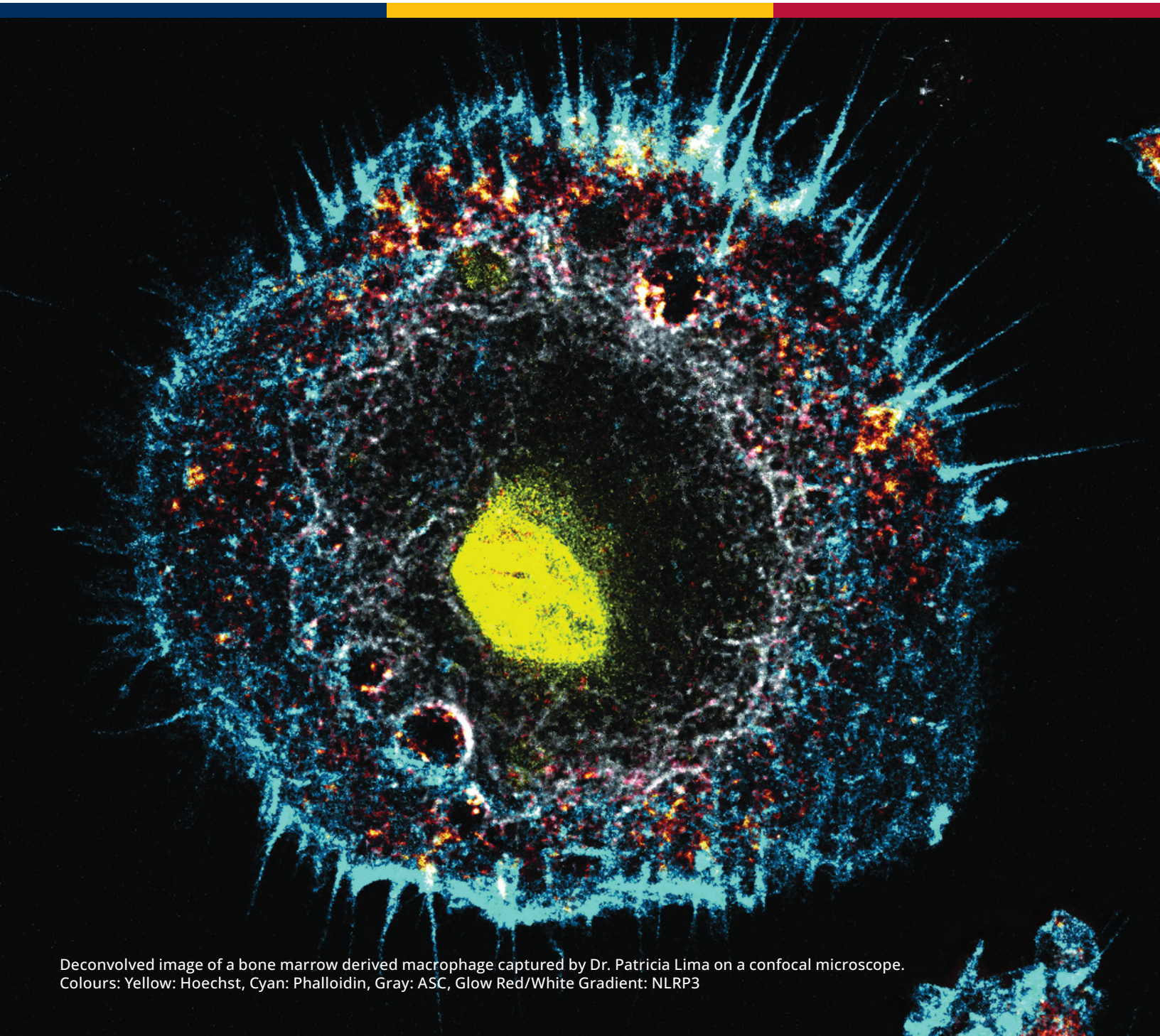
Queen's Health Sciences | School of Medicine

Queen's UNIVERSITY

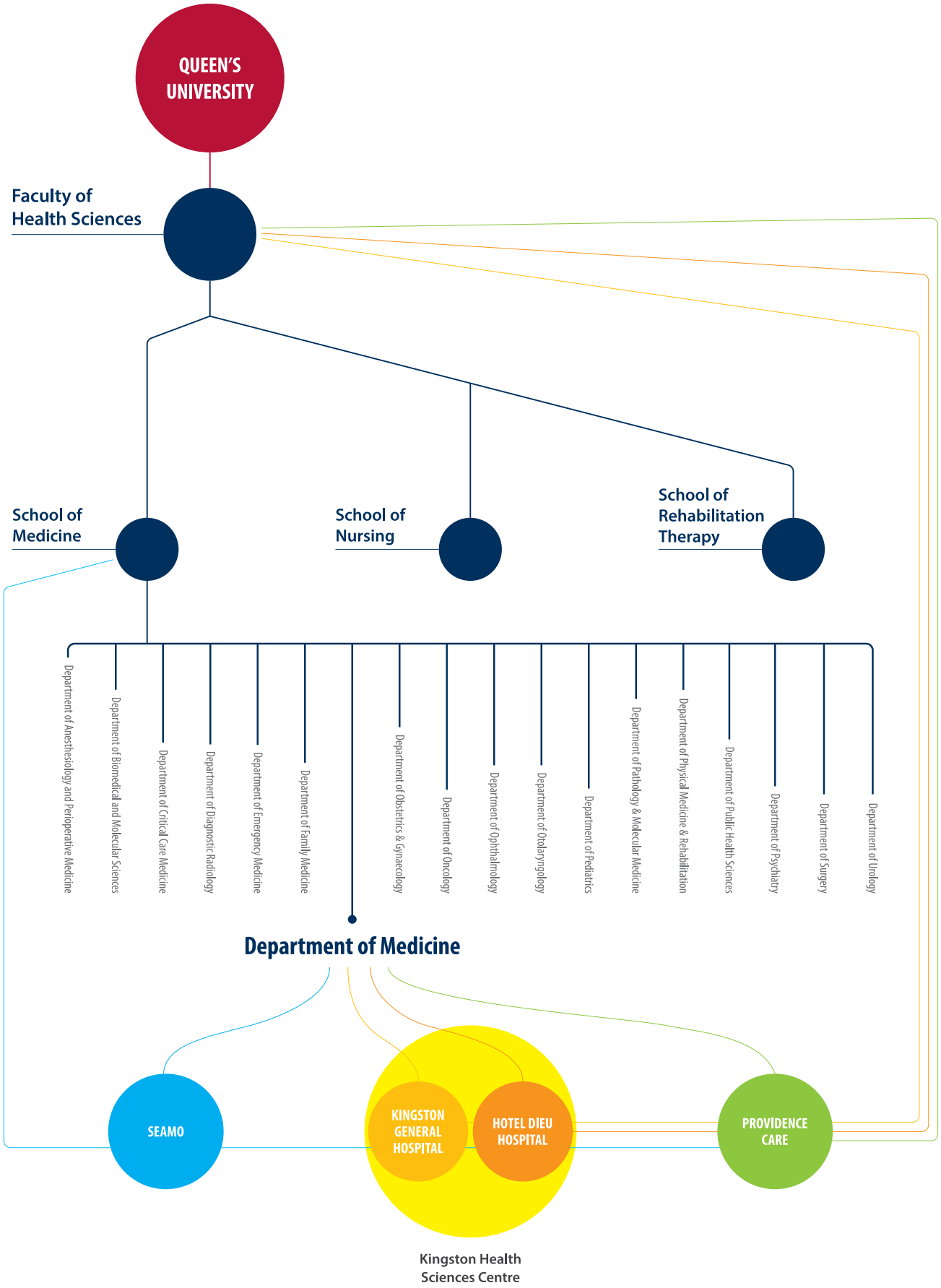
DEPARTMENT OF

MEDICINE 2023

Translational Institute of Medicine (TIME)



Deconvolved image of a bone marrow derived macrophage captured by Dr. Patricia Lima on a confocal microscope.
Colours: Yellow: Hoechst, Cyan: Phalloidin, Gray: ASC, Glow Red/White Gradient: NLRP3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MESSAGE FROM THE DIRECTOR OF TIME

The Translational Institute of Medicine (TIME) is celebrating its sixth anniversary with exciting growth and a new, large CFI grant which will fund a major expansion of our core facilities.

TIME is a research institute based in the Department of Medicine (DOM). TIME is devoted to helping researchers understand and improve human health by facilitating Bench to Bedside research. TIME's 200+ basic science, translational and clinical researchers, have been incredibly productive, securing over $27M for their research and publishing 985 articles in 2023. The components of TIME include a translational medicine graduate program (TMED), a large infrastructure platform (the Queen's Cardiopulmonary Unit, QCPU), an incubator grant award program, and a virtual network. This year we are including the QCPU and TMED annual reports under the umbrella of the TIME annual report, reflecting the integration of each of these programs as components of TIME within the DOM.

I would like to begin this annual report with several heartfelt thank-you notes! First, thank you to Dr. Stephen Vanner, the inaugural Director of TIME. Dr Vanner was my partner in creating TIME and led the institute for five years, leaving it in outstanding position and poised for further success. I would also like to thank Dr. Salwa Nihal, the administrative lead for TIME for her dedicated service. Second, I would like to acknowledge the support of Dr. Chris Smith, DOM Head, and all my DOM colleagues who have supported TIME since its inception. The DOM's ongoing investment in TIME allows us to provide affordable scientific services to the entire Queen's community. Finally, I would like to thank Dean Jane Philpott, who invested in TIME this year to initiate an ongoing commitment by QHS to TIME, coincident with my appointment as Director of TIME on July 1st 2023.

Let me summarize some highlights from TIME, TMED, and QCPU in 2023!

TIME

GROWTH OF TEAM TIME: In June 2023 we welcomed Ms. Shannan Davis, as the inaugural administrative assistant to the Director. Shannan is critical to all aspects of TIME, including planning and implementing special events, managing the new TIME grants software and incubator grant program, and serving as the interface with the DOM and TMED. She has quickly become so essential to our operation that we often wonder how we functioned in the years before Shannan! In early 2024, we also welcomed Mr. Benjamin Ott, MSc as a new biostatistician. If you have a question about study design or analysis, Benjamin can provide clear statistical and analytic guidance. His services are already in high demand.

TIME CORE - A NEW CORE FACILITY GRANT: Dr. Postovit and I are pleased to announce our team's success in securing a large CFI/Provincial grant to create the Translational Institute of Medicine - Core Facility (TIME Core). TIME Core is an ~$15M initiative which will go live in 2025 and will catalyze discovery science by ~20 research groups and over 100 trainees within Queen's Health Science (QHS). We anticipate that TIME Core will elevate Queen's to the forefront of research and training in areas such as biotechnology, clinical research, and biomolecular sciences, providing our learners and faculty with infrastructure tailored to their research needs.

TIME Core will be built adjacent to QCPU on level 1 of the Biosciences building. It is comprised of six research platforms which will deliver state-of-the art research tools that enable fundamental discoveries and facilitate translation of new knowledge into new biomarkers and therapies for major diseases affecting the health of Canadians, including *Cardiopulmonary Diseases, Cancer, Inflammatory Diseases, and Neurodegenerative Diseases*. Core platforms will be run by an expert staff scientist.

