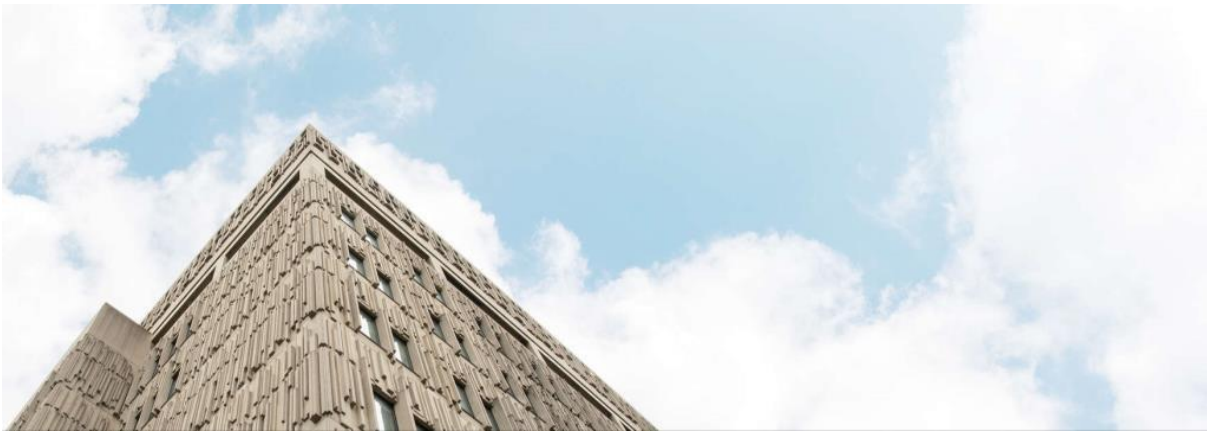
Institute of Medical Science
UNIVERSITY OF TORONTO



IMS Graduate Student Recruitment: September 2024

The Institute of Medical Science (IMS) is one of the largest graduate units at the University of Toronto. With over 600 active graduate faculty members, the IMS takes a leading role in translational research training that links fundamental discovery with patient-based research and clinical applications in health promotion and disease prevention with the intention of improving health outcomes for individuals and populations.

We are dedicated to training medical researchers and dissemination of new knowledge relevant to human biology and pathobiology within our Doctoral Stream Programs. The program includes both a Master of Science (MSc) and a Doctor of Philosophy (PhD) degree.

All applicants must identify an appropriate IMS faculty member as their research supervisor before initial registration in the IMS graduate program.

Within this document, you will find:

- available MSc and PhD positions
- research summaries, keywords
- supervisor's funding information, and
- contact information

Interested students may contact the principal investigator or administrative assistants as listed.

To learn more, see Prospective Students, browse our full faculty list on our Faculty Directory.

**Last Updated: February 2024*

Principal Investigator: *Alibhai, Shabbir*

Currently Accepting	**MSc**
Ideal Candidate	interest in geriatrics or oncology, clinical or health services research or quality of life
Research Summary	Focus on clinical research in geriatric oncology, prospective cohort studies, supportive care trials in older adults with various cancers, with a special focus in prostate cancer.
Keywords	geriatric oncology, geriatric assessment, supportive care, remote symptom monitoring, toxicity, decision making
Lab location	TGH - UHN
Available Funding	Yes
Relevant Links	https://www.uhnresearch.ca/researcher/shabbir-alibhai
Contact Information	shabbir.alibhai@uhn.ca 4163405125

Principal Investigator: *Barr, Cathy*

Currently Accepting	**MSc**
Ideal Candidate	lab experience is required
Research Summary	The lab studies the genetic and biological bases of psychiatric and cognitive disorders using molecular genetics and biology techniques (e.g. CRISPR, transcriptome, stem cells from patients).

Keywords	Genetics, depression, reading disabilities, molecular biology, stem cells, psychiatric disorders
Lab location	Krembil Research Institute, Toronto Western Hospital
Available Funding	Yes
Relevant Links	https://www.sickkids.ca/en/staff/b/cathy-barr/
Contact Information	cathy.barr@uhn.ca 416-603-5800 x2744

Principal Investigator: *Barua, Moumita*

Currently Accepting	**MSc; PhD**
Ideal Candidate	
Research Summary	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 lab is currently funded by 2 CIHR awards. The 3 main projects in the lab are: 1. Genome-wide association studies of kidney traits - basic programming knowledge is an asset for this human based study 2. Pax2 mediates kidney repair/regeneration - enthusiasm to work with mouse models is an asset 3. Mechanisms in Alport syndrome - enthusiasm to work with mouse models is again an asset

	We are looking for highly motivated trainees to join our supportive team to work on any one of these projects depending on applicant interests and strengths. Trainee career development is an important part of mentorship for the supervisor. Lab alumni have gone on to medical school, entered extremely competitive IMG residency programs and continued their research careers in academic institutions, industry and national organizations such as CIHI.
Keywords	large data sets, next-generation sequencing, single cell sequencing, proteomics, mouse models, kidney disease
Lab location	Toronto General Hospital
Available Funding	Yes
Relevant Links	https://orcid.org/0000-0003-0628-9071 https://ims.utoronto.ca/faculty/moumita-barua https://www.uhnresearch.ca/researcher/moumita-barua
Contact Information	moumita.barua@uhn.ca 416-340-4800 ext 8007

Principal Investigator: *Chapman, Kenneth*

Currently Accepting	**MSc; PhD**
Ideal Candidate	
Research Summary	We are testing the usefulness of exhaled nitric oxide measurements in the diagnosis of asthma (versus conventional measures of lung function including direct and indirect challenge studies). A broad range of other airway research is also underway including work with alpha-1 antitrypsin deficiency.

