 6):**

Innate immunity, redox, oxidative stress, DNA damage, pancreatic cancer

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Pancreatic cancer is associated with poor patient outcomes and there is dire need for more targeted treatments. We have recently discovered that pancreatic cancer cells are vulnerable to loss of redox homeostasis by targeting the endoplasmic reticulum-localized antioxidant protein PRDX4 (Jain et al., Science Advances 2021). PRDX4 depletion is associated with high levels of DNA damage. Damaged DNA that leaks into the cytoplasm is known to activate pattern recognition receptors and innate immunity signaling. In this project we will further characterize the types of DNA damage imparted by redox stress and determine whether factors secreted from redox-stressed pancreatic cancer cells can activate immune cell populations. Experimental tools may include cell culture, quantitative immune

fluorescence, qPCR and western blotting. This research will determine the potential for combining PRDX4 depletion or other redox targeting with immune checkpoint inhibition for enhanced therapeutic effect in pancreatic cancer.
Candidates applying for this position should have a background in (cancer)biology and experience working in a biochemistry or molecular biology laboratory.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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| **First Name:** Rebecca | **Last Name:** Bagnarol |
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## PART 3 – Project Information

**Project Title:**

Observing, Understanding, and Telling stories at end of Life for Opioid Use Disorder patients (OUTLOUD): Mixed-methods research and knowledge translation

**Keywords (min 6):**

Opioid-related health harms, Opioid analgesics, Palliative care, Healthcare access, Qualitative research, Health service research, Narrative inquiry, Health inequities, Pain management, Symptom management

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Our project uses mixed-methods sequential explanatory design to describe palliative care, opioid prescribing and end-of-life outcomes for people with opioid-related health harms (OHH) in Ontario. The prospective student will join this project for Phase 2: a qualitative study using narrative inquiry to explore the palliative experiences of patients with OHH, caregivers, as well as palliative care physicians and nurses. The student will learn about and assist with key activities such as participant

recruitment (e.g. identifying/screening participants, obtaining consent), facilitating interviews/focus groups and data coding and analysis. There will also be opportunities to contribute to innovative knowledge translation activities (e.g., art installations, video series).

This position offers an exciting opportunity to work in a multidisciplinary, collaborative environment. The student should have an interest in working with underrepresented populations, particularly at the end of life. The student must be able to communicate effectively and empathetically.

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# Supervisor/Project Information Form

## PART 1 – Personal Information

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| **First Name: Dana** | **Last Name: Debernyj** |
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## PART 3 – Project Information

**Project Title:**

Investigating the mechanism responsible for the genetic and infectious forms of thrombotic Microangiopathy associated with sialylation deficiency.

**Keywords (min 6):**

Kidney, rare disease, genetic, pediatric, thrombotic microangiopathy, hemolytic-uremic syndrome

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Patients with invasive Streptococcus pneumoniae infection can develop hemolytic-uremic syndrome (HUS). They sustain an acute kidney injury because of thrombosed kidney glomeruli that can lead to death (10%) or end-stage kidney disease (15%). All patients with pneumococcal HUS (P-HUS) have high blood levels of bacterial sialidase. This enzyme cleaves terminal sialic acid residues from endothelial glycoproteins, exposing galactose termini instead. Sialic acid or galactose termini acts as docking sites for distinct receptors on blood cells. Using exome sequencing, we discovered a novel form of HUS caused by loss-of-function mutations in gene that encodes a sialyltransferase that adds sialic acid to

galactose on nascent glycoproteins. Development of new therapies for both conditions has been hampered by our poor understanding of their pathophysiologies.

Students will work on this or a similar project within the Lemaire Laboratory while being accompanied by one of the research staff. The goal of this summer work semester is to introduce and further develop the knowledge and skills surrounding basic science. Students will be privy to a wide range of learning opportunities, seminars, and lab specific certifications provided by the Cell Biology program and the Research Institute.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 3 – Project Information

**Project Title:**

Gene therapy for heart failure prevention

**Keywords (min 6):**
Heart Disease, Gene Therapy, Myocardium, RNA, Western, Infraction, Heart Failure, Cardiomyocytes

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

A variety of cardiac diseases including high blood pressure, valve dysfunction and heart attacks are associated with the growth of cardiac muscle by enlargement of individual heart cells. When heart cells enlarge they also contain new proteins as a result of turning on specific genes. While this process is initially of benefit, ultimately, heart cell enlargement (or hypertrophy) and changes in gene expression have adverse effects that can contribute to the development of heart failure.

In this protocol we are using a well known and extensively studied rat animal model of coronary artery ligation (to produce heart attack or infarction) and aortic banding (pressure overload) to model chronic myocardial infarction and heart failure.

The objectives of present study are:
-Define the functional (e.g. cardiac structure, hemodynamics) interaction of i) S100A1 with Jarid2, RAGE, TLR4 and ii) S1006 with Jarid2, S100A6 with TLR4 and downstream signaling mechanisms activated in the myocardium in response to cardiac injury (coronary artery ligation or aortic banding).

An understanding of the molecular and epigenetic mechanisms leading to myocardial infarction proposed in this protocol may provide opportunities to design novel therapeutic strategies.

There are no specific skills the student requires, other than basic understanding of biology. The student will be taught all skills required for completion of the project and will focus on molecular analysis of animal tissue and cell culture (PCR / Western / Immunohistochemistry). Prior experience in these techniques will be considered a strong asset.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 3 – Project Information

**Project Title:**

Acute lung injury in lung transplantation

**Keywords (min 6):**

Lung injury, lung transplant, cellular molecular biology, physiology, bioinformatics

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

To be supervised by a graduate student or a research fellow, to participate in a biomarker discovery, validation and pathway analyses. The student is expected to conduct literature review, bioinformatics analyses, experimentation including cell culture and biochemical studies and/or immunohistological studies. Students with previous research experience are encouraged to apply.

