DEPARTMENT OF BIOCHEMISTRY & MEDICAL GENETICS

Dr. Mojgan Rastegar, Biochemistry & Medical Genetics, Regenerative Medicine Program
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Research: My lab studies the role of epigenetics in the brain development and human disease. In this regard, we use a combination of molecular and cellular biology techniques in primary neural stem cells and brain cell lines. A particular focus in our lab is on the role of DNA methylation, MeCP2 regulatory network, and downstream cell signaling pathways. The available projects in my lab for the next summer are designed to study the role selected FDA-approved drugs in brain-derived neural stem cells and human brain tumor cells. We will study the effect of these drugs on MeCP2 network and its downstream signaling pathways. We have exciting new data in the lab, on certain FDA-approved drugs (with low or no side effects) that control MeCP2 gene regulatory network in the brain. We will aim to characterize the cell signaling pathways that are involved in the effect of these drugs, and elucidate the molecular mechanisms of these effects through epigenetic approaches. The outcome is expected to be important in future therapeutic strategies of MeCP2-associetd neurological disorders and brain tumor.

DEPARTMENT OF HUMAN ANATOMY AND CELL SCIENCE

Name: Ji Hyun Ko
Contact: ji.ko@umanitoba.ca
Short description: The main goal of my research is to build and validate brain imaging-based biomarker that can help diagnosis and prognosis for neurological and psychiatric disorders such as Parkinson's disease, Alzheimer's disease, epilepsy, and posttraumatic stress disorder. The participating students will analyze human brain imaging data that are either publically available or collected in my on-going research studies.

Website: https://www.kolabneuro.com/

DEPARTMENT OF INTERNAL MEDICINE

Dr. Neeloffer Mookherjee, Internal Medicine and Immunology
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Research interest: What are the effects of inhaled air pollution in the lungs, and how does that impact chronic lung disease such as Asthma? We are also focused on developing treatments that will control inflammation without impairing the patients' immune system and ability to control infections, and those that will be beneficial in patients who do not respond to commonly used steroid treatments for asthma. See www.mookherjeelab.com for more details.

Dr. Janilyn Arsenio, Departments of Internal Medicine & Immunology
Janilyn.Arsenio@umanitoba.ca

Research interests: How does a single immune cell decide its own fate? Cell fate decisions – the choice to live or die, to become different cell types with unique functions — are essential to our understanding of health and disease. My lab focuses on understanding T cell fate diversity during immunity at the single-cell level. We are interested in how T cells become different functional regulators of the immune response to viral infection, as well as in cancer, autoimmunity, and transplantation.

DEPARTMENT OF IMMUNOLOGY

Supervisor	Research Interests
Dr. T. Murooka www.murookalab.ca	Imaging-based studies to define how pathogens (viruses, bacteria and parasites) change the way cells migrate, behave and function in living tissues. We also focus on how HIV evades detection by the immune system by remaining dorment cells: if we can figure out how to reverse this dormancy, we can better eliminate virus from the body.
Dr. S. Kung	How can we engage our immune cells further in the development of the next generation cancer immunotherapy? My lab studies regulatory networks underlying natural killer-cell functions and migrations. We have established engineering platform to manipulate natural killer cells.
Dr. Afshin Raouf	Stem cells are extraordinary cells that throughout our lives work hard to help maintain our body by replacing damaged cells. However, abnormal functions of these stem cells leads to many diseases including cancer and chronic wounds. Our lab focuses on understanding mechanisms that regulat stem cells functions and how they are altered to cause disease.
Dr. N. Mookherjee	What are the effects of inhaled air pollution in the lungs, and how does that impact chronic lung disease such as Asthma? We are also focused on developing treatments that will control inflammation without impairing the patients' immune system and ability to control infections, and those that will be beneficial in patients that do not respond to commonly used steroid treatments for asthma. See www.mookherjeelab.com for more details.
Dr. A. Marshall	Why do immune cells sometimes misbehave and cause leukemia, lymphoma or autoimmune diseases? We work with patient blood samples to understand what is going wrong. Our

