University of Manitoba Undergraduate Research Award competition
College of Pharmacy Research Projects

Name (Last, First):	**Stobart, Jillian**
Email:	**Jillian.stobart@umanitoba.ca**
Telephone:	**202-272-3180**
Title:	**Brain pericyte calcium signaling and blood flow control**
Number of students I would accept to work on this project:	**2**

Short Description of Research (250 words maximum):

Pericytes are cells found on brain capillaries. Exciting new evidence suggests that pericytes may regulate the blood-brain-barrier and dilate capillaries to increase blood flow where needed. Both of these roles are essential for brain health and pericytes may become dysfunctional or die during disease, such as stroke or Alzheimer's disease. Our research focuses on calcium signalling in pericytes, which is likely important for regulating blood flow. We want to know: what causes calcium signals in pericytes? What happens as a result of these signals? These questions are fundamental for understanding pericyte physiology and their role in the brain. This work may also lead to future development of pericyte-specific drugs for therapeutic use. Students who join our energetic team will have the opportunity to work directly with mice, including mouse handling, training, and injections. Students will also learn two-photon microscopy, the latest, state-of-the art microscopy technique in neuroscience. They will use this microscope to record movies of beautiful, never-before-seen calcium signals in pericytes in the brains of live mice in real-time. Students will also gain valuable computer skills by learning to analyze these calcium movies through programs such as MATLAB and R. Students will also develop communication and problem-solving skills by participating in regular lab meetings in a group setting. Our lab is located in the Apotex Centre at the Bannatyne Campus, a dynamic community that encourages interactions between scientists from various health research disciplines.

Name (Last, First):	**Leong, Christine**
Email:	**Christine.leong@umanitoba.ca**
Telephone:	**204-318-5276**
Title:	**Assistant Professor**
Number of students I would accept to work on this project:	**2**

Short Description of Research (250 words maximum):

My research program focuses on drug utilization and optimizing medication use in primary care. Specific areas of focus include polypharmacy and psychotropic medication use. Pharmacoepidemiology, systematic reviews and mixed methods studies are primary methods used in my program. Current projects include (1) linking data on addictions to administrative databases to study long term outcomes of substance use, and (2) a scoping review on patient values and preferences with respect to medication use in specific populations (e.g., older adults, breastfeeding/pregnant). The undergraduate student will be involved in data entry, literature searches,

and data extraction. The student may also be involved in assisting with the coordination of community engagement and research advisory meetings. There may be opportunities for manuscript writing and presentation.

Name (Last, First):	**Marzban Lucy**
Email:	**lucy.marzban@umanitoba.ca**
Telephone:	**204-789-3662**
Title:	**Development of a new therapeutic strategy to enhance survival of transplanted pancreatic islets in diabetes**
Number of students I would accept to work on this project:	**1-2**

Short Description of Research (250 words maximum):

Diabetes is the most common endocrine disorder worldwide. Two major types of diabetes are Type 1 (T1D; Juvenile onset) and type 2 (T2D; adult onset) diabetes. In both types of diabetes pancreatic islet beta cells fail to produce enough insulin leading to elevated blood glucose but the underlying mechanisms are different. In patients with T1D, beta cells are destroyed by the body's immune system, leading to lifelong insulin therapy. Islet transplantation has provided a feasible approach for treatment of T1D but is currently limited by low number of available pancreatic donors and short-term survival of transplanted islets. Both immunologic and non-immunologic factors contribute to islet graft failure in diabetic patients.

Formation of toxic protein aggregates, named islet amyloid, is one of the important non-immunologic factors that contributes to impaired beta-cell function and death in transplanted islets leading to islet graft failure. Studies in our group focus on exploring the mechanisms by which amyloid causes beta-cell death in islet grafts and develop new therapeutic strategies to protect transplanted islets from amyloid toxicity thereby prolonging islet graft survival in T1D patients. Students who join our research group will learn how to culture islets, prepare islet sections, immunolabel live and fixed cells/tissues, and use imaging techniques. Students will also develop problem-solving, data analysis, and presentation skills by participating in our regular lab meetings. Our lab is located in the Apotex Centre at Bannatyne Campus, a multi-disciplinary research environment that provides trainees various opportunities for interaction with scientists from other health research disciplines.

Name (Last, First):	**Shearer, Brenna**
Email:	**bshearer@pharmacistsmb.ca; Brenna.Shearer@umanitoba.ca**
Telephone:	**204.999.4076**
Title:	**Early evaluation and acceleration of pharmacy and public participation in the Pharmacists Manitoba Smoking Cessation Social Impact Bond initiative.**
Number of students I would	**2**

accept to work on this project:	

Short Description of Research (250 words maximum):

This community-based research project will be a prospective, mixed methodology study to evaluate early adoption, barriers, and acceleration of pharmacy, stakeholder, and public participation with the Pharmacists Manitoba Smoking Cessation Social Impact Bond (SIB). A SIB is a social finance tool where a non-government service provider runs the SIB initiative. Government and the service provider work together on program planning and setting outcomes and targets for each outcome. An investor provides funds to cover program costs and is reimbursed based on outcome metrics achieved. Pharmacists Manitoba is the Service Provider for the Smoking Cessation project. In April 2021, pharmacies will receive compensation for providing smoking cessation services and individuals can receive reimbursement for smoking cessation products and prescriptions.

Outcome targets measure pharmacist interactions and smoking cessation quit rates. Strategic initiatives to improve participation in the SIB should be implemented in the early stages to ensure awareness among all members of the public and all health care service providers and related agencies. Early evaluation of pharmacy recruitment, participation rates, barriers to pharmacy participation, and supports required will be completed through quantitative surveys and qualitative interviews. Referrals from stakeholders will be evaluated through quantitative surveys while public awareness and participation will be evaluated through social media quantitative analytics. The importance of early evaluation and recommendations for improvements to recruitment and communication among providers and public will support the overall success of the SIB and long term sustainability of the service as a publicly funded health care service by pharmacists.

Name (Last, First):	**Labouta, Hagar**
Email:	**Hagar.labouta@umanitoba.ca**
Telephone:	**204-474-8380**
Title:	Bioinspired nanoparticles for breaching the biological barriers
Number of students I would accept to work on this project:	**2**

Short Description of Research (250 words maximum):

Nanotechnology, or more appropriately nanoscience, is a multidisciplinary branch of science that currently receives a lot of attention from researchers in the pharmaceutical and biomedical fields. Using nanoparticles in drug delivery and diagnostics offers several advantages over traditional formulations, such as modified pharmacokinetics and tissue distribution, site-specific targeting, reduced toxicity, prolonged release, improved stability and bioavailability. My research program aims at understanding the interaction of nanoparticles within the different biological compartments and translating this knowledge to design new generations of bio-inspired nanoparticles for breaching the biological barriers of the body. The student will be involved in a cutting edge research program to design various nanoparticles with different size, composition and surface properties. The student will then test these particles using in vitro cell models developed in the lab for therapeutic applications.

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The student will work in a collaborative environment among a team of researchers with different backgrounds who will guide him/her in his summer research project. The student will also attend lab meetings and will present his or her work to the team. Depending on the student's progress and contribution to the project, he or she can be a co-author on the outcome publication.