Keywords	asthma; COPD; alpha-1 antitrypsin deficiency; exhaled nitric oxide
Lab location	TWH and Inspiration Research Limited
Available Funding	Yes
Relevant Links	https://pubmed.ncbi.nlm.nih.gov/?term=chapman+K.r.&sort=date
Contact Information	ken.chapman.airways@gmail.com 416-603-5499

Principal Investigator:	*Connelly, Kim*
Currently Accepting	**MSc; PhD**
Ideal Candidate	
Research Summary	Dr. Connelly runs a basic research laboratory at the Keenan Research Centre at St. Michael's Hospital where he focuses upon basic mechanisms of disease – primarily around the role of pathological extracellular matrix accumulation and the pro-sclerotic cytokine transforming growth factor beta, with a focus upon translating discoveries into therapies in humans. He developed the first hemodynamically validated model of diabetes induced HFpEF. He is the Director of the Krembil Stem Cell Facility at St. Michael's Hospital and uses regenerative cell based therapies to improve cardiac and renal dysfunction as a result of diabetes. With an H-index of 63 and i10-index of 196, Dr. Connelly's impactful work has been cited over 12,938 times, appearing in prestigious journals like the Journal of the American College of Cardiology (JACC), Circulation, European Heart Journal (EHJ), and Lancet Endocrinology and Diabetes. He serves as an associate editor for Cardiovascular Diabetology and Cardiovascular Drug Therapy and sits on the editorial boards of journals like The Canadian Journal of Cardiology and Cardiovascular Diabetology.

	Dr. Connelly has secured substantial funding, including grants from the Canadian Institutes of Health Research (CIHR), Heart and Stroke Foundation of Canada (HSF), and Canadian Foundation for Innovation (CFI), totaling >$2 million since 2016, along with additional support >$9 million from industry sources. He has also been a co-applicant on grants totaling >$25 million. Recognized for his scientific contributions, Dr. Connelly has received prestigious awards such as the HSF Clinician Scientist Award, CIHR New Investigator Award, SC Verma Award, and the Insulin 100 Emerging Leader Award. He has also been honored with the Canadian Cardiovascular Congress YIA 2012 and has served in leadership roles, including past chair of the Canadian Cardiovascular Guideline and chair of the macrovascular complication section for Diabetes Canada CPG 2018. In addition to his research leadership, Dr. Connelly serves as the Executive Director of the Keenan Research Centre for Biomedical Science at Unity Health Toronto, holds the Keenan Chair in Research Leadership, and leads the Division of Cardiology at St. Michael's Hospital in Toronto.
Keywords	Cardiovascular physiology, in particular the role of prosclerotic cytokines and extracellular matrix upon cardiac diastolic function in disease states such as hypertension and diabetes.
Lab location	St. Michael's Hospital
Available Funding	Yes
Relevant Links	https://pubmed.ncbi.nlm.nih.gov/?term=Kim+connelly
Contact Information	Kim.Connelly@unityhealth.to Admin Asst - Shermaine Hernandez: Shermaine.Hernandez@unityhealth.to (416) 864-5425 Admin Asst - Shermaine Hernandez: (416) 856-5705

Principal Investigator:	*Davis, Karen*
Currently Accepting	**MSc; PhD**

Ideal Candidate	Prefer students with a neuroscience background and ideally some research experience related to pain and/or brain imaging
Research Summary	The main focus of research in my lab is the central mechanisms underlying pain, the influence of attention and mechanisms of plasticity under normal conditions and in people with chronic pain. A variety of experimental techniques are used including structural and functional brain imaging using MRI and magnetoencephalography (MEG), psychophysical and cognitive assessment. The lab is particularly focused on examining brain-behaviour relationships to better understand the individual differences (including sex differences) in pain sensitivity and brain circuitry that provide insight into brain abnormalities in chronic pain, treatment responses, and to predict how patients with chronic pain will respond to specific treatments.
Keywords	pain, imaging, MEG, plasticity, attention, sex differences, brain
Lab location	Toronto General Hospital
Available Funding	Yes
Relevant Links	https://scholar.google.com/citations?user=Zd1fmDMAAAAJ&hl=en&oi=ao
Contact Information	karen.davis@uhn.ca 416-603-5662

Principal Investigator: *Desarkar, Pushpal*

Currently Accepting	**MSc**
Ideal Candidate	- willing to work with autistic adults and youth - Neuroscience/EEG background is welcome - willing to learn brain stimulation / neurophysiology - publication/presentation will be an asset