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# Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 3 – Project Information

**Project Title:**

Investigating the Brain-Heart Connection (IBHeC): Heart rate variability in older adults at risk for Alzheimer's Disease

**Keywords (min 6):**

Heart rate variability, Alzheimer's disease, mild cognitive impairment, late-life depression, biomarkers, psychophysiology

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Heart rate variability (HRV), defined as the variation in the time interval between consecutive heartbeats is a well-established surrogate of cardiac and emotional health that reflects the balance between sympathetic and parasympathetic activity of the autonomic nervous system. More recently, HRV has also been associated with cognitive health, with higher HRV correlating with greater executive function in healthy individuals. Reduced HRV is also associated with Alzheimer's disease (AD), consistent with evidence of early involvement of neuropathology in brainstem regions that support the autonomic nervous system. These findings suggest that HRV may represent a biomarker of AD risk. Lifetime history of depression or remitted depression (rMDD), and amnestic mild cognitive impairment (aMCI) are well-established risk factors for AD. There are no previous studies of HRV in older adults with a history of rMDD and evidence in MCI is inconsistent. This study will be the first to conduct a systematic analysis of HRV at rest and in response to a physiologically challenge in older adults with rMDD, aMCI, or comorbid rMDD+aMCI.

This summer studentship is best suited for trainees who are majoring in neuroscience or psychology or considering medical school. Students who are keen to analyze data and become involved in writing up abstracts or manuscripts are especially welcome.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 3 – Project Information

**Project Title:**

**Co-creating digital solutions for problem drinking in treatment-seeking smokers to reduce (compounded) risk for cancer**

**Keywords (min 6):**

Digital Health; Alcohol; Tobacco; Cancer Prevention

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

**Background.** Clinical guidelines recommend treating tobacco and alcohol use concurrently. Over 365,000 Ontarians smoke cigarettes and drink alcohol above guideline, which increases their risk for cancer. At CAMH, we developed the largest smoking cessation program in Ontario, i.e., the Smoking Treatment for Ontario Patients (STOP). In 2016, we integrated screening and brief intervention for alcohol use through STOP and found that only 45% of STOP patients, who reported at-risk alcohol use, were offered a brief intervention (BI) by their provider. Provider-reported barriers to offering the BI included concerns about damaging the therapeutic relationship and lack of time. Digital interventions

could address some of these barriers by providing automated messages directly to patients. The challenge is **matching evidence-based BI's** for alcohol use, to **digital modalities** of delivery, acceptable to patients and providers and feasible to implement into STOP.

**Objective.** To co-create evidence-based and adoptable, digital solutions to reduce alcohol consumption among active smokers who drink above guidelines.

**Impact.** If successful, this intervention can **improve population health and reduce healthcare costs,** by mitigating two main risk factors for cancer and addressing **provider concerns**.

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## PART 1 – Personal Information

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## PART 3 – Project Information

**Project Title:**

Psychosocial barriers to living donor kidney transplantation (LDKT)

**Keywords (min 6):**

Health equity; depression; anxiety; adult attachment; psycho-social distress; kidney transplantation; patient reported outcomes

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

**We investigate psychosocial barriers to LDKT in patients with chronic kidney disease (CKD).** Compared to dialysis or deceased donor kidney transplantation (KT), LDKT is the optimal treatment for advanced CKD. However, only 30-40% of kidney transplant recipients receive LDKT in Canada. The reasons for the underutilization of LDKT are not known.

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## PART 3 – Project Information

**Project Title:**

Developing a linguistically and culturally competent guide to kidney transplantation (KT) for **South-Asian Canadians**

**Keywords (min 6):**

Health equity; ethnocultural disparities; South-Asian Canadians; kidney transplantation; qualitative research; culturally competent care; health education; patient reported outcomes

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

**We are studying the cultural barriers that prevent South-Asian Canadians from receiving live donor KT. We will develop an education program to address those barriers and specific health education needs of South-Asian Canadians.** Living donor KT (LDKT) is the optimal treatment for many patients with advanced kidney disease. Compared to Caucasians, South-Asian Canadians are less likely to undergo LDKT. In Ontario, they are also less likely to register for deceased organ donation compared to the general public. Lack of transplant related knowledge, lack of awareness about the benefits of LDKT,

concerns about safety of the donor or culturally determined negative attitudes contribute to barriers for South-Asian Canadians to pursue LDKT. We are conducting a mixed methods study among South-Asian Canadians (patients with advanced kidney disease and members of the community) to understand culture specific barriers to KT and living donor transplant and their culture specific education needs. We will then engage patients, community leaders to help us develop new clinical pathways and produce a culturally competent kidney transplant education package.

**Students' role:** Literature review; collaboration with community groups; enrolling patients; organize focus groups; qualitative analysis; data entry and analysis using STATA; preparing abstracts, posters for conferences; writing manuscripts

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## PART 3 – Project Information

**Project Title:**

Developing a linguistically, culturally, and religiously competent guide to kidney transplantation (KT) for **African, Caribbean and Black Canadians**

**Keywords (min 6):**

Health equity; ethnocultural disparities; African, Caribbean and Black Canadians; kidney transplantation; qualitative research; culturally competent care; health education; patient reported outcomes

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

**We are studying the cultural barriers that prevent African, Caribbean and Black (ACB) Canadians from receiving live donor KT. We will develop an educational package about kidney donation and kidney transplant (KT) to address the cultural barriers and specific health education needs of ACB Canadians**. Living Donor KT (LDKT) is the optimal treatment for most patients with advanced kidney disease. Compared to Caucasians, ACB Canadians are less likely to undergo LDKT. Lack of transplant related knowledge, lack of awareness about the benefits of

KT, concerns about the safety of the donor or culturally determined negative attitudes contribute to barriers for ACB Canadians to pursue LDKT.
We are conducting a mixed methods study (questionnaires, interviews and focus groups) among ACB Canadians (patients with kidney disease and members of the community) to understand culture specific barriers to KT and living donor transplant and their culture-specific education needs. We will engage patients, community leaders and faith leaders to help us develop new clinical pathways and produce a culturally competent kidney transplant education package.
**Students' role**: Literature review; collaboration with community groups; enrolling patients; organize focus groups; qualitative analysis; data entry and analysis using STATA; preparing abstracts, posters for conferences; writing manuscripts.