CORES INCLUDE:

1. **Animal Research Centre (The ARC):** This state-of-the-art, ultraclean rodent facility will expand the veterinary capacity of Queen's and will function under the direction of Dr Andrew Winterborne.
2. **Advanced Microscope Core:** This core will offer super resolution light microscopy and low voltage electron microscopy
3. **Cellular Heterogeneity & Transcriptomics Core:** This core will offer spatial transcriptomic tools.
4. **Extracellular Vesicles Core:** This core will support the characterization and therapeutic use of micro vesicles.
5. **Personalized Medicine Core:** This core will be housed in KHSC and GIDRU and will support the manufacture of CAR-T cells, to treat patients with cancer, and mass spectroscopy, to better characterize the human microbiome, respectively.
6. **The Collaboratory:** This is a space that will be equipped to display and discuss large data sets such as those arising from studies that integrate proteomic, transcriptomic and metabolomic data.

CELEBRATION OF OUR FACULTY AND GRADUATE STUDENTS: I often say *it's a poor dog that doesn't wag their own tail*. In this regard TIME prides itself on celebrating the achievements of its members and their students. We celebrate the many outstanding publications of our membership using the *TIME Showcase* and *TIME Hall of Fame websites*. With Dr Hindmarch, we launched the *TIME to Talk Medicine and Science* podcast. In these podcasts we learn about the researcher as a person and discuss their discoveries while delving into the more personal narratives about their career trajectory, discoveries and their life outside of Medicine and Sciences. In addition, in 2023 we created a new December holiday event, *TIME for Science to Shine at Queen's*. This festive occasion celebrates the successes of our faculty and trainees in acquiring funding and making discoveries.

TIME is a strong supporter of our TMED students. This year we created two awards for TMED students. TIME *External Grant Application Award* for TMED students provides $1000 in personal prize money to students who prepare an external grant. The TIME *Research Excellence Award* for TMED Students provides $1500 to a select group of students who have achieved an outstanding milestone, manifest as a grant or publication, as adjudicated by a committee of faculty members. We also host a TMED *Research in Progress Session* to provide graduate students with a friendly critique of their evolving research, with the goal of refining and optimizing their science and enhancing their presentations.

NEW GRANT FUNDING MECHANISM: TIME made major advances in securing research funding for our *TIME incubator grant program*. Through a new partnership with UHKF we secure additional research funding and were able to budget $230,000 in funds to be awarded through a revamped, revamped grant process grant process.

The TIME Research Excellence Award for TMED Students provides $1500 to a select group of students who have achieved an outstanding discovery.

NEW GRANT PLATFORM: With the hard work of Ms. Shannan Davis, we have developed and customized a comprehensive online grant application tool that supports the entire workflow of a grant, from submission to peer-review and ultimately applicant feedback. This new virtual TIME grant tool better prepares our faculty for subsequent application to external funding agencies. This customizable software also supports the grants program of the DOM.

OUTREACH: We are highly engaged in inspiring young people to engage in research and Science. We participate in many outreach programs, such as *Science Rendezvous*. Our team generously volunteers their time to inspire the next generation of school children to aspire to careers in science through videos, live shows and summer camp programs. QCPU also supports Women in Science at Queen's (WiSQ), a grass roots group that supports the careers of female researchers across all STEM research fields. WiSQ was founded by one of our QCPU/TIME scientists, Dr. Patricia Lima.

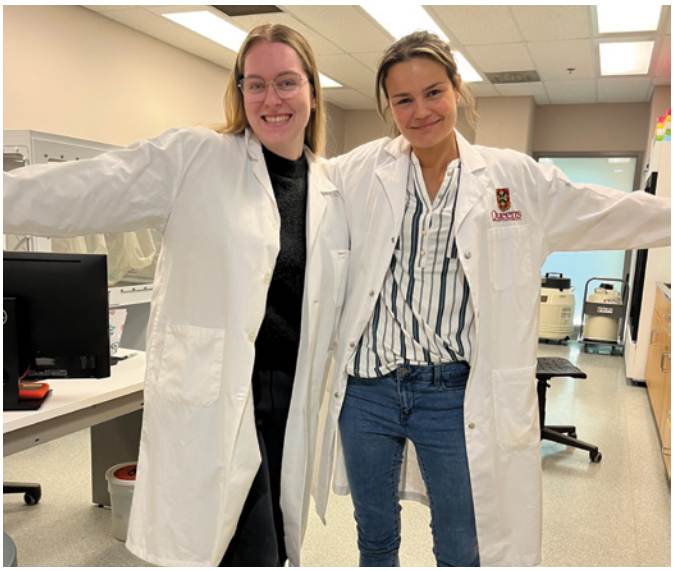
TMED

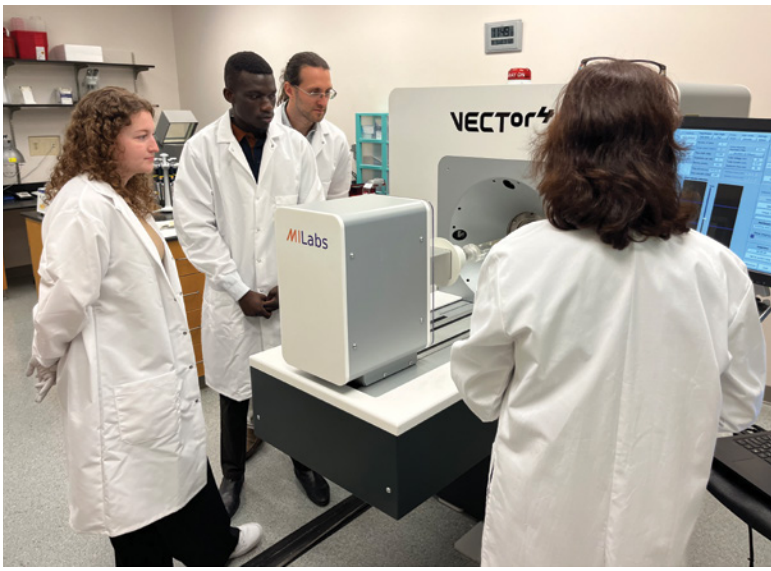
TIME is greatly enriched by TMED. TMED prepares MSc and PhD students to participate in all aspects of health from basic and translational research to outcomes research. TMED prepares students for careers in medicine, health-related industries and government. A huge thank you to Dr. Paula James, the inaugural TMED Graduate Program Director who was instrumental in creating TMED. Dr James has transitioned to be Deputy Head of Medicine. Dr Smith and I had the pleasure of appointing Dr. Anne Ellis as her successor. With Dr Ellis and co-director, Dr. Mark Ormiston at the helm, TMED is in good hands. The success of TMED is facilitated by the effective administrative leadership of Ms Julie Heagle, TMED's Graduate Program Advisor. Julie is the go-to person for 40 graduate students. Her guidance and wisdom are invaluable!

TMED students pursue research under the guidance of a faculty member mentor. In addition to this classical research experience, TMED students interact with patients in our clinics and attend Medical Grand Rounds. These experiences inform students about the reality of the lives of people living with disease and expose them to the practice of medicine. These unique aspects of TMED offer trainees experiences that cannot be achieved by classroom education.

The TMED trainees created a TMED Society which has been highly successful, creating special events, advancing I-EDIAA and community-based initiatives, hosting social events and award ceremonies, and providing strong peer-to-peer support. A big thank you to MSc graduate and TMED Society President, Mr. Isaac Emon, MSc'24 for his good humored and effective leadership of this group.

In 2023 TMED continued to grow. We welcomed 12 new faculty members including Dr. Teresa Purzner, Dr. Jamie Purzner, Dr. Mackenzie Bowman, Dr. Tim Hanna, Dr. Sarah Dick, Dr. Nicolle Domnik, Dr. Katie Goldie, Dr. Genevieve Digby, Dr. David Rodrigues, Dr. David Taylor, Dr. Christopher Lohans, and Dr. Akihiro Nakamura. We also hired TMED student Sophia Linton, PhD'24 (candidate) into a new part-time role of Educational and Outreach Coordinator. She is already making a positive difference, nurturing and supporting our students, creating new





faculty and student resources, and offering new faculty workshops, as well as one-on-one academic support to our students. This year TMED created a new TMED Excellence Award for Graduate Supervision, won by Dr. Michael Rauh. TMED is creating a new generation of researchers who will shape the research and medical landscape in Canada in years to come.