Research Summary	Using innovative brain stimulation techniques, including transcranial magnetic stimulation (TMS) and the combination of TMS and EEG (TMS-EEG), Dr. Desarkar is investigating evidence for atypical network plasticity and its connection with autism-associated difficulties (e.g. motor function difficulties, sensory sensitivities, executive function difficulties). He is using novel brain stimulation techniques to develop innovative 'brain mechanism-driven' treatment options for these autism-associated difficulties to improve outcomes for autistic adults.
Keywords	Autism, neurophysiology, rTMS, brain stimulation, plasticity
Lab location	CAMH
Available Funding	Yes
Relevant Links	https://www.camh.ca/en/science-and-research/science-and-research-staff-directory/pushpaldesarkar
Contact Information	Pushpal.Desarkar@camh.ca 4165358501, x 32726

Principal Investigator: *Diaconescu, Andreea*

Currently Accepting	**MSc; PhD**
Ideal Candidate	Computational neuroscience, Bayesian statistics, Machine Learning, EEG or fMRI expertise
Research Summary	Dr. Diaconescu's research is centered on the clinical validation of computational models of aberrant belief formation for predicting psychosis risk and treatment response in help-seeking youth populations, and identifying predictors of suicide attempts transdiagnostically using computational and neuroimaging methods.
Keywords	hierarchical Bayesian modelling, computational psychiatry, psychosis, suicide prevention, EEG, functional MRI, effective connectivity
Lab location	CAMH

Available Funding	Yes;
Relevant Links	cognemo.com
Contact Information	andreea.diaconescu@camh.ca (416) 535-8501 ext. 30585

Principal Investigator: *Fehlings, Michael*

Currently Accepting	**MSc; PhD**
Ideal Candidate	I am recruiting students interested in pursuing a PhD in my lab (I am open to bringing in MSc students who are motivated to transition to a PhD).
Research Summary	Our laboratory integrates molecular, imaging, electrophysiological and neurobehavioural approaches to examine the pathophysiology and treatment of traumatic and non-traumatic forms of spinal cord injury. Current studies in SCI are focused on understanding the mechanisms of the secondary injury after SCI with a focus on examining the role of inflammation, the development of novel neuroprotective strategies, and the use of stem cell transplantation strategies to repair the spinal cord. The translation from bench to bedside is a key goal of our research and is exemplified in the team's involvement in clinical research.
Keywords	-spinal cord injury -degenerative cervical myelopathy -neuroprotection -neural regeneration -clinical research
Lab location	Krembil Discovery Tower - Toronto Western Hospital

Available Funding	Awaiting Results
Relevant Links	https://pubmed.ncbi.nlm.nih.gov/?term=mg+fehlings&sort=date
Contact Information	Michael.Fehlings@uhn.ca 416-603-5627

Principal Investigator: *Feld, Jordan*

Currently Accepting	**MSc; PhD**
Ideal Candidate	Preferred students with background in virology or antiviral immune responses
Research Summary	Our lab focuses on hepatitis B and C infections with an interest in innate antiviral immunity, vaccine development (for HCV) and mechanisms of action of novel therapeutic agents (HBV).
Keywords	Hepatitis B virus Hepatitis C virus Vaccine Interferon Innate immunity
Lab location	UHN
Available Funding	
Relevant Links	
Contact Information	jordan.feld@uhn.ca; eliverta.bicja@uhn.ca

	416 340 4584

Principal Investigator: *Furlan, Julio*

Currently Accepting	**MSc**
Ideal Candidate	
Research Summary	My research program is currently focused on the impact of sleep disorders on individuals with spinal cord injury; the use of neuromodulation in the rehabilitation of individuals with spine disease; and cerebral concussion
Keywords	spinal cord injury; spine disease; sleep disorders; neuromodulation
Lab location	Lyndhurst Centre, Toronto Rehabilitation Institute and KITE Research Institute
Available Funding	Awaiting Results
Relevant Links	https://kite-uhn.com/scientist/julio-furlan
Contact Information	Julio.Furlan@uhn.ca 416-597-3422 (x 6129 with Julia)

Principal Investigator: *Grant, Robert*

Currently Accepting	**MSc; PhD**
Ideal Candidate	Students must have a demonstrated track record of training neural networks on computing clusters, an interest in applying machine

	learning to oncology, and the ability to collaborate within diverse teams.
Research Summary	Our research team applies machine learning to multi-modal data, aiming to improve outcomes for people with cancer. Data modalities include multi-omics, as well electronic health record data including clinical notes and pathology images.
Keywords	Machine learning; artificial intelligence; oncology; genomics
Lab location	Princess Margaret Cancer Centre
Available Funding	Yes
Relevant Links	
Contact Information	robert.grant@uhn.ca 4169464501x3308

Principal Investigator: *Hamani, Clement*

Currently Accepting	**MSc; PhD**
Ideal Candidate	
Research Summary	Our lab is interested in developing Brain Stimulation and Neuromodulation treatments in animal models of various neuropsychiatric disorders, as well as to understand the mechanisms responsible for these therapies. To these aims, we use a series of techniques that range from behavioural testing, stereotactic procedures, neurochemistry, histochemistry and molecular biology assays.