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## PART 3 – Project Information

**Project Title:**

Developing a linguistically and culturally competent guide to kidney transplantation (KT) for **Chinese Canadians**

**Keywords (min 6):**

Health equity; ethnocultural disparities; African, Caribbean and Black Canadians; kidney transplantation; qualitative research; culturally competent care; health education; patient reported outcomes

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

**We are studying the cultural barriers that prevent Chinese Canadians from receiving live donor KT. We will develop an education program to address those barriers and specific health education needs of Chinese Canadians.** Living donor KT (LDKT) is the optimal treatment for many patients with advanced kidney disease. Compared to Caucasians, Chinese Canadians are less likely to undergo LDKT. In Ontario, Chinese Canadians are also less likely to register to deceased organ donation compared to the general public. Lack of transplant related knowledge, lack of awareness about the benefits of LDKT, concerns

about safety of the donor or culturally determined negative attitudes contribute to barriers for Chinese Canadians to pursue LDKT. We are conducting a mixed methods study (questionnaires, interviews and focus groups) among Chinese Canadians (patients with advanced kidney disease and members of the community) to understand culture-specific barriers to KT and living donor transplant, and their culture-specific education needs. We will then engage patients, community leaders and faith leaders to help us produce culturally competent kidney transplant education package.
**Students' role:** Literature review; collaboration with community groups enrolling patients; organize focus groups; qualitative analysis; data entry and analysis using STATA; preparing abstracts, posters for conferences; writing manuscripts

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## PART 3 – Project Information

**Project Title:**

Developing a linguistically, culturally, and religiously competent guide to kidney transplantation (KT) for **Muslim Canadians**

**Keywords (min 6):**

Health equity; ethnocultural disparities; Muslim Canadians; kidney transplantation; qualitative research; culturally competent care; health education; patient reported outcomes

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

**We are studying the cultural and religious barriers that prevent Muslim communities from accepting KT. We will develop a culturally and religiously sensitive educational package about kidney donation and kidney transplant (KT)to address cultural and religious barriers and specific health education needs of Muslim Canadians.** KT is the optimal treatment for most patients with advanced kidney disease. Compared to Caucasians, patients with South Asian and Middle Eastern background are less likely to receive live donor KT. Many of these patients belong to the Muslim community. Lack of

transplant related knowledge, lack of awareness about the benefits of KT and concerns about the religious position of Islam about KT and organ donation contribute to barriers to transplant. We are conducting a mixed methods study (questionnaires, interviews, and focus groups) among Muslim Canadians (patients with kidney disease and members of the community) to understand culture specific and religious barriers to KT. We will engage patients, faith leaders and Muslim organizations to help us produce culturally and religiously sensitive KT education package.

**Students` role:** Literature review; collaboration with community groups; enrolling patients; organize focus groups; qualitative analysis; data entry and analysis using STATA; preparing abstracts, posters for conferences; writing manuscripts

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Electronic patient reported outcome measures to guide systematic symptom and distress management among **heart transplant recipients**

**Keywords (min 6):**

Patient reported outcome measures; electronic data capture; health related quality of life; validation studies; heart transplantation; symptom management

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Solid organ transplant recipients (SOT) and professionals repeatedly identified management of physical and emotional symptoms as key priorities. Up to 40% of SOT recipients suffer from manageable emotional (depression, anxiety) and physical (chronic pain, fatigue) symptoms that impair their quality of life. Distress and symptom burden are also risk factors for non-adherence and poor clinical outcomes. Better addressing physical and emotional symptoms will improve adherence, quality of life and clinical outcomes. Patient reported outcome measures (PROMs) quantify physical and emotional symptoms.

Electronic capture of PROMs (ePROMs) enables real-time evaluation of results. The Patient Reported Outcome Measurement Information System (PROMIS) computer adaptive testing (CAT) item banks have been developed by the NIH to assess domains that are relevant across chronic conditions. CAT improves measurement precision while reducing questionnaire burden. **In this project we will develop a patient-centered ePROM assessment and response toolkit, and pilot test the feasibility of a trial with this toolkit to improve outcomes for heart transplant recipients.**

**Students' role:** Literature review; enrolling patients; organize focus groups; data entry and analysis using STATA; preparing abstracts; posters for conferences; writing manuscripts

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| **Telephone (Lab):** | **E-mail:** Lidiia.Iunashko@uhn.ca |

## PART 3 – Project Information

**Project Title:**

Electronic patient reported outcome measures to guide systematic symptom and distress management among **kidney transplant recipients**

**Keywords (min 6):**

Patient reported outcome measures; electronic data capture; health related quality of life; validation studies; kidney transplantation; symptom management

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Solid organ transplant recipients (SOT) and professionals repeatedly identified management of physical and emotional symptoms as key priorities. Up to 40% of SOT recipients suffer from manageable emotional (depression, anxiety) and physical (chronic pain, fatigue) symptoms that impair their quality of life. Distress and symptom burden are also risk factors for non-adherence and poor clinical outcomes. Better addressing physical and emotional symptoms will improve adherence, quality of life and clinical outcomes. Patient reported outcome measures (PROMs) quantify physical and emotional symptoms.

Electronic capture of PROMs (ePROMs) enables real-time evaluation of results. The Patient Reported Outcome Measurement Information System (PROMIS) computer adaptive testing (CAT) item banks have been developed by the NIH to assess domains that are relevant across chronic conditions. CAT improves measurement precision while reducing questionnaire burden. **In this project we will develop a patient-centered ePROM assessment and response toolkit, and pilot test the feasibility of a trial with this toolkit to improve outcomes for kidney transplant recipients.**

**Students' role:** Literature review; enrolling patients; organize focus groups; data entry and analysis using STATA; preparing abstracts; posters for conferences; writing manuscripts

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# Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Electronic patient reported outcome measures to guide systematic symptom and distress management among **liver transplant recipients**

**Keywords (min 6):**

Patient reported outcome measures; electronic data capture; health related quality of life; validation studies; liver transplantation; symptom management

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Solid organ transplant recipients (SOT) and professionals repeatedly identified management of physical and emotional symptoms as key priorities. Up to 40% of SOT recipients suffer from manageable emotional (depression, anxiety) and physical (chronic pain, fatigue) symptoms that impair their quality of life. Distress and symptom burden are also risk factors for non-adherence and poor clinical outcomes. Better addressing physical and emotional symptoms will improve adherence, quality of life and clinical outcomes. Patient reported outcome measures (PROMs) quantify physical and emotional symptoms.

