We are extremely pleased to announce the winners of the Translational Institute of Medicine (TIME) Incubator Grant 2020 competition

With $150,000 in funds provided by the members of the Department of Medicine (DOM), PI's from DOM assembled teams spanning different departments. Seven applications went forward for external review by experts from the McMaster University and the University of Alberta. Based on their recommendations, the following four teams were awarded funding:

TIMEKeeper: A Comprehensive Cardiovascular Biobank Linked to Clinical Data to Support Implementation of Personalized Medicine through Translational Research


Dr. Archer

PI: Dr. Stephen Archer (DOM)

Co-PIs: Dr. Charlie Hindmarch (DOM), Dr. Cathy McLallen (DOM)

Collaborators: Dr. Gian Bisleri, Dr. Al Jin, Dr. Amer Johri, Dr. Paula James, Dr. David Lillicrap, Dr. Michael Rauh, Dr. Pati Lima, Dr. Stephen Vanner, Dr. D Payne, Dr. P Malik, Dr. V Sniekus, Dr. Chris McPhee, Dr. Francois Potus, Dr. Dianne Lougheed, Dr. Strivastava, Dr. Andres Enriquez, Dr. Brian Amsden, Dr. Christine D'Arsigny, Dr. Mark Ormiston, Dr. Donald Maurice, Mrs. Brooke Ring


Dr. Hindmarch

There is currently a major unmet need for a prospective, characterized, standardized and integrated repository of tissues from consented patients with cardiovascular disease (CVD) and controls. CVDs account for 31% of global deaths and in Canada, CVD is the second leading cause of death, taking 33,600 lives a year, with increased risk of death for females, or First Nation persons. Canada spends more than $20.9 billion a year on the treatment of CVD. Kingston Health Science Center (KHSC) and its 24 satellite facilities serve 500,000 residents in the South Eastern Ontario region. KHSC operates 440 inpatient beds and on an annual basis admits more than 22,000 patients, performing approximately 9,000 surgical procedures. Queen's University is home to a rich environment of translational research and a bench-to-bedside-and-back philosophy. In this proposal our research team includes both clinicians and clinician-scientists, as well as, basic research collaborators across the Faculty of Health Sciences.


Dr. McLallen

Currently, many CVD researchers at Queen's rely upon samples collected as part of limited local studies, samples obtained through public databases, or external collaborations, focusing nationally and/or internationally rather than locally. As we expand our team of clinician-scientists in the department of medicine, this dependency on external samples and an ad hoc approach is proving to be a major bottleneck to discovery-based translational research at Queen's University, particularly as we have the opportunity to study the patients who come to us as south eastern Ontario's only tertiary care centreBeginning with patients admitted for cardiac services and then expanding to all patients at KHSC, we will begin a biobanking program with patients who are competent to provide informed consent. They will be approached to have their blood, plasma and DNA/RNA biobanked using a simple consent form in a consistent and organized manner that is compatible with downstream 'omic' technologies like genomics, transcriptomics metabolomics and proteomics. Equally important to the TIMEKeeper vision is that patients will simultaneously be consented to have their clinical data, resident in the patient care system (PCS; our current electronic health record system), accessed to determine their clinical phenotype. Moreover, individual researchers can link their OMIC data to patient health care utilization and outcomes (pursuant to approval from ICES and adequate funding). The simultaneous consent for sample acquisition, local healthcare data access and linkage to the ICES registry is unique in Canada.

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Parathyroid gland cell phenotype and pathological alternations in bones and blood vessels; the impact of dietary phosphate

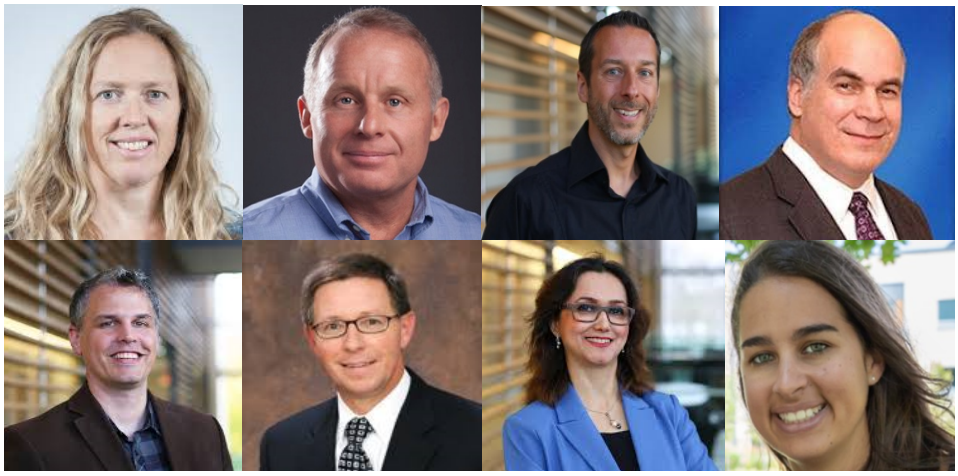
PI: Dr. Rachel Holden (DOM)