Keywords	Deep Brain Stimulation Focused ultrasound Psychiatric disorders Traumatic Brain injury Animal models
Lab location	Sunnybrook
Available Funding	Yes
Relevant Links	https://pubmed.ncbi.nlm.nih.gov/?term=hamani+c
Contact Information	clement.hamani@sunnybrook.ca 4164806100 ext 3315

Principal Investigator: *Koritzinsky, Marianne*

Currently Accepting	**MSc; PhD**
Ideal Candidate	We are seeking a motivated and dedicated student to join our research team. Applicants must have background in molecular and cellular biology and/or biochemistry and previous laboratory experience. They must be excited about fundamental science discovery and focused on learning and growing as scientists. We offer an outstanding learning environment, excellent mentorship and opportunity to contribute to solving important fundamental research questions.
Research Summary	The goal of our team is to increase the understanding of molecular and cellular responses to hypoxia, altered metabolism and redox homeostasis in the tumor microenvironment, interaction with radiation and immune therapy - with the ultimate goal of targeting these responses to improve patient outcomes.

Keywords	Tumor microenvironment, redox homeostasis, metabolism, hypoxia, protein folding, mRNA translation
Lab location	Princess Margaret Cancer Research Tower
Available Funding	Yes
Relevant Links	DOI: 10.1126/sciadv.adj6409 DOI: 10.1126/sciadv.abf7114 DOI: 10.1016/j.jbc.2021.100505
Contact Information	Marianne.Koritzinsky@uhn.ca 4165817841

Principal Investigator: *Kumar, Sanjeev*

Currently Accepting	**MSc; PhD**
Ideal Candidate	Technical skills in electroencephalography data analyses, familiarity with statistical methods, ability to analyze large datasets.
Research Summary	Clinical research into cognitive disorders such as Alzheimer's disease. Studies involving transcranial magnetic stimulation, transcranial direct current stimulation, electroencephalography and brain imaging to understand cortical neurophysiology features such as cortical excitability and cortical plasticity. Another line of research in our lab is regarding pharmacological and non-pharmacological interventions for behavioural symptoms of dementia.
Keywords	Dementia, cognitive disorders, biomarkers, brain stimulation, Behavioural symptoms of dementia, Standardization of interventions.

Lab location	CAMH
Available Funding	Awaiting Results
Relevant Links	https://www.camh.ca/en/science-and-research/science-and-research-staff-directory/sanjeevkumar
Contact Information	Sanjeev.kumar@camh.ca 416-535-8501

Principal Investigator: *Kwan, Jennifer*

Currently Accepting	**MSc;**
Ideal Candidate	We are seeking dedicated students interested in molecular biology. As a Clinician-Scientist & IMS graduate, Dr. Kwan is keen to mentor the next generation of scientists.
Research Summary	We are developing novel biomarkers and therapeutics for treatment-related side effects to improve the health and quality of life of cancer patients in the long-term.
Keywords	Breast Cancer, Molecular Biology, Cell Culture, Mouse Models, Biomarkers, Drug Discovery
Lab location	Princess Margaret Cancer Centre/ Research Institute, University Health Network
Available Funding	Yes
Relevant Links	
Contact Information	jennifer.kwan@uhn.ca

Principal Investigator:	*Lam, Tony K.T.*
Currently Accepting	**MSc; PhD**
Ideal Candidate	
Research Summary	The Lam lab investigates novel nutrient sensing-dependent pathway in the small intestine, kidney and the brain that impact glucose homeostasis, food intake and body weight in rats and mice.
Keywords	Kidney, Small Intestine, Brain, Diabetes, Obesity,
Lab location	MaRs Centre
Available Funding	Yes
Relevant Links	
Contact Information	tonykt.lam@uhn.ca 4165817880

Principal Investigator:	*Madani, Amin*
Currently Accepting	**MSc;**
Ideal Candidate	background in AI, machine learning, deep learning or education preferred
Research Summary	The aim of our research program is to develop and validate new technologies and methodologies to improve surgical performance.

	Examples include computer vision deep learning models that are capable of identifying surgical anatomy and augment surgeons' mental model, telestration tools for live on-site and remote telecoaching, intra-operative navigation and post-operative video analysis, the use of haptic devices and machine learning for performance assessment, and video games for team-training.
Keywords	surgical education, machine learning, computer vision, assessment, performance, patient safety
Lab location	University Health Network
Available Funding	Yes
Relevant Links	https://temertysimcentre.com/surgical-artificial-intelligence-research-academy-sara/
Contact Information	amin.madani@uhn.ca (416) 340-3843