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Electronic capture of PROMs (ePROMs) enables real-time evaluation of results. The Patient Reported Outcome Measurement Information System (PROMIS) computer adaptive testing (CAT) item banks have been developed by the NIH to assess domains that are relevant across chronic conditions. CAT improves measurement precision while reducing questionnaire burden. **In this project we will develop a patient-centered ePROM assessment and response toolkit, and pilot test the feasibility of a trial with this toolkit to improve outcomes for liver transplant recipients.**

**Students' role:** Literature review; enrolling patients; organize focus groups; data entry and analysis using STATA; preparing abstracts; posters for conferences; writing manuscripts

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Risk Factor Analysis of Hereditary Breast and Ovarian Cancer

**Keywords (min 6):**

Breast cancer, BRCA1, BRCA2, epidemiology, prospective, observational

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Women with a BRCA1 or BRCA 2 mutation are at increased risk for breast and ovarian cancers. There have been many impactful discoveries over the past 20 years of risk factors associated with the development of these cancers in mutation carriers. With a current database of over 16,000 women, we will continue to investigate the predictors of long term survival associated with surgical and non-surgical treatment of mutation carriers who develop cancer.
Through his/her placement, the student will gain exposure to cancer genetics, epidemiology and the analysis of multiple exposures. The findings from this study will have a significant impact and influence

on management options for high risk women. These findings will be published in a peer-reviewed journal and presented at conferences to both clinicians and the general public.

Student Responsibilities may include, and are not limited to:

- Research Ethics Board applications
- Data collection, analysis and quality control
- Conducting Follow-up interviews with participants
- Supporting Manuscript preparation
- Collaborations with other clinicians and scientists

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# Supervisor/Project Information Form

## PART 1 – Personal Information

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| **Telephone (Lab):** | **E-mail: yuliya.nikolova@camh.ca** |

## PART 3 – Project Information

**Project Title:**

The neural basis of cognitive dysfunction in addiction

**Keywords (min 6):**

neuroimaging, MRI, cognition, addiction

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

A summer research position is available in Dr. Nikolova's lab to support the neuroimaging component of the Cognitive Dysfunction in the Addictions (CDiA) study. The study aims to characterize the neural circuits underlying cognitive deficits in people with substance use disorders, and map individual differences in brain structure and function onto clinical outcomes.

The research practicum will focus on MRI data processing and quality control, data entry and statistical analysis. Prior experience with computer programing (e.g., R, MATLAB) or neuroimaging data (fMRI, structural or diffusion MRI) will be considered an asset, though it is not required. Training will be provided.

The successful candidate will support a healthy workplace that embraces diversity, encourages teamwork, and complies with all applicable CAMH policies, as well as all regulatory and legislative requirements. This position is located at 250 College Street.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Engagement, Recruitment and Retention of Small-to-Medium Enterprises in the Skilled Trades in Ontario: Understanding the Impact of the Employer

**Keywords (min 6):**

Apprenticeship, retention, genetics, epigenetics, workplace mental health, recruitment, occupational science

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

We are proposing a study that focuses on leveraging new and existing apprentices and employers to evaluate apprentice retention rates of the Ontario Electrical League's (OEL) employer mentorship program. We aim to recruit 100 employers and apprentices that are actively engaged in the OEL's mentorship program to determine whether the program fosters sustainable, long-term apprentice retention. The recruited participants will complete a self-administered surveys to determine the factors associated with recruitment and retention. Participants will also be invited to complete standardized

self-report assessment tools that examine their mental health and perceived workplace resources and demands. Following the surveys, interviews will be used to better understand recruitment and retention factors associated with a career in the skilled trades through the experience and perspective of the apprentice and the employer. We will also perform genetic and epigenetic analyses using DNA extracted from saliva to investigate the potential link between genetic factors with occupational stressors and burnout at the workplace as well as with employees'/apprentices' retention rate.
The student will be involved in data collection (through survey and interviews), quantitative and qualitative data analyses, and report preparation. The student needs to have a good knowledge in computer skills and statistics.

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## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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| **Telephone (Lab):** | **E-mail: samantha.singh@sickkids.ca** |

## PART 3 – Project Information

**Project Title:**

Systematic Review of Drug Safety information: Diuretics

**Keywords (min 6):**

Safety, Adverse Drug Events, Drug-Associated Harm, Epidemiology, Drug Safety

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

We will perform a systematic review of drug safety information for a commonly used diuretic agent: furosemide. A librarian -assisted search of selected electronic databases will generate a list of titles and abstracts for review by the student; selected titles will be obtained in full text for further review. Selected articles will have safety data abstracted using standardized approach from case reports, case series, and cohort studies. Data will be presented with the absolute numbers and proportions of patients with each event type, or all severe events. Data from Case-reports and case series will complement the above descriptions.

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## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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| **Telephone (Lab):** | **E-mail: bahar.golbon@uhn.ca** |

## PART 3 – Project Information

**Project Title:**

CANNECT Database: The Role of Preoperative Data in Guiding Surgery and Determining Cancer Outcomes

**Keywords (min 6):**

Endocrine surgery, oncology, thyroid, preoperative ultrasound, thyroid nodule, clinical research

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Thyroid cancer is the most common cancer in many demographics and one of the fastest growing malignancies with an annual increase of 6.2% in Canada from 1992 to 2013. Thyroid cancer patients have a very good prognosis so clinicians must be cautious in overtreatment of disease. Currently, low-risk thyroid cancer is treated quite variably in Canada given a paucity of data linking the preoperative scans and aggressiveness of treatment with prognosis. The objective of this project is to determine if preoperative data including ultrasounds, can guide endocrinologists and surgeons in developing evidence-based treatment plans for patients which optimize outcomes and decrease exposure to

morbid treatment modalities. The research student will facilitate the data collection and analysis of this study. They will curate and transfer data points of interest from electronic patient records to a cloud-based database (REDCap). The data points include: demographic, pre-operative, surgical, and follow-up data.

Previous temporary summer students have had the opportunity to initiate and publish data as well as become familiar with research methods and communication and presentation of data.

Students should have experience reading scientific articles. Experience in data collection from medical charts is preferred, but not necessary. Students will work in multidisciplinary teams made up of students, surgeons, endocrinologists, radiologists and pathologists.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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| **Telephone (Lab): 416-603-5320** | **E-mail: aylin.reid@utoronto.ca** |

## PART 2 – Administrative Assistant's Information

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| **First Name: Smitha** | **Last Name: Felix** |
| **Telephone (Office): 416-603-5320** | **Address: Toronto Western Hospital, 5WW** |
| **Telephone (Lab):** | **E-mail: smitha.felix@uhn.ca** |

## PART 3 – Project Information

**Project Title:**

Investigating cell types involved in increased seizure susceptibility in neurofibromatosis type 1

**Keywords (min 6):**

Neurofibromatosis type 1, seizures, epilepsy, interneurons, excitatory neurons, electrophysiology

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Neurofibromatosis type 1 (NF1) is a genetic disorder with various cutaneous and neurological manifestations. Although patients with NF1 have an increased risk of seizures, the reasons behind this are not fully understood. Genetic mouse models also demonstrate increased seizure susceptibility. The overall goal of this project is to gain an understanding of the specific cell types responsible for this phenomenon, particular whether this is mediated by changes in excitatory versus inhibitory neurons. The main role of the summer student will be to perform various behavioural and electrophysiological studies in a mouse model of NF1. There will also be some molecular work such as PCR and western

blotting. Experience in any animal models and/or any of these techniques will be a definite asset but not necessary for the position.