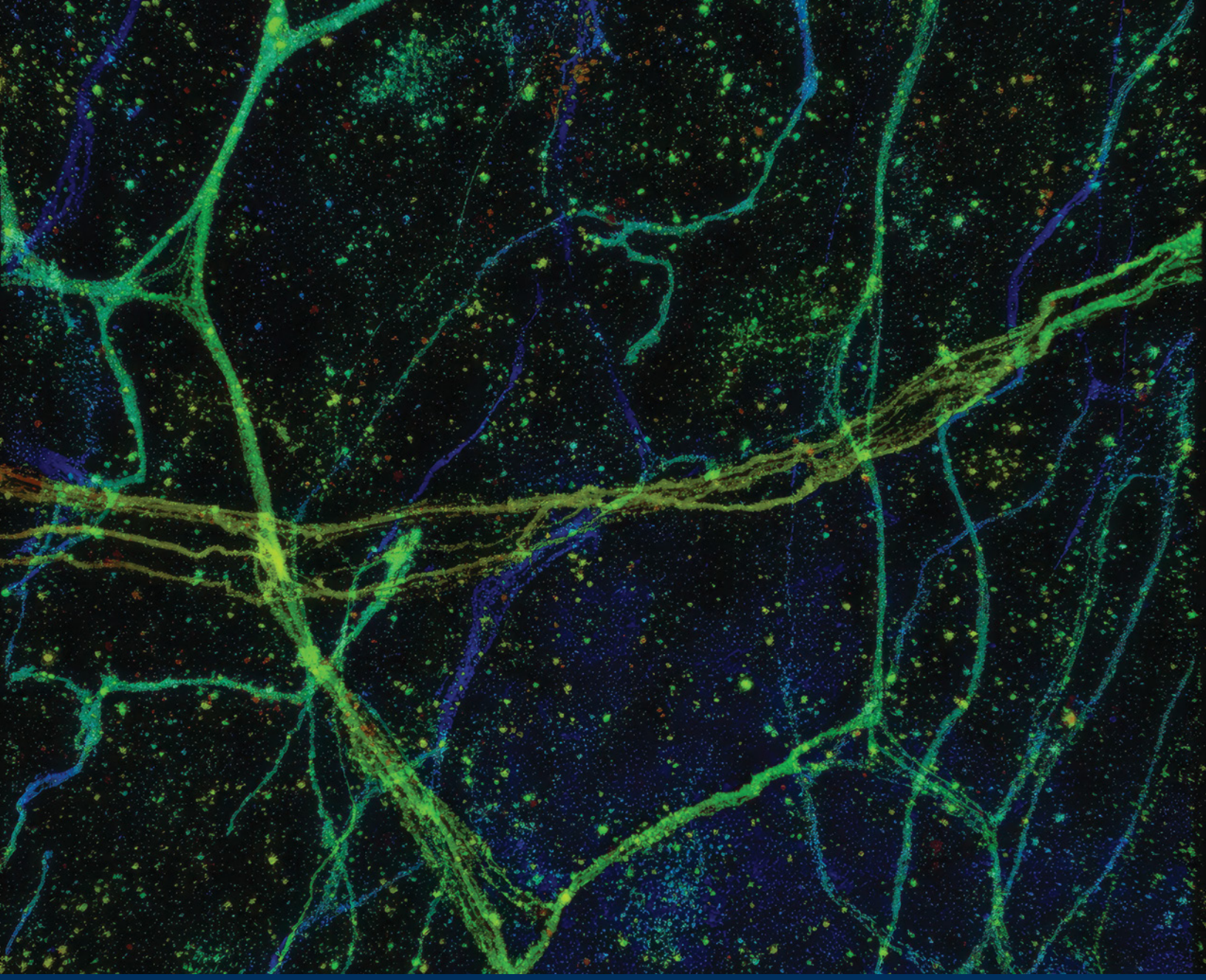
QCPU

2023 was a banner year for TIME's largest core facility, QCPU. Since its inception QCPU has served 94 PIs in 27 departments spread across 3 faculties. Although initially envisioned as a center to support heart and lung research, QCPU is now a broad core facility that advances all forms of research, including science outside the biomedical field. QCPU has a unique service model in which our team of seven scientists performs research for a faculty member on a cost recovery basis. They work with faculty members and trainees to optimally plan studies, perform the research, and then return the data to the faculty member. The users purchase services, either based on an hourly fee or through a discounted, bundled SuperUser package. The client retains ownership of their idea and data while benefiting from access to our state-of-the-art equipment and highly experienced staff. Whether you need biostatistics, micro-PET-SPECT-CT imaging of a rodent, flow cytometry, 2-photon confocal microscopy, Next Gen sequencing, or histology, the QCPU team can help! QCPU's services are also a boost to new faculty, facilitating their research while they await the opening of their own laboratories. In 2023, QCPU's scientists were acknowledged in 28 publications, and we wrote 9 letters of support for large grant applications, four of which were awarded. While we charge users for our scientific services, this fee is highly subsidized. I want to thank the physicians of the Department of Medicine and philanthropists, notably the WJ Henderson Foundation, for their ongoing financial support. It is these two funding sources that allow us to keep users fees low. QCPU also has an educational mission. Our scientists train the undergraduate and graduate students of our faculty clients. This year 11 TMED students have benefited from hands on training by QCPU scientists.

QCPU scientists are highly engaged on the national level in outreach and capacity building in science. Our scientists are leaders in Canada's scientific platform associations including the Canadian Cytometry and Microscopy Association (CCMA) and the Canadian Network of Platform Scientists (CNSP).

Another aspect of QCPU that may not be widely known is out partnership with Kingston Health Science Center (KHSC). We are in our sixth year as a satellite of KHSC and are home to a clinical echocardiography laboratory for patient studies as well as clinics that provide service for pediatric patients. This year the QCPU site cardiac ultrasound laboratory will expand, and we anticipate we will host the performance of 3500 echoes/year in 2024.

Dr. Stephen Archer
Director of the Translational Institute of Medicine (TIME)
Scientific Director of the Queen's CardioPulmonary Unit (QCPU)



Translational Institute of Medicine | TIME

SECTION I

Translational Institute of Medicine | TIME

What is TIME?

The Translational Institute of Medicine (TIME) is an institute comprised of over 210 basic and clinician-scientists across multiple departments within QHS. It was created to capture the breadth of translational research at Queen's University and maximize sharing of state-of-the-art research platforms and expertise between research groups in the Department of Medicine and their collaborators. TIME currently comprises of a variety of research groups whose interests span the spectrum of translational research.

Co-founded by clinician-scientists Drs. Stephen Vanner and Stephen Archer, TIME's vision embraces a culture of collaborative and interdisciplinary translational health research that is intended to accelerate the discovery of novel and effective clinical therapies, as well as develop integration into clinical practice to improve patient care.

210+

Basic and Clinician-Scientists

TIME AIMS TO ACHIEVE ITS VISION THROUGH:

- → State-of-the-art research platforms, such as the Queen's CardioPulmonary Unit (QCPU), supported by staff scientists.
- → The Translational Medicine (TMED) Graduate Program, a unique research-based graduate program that focuses on training students in translational medicine at both master's and doctoral levels.
- → Incubator grant competitions that enable its members to collaborate using TIME's infrastructure with the goal of increasing success in obtaining external grant funding.
- → TIME Research Network, a web-based tool which allows TIME members to identify research, equipment and expertise to support their research program.

TIME Strategic Plan

THIS STRATEGIC PLAN WAS COMMITTED TO 4 GUIDING PRINCIPLES:

Vision & Impact

To forge a cohesive and inclusive, interdisciplinary research community.

Growth & Sustainability

Create a dependable and sustainable financial plan.

Research Excellence

Prioritizing 'Research Excellence' in its decision making.

Education Excellence

Training Highly Qualified People (HQP) to act as ambassadors through the Translational Medicine (TMED) Graduate Program.

IN 2023 WE MADE A POSITIVE IMPACT IN ACHIEVING MANY METRICS OF SUCCESS IN CONTRIBUTION TO OUR CORE PILLARS, IN ALIGNMENT WITH OUR 5-YEAR STRATEGIC PLAN:

Vision & Impact

- → Enhanced visibility of TIME within QHS is achieved in part through the TIME Showcase and Hall of Fame, our Podcast series - hosted by Drs Hindmarch and Archer, and the TIME Medical Grand Rounds.
- → Hosted the TIME EDII speaker, Dr Jason Berman from the University of Ottawa.
- → QCPU scientists attended the Canadian Cytometry and Microscopy Association CoLD Summit conference, and the Canadian Network of Platform Scientist conference and shared the vision and success of TIME with core facility leaders from across Canada.
- → TIME created a new event to celebrate the research excellence of our members, TIME for Science to Shine at Queen's University.

Research Excellence

- → QCPU continues to deliver state-of-the-art infrastructure, and since its inception, it has served 94 groups, across three faculties, as well as industry partners and external academic partners.
- → The research funding secured by TIME members increased from $18M to $27M.
- → Funded two $30K TIME/ICES grants in 2023.

Education Excellence

- → TMED welcomed 14 students in 2023, and now has 27 MSc and 13 PhDs enrolled.
- → Graduation of 13 TMED MSc students, and 2 PhD students in 2023.
- → QCPU supported in the training of 67 students.
- → Created a graduate training course in Cell Imaging Analysis (TMED865).
- → TMED students co-authored 58 publications.

Growth & Sustainability

- → TIME members (led by Drs. Archer and Postovit) secured Canadian Foundation for Innovation (CFI) entitled TIME Core, which will bring in ~$15M for key infrastructure to facilitate World Class research at Queen's University. Funds secured through TIME Core will also be used to upgrade and evergreen QCPU infrastructure.
- → Partnership with the University Hospital Foundation Kingston (UHFK) has brought in $437K of donor funding that will be used to fund TIME-UHFK incubator grants in 2024 and beyond.
- → Received funding support in the amount of $200K per year from QHS to support the operation of TIME and its expansion in 2024.
- → Secured $425-$675K annually from the Department of Medicine's Research Innovation Committee to support TIME in perpetuity.

~$15M for key infrastructure to facilitate World Class research at Queen's University.

1) 2023 Research in Progress Sessions (RPS)
2) TIME for Science to Shine party
3) TIME Core Celebration
4) Resident Research Fair 2023

TIME Highlights

MARCH 13, 2023

It was officially announced the Dr. Archer and Dr. Postovit were successful in their Canadian Foundation for Innovation (CFI) project for $15 million to create the 'Translational Institute of Medicine Core Facility (TIME Core)'.

MAY 13, 2023

Kingston's Science Rendezvous occured downtown at the Leon's Center featured 12 volunteers and a live show 'Smashing Strawberries' starring Dr. Charlie Hindmarch and Dr. Nicolle Domnik.

JUNE 9, 2023

Dr. Archer's Too Legit to Quit Party, celebrating Dr. Archer's 10 years of service as Head of the Department of Medicine. The event consisted of a silent auction, games, tribute videos and guest speakers. It also acted as the celebration kickoff to his new role as the Director of TIME.

SEPTEMBER 12, 2023

Resident Research Fair, an annual event which invites all PGY-1 medical residents to learn and network about the research programs they can participate in and contribute to.

BEGINNING IN SEPTEMBER 2023

TIME hosts a monthly TMED 'Research in Progress' Session where TMED graduate students are joined by their colleagues and faculty. In these sessions they present their research and receive constructive feedback.

SEPTEMBER 14, 2023

TIME hosted EDII Speaker Dr. Jason Berman from the CHEO Research Institute gave a talk at Medical Grand Rounds entitled 'Equity, Diversity & Inclusion in Health Research'.

SEPTEMBER 22, 2023

TIME partnered with ICES to sponsored two population health grants as part of the Data Science Day 2023 program.

DECEMBER 15TH, 2023

'TIME for Science to Shine' at Queen's was TIME's first annual Holiday Party and Award Ceremony! An evening gala in celebration of research successes by TIME faculty and TMED students. The evening featured TMED student awards, research recognition, a cool cake, music and dancing. Dr. Stephen Vanner was thanked for his service as inaugural TIME Director. Dr. Paula James was recognized for her service as inaugural leader of the TMED graduate program.

Dr. Stephen Archer
Director of TIME | Scientific Director of QCPU
stephen.archer@queensu.ca

Dr. Stephen Archer has:

300+
Publications

113
H-index

55K+
Citations

70
Mentored Trainees

Dr. Stephen Archer is a clinician-scientist and graduate of Queen's University (Meds '81). He is a practicing cardiologist who specializes in the care of patients with various forms of pulmonary hypertension. His is currently the scientific director of the Translational Institute of Medicine (TIME) and QCPU. His other interests include training the next generation of clinician-scientists. He enjoys time with family and is an avid hockey player, guitarist, and coffee drinker.

Dr. Archer directs a CIHR-funded research lab, where he and his international team of researchers study basic mechanisms of oxygen sensing, mitochondrial metabolism, mitochondrial dynamics, epigenetics and cardiac inflammation. His team endeavours to translate these basic science discoveries into experimental therapeutics for patent ductus arteriosus, pulmonary hypertension and cancer. Dr Archer is specifically interested in the cellular and molecular mechanisms by which mitochondria regulate cell proliferation (a process called mitotic fission). He holds several patents for repurposed and novel therapeutics, including the use of inhibitors of pyruvate dehydrogenase kinase (PDK) to treat cancer and inhibitors of dynamin related protein1 (Drp1) to treat cancer and cardio-vascular diseases.

He has over 300 publications, and his H-index is 113, with over 55,000+ citations. He has mentored over 70 trainees, many of whom are leaders in science and medicine. His translational cardiovascular research has been recognized with numerous awards, including being elected as a Fellow of the Royal Society of Canada and being awarded Distinguished Scientist Awards from the American Heart Association and American College of Cardiology. He received the AFMC Presi-dent's Award for Exemplary National Leadership in Academic Medicine in 2019 and was named the Chicago American Heart Association Coeur d'Or recipient in 2013 for leadership in establishing a STEMI network of care for the city of Chicago, while President of the Chicagoland American Heart Association. In 2020 he was awarded the School of Medicine's C. Franklin and Helene K. Bracken Chair.