Principal Investigator: *Mah, Linda*

Currently Accepting	**MSc; PhD**
Ideal Candidate	Neuroscience
Research Summary	The Mah lab focuses on developing novel risk markers for dementia based on behavioural paradigms, neuroimaging, and physiological measures, as well as neurostimulation and other non-pharmacological interventions to prevent dementia. Current studies include neurostimulation clinical trials using deep transcranial magnetic stimulation in older adults with subjective cognitive decline, mild cognitive impairment, and late-life depression and measurement of heart rate variability in these

	populations.
Keywords	Depression, dementia, Alzheimer's, emotion, cognition, neurostimulation, neuroimaging
Lab location	Rotman Research Institute
Available Funding	Yes
Relevant Links	https://www.researchgate.net/profile/Linda-Mah https://psychiatry.utoronto.ca/faculty/linda-mah
Contact Information	Lmah@research.baycrest.org 416 785 2500 ext 3365

Principal Investigator: *Martinu, Tereza*

Currently Accepting	**PhD**
Ideal Candidate	
Research Summary	My lab studies mechanisms and biomarkers of chronic rejection after lung transplantation. Available projects at this time include: 1) The role of macrophages and macrophage-derived proteins in lung fibrosis after transplantation; and 2) Mechanisms of epithelial cell injury after lung transplantation, specific role of epithelial club cells and club cell secretory protein. Techniques used to study these topics include: flow cytometry, immunofluorescence, transcript analysis, single cell RNA sequencing, and cell culture.

Keywords	Lung transplant, chronic rejection, epithelial injury, single cell RNA sequencing
Lab location	PMCRT
Available Funding	Yes
Relevant Links	https://pubmed-ncbi-nlm-nih-gov.myaccess.library.utoronto.ca/?term=Martinu%2C+Tereza%5BAuthor+-+Last%5D&sort=pubdate
Contact Information	tereza.martinu@uhn.ca

Principal Investigator: Minian, Nadia

Currently Accepting	**MSc; PhD**
Ideal Candidate	
Research Summary	Background: Varenicline is a pharmacological intervention for tobacco dependence that is safe and effective in facilitating smoking cessation. Enhanced adherence to varenicline augments the probability of prolonged smoking abstinence. However, research has shown that one-third of people who use varenicline are nonadherent by the second week. There is evidence showing that behavioral support helps with medication adherence. We have designed an artificial intelligence (AI) conversational agent or health bot, called “ChatV,” based on evidence of what works as well as what varenicline is, that can provide these supports. ChatV is an evidence-based, patient- and health care provider–informed health bot to improve adherence to varenicline. ChatV has been programmed to provide medication reminders, answer questions about varenicline and smoking cessation, and track medication intake and the number of cigarettes.

Objective:

This study aims to explore the feasibility of the ChatV health bot, to examine if it is used as intended, and to determine the appropriateness of proceeding with a randomized controlled trial.

Methods:

We will conduct a mixed methods feasibility study where we will pilot-test ChatV with 40 participants. Participants will be provided with a standard 12-week varenicline regimen and access to ChatV. Passive data collection will include adoption measures (how often participants use the chatbot, what features they used, when did they use it, etc). In addition, participants will complete questionnaires (at 1, 4, 8, and 12 weeks) assessing self-reported smoking status and varenicline adherence, as well as questions regarding the acceptability, appropriateness, and usability of the chatbot, and participate in an interview assessing acceptability, appropriateness, fidelity, and adoption. We will use “stop, amend, and go” progression criteria for pilot studies to decide if a randomized controlled trial is a reasonable next step and what modifications are required. A health equity lens will be adopted during participant recruitment and data analysis to understand and address the differences in uptake and use of this digital health solution among diverse sociodemographic groups. The taxonomy of implementation outcomes will be used to assess feasibility, that is, acceptability, appropriateness, fidelity, adoption, and usability. In addition, medication adherence and smoking cessation will be measured to assess the preliminary treatment effect. Interview data will be analyzed using the framework analysis method.

Keywords	Implementation Science, Mixed Methods, Digital Interventions, AI, Smoking Cessation, Varenicline, Cancer Prevention
Lab location	CAMH
Available Funding	Yes
Relevant Links	https://www.nicotinedependenceclinic.com/en/knowledge-translation https://www.researchprotocols.org/2023/1/e53556/

	https://journals.sagepub.com/doi/full/10.1177/20552076231182807
Contact Information	nadia.minian2@camh.ca 416-585-3501

Principal Investigator: *Nissim, Rinat*

Currently Accepting	**MSc**
Ideal Candidate	Student must have previous experience with qualitative analysis (e.g., grounded theory; thematic/content analysis)
Research Summary	Lab focuses on the psychosocial needs of family caregivers of individuals with a cancer diagnosis, utilizing qualitative and mixed-method research approaches.
Keywords	Qualitative research; Psychosocial oncology; Family caregivers
Lab location	Princess Margaret Cancer Centre
Available Funding	Yes
Relevant Links	
Contact Information	rinat.nissim@uhn.ca 416-340-4800 ext 3586

Principal Investigator: *Pasternak, Jesse*

Currently Accepting	**MSc**
Ideal Candidate	We are looking for hard working, independent colleagues who are excited about the research and enjoy working with a team of other students including international grad students, residents, fellows and other surgeons. Background in statistics and experience in writing papers is a huge asset
Research Summary	Outcomes research on endocrine oncology disease specifically thyroid, parathyroid and adrenal tumors. We perform clinical trials and surgical innovation research.
Keywords	Endocrinology, Surgery, Thyroid, Parathyroid, Adrenal, Health Outcomes
Lab location	UHN
Available Funding	Awaiting Results
Relevant Links	https://surgery.utoronto.ca/faculty/jesse-pasternak
Contact Information	jesse.pasternak@uhn.ca 4165694212

Principal Investigator: *Penner, Melanie*

Currently Accepting	**PhD**
Ideal Candidate	Previous research experience and experience with neurodivergent children is an asset.