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# SUMMER UNDERGRADUATE RESEARCH PROGRAM 2023
# Supervisor/Project Information Form

## PART 1 – Personal Information

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| **First Name: Aylin** | **Last Name: Reid** |
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## PART 2 – Administrative Assistant's Information

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| **Telephone (Lab):** | **E-mail: smitha.felix@uhn.ca** |

## PART 3 – Project Information

**Project Title:**

Identifying cell-specific pathways involved in cognitive deficits after experimental traumatic brain injury

**Keywords (min 6):**

Traumatic brain injury, memory, cognition, electrophysiology, mice, anxiety

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Traumatic brain injury can have a variety of devastating consequences, including long-term deficits in memory and cognition. and the development of post-traumatic epilepsy. Evidence indicates rhythmic brain activities are part of the cognitive code, and show specific changes with disease states, indicating they may be a target for biomarker, mechanistic, and therapeutic investigations. The overall goal of this project is to develop a cognitive readout platform to identify altered cell-specific pathways in brain injury disease states. The main role of the summer student will be to perform various cognitive behavioural tests in a mouse model of traumatic brain injury. The student will also assist in the

collection of in vivo and in vitro electrophysiology recordings. Together these data will be used to obtain "mappings" between the in vitro and in vivo data to identify cell-specific pathways involved in the cognitive deficits.

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## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Investigating the role of the kynurenine pathway in a zebrafish model of traumatic brain injury

**Keywords (min 6):**

Traumatic brain injury, kynurenine, cognition, seizure, zebrafish, IDO1

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Traumatic brain injury can have a variety of devastating consequences, including long-term deficits in memory and cognition and the development of post-traumatic epilepsy. Evidence suggests overactivity of the kynurenine pathway after injury may be involved in the development of neurological deficits. The overall goal of this project is to use a zebrafish model of traumatic brain injury to determine whether pharmacological modulation of this pathway after traumatic brain injury will impact neurological outcomes. The main role of the summer student will be to induce traumatic brain injury in zebrafish and perform various behavioural tests to compare cognition and seizure susceptibility in animals receiving

various treatments after brain injury. Experience with basic science/preclinical neurological models is an asset but not required.

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## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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| **Telephone (Lab):** | **E-mail: Sharon.Wright@uhn.ca** |

## PART 3 – Project Information

**Project Title:**

Traumatic Stress in Patients with Acute Leukemia and their Caregivers

**Keywords (min 6):**

Leukemia, traumatic stress, acute stress disorder ,PTSD, caregivers, psychotherapy, adults, children

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

The project involves the study of psychological distress in patients with leukemia and their caregivers. This includes adults with acute leukemia and their caregivers, who are typically spouses or adult children, and children with leukemia, whose caregivers are typically their parents. Traumatic stress symptoms, which may meet the criteria for acute stress disorder or posttraumatic stress disorder, have been shown to be extremely common in both patients with acute leukemia and their caregivers and to adversely affect their quality of life. We are conducting a multisite study funded by the Canadian Institutes of Health Research and the Canadian Cancer Trials Group to evaluate the prevalence and predictors of these symptoms and their response to psychotherapeutic and symptom control

interventions. The student's project would focus on the prevalence and predictors of traumatic stress symptoms in the caregivers of adults and of children with acute leukemia. The student would join a multidisciplinary research team and benefit from a rich learning environment in the Department of Supportive Care at Princess Margaret Cancer Centre.

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## PART 1 – Personal Information

| | |
|---|---|
| **First Name: Gary** | **Last Name: Rodin** |
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## PART 2 – Administrative Assistant's Information

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| **First Name: Sharon** | **Last Name: Wright** |
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| **Telephone (Lab):** | **E-mail:** Sharon.Wright@uhn.ca |

## PART 3 – Project Information

**Project Title:**

The Quality of Dying and Death of Patients in Residential Hospice Care

**Keywords (min 6):**

quality of death, hospice, palliative, end-of-life, caregivers, adults

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

The project involves the study of the quality of dying and death of patients who have been cared for in a residential hospice at the end of life. More specifically, this study is intended to validate a novel measure of the quality of dying and death that has been designed to have global relevance and applicability. The data on this measure, referred to as the Quality of Dying and Death Questionaire- Revised Global Version, is obtained from online interviews with the primary family caregiver of the patient 3-6 months after their death. These interviews are being conducted with caregivers of patients in 3 hospices in Toronto and one in North Carolina. Ratings on the quality of dying and death are also being obtained for comparison from the physicians and nurses in these hospices. The student's project would focus on the

predictors of the quality of dying and death in patients in residential hospice care and the student would have the opportunity to participate in interviews with bereaved caregivers. The student would join a multidisciplinary research team and benefit from a rich learning environment in the Department of Supportive Care at Princess Margaret Cancer Centre.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Psilocybin Assisted Psychotherapy for Bipolar Depression: An fMRI Emotional-Processing Pilot Study

**Keywords (min 6):**

Psilocybin, mood disorders, neuroscience, psychedelics, fMRI, bipolar disorder

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Psychedelics have re-emerged as a promising treatment for treatment resistant psychiatric conditions. Psilocybin assisted therapy (PAT) has been evaluated for unipolar depression with promising results, however, patients with history of mania or hypomania have been excluded. Bipolar depression is very difficult to treat and requires novel interventions. The present study will be the first study to evaluate psilocybin for bipolar depression and will also evaluate neurobiological outcomes, namely, changes in amygdala reactivity in response to psilocybin therapy. This study is already fully funded and Health Canada approved allowing the student to be involved with actual participant recruitment, scaling,

outcomes measures, analysis, etc. in this exciting field of psychedelic medicine. Experience with clinical research, working with psychiatric patients and fMRI are all assets but not mandatory to apply.