Dr. Charlie Hindmarch
Scientific Operations Director,
Translational Institute of Medicine (TIME)
c.hindmarch@queensu.ca

Dr. Hindmarch's 'Environment Genome Interface" lab has research interests in the transcriptional control of pulmonary hypertension.

Dr. Charlie Hindmarch is Assistant Professor (DBMS/DOM) and Director of the Genomics, Transcriptomics, and Molecular Medicine laboratory within Queen's CardioPulmonary Unit (QCPU).

Dr. Hindmarch graduated in 2001 with a BSc in Marine Biology in 2002 (University of Plymouth, UK), in 2003 with an MSc in Biochemical Pharmacology (University of Southampton, UK) and in 2009 with a PhD in Neuroscience and Endocrinology (University of Bristol, UK). Following his PhD, Hindmarch held two consecutive Postdoctoral Fellowships before taking the role of Senior Research Associate at the University of Bristol. Dr. Hindmarch has previously held visiting professorships at the University of Malay (Malaysia) and at the Federal Rural University of Rio de Janeiro (Brazil). Dr. Hindmarch has been at Queen's University since early 2016 and currently has 60 published papers (h-index= 27, i10=44).

Dr. Hindmarch's 'Environment Genome Interface" lab has research interests in the transcriptional control of pulmonary hypertension. His lab utilizes well controlled pre-clinical models, and 'omic techniques (genomics, proteomics, methylomics, transcriptomics etc), together with bioinformatic analysis to establish stable signatures of gene expression in various tissues relevant to the disease. Dr Hindmarch also has a long-standing interest in structures of the brain that underpin hydromineral homeostasis, and cardiovascular control.

When Charlie is not at work, he loves to spend time with his wife and three sons, and spending lots of time outside riding mountain bikes, hiking, skiing, skating, and swimming in the beautiful lakes in our region.

Shannan Davis

Administrative Assistant, Translational Institute of Medicine (TIME)
shannan.davis@queensu.ca

Shannan is the Administrative Assistant to the Director of TIME, and it's hard to imagine how we ever managed without her. Often found at the entrance of QCPU, Shannan is key member of the TIME and QCPU teams, ensuring that everything runs smoothly and efficiently. She holds an Honours Bachelor of Arts in Geography and Political Science from the University of Ottawa, offering a broad and insightful perspective to her role. Beyond her administrative responsibilities, Shannan is instrumental in planning and coordinating TIME events and grant competitions.

TIME Team

TIME Metrics

Membership: 214

	RESEARCH REVENUE	PUBLICATIONS	AWARDS/RECOGNITIONS
DOM	$ 10,736,205.52	545	74
DBMS	$ 12,458,885.52	325	15
PMM	$ 3,895,574.74	115	1
	$ 27,090,665.78	**985**	**90**

DOM = Department of Medicine
DBMS = Department of Biomedical and Molecular Sciences
PMM = Pathology and Molecular Medicine

TIME Members Funding Success

CIHR | Fall 2022

Bruce Banfield

Biomedical and Molecular Sciences

$856,800

FUNCTIONS OF A CONSERVED HERPESVIRUS TEGUMENT PROTEIN

Dr. Banfield is an expert on viruses, with a focus on the study of the herpes simplex virus types 1 and 2 (HSV-1 and HSV-2). Both viruses cause lifelong infections for which there is no cure, and which can be severe in people with compromised immune systems. Dr. Banfield's research program aims to deepen our understanding of HSV replication with an aim to identifying new antiviral drug targets.

Christopher Mueller

Queen's Cancer Research Institute

$891,226

USING A LIQUID BIOPSY TO OPTIMIZE METASTATIC BREAST CANCER TREATMENT

Dr. Mueller is investigating new strategies to extend the lives of women with metastatic breast cancer. He led the development of a blood test that will be used to determine if a given patient is responding well to the treatment of choice within the first few weeks of therapy. This grant will allow the team to start a clinical trial in Kingston and Ottawa that will determine whether the new blood test can be used to guide clinical decisions and help physicians provide the most effective treatment for each patient.

Patrick Stroman
Biomedical and Molecular Sciences/ Centre for Neuroscience Studies

$646,425

INVESTIGATING THE NEUROBIOLOGICAL BASIS OF HEIGHTENED PAIN AND DYSFUNCTION IN FIBROMYALGIA, BY MEANS OF FUNCTIONAL MAGNETIC RESONANCE IMAGING

Dr. Stroman is developing methods to apply Functional magnetic resonance imaging (fMRI) to the study of the central nervous system. His research program will use fMRI to investigate pain in patients with fibromyalgia, a poorly understood chronic condition that, affects roughly a million Canadians. The team will look at why people with fibromyalgia experience heightened pain, exploring the neurobiological basis of pain.

Xiaolong Yang
Pathology and Molecular Medicine

$956,250

INVESTIGATING THE PTK-HIPPO AXIS IN BREAST CANCER METASTASIS

Dr. Yang studies how cancer initiates, progresses, and resists chemotherapeutic drugs. This program will investigate the role of a group of genes called "Hippo" in breast cancer spreading and metastasis. The results will inform the development of new treatment strategies that target metastasis, which accounts for over 90% breast cancer fatalities.

Shetuan Zhang
Biomedical and Molecular Sciences

$1,048,050

MOLECULAR MECHANISMS UNDERLYING CARDIAC SURGERY ASSOCIATED ATRIAL FIBRILLATION

Dr. Zhang focuses on the molecular mechanisms of cardiac arrhythmias and sudden cardiac death. In collaboration with Drs. Baranchuk and El Diasty (Medicine), his current research will reveal the role of inflammation in atrial arrhythmias following cardiac surgery. The goal is to explore novel ways to prevent and treat post-operative arrhythmia, which can cause adverse effects, including death.

CIHR | Priority Announcements

Chandrakant Tayade
Biomedical and Molecular Sciences

$100,000

ROLE OF IL-33-INNATE LYMPHOID CELLS 2 (ILC2) PATHWAY IN ENDOMETRIOSIS PATHOPHYSIOLOGY AND THERAPEUTIC TARGETING

Dr. Tayade is an expert on endometriosis, a disease in which the lining of the uterus – or endometrium – grows on other organs in the pelvic cavity, such as bowel, bladder, and ovaries. Endometriosis can lead to infertility, but there's still no cure for it, and treatment often requires an invasive surgical procedure. This research program will focus on of interleukin 33 (IL-33), a protein associated with lesion growth, blood supply and pain in endometriosis, to develop new therapeutic and diagnostic strategies.

CIHR | Spring 2023

Stephen L. Archer and Patricia Lima
Medicine

$979,200

THE ROLE OF MITOCHONDRIA AND THE NLRP3 INFLAMMASOME IN RIGHT VENTRICULAR FAILURE IN PULMONARY ARTERIAL HYPERTENSION

With co-PI Dr. Patricia Lima, Dr. Archer studies the causes of right ventricular failure (RVF), the leading cause of death in people with pulmonary arterial hypertension (PAH). Current PAH therapies do not target the right ventricle (RV). This project will explore mechanisms of mitochondrial damage and define how mitochondrial DNA released from RV myocytes and inflammatory cells contributes to inflammatory pathways that can cause RVF. It will also identify novel targets for therapeutics to treat inflammatory RV failure, such as inhibitors of the NLRP3 inflammasome, a pathway which regulates the immune system.

Kerstin de Wit
Emergency Medicine

$1,396,125

CANADIAN EMERGENCY DEPARTMENT-ORIENTED PULMONARY EMBOLISM TESTING (CED-OPET STUDY)

Dr. de Wit studies pulmonary embolism (PE, blood clots in the lung circulation) are potentially life-threatening, but many patients are unnecessarily tested for possible PE, exposing them to costly imaging studies, including CT pulmonary angiograms, which involves risks of intravenous contrast and radiation. This study will examine the effectiveness of a new bedside tests and blood tests for pulmonary embolism in patients, to mitigate reliance on CT scans.

Kimberly Dunham-Snary
Biomedical and Molecular Sciences, Medicine

$879,750

TARGETING THE MITO-'OME: IDENTIFYING CIRCULATING BIOMARKERS OF SKELETAL MUSCLE MITOCHONDRIAL HEALTH IN CARDIOMETABOLIC DISEASE

Dr. Dunham-Snary studies cardiometabolic diseases (CMDs), which increase the risk of type 2 diabetes (T2DM) and are prevalent, affecting over 20 per cent of Canadians. This project will explore mitochondrial DNA (mtDNA) signatures in various ancestry groups to understand the role of genetic and molecular factors in predisposing to CMDs and T2DM. This study strives to enhance early intervention in CMD and inform personalized care while addressing healthcare inequalities.

Nader Ghasemlou
Anesthesiology, Biomedical and Molecular Sciences

$956,250

CIRCADIAN RHYTHM CONTROL OF CHRONIC PAIN AND NEUROINFLAMMATION: A BEDSIDE-TO-BENCH STUDY

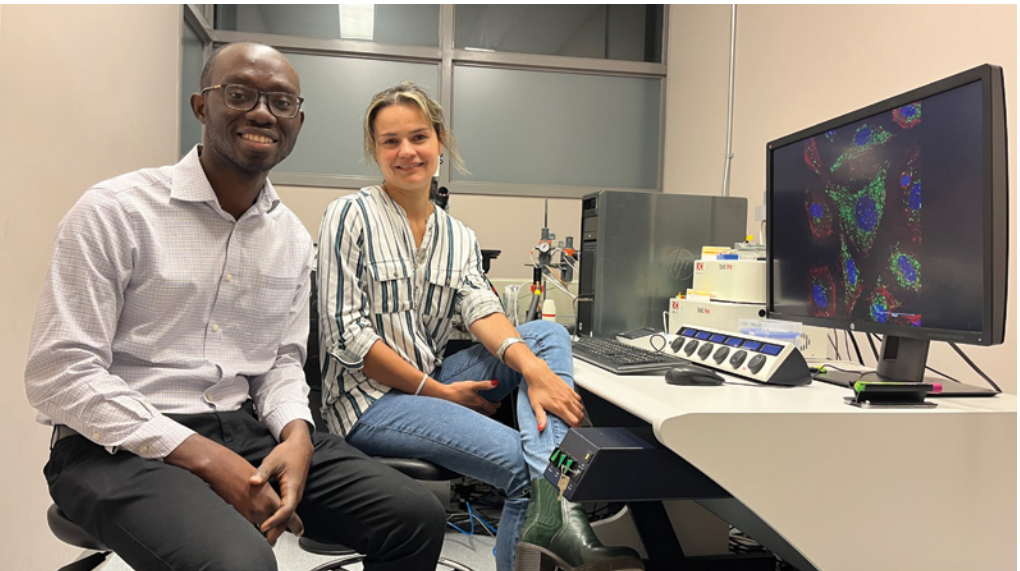
Dr. Ghasemlou studies the circadian rhythms which play a crucial role in regulating various aspects of life, including immune and nervous system functions. His study will investigate mechanisms through which cell-intrinsic circadian rhythms affect chronic pain and immune cell function. Taking advantage of both human and preclinical studies, this work can potentially lead to new treatment strategies for chronic pain conditions and reduce reliance on opioids.