Research Summary	My lab conducts research that broadly aims to improve care delivery for autistic children/youth, including in the community.
Keywords	Autism Health services
Lab location	Holland Bloorview Kids Rehab
Available Funding	Yes
Relevant Links	https://hollandbloorview.ca/research-education/bloorview-research-institute/research-centres-labs/autism-research-centre/autism-research-centre-our-team/dr-melanie-penners-lab
Contact Information	mpenner@hollandbloorview.ca 416-425-6220 x3832

Principal Investigator: *Ravindran, Arun*

Currently Accepting	**MSc**
Ideal Candidate	
Research Summary	Neurobiology and therapeutics of mood and anxiety disorders. Global mental health implementing mental health education programs in low- and middle-income countries.
Keywords	psychopharmacology, depression, anxiety, global mental health, mental health literacy.
Lab location	CAMH

Available Funding	Yes
Relevant Links	https://www.researchgate.net/profile/Arun-Ravindran-3/research
Contact Information	arun.ravindran@camh.ca dea.gjomema@camh.ca

Principal Investigator: *Rizvi, Sakina*

Currently Accepting	**MSc; PhD**
Ideal Candidate	For PhD students - background in psychiatry research; experience with brain imaging research preferred if doing an imaging study; for psychotherapy studies just background in psychiatry research would be expected For MSc students - some experience working in the area of mental health (either through research or employment) preferred; some experience in a research environment through a senior thesis or as a student researcher
Research Summary	We conduct studies on the neurobiology of depression and suicide risk using PET/fMRI. We also test novel psychotherapy interventions for suicide risk.
Keywords	Suicide; treatment resistant depression; brain imaging; psychotherapy
Lab location	St. Michael's Hospital
Available Funding	Awaiting Results; Yes
Relevant Links	www.ASRlifec.a
Contact Information	rizvisa@smh.ca

Principal Investigator:	*Sage, Andrew*
Currently Accepting	**MSc**
Ideal Candidate	We are actively seeking talented students with a wide range of experience and training, including: computer science, biomedical engineering, biology and physiology.
Research Summary	Since the first successful lung transplant in Toronto in 1983, UHN has become the global leader in the transplantation. UHN's Toronto Lung Transplant Program is the largest of its kind in the world and home to many key advancements in the field, including Ex Vivo Lung Perfusion (EVLP). Unfortunately, up to 80% of donated lungs are not used for transplantation due to suspected injury and it is our mission to leverage EVLP to find better tools and techniques that will allow us to rescue more organs for those in need.
Keywords	artificial intelligence, machine learning, biotechnology, diagnostics
Lab location	TGH
Available Funding	Yes
Relevant Links	https://sagelabuhn.ca/
Contact Information	andrew.sage@uhn.ca

Principal Investigator:	*Serban, Monica*
Currently Accepting	**MSc**

Ideal Candidate	Skills in machine learning, Bayesian Network modeling, statistical analysis, and proficiency in data analysis using R, Stata, or Python.
Research Summary	My lab primarily focuses on personalizing and optimizing radiotherapy treatments while establishing clinical evidence for morbidity risk factors in cervix cancer. Much of our research revolves around over 3000 patients enrolled in the EMBRACE study (embracestudy.dk). Among our research interests is the establishment of clinical evidence for female sexual organs' dose tolerances through standard statistical analysis and machine learning techniques.
Keywords	Cervix cancer radiation therapy, Vaginal toxicity, Bayesian Networks predictive models, Statistical analysis, Clinical trials
Lab location	Princess Margaret Cancer Centre
Available Funding	Yes
Relevant Links	
Contact Information	monica.serban@uhn.ca ruti.shahin@uhn.ca (Ruth Shahin - administrative assistant) 437-249-5275

Principal Investigator: *Sgro, Michael*

Currently Accepting	**MSc**
Ideal Candidate	
Research Summary	Dr. Sgro has a research interest in neonatal hyperbilirubinemia, particularly looking at severe hyperbilirubinemia and the incidence of acute bilirubin encephalopathy and chronic bilirubin

	encephalopathy. He has developed a reputation both nationally and internationally as an expert in the field of Fetal Alcohol Spectrum Disorder, sepsis and prenatal exposures. This is supported by the number of publications, presentations, successful grant applications and committee memberships.
Keywords	neonatal hyperbilirubinemia neonatal sepsis
Lab location	St. Michael's Hospital
Available Funding	
Relevant Links	https://research.unityhealth.to/researchers/michael-sgro/
Contact Information	Michael.Sgro@unityhealth.to 647 274 1583