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# SUMMER UNDERGRADUATE RESEARCH PROGRAM 2023
# Supervisor/Project Information Form

## PART 1 – Personal Information

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| **Telephone (Lab): Same** | **E-mail: Dmitry.Rozenberg@uhn.ca** |

## PART 3 – Project Information

**Project Title:**

Accuracy and Reliability of Internet Resources on Exercise Training in Ehlers-Danlos Syndrome

**Keywords (min 6):**

Ehlers-Danlos Syndrome; Exercise Training; Internet Resources; Rehabilitation; Education Resources; Health-Related Information

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

**Background/Rationale:** Ehlers-Danlos Syndrome (EDS) is a group of genetic connective tissue disorders characterized by multi-systemic manifestations including joint hypermobility and cardiopulmonary restrictions. Individuals with EDS commonly use the internet as a source of health information; however, the accuracy and reliability of content surrounding exercise training has not been evaluated.

**Aim:** To characterize the internet resources on exercise training in EDS and assess content, readability, and quality of websites.

**Methods:** The first 100 identified English websites searching for "exercise training in Ehlers-Danlos Syndrome" will be searched using Google, Yahoo, and Bing. We will compare the online recommendations provided on exercise training with recent scientific consensus recommendations. Website quality will be assessed using a validated instrument (DISCERN) and General Quality Scale. The search, content, and quality review will be performed by two reviewers and we will use multivariable regression to adjust for type of website, geographic location and website date.

**Significance:** This will be the first comprehensive assessment of content and quality of available online resources. This work will provide critical insight on the current state of health-related information for individuals with EDS.

**Student Role:** The student will be responsible for working with the multidisciplinary team to refine the project protocol, conduct website appraisal, and draft a conference abstract. Previous research experience with data abstraction an asset, but not essential.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

A scoping review of Alternative Level of Care (ALC) to patient transitions and access to care through quality improvement

**Keywords (min 6):**

Alternative Level of Care; Patient Transition; Housing Support; Scoping Review; Mental Health; and Hospital-Community partnership

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Alternate Level of Care (ALC) is a designation given to patients who no longer require the intensive support provided in a hospital setting, but who remain in hospital due to non-availability of housing with the healthcare support they need. In 2012, Centre for Addiction and Mental Health (CAMH) and a group of community housing agencies come together and established a partnership model to facilitate the

transition of ALC patients from inpatient units to high support housing in the community with the support that the patients need.

The research project aims to conduct a scoping review to better understand how and when the partnership works with key focus on structure, roles and communication within the partnership and the lessons learnt in the context of ALC. The student is expected to work with researchers, program and/or clinical teams to finalize the key scoping review research question, identify the scoping review framework, define inclusion/exclusion criteria, search and extract evidence from literature and present results. The results of the research project will inform ongoing qualitative evaluation of ALC and support Quality Improvement. The student will have an opportunity to also be involved and work with hospital leadership and clinical teams to analyze ALC data and a quality improvement intervention for this patient population.

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# Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Respiratory symptoms associated with work in medical instrument cleaning in hospitals

**Keywords (min 6):**

Asthma, disinfectants, work-related, occupational, airways

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Previous studies have shown an increased risk of developing asthma and respiratory symptoms among workers exposed to cleaning and disinfecting agents. A questionnaire survey of hospital workers with varying levels of exposure to cleaning and disinfecting agents was recently published by our group, confirming associations with some of these exposures (Garrido A, House R, Lipszyc Joshua, Liss G, Holness DL, Tarlo SM. Cleaning Agent Usage in Healthcare Professionals and Relationship to Lung and Skin Symptoms. J Asthma. 2021 Jan 25:1-14.). However, this study did not include hospital workers cleaning medical and surgical instruments in whom the exposure to cleaning and disinfecting agents is

expected to be especially high. We therefore hope to undertake a similar survey of these workers to compare with the other hospital workers.
The study has ongoing research ethics approval. The student would liaise with managers and the workers to recruit participants and to complete the questionnaire. A database will be developed and results will be analysed with comparisons to other groups of workers.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Neuroprotection and Neuroregeneration after acute and chronic spinal cord injury

**Keywords (min 6):**

Spinal cord injury
Neuroprotection
Neuroregeneration

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

In our models of acute spinal cord injury in Wistar or RNU rats we are examining a number of therapeutic strategies to improve recovery including the following: anti-inhibitory drugs, ampakines and and ischaemia inhibitors.
We perform a large number of clinical and histological outcome measures to determine safety and efficacy. The clinical tests include locomotion, nociception, ladder walk, inclined plane and 5 others.

The histological outcome measures include immunohistochemical analyses for phenotype and spared tissue.
The injury models we are use are: cervical or thoracic acute cord compression with modified extradural clips.

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## PART 1 – Personal Information

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## PART 3 – Project Information

**Project Title:**

Studies in outcome measures, cognitive impairment and quality of life in systemic lupus erythematosus (SLE).

**Keywords (min 6):**

Rheumatology, Clinical Epidemiology, Cognitive Impairment, Quality of Life, Health Outcomes

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

The student will participate in on of a number of ongoing and proposed clinical research studies relating to systemic lupus erythematosus (SLE) with particular focus on outcome measures for cognitive impairment in SLE, anxiety and depression and quality of life and associated factors related to these complications.

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## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Investigating neuron-glial crosstalk using Patch-seq and large-scale electron microscopy

**Keywords (min 6):**

Glia, neurons, RNAseq, electron microscopy, computer programming, data science

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Glial cell types, including oligodendrocytes, astrocytes, and microglia, are the supporting cells of the brain. These cell types interact with neurons in various roles, including to prune synapses and maintain neuronal homeostasis. While single-cell RNAsequencing performed on dissociated cells has revealed gene expression profiles of the brain's cell types in exquisite detail, these methods are unable to capture the rich network of cellular connections and interactions.

Here, we propose to use two complementary methods to better understand neuron-glial crosstalk. First, we will use data from Patch-seq, an emerging method for sampling transcriptomes from living neurons

following electrophysiological characterization. We will specifically build on recent work from our lab demonstrating that Patch-seq also samples mRNA from cells in the local microenvironment, including microglia. Second, we will integrate large-scale electron microscopy volumes, providing ultra-detailed data on cellular microstructure, including which cells are directly connected to one another. By integrating these disparate data types, we aim to develop detailed "maps" of various neuronal subtypes and how they form connections with each glial subtype.

This project will require some background in computer programming and data analysis. This position is limited to students at the UofT St. George campus.