Annette Hay
Medicine, Canadian Cancer Trials Group

$3,056,172

A PHASE III NON-INFERIORITY RANDOMIZED CONTROLLED TRIAL OF FIXED-DURATION DARATUMUMAB VERSUS CONTINUOUS DARATUMUMAB AMONG TRANSPLANT INELIGIBLE OLDER ADULTS WITH NEWLY DIAGNOSED MULTIPLE MYELOMA

Dr. Hay studies multiple myeloma which is an incurable blood cancer. Current treatment options are associated with serious side effects, poor quality of life, and high costs. This clinical trial will compare the current standard treatment of continuous daratumumab, to a fixed shorter duration of treatment, seeking a safer and more cost-effective option for older adults with newly diagnosed myeloma.



Annette Hay
Medicine, Canadian Cancer Trials Group

$3,056,176

THE TACTFUL TRIAL: A FIRST-IN-HUMAN MULTI-CENTRE TRIAL OF BCMA SPECIFIC T-CELL ANTIGEN COUPLER INFUSION, GENERATED FROM CRYOPRESERVED G-CSF-MOBILIZED PERIPHERAL BLOOD, IN PATIENTS WITH RELAPSED AND REFRACTORY MULTIPLE MYELOMA

Multiple myeloma requires continuous treatment and frequent hospital visits. In this first-in-human clinical trial, Dr. Hay will test a novel cellular therapy, designed to reduce side effects. The personalized treatment will be manufactured in Canada for each patient, using their own pre-stored blood cells. The outcomes of this study include a recommended treatment dose for further testing, and laboratory studies to understand how these treatments work biologically.

Alyson Mahar
School of Nursing, Queen's Cancer Research Institute

$256,274

BEYOND THE BINARY: GENDER DIVERSITY IN CANCER HEALTH SERVICES RESEARCH

Dr. Mahar studies gender diverse people, including transgender, nonbinary, and gender nonconforming individuals, who face potential disparities in cancer care and outcomes compared to other groups. Co-created by gender diverse people and using a community-based approach, this project will establish a foundation to strengthen Canadian cancer health services research capacity to consider, integrate, and apply a gender diversity lens within cancer research. The research team and advisory council will determine barriers and facilitators to the inclusion of gender diversity in cancer research, identify gender diverse people's priorities for inclusion and representation, and develop best practices for how to conduct better research that is equitable and inclusive.

Parvin Mousavi
School of Computing

$692,326

REAL-TIME MOLECULAR-IMAGING GUIDANCE OF BREAST CONSERVING SURGERY

Breast cancer affects one in eight women and is a leading cause of female cancer-related deaths, with incomplete tumor resection often leading to additional surgeries and complications. In this project, Dr. Mousavi, co-investigators Jay Engel (Surgery) and Gabor Fichtinger (Computing), and collaborators will assess the next-generation of breast conserving surgical intervention technology, NaviKnife, to allow for marked improvements in surgical outcomes. NaviKnife, a turnkey technology using real-time metabolomic tissue typing, artificial intelligence, and image-guided tracking, will aid surgeons in achieving complete tumor resection with minimal tissue loss in breast conserving surgery.

Wendy R. Parulekar
Canadian Cancer Trials Group, Biomedical and Molecular Sciences

$1,602,675

OPTIMIZING HEAD AND NECK TUMOUR AND SYMPTOM CONTROL IN PATIENTS UNABLE TO TOLERATE CURATIVE (RADIO) THERAPY: A PHASE III TRIAL COMPARING STEREOTACTIC BODY RADIATION THERAPY TO STANDARD PALLIATIVE RADIATION TREATMENT

Patients with advanced head and neck squamous cell carcinoma (AHNC) who are ineligible for standard curative radiotherapy, have limited palliative radiotherapy treatment options and poor outcomes. In this project, Dr. Parulekar will lead a randomized phase III trial which will assess the effectiveness of dose escalated conformal radiotherapy, also known as stereotactic body radiation therapy (SBRT). This novel treatment strategy may provide better survival rates and symptom control, offering a new treatment option for this patient population.

Chandrakant Tayade & Madhuri Koti
Biomedical and Molecular Sciences

$914,176

ROLE OF IL-33-INNATE LYMPHOID CELLS 2 (ILC2) PATHWAY IN ENDOMETRIOSIS PATHOPHYSIOLOGY AND THERAPEUTIC TARGETING

Drs. Tayade and Koti study endometriosis (EM), an idiopathic disease that affects millions of women worldwide, causing infertility and recurring symptoms of pain. This study will help establish foundational knowledge about the role of interleukin 33 derived Innate Lymphoid Cells 2 in the pathophysiology of endometriosis, potentially leading to new immune-based treatments targeting lesion growth and pain while preserving fertility in endometriosis patients.

Stephen Vanner
Department of Medicine

$665,500

DEVELOPING A POTENT NON-ADDICTIVE ANALGESIC AS AN ALTERNATIVE TO CONVENTIONAL OPIOIDS

Opioids are needed to treat severe pain caused by inflammation or tumours, yet their use is limited by their debilitating side effects and potential to cause addiction, which continues to devastate countless lives. This team, led by Dr. Vanner, has developed a new pain medication that is non-addictive and effective, which requires continued preclinical testing to help bring it to level where it can be tested in human trials.

CIHR Team Grants

Karen Yeates
Medicine

$2,500,000

STOP NCDS: SCALING UP EVIDENCE-BASED HEALTH SYSTEM INTERVENTIONS THROUGH THE USE OF SUSTAINABLE HEALTHCARE FINANCING AND DIGITAL TECHNOLOGY PLATFORMS TO IMPROVE NON-COMMUNICABLE DISEASE PREVENTION AND CONTROL IN TANZANIA

Jointly awarded by CIHR and Global Alliance for Chronic Diseases (GACD), in response to the call for research into Non-Communicable Diseases Risk Prevention. The funding over five years will support Dr. Yeates' *STOP NCDs* project focused on the development of health resources within remote Tanzanian communities. The team of Canadian and Tanzanian researchers along with policy makers and decisions makers from Tanzania's Ministry of Health will evaluate and adapt HIV treatment strategies, extending them to treat cardiovascular diseases through the identification of individuals displaying risk factors such as high blood pressure and diabetes.

The program aims to provide low-cost health insurance to those with cardiovascular risk factors and connect patients to interventions through text messaging and voice recordings. Regional nurses will be provided with cost-effective digital training, allowing them to identify cardiovascular risk factors and track patient progress. Nurses will also be provided with further training to allow them to prescribe medications and treat patients through risk factor management. This collaborative effort with Tanzanian public health officials will support the use of the most cost-effective and sustainable strategies to impact health outcomes.

NFRF 2022 Exploration

Christopher Lohans
Biomedical and Molecular Sciences

Carlos Escobedo
Chemical Engineering

Aristides Docoslis
Chemical Engineering

Prameet Sheth
Pathology and Molecular Medicine

$250,000

A RAPID DETECTION PLATFORM TO GUIDE THE TREATMENT OF ANTIBIOTIC RESISTANT INFECTIONS

Development of a new diagnostic device to quickly diagnose antibiotic-resistant bacterial infections. Many current methods rely on bacterial culturing, which can take several days – a time during which infections can worsen. A new ultrasensitive method will be able to detect resistant bacteria in just one hour, directly from patients' blood or urine samples using surface-enhanced Raman spectroscopy. Drs Lohans, Escobedo, Doscoslis and Sheth also expect the technology can be used to deepen our understanding of the degradation and metabolism of antibiotics and other drugs.

Parvin Mousavi
School of Computing

David Maslove
Medicine & Critical Care Medicine

$250,000

TOWARDS ACTIONABLE AI IN THE ICU

Along with colleagues from business, critical care, computing and surgery, Drs Mousavi and Maslove, aims to improve the management of intensive care unit (ICU) patients across Canada using machine learning methods coupled with large-scale physiologic data. They will explore strategies to identify and anticipate important clinical events, with an emphasis on personalized therapeutic strategies, integration with clinical workflows, as well as the ethical and equitable deployment of artificial intelligence-based systems.

Amer Johri
Medicine

Nazanin Alavi
Psychiatry

$250,000

ACCELERATED REMOTE CONSULTATION TELE-POCUS IN CARDIOPULMONARY ASSESSMENT

Drs. Johri and Alavi intend to establish a national remotely supervised virtual point-of-care ultrasound (Tele-POCUS) program. While this revolutionary technology can facilitate clinical examinations by providing the ability to assess the heart, lungs, and other organs immediately at the bedside and live-stream images from remote regions directly to experts thousands of kilometres away, it also poses challenges related to technology access, inclusion, and human-to-system interactions. The team of psychosocial, medical, and digital experts will look at the implementation and sustainability of the new technology and work with remote and Indigenous communities on impact assessment.

Xiaolong Yang
Pathology and Molecular Medicine

Shetuan Zhang
Biomedical and Molecular Sciences

$250,000

CARDIAC-SPECIFIC TARGETING OF TUMOR SUPPRESSOR LATS FOR HEART FAILURE THERAPY

This project's goal is to increasing patient survival rates of heart failure. Myocardial infarctions or hypertension-related cardiac hypertrophy result in decreased oxygen flow to the heart tissue, causing cardiac muscle cells (cardiomyocytes) to die, resulting in heart failure. However, available treatment strategies only target symptoms, and there are currently no clinically approved drugs that promote cardiomyocyte survival and/or regeneration. Drs. Yang and Zhang will focus on developing new therapeutical drugs for heart failure using artificial intelligence and biosensor technologies and testing them on pre-clinical models. Specifically, it will deliver small molecule drugs to heart tissue to inhibit cardiomyocyte death caused by LATS, an enzyme that is upregulated during the heart failure process.

SEAMO – Endowed Education & Scholarship Fund

$15,000

2023

Dr. Marie Leung
Medicine | Division of General Internal Medicine

Development and implementation of an integrated social medicine curriculum for core Internal Medicine trainees to improve care for disadvantaged populations.

Dr. Christine Liak
Medicine | Division of Respirology

Developing an online educational tool for clinical cardiopulmonary exercise testing interpretation.

Dr. Audrey Tran
Medicine | Division of General Internal Medicine

Assessment ratings and narrative themes in faculty-triggered vs. learner-triggered assessments within competency-based medical education: a mixed methods study.

SEAMO – Innovation Fund

$150,000

2023-24

Dr. Aws Almufleh
Medicine | Division of Cardiology

Academic community collaboration; building the capacity of primary care to lead the management of patients with congestive heart failure.

Dr. Jagdeep Walia
Department of Biomedical and Molecular Sciences | Paediatrics

Restoring creatine to empower active tissues in 'energy deficit' in chronic kidney disease.

Dr. Gavin Winston
Medicine | Division of Neurology

Multimodal data integration for epilepsy surgery assessment and planning: incorporation of advanced neuroimaging to improve pre-surgical.

TIME ICES Grants

Dr. Aws Almufleh
Medicine

$30,000

PREDICTORS OF OUTCOMES OF HEART FAILURE DIAGNOSED IN THE COMMUNITY COMPARED TO A DIAGNOSIS MADE IN THE ACUTE CARE SETTING

Dr. Prameet Sheth
Pathology and Molecular Medicine

$30,000

MONITORING THE DEVELOPMENT OF RESISTANCE OF SARS-COV-2 TO THE ANTI-VIRAL NIRMATREL-VIR-RITONAVIR

TIME Outreach

Science Rendezvous

Science Rendezvous Kingston is part of the annual Canada-wide Science Rendezvous events and is a non-for-profit organization dedicated to providing programming by bringing exciting research and stem experiences to the public. The Science Rendezvous program is a free family festival that takes science out of the lab and onto the streets, or virtually into the classroom and homes of scientifically curious minds.