	lab is defining the intracellular signalling networks controlling B lymphocyte activation, migration and metabolism.
Dr. A. S. Gounni	Are you interested in finding a cure for severe asthma? Our lab had discovered an exciting regulatory pathway in asthma: neuronal chemorepellent sempahorin3E and its receptor plexinD1. The understanding of this pathway to tackle this devastating disease will be the focus of your journey in Dr. Gounni's lab. https://www-ncbi-nlm-nih-gov.uml.idm.oclc.org/pubmed/?term=Gounni+A
Janilyn Arsenio	How does a single immune cell decide its own fate? Cell fate decisions – the choice to live or die, to become different cell types with unique functions—are essential to our understanding of health and disease. My lab focuses on understanding T cell fate diversity during immunity at the single-cell level. We are interested in how T cells become different functional regulators of the immune response to viral infection, as well as in cancer, autoimmunity, and transplantation.
Dr. JE Ghia	Always wanted to know how your gut works? What is making you going to the toilet when you have a diarrhea? We have some of the answers. See http://www.ghialab.com for more details.

DEPARTMENT OF NEUROSURGERY

Name: Perry Dhaliwal

Email: Pawandeep.Dhaliwal@umanitoba.ca

Research description:

Spinal Cord Injury Management in Manitoba – Relationship Between Mean Arterial Blood Pressure and Functional Outcomes

Acute traumatic spinal cord injury has devastating consequences for patients. Current management strategies have highlighted the importance of maintaining adequate spinal cord perfusion following spinal cord injury though the evidence is limited. The primary objective of this study is to evaluate the association between mean arterial pressure (MAP) and functional outcomes in patients with spinal cord injury.

DEPARTMENT OF OBSTETRICS, GYNECOLOGY AND REPRODUCTIVE SCIENCES

Name: Dr. Christy Pylypjuk

Dr. Pylypjuk is an Assistant Professor in the Department of Obstetrics, Gynecology and Reproductive Sciences, with a subspecialty practice in Maternal-Fetal Medicine. She is also the HSC Site Lead for the Canadian Preterm Birth Network. Her research interests relate to: i) the prediction of adverse pregnancy outcomes using fetal ultrasound, maternal serum analytes, and other risk-stratification models; ii) fetal anomalies and novel ultrasound markers of fetal well-being; iii) long-term neurodevelopmental outcomes following perinatal exposures; and iv) perinatal epidemiology.

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DEPARTMENT OF PATHOLOGY, HUMAN ANATOMY & CELL SCIENCE

Name: Tanveer Sharif
Designation: Assistant Professor

Programme Description:
One of the difficulties in obtaining effective treatment outcomes from cancer therapies is the complex genetic heterogeneity of tumors. Tumor masses consist of several distinct populations of cancer cells that vary in their degree of differentiation and susceptibility to chemotherapies. Within the heterogenous tumor mass there exists small populations of poorly differentiated cells that possess stem-like properties such as the ability to self-renew and undergo multi-lineage differentiation. These poorly differentiated cancer cells are often more resistant to cancer treatments such as chemotherapy and radiation. Because of their self-renewal capacity and differentiation potential, these stem-like cancer cells can survive chemotherapeutic assault and re-initiate tumor formation at very low cell numbers, hence they are often referred to as tumor-initiating cells (TICs). As such, TICs are considered the major culprits behind cancer recurrence and relapse. Dr. Sharif's research focuses to understand the differences between heterogenous cell populations within tumors that dictate chemotherapy resistance.

DEPARTMENT OF PHARMACOLOGY AND THERAPEUTICS

Name: Paul Fernyhough
(Dept of Pharmacology & Therapeutics and Division of Neurodegenerative Disorders, St Boniface Hospital Albrechtsen Research Centre.)

Contact information:
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Research description: "Modulating G protein coupled receptors to repair nerves"
We are studying the regulation of neuronal growth and excitability by G protein coupled receptors (GPCR). Adult neurons express the muscarinic receptor GPCR that responds to the neurotransmitter, acetylcholine. We have discovered that the muscarinic receptor controls growth of neurons by regulating the activity of calcium and potassium channels in the plasma membrane. The project will test the hypothesis that muscarinic receptors block potassium channels to enhance excitability while restricting the growth of neurons. The student will learn primary neuron culture and techniques for measuring the axonal outgrowth. The student will treat cultures with specific modulators of muscarinic receptors and potassium channels and assess impact on growth. Data will be analysed and the student will learn how to generate presentations (for oral or poster settings).
(For background information the following papers should be reviewed:
Calcutt et al (2017) J Clinical Investigation 127: 608
Sabbir et al (2018) Front Neurosci 12: 402)