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## Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Learning and memory in C. elegans

**Keywords (min 6):**

Worms, learning and memory, C. elegans, neurobiology, genetics, memory, learning, genes

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Our goal is to use the power and specificity of modern molecular genetics to reveal the component processes of learning and memory. In undertaking a mutational screening approach to learning and memory, we have taken advantage of the best-known multicellular organism, the nematode C. elegans. C. elegans has proven to be an excellent molecular model for mammalian (including human) biochemical functions. We will use the C. elegans learning and memory genes discovered to find their relevant mammalian homologues. Most important, the C. elegans mutants should allow us to ask if we can separate associative from non-associative learning, short from long-term memory, and learning and memory in one sensory modality from that in another sensory modality.

DESCRIPTION OF STUDENT PARTICIPATION: The students will participate in the initial screens for new learning mutant worms, as well as all of the behavioural testing to determine if the deficits are in learning, memory storage or the recall of memories.

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## PART 1 – Personal Information

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| **First Name: John** | **Last Name: Vincent** |
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| **Telephone (Lab):** | **E-mail: john.vincent@camh.ca** |

## PART 3 – Project Information

**Project Title:**

Functional studies of autism/intellectual disability gene PTCHD1

**Keywords (min 6):**

X-linked; autism; intellectual disability; Patched-related gene; missense mutation; protein stability

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

The X-linked gene PTCHD1 has been identified as a causative gene for ASD and/or intellectual disability in boys. Loss of function mutations are almost certainly causative, however missense mutations are generally reported clinically as variants of unknown significance, as there is currently no assay developed to determine their etiopathological status. Here we plan to explore this by measuring PTCHD1 protein with missense mutations for protein stability and longevity, using WB, also cycloheximide chase assay, as well as measuring free energy by circular dichroism and other approaches. We will also use immunohistochemistry to follow the progress of mutant PTCHD1 proteins through the cellular machinery post translation.

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## PART 1 – Personal Information

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## PART 3 – Project Information

**Project Title:**

Evaluation of small molecules and peptides as molecular chaperones or allosteric modulators to restore function of Rett syndrome protein MECP2 with missense mutations

**Keywords (min 6):**

Rett syndrome' MECP2; molecular chaperone; allosteric modulator; missense mutation; protein degradation; protein stability

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Rett syndrome (RTT) is the second most common genetic cause of intellectual disability in girls, and is caused by mutations in the X-linked gene *MECP2*. We are hoping to develop small molecules or peptides that can bind to the mutant MECP2 protein and restore its activity and/or stabilize the protein in cells, and thus potentially reverse the symptoms of RTT.

Specifically, we aim to:

- develop compounds to reverse MECP2 protein degradation, and/or restore its function, through **a.** computational screening for small molecules, and **b.** screening for short peptides, targeting wild-type MECP2, and the most common missense and nonsense mutations.
- Use patient derived induced pluripotent stem cells (iPSC) and lymphoblasts with specific MECP2 mutations, as well as generating additional cell lines with the required MECP2 mutations using CRISPR/cas9 editing, so we can measure MECP2 mRNA and protein levels, before and upon addition of our selected compounds.
- assay compounds for ability 1. to recover DNA-binding and/or chromatin-clustering and gene regulation abilities of MECP2; 2. to stabilize MECP2 protein; 3. to recover normal neuronal morphology.

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# Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Using neuroimaging-based biomarkers to inform interventional treatment methods for people with mental illness

**Keywords (min 6):**

neuroimaging, mental illness, clinical trials, brain stimulation, schizophrenia, depression

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Dr. Voineskos' lab is part of a large, multidisciplinary research lab at the Centre for Addiction and Mental Health, which is affiliated with the University of Toronto. Dr. Voineskos' research uses neuroimaging and brain stimulation in the context of clinical trials to discover new treatments for those with mental illness, with an emphasis on schizophrenia and depression.

The successful candidate will be part of a dynamic team of psychiatrists, engineers, and clinical researchers interested in understanding brain function and dysfunction. They will have an opportunity

to gain world-class experience in neuroimaging data analysis from a large, integrated, and collaborative team. The project will focus on analyzing neuroimaging data from existing datasets, including functional MRI, structural MRI, and diffusion MRI. Familiarity with neuroimaging, programming (e.g., bash, Python, R), linux, and statistics is an asset; as is a basic knowledge of neuroscience, psychology, and/or biology. Training will be provided.

The successful candidate will support a healthy workplace that embraces diversity, encourages teamwork, and complies with all applicable CAMH policies, as well as all regulatory and legislative requirements. This position is located at 250 College Street.

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## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Evaluating the presence of accelerated aging in cancer and normal tissues treated ex vivo with radiation.

**Keywords (min 6):**

Lab-on-chip, cancer, radiotherapy, aging, senescence, ex vivo

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

The backbone to the treatment of soft-tissue sarcoma (STS) is a combination of radiotherapy (RT) with surgery. Stress secondary to DNA damaging therapeutic agents and RT can lead to treatments induced cellular aging or senescence. Chronic senescence may permanently confer a state of stemness in neighboring cells and create a microenvironment that promotes neoplastic growth, metastasis, and immunosuppression. Drug inhibition of Bcl-2, Bcl-x(L), Bcl-w (conceptually referred to as senolytics)

specifically induce apoptosis in senescent murine cells, improve aging-related functional decline of organs.

We hypothesize that preoperative RT induces senescence in STS and normal tissues. The addition of a senolytics will preferentially eliminate more senescent cancer than normal cells. Micro-Dissected Tumor (MDT) are tissues that are specifically dissected into sizes that can be incorporated and cultured in microfluidic devices (lab-on-chip). Working with a graduate student, **the Summer student** will generate MDTs from 6 human STS samples obtained either at biopsy or at the time of surgery. They will be processed as per our established lab-on-chip techniques. MDTs will be irradiated ex-vivo on-chip and subsequently, evaluated using various methods including live microscopy, supernatant analysis, and other embedding techniques to assess the presence of cellular senescence and response to senolytics.

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## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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| **Telephone (Lab): n/a** | **E-mail: bibin.varghese@camh.ca** |

## PART 3 – Project Information

**Project Title:**

ASPIRE Toronto: The Alliance of Suicide Prevention, Intervention, Research and Education at the University of Toronto

**Keywords (min 6):**

Suicide prevention, knowledge translation, health policy, qualitative research, medical education, capacity building

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

In the last two decades, suicide prevention was recognized as a global public health priority, and national prevention strategies have emerged in many countries, which have successfully facilitated developments in the field. In Canada, the Mental Health Commission of Canada has identified suicide rate reduction as a key priority, highlighting the need for widespread suicide prevention, intervention, and postvention strategies. Reviews of evidence from recent decades demonstrate significant advances over time in both the theoretical understanding and prevention of suicide.