In 2023, the Kingston chapter resumed its first full-scale event in-person event at the Leon's Center, downtown Kingston since 2019. QCPU's 'Mobile Research Unit' booth featured light microscopes; a mini-CT-scanner and safety equipment and a gene sequencing puzzle. QCPU's booth was visited by over 5,000 participants! Including some very special guests.

Not only did we participate with a booth, we also created another episode of our YouTube series for the QCPU Edu-Lab on 'How to measure your lung capacity' featuring our resident 'mad British scientist', Dr. Charlie Hindmarch. On top of that, Dr. Hindmarch also did a LIVE in-person show called 'Smashing Strawberries' for an audience of over 250! Young participants came onstage to help Dr. Hindmarch extract DNA from a Strawberry, ably assisted by his hilarious racoon lab assistant (played by Dr. Nicolle Domnik).

5K+

Participants

Dr. Hindmarch also did a LIVE in-person show called 'Smashing Strawberries' for an audience of over 250!

Women in Science at Queen's University (WiSQ)

The Women in Science Queen's (WiSQ) was founded in 2019 by Dr. Patricia Lima. She envisioned promoting a healthy and inclusive environment in the scientific community at Queen's. The idea of fostering discussions about equity, wellness, career development, and means to retain women in science at Queen's was endorsed by the Human Rights and Equity Office and funded by the Inclusive Community Fund (ICF). Since then, the WiSQ group has grown in leadership and gained several followers within the Kingston community. Other QCPU members volunteering in the WiSQ executive activities are Brooke Ring, Dr. Elahe Alizadeh, Rachel Bentley and Dr. Ruaa Al-Qazazi.

In 2023, WiSQ seminars were also part of Queen's Global Summer Program (QGSP), a program that introduces to the students the United Nations Global Goals (currently, Sustainable Development Goals or SDGs), highlighting inequity, food security, gender equality, health and well-being, Indigeneity, biodiversity, climate action, and policy.

OTHER ACTIVITIES OF WISQ IN 2023 INCLUDED:

- → The celebration of the International Women's Day (IWD 2023) with other ERGs at Queen's.
- → Organizing a meeting-discussion about Kingston Health Innovation Ecosystem and its impact on the Canadian Economy, in collaboration with WE-CAN, the Queen's Partnerships & Innovation and the Ontario Bioscience (OBIO) Women in Health Initiative.
- → Hosting a panel of discussion on "Self-Awareness in the Workplace" with: Shannon Hill, Jenny Lee and Miguel Hahn.
- → Participating at the Diverse Employee Wellness Lunch, at Queen's.

Finally, WiSQ also continues with their mandate of outreach by touring 25 participants from Girls Inc. through QCPU. WiSQ and QCPU's are looking forward to maintaining this partnership into 2024 and continuing to promote outreach & inclusion in science!

Please follow us on X (@womeninscience6) to find out about our events or add our group (Women in Science at Queen's – WiSQ) to your Outlook calendar.

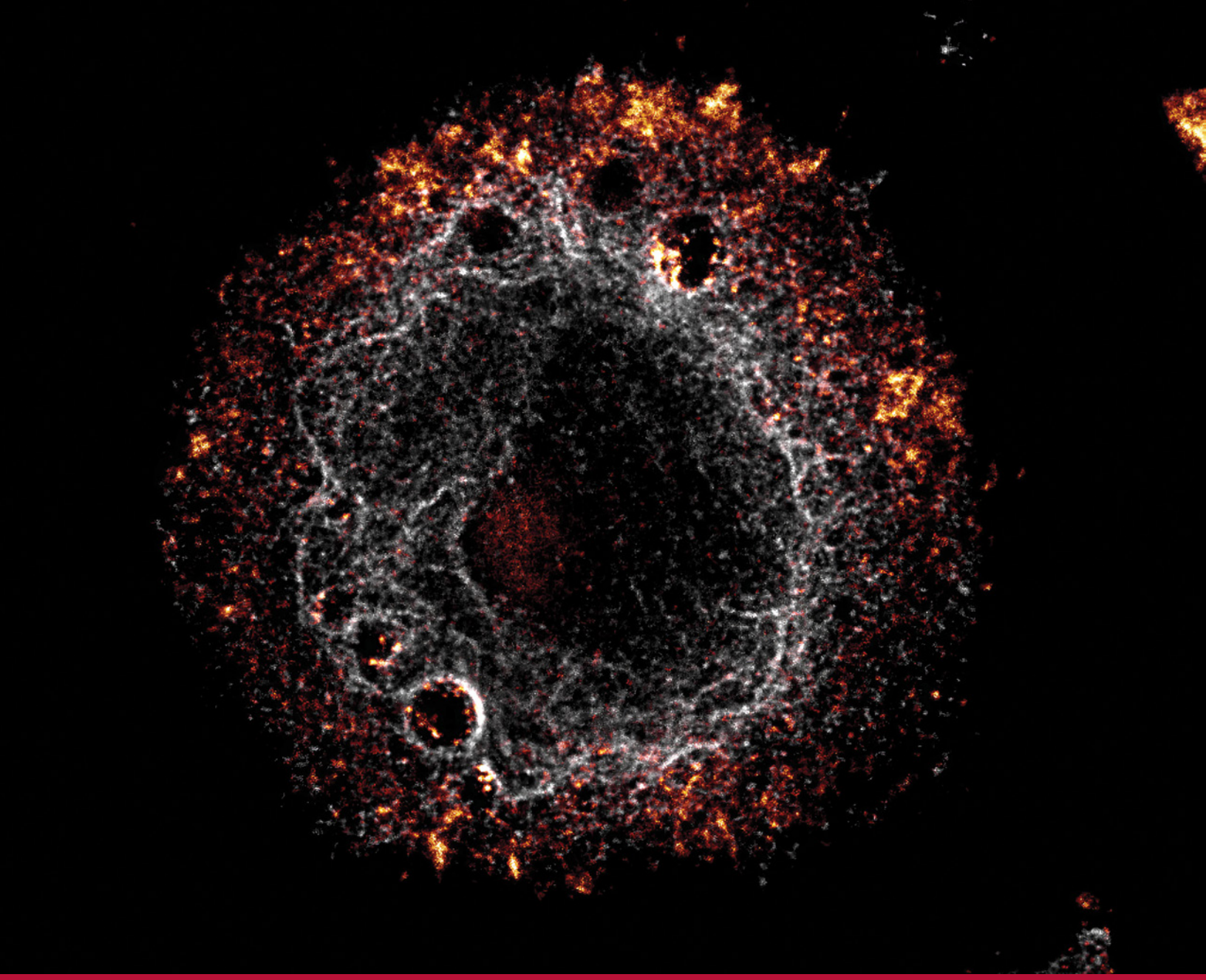
Toast Masters at Queens group Holiday Celebration

ToastMasters

Bhadresh Patel

President | Toastmasters at Queens

"Toastmasters at Queens is a non-profit club where students and community members come together to improve their public speaking and leadership skills. Our club offers a learn-by-doing program intended to help members gain the skills needed to achieve their personal and professional goals. We meet every Thursday from 5:30 pm to 6:30 pm in a hybrid format—both online and at the Biosciences Complex at Queen's University. Our goal is to provide a positive and supportive environment, where members are empowered to develop self-confidence and achieve personal growth. Our club has a significant impact beyond the university walls. Members gain valuable skills that enable them to contribute meaningfully to the Kingston community, becoming effective leaders and advocates in various local initiatives. Our relationship with the QCPU boardroom has been instrumental in our growth and success, allowing us to provide a consistent and professional meeting space that fosters learning and collaboration."



Translational Medicine Graduate Program | TMED

SECTION II

Translational Medicine Graduate Program | TMED

Message from the TMED Directors

We are extremely proud of the many accomplishments and successes of the TMED program, as well as our students, staff, and faculty members. Our program continues to attract exceptional students and remains highly competitive. With the growing needs of our students and faculty, our program has maintained a commitment to excellence in graduate education. Here are just a few of the many highlights of 2023.

Our sincere congratulations to Dr. Paula James, who has moved on from her role as the TMED Graduate Program Director, to her newest endeavor as the Deputy Head in the Department of Medicine. Dr. James was instrumental in the vision and creation of the TMED Graduate Program in partnership with Dr. Stephen Archer and Dr. Stephen Vanner. Since 2016, she has been an exceptional leader with an unwavering enthusiasm and dedication to the program. We thank her for her diplomacy, commitment, and guidance which have built an extremely successful graduate program with a strong and positive reputation on campus and beyond.

TMED students have continued to succeed. Highlights for the year include graduation of 13 MSc graduates and 2 PhD graduates. In addition, 2 students were promoted from the MSc to the PhD Program through the Mini-Master's route. Our students received multiple awards for their research including, 1 Canadian Graduate Scholarship – Doctoral – Vanier, 1 Canadian Graduate Scholarship – Doctoral – NSERC, and 5 Canadian Graduate Scholarships – Master's, as well as several highly competitive cross-faculty internal university awards. Two of our students (Jana Livingston, PhD'27 candidate, and Abigail Davis, MSc'24 candidate), who had the highest-ranking presentations during the TMED 801 Seminars, were chosen to present their research to the Department of Medicine during Medical Grand Rounds in 2024.

Under the exceptional leadership of President Isaac Emon, MSc'24 (candidate), the TMED Student Society continues to foster a supporting and flourishing community for our students to connect to each other and the program through events and activities. The peer-mentoring program remains highly beneficial, particularly for our first-year students. The Society has also pursued many I-EDIAA and community-based activities in the Kingston area, including two highly successful events focused on raising awareness and support for food insecurity. The Society plans for an I-EDIAA Speaker Symposium in the spring of 2024.

13

MSc Graduates

2

PhD Graduates

1

Canadian Graduate Scholarship – Doctoral – Vanier

1

Canadian Graduate Scholarship – Doctoral – NSERC

5

Canadian Graduate Scholarships

Thank you to the TMED faculty members who continue to offer their invaluable guidance and mentorship to help our graduate students succeed.

Julie Heagle, Graduate Program Advisor, continues to manage the many deliverables and responsibilities of the program with exceptional professionalism, leadership and commitment to our students and faculty members. With Julie's insight and guidance, we created a new part-time role of Educational and Outreach Coordinator, which specifically focuses on the educational needs of our students and faculty and offers additional support to our students. In May 2023, the program hired Sophia Linton, PhD'24 (Candidate) for this role, who has been outstanding. Sophia has accomplished many key deliverables, including the creation of several effective new faculty and student resources, creating, and new faculty workshops, providing outstanding one-on-one academic support to our students, moving all our courses to a more accessible platform, and creating a new faculty awards program. Thank you to Julie and Sophia for your outstanding leadership and commitment to excellence in graduate education at Queen's.