Principal Investigator: *Tyrell, Pascale*

Currently Accepting	**MSc; PhD**
Ideal Candidate	The ideal candidate will have strong statistical background and training, can program proficiently in python, has exposure to machine learning, and can effectively work with digital imaging data (on a large-scale). Some knowledge of CNNs and biomarker measurement using image processing would be desirable.
Research Summary	This project concerns biomarker analysis for large neuroimaging datasets. The biomarkers are extracted using various deep learning and image processing techniques. The thesis will include the design and investigation of various predictive and statistical analysis techniques for the imaging biomarkers on large cohorts, to learn more about disease mechanisms, and to prepare the biomarkers for translation. The diseases of interest include brain cancer (pediatrics, adults), neurodegenerative diseases (Alzheimer's, dementia, vascular disease),

	among others.
Keywords	Artificial Intelligence/ Machine Learning, Biostatistics, Diabetes Patient engagement Qualitative research
Lab location	MSB, UofT
Available Funding	Yes
Relevant Links	https://www.tyrrell4innovation.ca/ https://www.torontomu.ca/electrical-computer-biomedical/people/faculty/april-khademi/
Contact Information	pascal.tyrrell@utoronto.ca

Principal Investigator: van Klei, Wilton

Currently Accepting	**MSc**
Ideal Candidate	Self-motivated, curious, intellectually driven, organized
Research Summary	Measuring utilization of blood products in perioperative patients and assessing clinical practice related to guidelines for red blood cell and/or albumin transfusion.
Keywords	Transfusion, Perioperative Outcomes, Albumin, Red Blood Cells
Lab location	TGH
Available Funding	Yes

Relevant Links	https://anesthesia.utoronto.ca/faculty/wilton-van-klei
Contact Information	sarah.russell@uhn.ca (416) 340-5164

Principal Investigator: *Vincent, John*

Currently Accepting	**PhD**
Ideal Candidate	The project requires a highly motivated student with good wet-lab skill sets, and experience with standard DNA, RNA, and protein methodologies, such as PCR, RT-PCR, western blotting, and ICC.
Research Summary	PTCHD1 in autism and cognition: from function to diagnostics and therapeutics: PTCHD1 is an X-linked gene, mutations of which are known to result in autism and or intellectual disability. We propose to explore the following avenues of research: 1. the use of in vitro and in silico approaches to delineate temporospatial expression of PTCHD1, its isoforms, and its biomolecular interactors. 2. Identify NMD pathway used for PTCHD1 LoF mutations in Neuro2A lines using ASOs. Attempt restoration of PTCHD1 protein levels through
Keywords	PTCHD1; missense mutation; loss-of-function mutation; function and biomolecular interactions; development of therapies
Lab location	CAMH
Available Funding	Awaiting Results
Relevant Links	PMID: 37990104; PMID: 35328080; PMID: 28416808; PMID: 20844286
Contact Information	john.vincent@camh.ca

416 535 8501 x36487

Principal Investigator: *Vogel, Arndt*

Currently Accepting	**MSc; PhD**
Ideal Candidate	Background in any of our key focus areas is welcomed, but not required: We engage in comprehensive investigations utilizing murine models of liver cancer, patient-derived organoids (PDO), xenografts (PDx), molecular profiling, multiplex immunohistochemistry, and drug screening. Simultaneously, in the dry lab arena, we specialize in the analysis of RNA-seq data (both bulk and single cell), along with the scrutiny of large datasets.
Research Summary	The Vogel laboratory, situated within the newly inaugurated Liver Labs at the Max Bell facility of the Toronto General Hospital Research Institute, is focused on liver cancer research—a pivotal area in the study of one of the most prevalent and aggressive tumor types worldwide. Our research program is multifaceted, delving into critical aspects of the disease, including tumor evolution, therapy options and strategies, as well as mechanisms of drug resistance. Our interests span both wet and dry components of the research landscape. In the wet lab domain, we engage in comprehensive investigations utilizing murine models of liver cancer, patient-derived organoids (PDO), xenografts (PDx), molecular profiling, multiplex immunohistochemistry, and drug screening. Simultaneously, in the dry lab arena, we specialize in the analysis of RNA-seq data (both bulk and single cell), along with the scrutiny of large datasets. This encompasses data integration efforts and translational analysis of patients treated in investigator-initiated trials.
Keywords	Cancer, immunotherapy, targeted therapy, biomarkers, resistance mechanism
Lab location	TGH
Available Funding	Yes
Relevant Links	https://pubmed.ncbi.nlm.nih.gov/?term=Vogel+A+and+%

Contact Information	Clincial Administration: Stephanie Vieira; stephanie.vieira@uhn.ca T: 416-340-4800 ext 2004 F: 416-340-4533