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ASPIRE's goal is to foster multimodal suicide prevention research at the University of Toronto, including students from all disciplines, while supporting under-represented minorities and women. We act a research incubator and collaborative network.

The successful summer student candidate will support the creation of a database of suicide prevention research across the University of Toronto, engage in knowledge translation and integration strategies to foster collaboration across the network, and participate in scoping review and policy papers (i.e., for the Canadian Journal of Psychiatry) focusing on the need to understand and research suicide as a complex, multifactorial outcome with bio/psycho/social/cultural underpinnings.

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## PART 1 – Personal Information

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## PART 3 – Project Information

**Project Title:**

Genetic studies of psychiatric conditions

**Keywords (min 6):**

Suicide attempt, suicidal ideation, suicidality, self-harm, psychiatric disorders, genome-wide association studies, meta-analysis, pharmacogenetics

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Suicide claims over 800,000 lives each year worldwide, and with each suicide, there are at least 20 suicide attempters and 60 individuals who suffer from thoughts of suicide, making it a serious public health problem. The biological mechanism underlying suicidality remains unclear, but genetic factors likely play an important role. The overall goal of our research program is to identify genetic markers that predict suicidality and treatment response/side effects, leading to improved suicide prevention and treatment outcomes in psychiatric patients. The summer student will be carrying out a project related to suicidality and/or psychiatric pharmacogenetics, involving genotypes, environmental factors, demographic, and clinical data. Research methodologies may include genome-wide association studies, gene-gene interaction analysis, gene-environment interaction analysis, and meta-analysis.
Knowledge of basic statistical and genetic concepts is required, and experience working with R software is recommended.

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## PART 1 – Personal Information

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## PART 3 – Project Information

**Project Title:**

Pharmacoepigenetics of antidepressant response in generalized anxiety disorder

**Keywords (min 6):**

Generalized anxiety disorder (GAD), pharmacogenetics, pharmacoepigenetics, SSRI/SNRI antidepressant response, genetics, epigenetics

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

This research proposal will use multi-dimensional measures to identify clinical, genetic, epigenetic, and environmental factors that influence SSRI/SNRI antidepressant response and side effects in individuals with generalized anxiety disorder (GAD). The primary goal of this research proposal is to utilize integrative approaches that incorporate known functional information (i.e., gene expression) in genome-wide studies to identify novel genomic and epigenomic markers associated with SSRI/SNRI response and/or side-effects (discovery sample N=450 – already collected) in individuals with GAD. We will validate these observations in a newly collected sample of prospectively assessed GAD patients (N=150) and perform a meta-analysis. In addition, we will conduct whole genome methylation analyses in a subset of patients (discovery, N=100 and validation, N=100). Identification of clinical, genetic, and epigenetic factors and incorporation of these in a pharmaco-epi-genetic test will lead to improvement in treatment response and reduce the socioeconomic burden of GAD.

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## PART 1 – Personal Information

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## PART 3 – Project Information

**Project Title:**

Critical roles of alterations of gap junction coupling in aging related hippocampal Hyperexcitability: Investigation in mouse models

**Keywords (min 6):**
EEG, Electrical synapses, chemical synapses, hippocampus, memory, mice

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

The hippocampus is critical for memory in humans, non-human primates, and rodents. Aging is associated with impaired hippocampal memory. Growing studies indicate hippocampal hyperactivity/hyperexcitability (HH) a cause factor of hippo memory impairment in aged humans and rodents. The hippocampal HH is attributable to altered glutamate and/or GABA synapses in the hippo CA3 region, but underlying mechanisms are unclear. Intercellular communications via electrical synapses or gap junction couplings (GJCs) are fundamental for brain activities, but GJCs in aging/aged brain are an understudied area. Thus far, only a few studies examined aging related alterations of hippocampal GJCs in rodent models, suggesting that GJCs may increase in aged glutamatergic neurons and decrease in aged astrocytes relative to young hippocampal cells. However, CA3 specific GJC activities and their impacts on hippocampal HH remain uncharacterized. Previous works from our lab demonstrated CA3 HH in aged C57 black mice. Based on the above information, we hypothesize that altered GJC activities in CA3 cells are major attributors of hippocampal HH and memory impairment in aged C57 mice. Specific experiments are: 1) to recognize aged memory-impaired mice and associated hippocampal EEG signals; 2) to obtain hippocampal slices from young and aged mice and to assess GJC activities in pyramidal neurons, GABAergic interneurons, and astrocytes in the CA3 region. An undergraduate summer research student to be recruited is expected to participate in the above-described experiments.

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# Supervisor/Project Information Form

## PART 1 – Personal Information

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## PART 2 – Administrative Assistant's Information

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## PART 3 – Project Information

**Project Title:**

Randomized Phase II trial of electronic Symptom screening with Targeted Early Palliative care (eSTEP)

**Keywords (min 6):**

Cancer; Palliative Care; Symptom Assessment; Patient Reported Outcome Measures; Quality of Life; Feasibility Studies

**Project Description - Please indicate the research project that the student will be undertaking in your lab and if specific background/experience is required. (Maximum: 200 words!)**

Early palliative care (EPC) has been shown to improve quality of life and symptom control in patients with advanced cancer. As EPC is not possible in all settings, to ensure equitable access based on symptom severity we developed a novel intervention, Symptom screening with Targeted Early Palliative care (STEP), and demonstrated its feasibility in a previous trial at the Princess Margaret Cancer Centre (PM). In response to the COVID-19 pandemic and subsequent shift to virtual care, our team has developed a virtually-delivered version, electronic STEP (eSTEP). eSTEP utilizes routine symptom

screening before oncology visits to trigger a short virtual palliative care consult for patients who report moderate-to-severe symptoms, and subsequent virtual palliative care clinic visits.
Alongside the study team, the SURP student will assist with recruitment and data collection for a funded randomized phase II trial at the PM oncology clinics comparing eSTEP with symptom screening alone (usual care) for patients with advanced cancer. All participants will complete questionnaires at baseline, 2, 4, and 6 months, which include scales for quality of life, symptom control, depression, and satisfaction with care.
No specific experience is required but an interest in clinical research and patient interaction is important.