And finally, thank you to the TMED faculty members who continue to offer their invaluable guidance and mentorship to help our graduate students succeed. Dr. Michael Rauh has won the first ever TMED Excellence Award for Graduate Supervision, in recognition of his esteemed efforts and commitment to student mentorship at the TMED. The award was presented at the Annual TMED Banquet. This year, we welcomed many new faculty members as supervisors, including Dr. Teresa Purzner, Dr. Jamie Purzner, Dr. Mackenzie Bowman, Dr. Tim Hanna, Dr. Sarah Dick, Dr. Nicolle Domnik, Dr. Katie Goldie, Dr. Genevieve Digby, Dr. David Rodrigues, Dr. David Taylor, Dr. Christopher Lohans, and Dr. Akihiro Nakamura.

We are confident that our program's many successes will continue to grow because of the dedication of our exceptional faculty members, staff, and students. They will continue to generate new and exciting knowledge, which will be translated into ongoing improvements in health outcomes.

Dr. Anne K. Ellis
Graduate Program Director

Dr. Mark Ormiston
Graduate Program Co-Director

27 MSc Students

13 PhD Students

13 MSc Graduates

2 PhD Graduates

TMED Students

Spring 2023 Convocation Ceremony

DEVON COLE, MSC'23
Supervisor: Dr. Mark Ormiston

DR. CAITLYN VLASSCHAERT, PHD'23
Supervisors: Dr. Michael Rauh and Dr. Matthew Lanktree

Fall 2023 Convocation Ceremony

SAMANTHA ABLES, MSC'23
Supervisors: Dr. David Reed and Dr. Alan Lomax

CASSIE BRAND, MSC'23
Supervisors: Dr. Jacob Rullo and Dr. Alan Lomax

NOLAN BREAULT, MSC'23
Supervisor: Dr. Stephen Archer

ALYSSA BURROWS, MSC'23
Supervisor: Dr. Anne Ellis

PIERCE COLPMAN, MSC'23
Supervisor: Dr. Stephen Archer

EMMANUEL FAGBOLA, MSC'23
Supervisor: Dr. Mark Ormiston

GEORGIA KERSCHE, MSC'23
Supervisor: Dr. Amer Johri

JAMES KING, MSC'23
Supervisors: Dr. David Reed and Dr. Alan Lomax

KATIE LINDALE, MSC'23
Supervisors: Dr. Amber Simpson and Dr. David Berman

DR. JOSEPH NASHED, PHD'23
Supervisor: Dr. DJ Cook

TRINITY VEY, MSC'23
Supervisor: Dr. Karen Yeates

Successful Promotions from MSc to PhD Program

MIA WILKINSON, PHD '24 (CANDIDATE)
Supervisors: Dr. Kimberly Dunham Snary and Dr. Chris McGlory

JANA LIVINGSTON, PHD '25 (CANDIDATE)
Supervisor: Dr. Jacob Rullo

TMED Awards

National and Provincial Canadian Graduate Scholarship – Doctoral – Vanier

DILAKSHAN SRIKANTHAN
Supervisors: Dr. Parvin Mousavi and Dr. John Rudan

Canadian Graduate Scholarship-Doctoral – NSERC

KYLA TOZER
Supervisor: Dr. Prameet Sheth

Canadian Graduate Scholarship – Master's

JANA LIVINGSTON
Supervisor: Dr. Jacob Rullo

Canadian Graduate Scholarship – Master's

ABIGAIL DAVIS
Supervisor: Dr. Anne Ellis

Canadian Graduate Scholarship – Master's

ISAAC EMON
Supervisor: Dr. Stephen Archer

Canadian Graduate Scholarship – Master's TARRA

KAITLYN ANDREWS
Supervisors: Dr. Teresa Purzner and Dr. James Purzner

Canadian Graduate Scholarship – Master's TARRA

SOFIA SKEBO
Supervisor: Dr. Mark Ormiston

Ontario Graduate Scholarship

QUENTIN TSANG
Supervisors: Dr. Stephen Vanner, Dr. David Reed and Dr. Prameet Sheth

Ontario Graduate Scholarship

ABHISHEK SHASTRY
Supervisors: Dr. Kimberly Dunham Snary and Dr. Charlie Hindmarch

Internal Queen's Awards

Queen Elizabeth II Graduate Scholarship in Science and Technology

RACHEL BENTLEY
Supervisor: Dr. Stephen Archer

Margaret Andersen Graduate Award

LUBNAA HOSSENBACCUS
Supervisor: Dr. Anne Ellis

R. Samuel McLaughlin Award

DECLAN GAINER
Supervisor: Dr. Mark Ormiston

R. Samuel McLaughlin Award

DYLAN ZHAO
Supervisors: Dr. Prameet Sheth and Dr. Christopher Lohans

Franklin Bracken Fellowship

JASMIN KHELA
Supervisor: Dr. Yuka Asai

Graduate Entrance Tuition Award

ALEXANDRA MCDONALD
Supervisors: Dr. Michael Rauh and Dr. Susan Crocker

Graduate Entrance Tuition Award

KANA OGAWA
Supervisors: Dr. Teresa Purzner and Dr. James Purzner

- Read, A. D., Bentley, R. E. T., Martin, A.Y., Mewburn, J. D., Alizadeh, E., Wu, D., Lima, P. D. A., Dunham-Snary, K. J., Thébaud, B., Sharp, W., & Archer, S. L. (2023). Electron leak from the mitochondrial electron transport chain Complex I at site IQ is crucial for oxygen sensing in rabbit and human ductus arteriosus. *Journal of the American Heart Association,12*(13), e029131. https://doi.org/10.1161/JAHA.122.029131
- Bentley, R. E. T., Hindmarch, C. C. T., & Archer, S. L. (2023). Using omics to breathe new life into our understanding of the ductus arteriosus oxygen response. *Seminars in Perinatology,47*(2), 151715. https://doi.org/10.1016/j.semperi.2023.151715
- Breault, N. M.; Wu, D.; Dasgupta, A.; Chen, K.-H.; Archer, S. L. Acquired Disorders of Mitochondrial Metabolism and Dynamics in Pulmonary Arterial Hypertension. *Frontiers in cell and developmental biology* 2023, *11*, 1105565–1105565. https://doi.org/10.3389/fcell.2023.1105565
- Wu, D.; Jansen-van Vuuren, R. D.; Das Gupta, A.; Chen, K.-H.; Al-Qazazi, R.; Martin, A.; Breault, N. M.; Mewburn, J. D.; Lima, P. D.; Jones, O.; Archer, S. L. Abstract 10715: Therapeutic Efficacy of Drpitor1a, a Novel Dynamin-Related Protein 1 (DRP1) Inhibitor, in Preclinical Pulmonary Arterial Hypertension. *Circulation (New York, N.Y.)* 2022, *146* (Suppl_1). https://doi.org/10.1161/circ.146.suppl_1.10715
- Burrows, A.; Thiele, J.; Linton, S.; Hossenbaccus, L.; Sheth, P.; Vanner, S.; Ellis, A. Immunoglobulin-A,G,M Antibody Responses Over Time to Four Severe-Acute-Respiratory Coronavirus Proteins Following First and Second mRNA Vaccination. *Journal of allergy and clinical immunology* 2023, *151* (2), AB24–AB24. https://doi.org/10.1016/j.jaci.2022.12.078
- Burrows A, Davis A, Hossenbaccus L, Ellis AK. Adjunctive medications for food-induced anaphylaxis. In: Reference Module in Food Science. Elsevier; 2023. https://doi:10.1016/B978-0-323-96018-2.00072-9
- Colpman, P.; Dasgupta, A.; Archer, S. L. The Role of Mitochondrial Dynamics and Mitotic Fission in Regulating the Cell Cycle in Cancer and Pulmonary Arterial Hypertension: Implications for Dynamin-Related Protein 1 and Mitofusin2 in Hyperproliferative Diseases. *Cells (Basel, Switzerland*) 2023, *12* (14), 1897. https://doi.org/10.3390/cells12141897
- Colpman, P.; Chen, K.-H.; Mewburn, J.; Goodall-Halliwell, I.; Das Gupta, A.; Archer, S. L. Abstract 15168: The Role of Mitochondrial Fission Factor (MFF) and Increased Midzone Mitochondrial Fission in Pulmonary Arterial Hypertension: Implications for Proliferation, Mitophagy, and Apoptosis. *Circulation (New York, N.Y.)* 2023, *148*(Suppl_1). https://doi.org/10.1161/circ.148.suppl_1.15168
- Mikayla Erdelsky, Sarah A. Groves, Charmi Shah, Bibiana Umana, Samantha B. Delios, Donald H. Maurice. (2023). Phosphodiesterase 4 activity uniquely regulates ciliary cAMP-dependent 3T3-L1 adipogenesis. Cellular Signalling. 113. https://doi.org/10.1016/j.cellsig.2023.110981
- Al-Qazazi R, Emon IM, Potus F, Martin AY, Lima PDA, Vlasschaert C, Chen K-H, Wu D, Gupta AD, Noordhof C, Jefferson L, McNaughton AJM, Bick AG, Pauciulo MW, Nichols WC, Chung WK, Hassoun PM, Damico RL, Rauh MJ, Archer SL. Germline and Somatic Mutations in DNA Methyltransferase 3A (DNMT3A) Predispose to Pulmonary Arterial Hypertension (PAH) in Humans and Mice: Implications for Associated PAH. medRxiv. 2023:2023.2012.2030.23300391. https://doi.org/10.1101/2023.12.30.23300391
- Coverdale, N. S., Champagne, A. A., Allen, M. D., Tremblay, J. C., Ethier, T. S., Fernandez-Ruiz, J. & Olver, T. D. (2023-4). Brain atrophy, reduced cerebral perfusion, arterial stiffening and wall thickening with ageing coincide with stimulus-specific changes in fMRI-BOLD responses. *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology*.
- Douchant, K., He, S. M., Noordhof, C., Greenlaw, J., Vancuren, S., Schroeter, K., Allen-Vercoe, E., Sjaarda, C., Vanner, S. J., Petrof, E. O., Sheth, P. M., & Guzman, M. (2024). Defined microbial communities and their soluble products protect mice from Clostridioides difficile infection. *Commun Biol*, *7*(1), 135. https://doi.org/10.1038/s42003-024-05778-6
- Linton S, Hossenbaccus L, Ellis AK. Evidence-based use of antihistamines for treatment of allergic conditions. Ann Allergy Asthma Immunol. 2023;S10811206(23)00524-0. https://doi.org/10.1016/j.anai.2023.07.019
- Linton S, Xu K, Hossenbaccus L, et al. Anxiety in adults with asthma during the coronavirus disease 2019 pandemic: a Canadian perspective. Allergy Asthma Clin Immunol. 2023;19(1):73. Published 2023 Aug 23. https://doi.org/10.1186/s13223-023-00833-z