DEPARTMENT OF PHYSIOLOGY AND PATHOPHYSIOLOGY

Name: Tooru Mizuno

Contact information:
Department of Physiology & Pathophysiology
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Description of Research:
Our laboratory is interested in identifying the brain mechanisms that regulate body weight and food intake and understanding the mechnisms leading to obesity and obesity-associated impairments such as diabetes. Environmental factors affect physiological function such as behavior and metabolism through alterations in the activity of brain signaling pathways. When mice are maintained in the enriched environment (i.e. higher levels of environmental stimulation compared to the conventional husbandry condition), these mice have reduced fat mass and are protected from the development of obesity. Thus, environmental enrichment provides a unique experimental model that may help identify a key brain mechanism as a potential target for anti-obesity drug development. Students will participate in the ongoing research project aiming to understand how the brain regulates metabolism by mediating environmental factors. Students will get hands-on experience on research techniques such as animal studies, cell culture, biochemical analysis, molecular biological analysis and data analysis under the direct supervision by senior laboratory members. She/he will be provided with the opportunity to interact with other members of the Endocrinology & Metabolic Disease Research Group.

Name: Chris Pascoe

Contact: Children's Hospital Research Institute of Manitoba
John Buhler Research Centre
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Research description:
My research program is interested in understanding the developmental origins of asthma and other chronic lung disease. Specifically, how early life environmental exposures, such as diabetes and cigarette smoke, influences the development and function of the lung at a cellular and molecular level. My lab also has a specific interest in understanding how the lung using lipid signalling molecules, called oxylipins, to coordinate cell and organ function. By understanding the origins of lung disease we can develop better treatments and preventative strategies.

DEPARTMENT OF SURGERY

Name: Dr. Premal Patel

Contact information: AD203-720 Sherbrook Avenue
Health Sciences Centre
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Email: ppatel5@hsc.mb.ca

Research Description:

Dr. Premal Patel joined the Section of Urology in July of 2019 as an Assistant Professor. He completed his Fellowship training in Male Infertility, Microsurgery and Sexual Medicine at the University of Miami. Dr. Patel is an expert in microsurgery and specializes in novel surgical techniques for vasectomy reversal and sperm extraction. Prior to completing his Fellowship, he completed his Urology Residency at the University of Manitoba and obtained his Medical Degree from the University of Calgary. Please visit http://www.manitobafertility.com/ to learn more about Male Reproductive Urology and how to contact Dr. Patel.

DEPARTMENT OF THORACIC SURGERY

Name: Dr. Biniam Kidane
Contact Info:

Address - GH604 – Health Sciences Centre
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Description of research:

Dr Kidane has a research interest in peri-operative care specifically in the thoracic surgery sphere but also in all surgical disciplines. Specifically, he has a special interest in lung protective ventilation during thoracic surgery as well as peri-operative practice variation and quality improvement. He also has a research interest in health services and outcomes research as it relates to esophageal and lung cancer. Esophageal cancer is a devastating illness with historically poor survival; furthermore, the treatment of esophageal cancer can also be difficult and cause significant reductions in the quality of life of patients with esophageal cancer. Dr Kidane's program of research in esophageal cancer brings together elements of surgical quality, patient quality of life, oncologic outcomes and health resource utilization with the ultimate goal of identifying the right treatment for the right patient at the right time.

Name: Dr. Sadeesh Srinathan

Contact Info:

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Winnipeg, MB R3A 1R9
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Description of research:

Dr Srinathan's clinical area of interest and expertise is in all aspects of General Thoracic Surgery. His research is focussed on issues related to adverse events after surgery relevant to all branches of surgery. Dr Srinathan's focus on adverse events is a result of his belief that the clearly established benefits of surgical intervention for many clinical entities is diminished due to the morbidity attendant with surgical interventions such as post-operative MI, pneumonia etc. He feels that by being able to decrease these adverse events, the overall benefit of all surgical interventions can be enhanced.

These issues are approached using the tools of clinical epidemiology which manifests as observational studies and clinical trials. He is also actively involved in research on methodological aspects of clinical epidemiology.