Principal Investigator: *Wainberg, Michael*

Currently Accepting	**MSc; PhD**
Ideal Candidate	We encourage applications from a wide range of backgrounds, though strong programming skills are a must! Biology experience is an asset but not a necessity; you can learn on the job. We are extremely open to remote work and flexible working hours.
Research Summary	The Wainberg lab applies statistics, machine learning and other computational approaches to large datasets to learn how genetics causes brain diseases.
Keywords	Human genetics, psychiatric disorders, neurodegenerative disorders, functional disorders, bioinformatics, machine learning.
Lab location	Mount Sinai
Available Funding	Yes
Relevant Links	https://wainberglab.org
Contact Information	m.wainberg@utoronto.ca

Principal Investigator: *Wang, Kasper*

Currently Accepting	**MSc, PhD**
Ideal Candidate	Students interested in cell biology/genetics of human disease are welcome.
Research Summary	We study mechanisms of liver fibrosis. We have previously demonstrated that Prominent-1 (aka CD133), which is expressed by liver progenitor/stem cells, has two functions in liver injury/fibrosis. (1) Biliary progenitor cells expressing Prom1 drive fibrogenesis by activating adjacent resident liver fibroblasts. (2) Prom1 is an essential ciliary body protein required for biliary epithelial cell polarity and loss-of-function is associated with impaired biliary epithelial repair/restitution. Our lab is delving deeper in the polymorphisms and missense mutations in patients with biliary atresia (BA), the most common cause of liver failure in children to further characterize Prom1 and other genes role in the pathogenesis of BA.
Keywords	liver failure, biliary atresia, prominin-1, fibrosis, polymorphism, mutation
Lab location	SickKids RI, 17th floor
Available Funding	Yes
Relevant Links	http://www.ncbi.nlm.nih.gov/sites/myncbi/kasper saonun.wang.1/bibliography https://www.sickkids.ca/en/staff/w/kasper-wang/
Contact Information	kasper.wang@sickkids.ca (416) 813-6357

Principal Investigator: Witheford, Miranda

Currently Accepting	**MSc**
Ideal Candidate	Experience with machine learning models, bioengineering, and flow dynamics would be an asset.
Research Summary	Aortic aneurysms, dilatations of the aorta, can be repaired using complex stent grafts; their failure can be catastrophic. My work examines deformational changes to the aorta after stent implantation to determine how conformational changes impact stent failure. Assessments use both complex imaging and flow analysis, combined with machine learning.
Keywords	Aortic aneurysm, endovascular aortic aneurysm repair, aortic deformation, machine learning, stent instability
Lab location	TGH
Available Funding	Yes
Relevant Links	Witheford M, Borghese O, Mastracci TM, Maurel B. An observational assessment of aortic deformation during infrarenal and complex endovascular aortic aneurysm repair. J Vasc Surg. 2022 Sep;76(3):645-655.e3. doi: 10.1016/j.jvs.2022.03.861. Epub 2022 Mar 31. PMID: 35367562.
Contact Information	miranda.witheford@uhn.ca Admin asssistant: dilfuza.khakimzhanova@uhn.ca 416-340-3868

Principal Investigator: *Wu, Robert*

Currently Accepting	**MSc**
Ideal Candidate	Students with interest in remote monitoring from a clinical or technical perspective

Research Summary	Wearable remote monitoring research in people with COPD
Keywords	COPD, wearable, remote monitoring
Lab location	TGH; UHN
Available Funding	Yes
Relevant Links	https://www.uhnresearch.ca/researcher/robert-wu
Contact Information	robert.wu@uhn.ca 416 340 4567

Principal Investigator: *Yeung, Jonathan*

Currently Accepting	**MSc**
Ideal Candidate	Interest in cancer, experience with mouse models and immunologic assays
Research Summary	Esophageal adenocarcinoma genomics and lung transplant cell free DNA
Keywords	immunology, bioinformatics, organoids, mouse models
Lab location	TGH
Available Funding	Yes

Relevant Links	
Contact Information	jonathan.yeung@uhn.ca 416-340-3121

Principal Investigator: *Zheng, Chao*

Currently Accepting	**MSc**
Ideal Candidate	The candidate for this position is expected to be a self-motivated, recent undergraduate student with a strong background in chemistry or neuroscience. A major in organic chemistry, medicinal chemistry, or pharmaceutical sciences is an asset.
Research Summary	The Zheng research group focuses on the development and application of innovative radiopharmaceuticals for the diagnosis and assessment of treatment in neuropsychiatric and neurodegenerative disorders. Dr. Chao Zheng's research program has specific objectives: 1) Discovery of cutting-edge radiopharmaceuticals for brain imaging applications; 2) Developing and applying novel PET imaging methods that directly capture biochemical or phenotypic changes in vivo. This involves integrating disciplines such as medicinal chemistry, radiochemistry, quantitative PET imaging from in vitro and preclinical in vivo studies, and pharmacology. This excellent research opportunity will provide extensive training in radiochemistry and PET neuroimaging in a preclinical and clinical research environment.
Keywords	Alzheimer's disease, neuropsychiatric and neurodegenerative disorders, organic and medicinal chemistry, radiochemistry, PET neuroimaging, molecular imaging in neuroscience
Lab location	CAMH

Available Funding	Yes
Relevant Links	https://www.camh.ca/en/science-and-research/science-and-research-staff-directory/chaozheng
Contact Information	chao.zheng@camh.ca