Co-PIs: Dr. Michael Adams (DOM, DBMS)

Collaborators: Dr. Martin Petkovich, Dr. Charlie Hindmarch, Dr. Elahe Alizadeh, Dr. Marosh Manduch, Dr. Ross Walker

Abnormalities in the metabolism of dietary phosphate are linked to cardiovascular disease in humans. The amount and type of dietary phosphate, and its ratio with calcium in our food supply, has changed substantially over the past 20 years with the widespread use of inorganic phosphate food additives. A diet enriched in phosphate, but with relatively low calcium, triggers the release of hormones, including parathyroid hormone, that lead to osteoporosis and vascular disease. For this reason, some people require the removal of their parathyroid gland to prevent further damage. We believe that this altered dietary ratio drives long-term cellular changes in the parathyroid gland that are central to the maladaptive changes in structure and function of bones and blood vessels.

In this research, using our pre-clinical rat model, we will determine the mechanisms by which parathyroid gland adaptations to dietary phosphate are altered by the ratio between phosphate and calcium in the diet. In addition, in humans undergoing surgical removal of a parathyroid gland, we will characterize the cell populations present as a result of the typical diet. Current regulations do not require that food labels include the amount of phosphate that is added to the food supply. The evidence from these studies may be important to exposing an important, but insidious, public health problem.



(Top Left to bottom right: Dr. Holden, Dr. Adams, Dr. Manduch, Dr. Petkovich, Dr. Hindmarch, Dr. Walker, Dr. Alizadeh, Corinne Babiolakis)

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Prevalence of atrial cardiopathy in Transient Ischemic Attack/ Minor Stroke

PI: Dr. Shirin Jalini (DOM)

Co-PIs: Dr. Ramana Appireddy (DOM), Dr. Albert Jin (DOM), Dr. Zardasht Jaff (DOM), Dr. Donatella Tampieri (Radiology), Dr. Rob Dhillon (Radiology), Dr. Dominique DaBreo (Radiology)

Transient Ischemic Attack (TIA) and minor stroke are more prevalent than previously thought. These patients are at risk of stroke recurrence and the most effective prevention strategy depends on determining the cause of the inciting event. Despite advancements in technology, the cause of stroke is not found in approximately one third of patients (cryptogenic stroke). It has long been suspected that the blood clot causing the stroke in these patients originates from the heart.

Atrial cardiopathy is a broad term which implies dysfunctional atria within the heart. It is hypothesized that structural and/or electrophysiological changes within chambers of the heart can predispose it to form blood clots, which can travel to the brain. This can happen independent of known thrombogenic arrythmias such as atrial fibrillation.

Our research focuses on identifying known imaging, electrophysiological and serum markers of atrial cardiopathy in cryptogenic TIA/ minor stroke patients. We hypothesize that atrial cardiopathy is more prevalent in this patient population compared to patient whose cause of stroke is known. This will potentially provide these patients with better and more targeted stroke prevention strategies

(Top Left to bottom right: Dr. Appireddy, Dr. Albert Jin, Dr. Jaff, Dr. Tampieri, Dr. Dhillon, Dr. DaBreo)

Combining neuroimaging and robot-based behavioral assessment to identify biomarkers of cognitive dysfunction in people with Epilepsy

PI: Dr. Gavin Winston (DOM)

Co-PIs: Dr. Jason Gallivants (DBMS, Psychology)

Collaborators: Dr. Lysa Boisse Lomax (DOM), Dr. Garima Shukla (DOM), Dr. Micheele Keiski (DOM), Dr. Stephen Scott (DBMS)

Epilepsy is a common neurological disorder affecting around 300,000 Canadians. Aside from seizures, many patients also suffer with cognitive problems, including memory, processing speed and planning. These affect day-to-day life and are a key factor in impaired quality of life. Patients are usually assessed by neuropsychological evaluation, which is lengthy, expensive and fatiguing for the patient.

In a collaboration between the Department of Medicine (Neurology), DBMS and Psychology, we will evaluate cognitive problems in people with epilepsy using both conventional neuropsychology and robotic assessment with the Kinarm robot developed at Queen's. We will also acquire detailed brain scans looking at the structure and function of the brain.

We aim to develop robotic-based evaluation of cognition as a valuable clinical tool to more easily identify the cognitive deficits and to understand the changes in brain networks that underlie these problems. In particular, we wish to understand why both focal epilepsies, such as temporal lobe epilepsy, and generalised epilepsies share some of the same impairments. Improved understanding of the underlying causes may help provide better treatments in future.

(Top Left to bottom right: Dr. Winston, Dr. Gallivants, Dr. Lomax, Dr. Shukla, Dr. Keiski, Dr. Scott)

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