- Burrows AG, Davis A, Hossenbaccus L, Ellis AK. Adjunctive medications for food-induced anaphylaxis. In: Reference Module in Food Science. Elsevier; 2023. https://doi:10.1016/B978-0-323-96018-2.00072-9
- Wise SK, Damask C, Roland LT, … Hossenbaccus, L et al. International consensus statement on allergy and rhinology: Allergic rhinitis - 2023. Int Forum Allergy Rhinol. 2023;13(4):293-859. https://doi.org/10.1002/alr.23090
- Burrows, A.; Thiele, J.; Linton, S.; Hossenbaccus, L.; Sheth, P.; Vanner, S.; Ellis, A. Immunoglobulin-A,G,M Antibody Responses Over Time to Four Severe-Acute-Respiratory Coronavirus Proteins Following First and Second mRNA Vaccination. *Journal of allergy and clinical immunology* 2023, *151* (2), AB24–AB24. https://doi.org/10.1016/j.jaci.2022.12.078
- Maheu, M. G., James, N., Clark, Z., Yang, A., Patel, R., Beaudette, S. M., MacPherson, R. E. K., & Duarte-Guterman, P. (2023). Running to remember: The effects of exercise on perineuronal nets, microglia, and hippocampal angiogenesis in female and male mice (p. 2023.11.24.568577). bioRxiv. https://doi.org/10.1101/2023.11.24.568577
- Al-Qazazi R, Emon IM, Potus F, Martin AY, Lima PDA, Vlasschaert C, Chen K-H, Wu D, Gupta AD, Noordhof C, Jefferson L, McNaughton AJM, Bick AG, Pauciulo MW, Nichols WC, Chung WK, Hassoun PM, Damico RL, Rauh MJ, Archer SL. Germline and Somatic Mutations in DNA Methyltransferase 3A (DNMT3A) Predispose to Pulmonary Arterial Hypertension (PAH) in Humans and Mice: Implications for Associated PAH. medRxiv. 2023:2023.2012.2030.23300391. https://doi.org/10.1101/2023.12.30.23300391
- Cui, E.; Kersche, G.; Grubic, N.; Hetu, M.-F.; Pang, S.; Johri, A. EFFECT OF PHARMACOLOGIC ANTI-ATHERO-SCLEROTIC THERAPY ON CAROTID INTRAPLAQUE NEOVASCULARIZATION: A SYSTEMATIC REVIEW. *Journal of the American College of Cardiology* 2023, *81* (8), 1460–1460. https://doi.org/10.1016/S0735-1097(23)01904-6
- Cui, E.; Kersche, G.; Grubic, N.; Hétu, M.-F.; Pang, S. C.; Sillesen, H.; Johri, A. M. Effect of Pharmacologic Anti-Atherosclerotic Therapy on Carotid Intraplaque Neovascularization: A Systematic Review. *Journal of clinical lipidology* 2023, *17* (3), 315–326. https://doi.org/10.1016/j.jacl.2023.04.009
- Linton S, Hossenbaccus L, Ellis AK. Evidence-based use of antihistamines for treatment of allergic conditions. Ann Allergy Asthma Immunol. 2023;S1081-1206(23)00524-0. https://doi.org/10.1016/j.anai.2023.07.019
- Linton S, Xu K, Hossenbaccus L, et al. Anxiety in adults with asthma during the coronavirus disease 2019 pandemic: a Canadian perspective. Allergy Asthma Clin Immunol. 2023;19(1):73. Published 2023 Aug 23. https://doi.org/10.1186/s13223-023-00833-z
- Wise SK, Damask C, Roland LT, … Linton, S et al. International consensus statement on allergy and rhinology: Allergic rhinitis - 2023. Int Forum Allergy Rhinol. 2023;13(4):293-859. https://doi.org/10.1002/alr.23090
- Burrows, A.; Thiele, J.; Linton, S.; Hossenbaccus, L.; Sheth, P.; Vanner, S.; Ellis, A. Immunoglobulin-A,G,M Antibody Responses Over Time to Four Severe-Acute-Respiratory Coronavirus Proteins Following First and Second mRNA Vaccination. *Journal of allergy and clinical immunology* 2023, *151* (2), AB24–AB24. https://doi.org/10.1016/j.jaci.2022.12.078
- Dr Rocco Latorre , Ms Shavonne Teng , Mr Parker Lewis , Ms Rachel Pollard , Dr Chloe Peach , Mr Gokul Thanigai , Ms Tracy Chiu , Dr Dane Jensen , Dr Nestor Jimenez-Vargas , Ms Abby Mocherniak , Dr Matthew Bogyo , Dr Michael Gaspari , Professor Stephen Vanner, Professor Nathalie Pinkerton , Professor Kam Leong , Ms Divya Bhansali , Professor Brian Schmidt. (2023). Nanomedicines targeting PAR2 signaling in endosomes of colonocytes and nociceptors reverse colonic inflammatory pain. *Nature Nanotechnology. Currently under review*- NNANO-23102594
- Stephenson, C.; Malakouti, N.; Nashed, J. Y.; Salomons, T.; Cook, D. J.; Milev, R.; Alavi, N. Using Electronically Delivered Therapy and Brain Imaging to Understand OCD Pathology: A Pilot Feasibility Study. *Frontiers in psychiatry* 2023, *14*, 1050530–1050530. https://doi.org/10.3389/fpsyt.2023.1050530
- Standage, D. I.; Areshenkoff, C. N.; Gale, D. J.; Nashed, J. Y.; Flanagan, J. R.; Gallivan, J. P. Whole-Brain Dynamics of Human Sensorimotor Adaptation. *Cerebral cortex (New York, N.Y. 1991)* 2023, *33* (8), 4761–4778. https://doi.org/10.1093/cercor/bhac378

- Co-Author. (Gelman, I; Sharma, N; Mckeeman, O; Tomei, N; Baranchuk, A; Zhang, S; El Diasty, M). (2023). Effects on Cardiac Electrophysiology and its Anti-arrhythmic Actions of Amiodarone. : 19. Funding Sources: Canadian Institutes of Health Research (CIHR).
- Shastry, A., & Dunham-Snary, K. (2023). Metabolomics and mitochondrial dysfunction in cardiometabolic disease. Life sciences, 333, 122137. https://doi.org/10.1016/j.lfs.2023.122137
- M.M. VandenBroek, S.I. Skebo, M.L. Ormiston. "Targeting BMPR-II in pulmonary arterial hypertension: a case of Hercules versus the Hydra?" Expert Opinion on Therapeutic Targets. January 2023.
- Kyla Tozer, Calvin P. Sjaarda, Emily Moslinger, Henry Wong, Danielle Brabant-Kirwan, Robert Kozac,
- Prameet M. Sheth. Comparison of SARS-CoV-2 viral loads in the nasal mucosa of patients infected with BA.1, BA.2 or BA.5 Omicron lineages. Open Forum Infectious Diseases.
- Sjaarda CP, Lau L, Simpson JT, Fattouh R., Biondi M., Maguire F., Campigotto A., Feng Y., Tozer K., Wong H., Sung W., Kim S., Marshall C., Sheth P., Kozak R. Prevalence of Low-Frequency, Antiviral Resistance Variants in SARS-CoV-2 Isolates in Ontario, Canada, 2020-2023. JAMA Netw Open. 2023;6(7):e2324963. https://doi.org/10.1001/jamanetworkopen.2023.24963
- Degro C. E., Jimenez-Vargas N. N., Tsang Q. K., Yu Y., Guzman-Rodriguez M., Alizadeh E., Hurlbut D., Reed D. E., Lomax A. E., Stein C., Bunnett N. W., & Vanner S. J., Evolving acidic microenvironments during colitis provide selective analgesic targets for a pH-sensitive opioid. (2023). *PAIN*. 164(11), 2501-2515. https://doi.org/10.1097/j.pain.0000000000002956
- Brant B. J. A., Yu Y., Abu Omar A., Jaramillo-Polanco J., Lopez Lopez C., Jimenez-Vargas N. N., Tsang Q. K., McDonell A., Takami K., Reed D. E., Lomax A. E., Vanner S. J., & Tuck C. J. (2023). Dietary monosodium glutamate increases visceral hypersensitivity in a mouse model of visceral pain. *Neurogastroeneterology and Motility*. 35:e14596. https://doi.org/10.1111/nmo.14596
- Tuck C. J., Abu Omar A., De Palma G., Osman S., Jimenez-Vargas N. N., Yu Y., Bennet, S. M. P., Jaramillo-Polanco J. O., Baker C. C., Bennett A. S. W., Guzman-Rodrigeuz M., Tsang Q. K., Alward T., Rolland S., Morissette C., Verdu E. F., Bercik P., Vanner S. J., Lomax A. E., & Reed D. E. *Gut*. 72, 1636-1637 Published Online First: 03 Feb 2023. https://doi.org/10.1136/gutjnl-2022-329184
- M.M. VandenBroek, S.I. Skebo, M.L. Ormiston. "Targeting BMPR-II in pulmonary arterial hypertension: a case of Hercules versus the Hydra?". *Expert Opinion on Therapeutic Targets.* January 2023.
- Vlasschaert C, Mack T, Heimlich JB, Niroula A, Uddin MM, Weinstock JS, Sharber B, Silver AJ, Xu Y, Savona MR, Gibson CJ, Lanktree MB, Rauh MJ, Ebert BL, Natarajan P, Jaiswal S, Bick AG. A practical approach to curate clonal hematopoiesis of indeterminate potential in human genetic datasets. Blood. 2023 Jan 18:blood.2022018825. https://doi.org/10.1182/blood.2022018825 Epub ahead of print. PMID: 36652671.
- Vlasschaert C, Heimlich JB, Rauh MJ, Natarajan P, Bick AG. Interleukin-6 Receptor Polymorphism Attenuates Clonal Hematopoiesis-Mediated Coronary Artery Disease Risk Among 451 180 Individuals in the UK Biobank. Circulation. 2023 Jan 24;147(4):358-360. https://doi.org/10.1161/CIRCULATIONAHA.122.062126 Epub 2023 Jan 23. PMID: 36689568; PMCID: PMC9883044.
- Vlasschaert C, McNaughton AJM, Chong M, Cook EK, Hopman W, Kestenbaum B, Robinson-Cohen C, Garland J, Moran SM, Paré G, Clase CM, Tang M, Levin A, Holden R, Rauh MJ, Lanktree MB. Association of Clonal Hematopoiesis of Indeterminate Potential with Worse Kidney Function and Anemia in Two Cohorts of Patients with Advanced Chronic Kidney Disease. J Am Soc Nephrol. 2022 May;33(5):985-995. https://doi.org/10.1681/ASN.2021060774 Epub 2022 Feb 23. PMID: 35197325; PMCID: PMC9063886.
- Vlasschaert C, Heimlich JB, Rauh MJ, Natarajan P, Bick AG. Interleukin-6 Receptor Polymorphism Attenuates Clonal Hematopoiesis-Mediated Coronary Artery Disease Risk Among 451 180 Individuals in the UK Biobank. Circulation. 2023 Jan 24;147(4):358-360. https://doi.org/10.1161/CIRCULATIONAHA.122.062126 Epub 2023 Jan 23. PMID: 36689568; PMCID: PMC9883044.

- Vlasschaert C, Mack T, Heimlich JB, Niroula A, Uddin MM, Weinstock J, Sharber B, Silver AJ, Xu Y, Savona M, Gibson C, Lanktree MB, Rauh MJ, Ebert BL, Natarajan P, Jaiswal S, Bick AG. A practical approach to curate clonal hematopoiesis of indeterminate potential in human genetic data sets. Blood. 2023 May 4;141(18): 2214-2223. https://doi.org/10.1182/blood.2022018825 PMID: 36652671; PMCID: PMC10273159.
- Vlasschaert C, Lanktree MB, Rauh MJ, Kelly TN, Natarajan P. Clonal haematopoiesis, ageing and kidney disease. Nat Rev Nephrol. 2024 Mar;20(3): 161-174. https://doi.org/10.1038/s41581-023-00778-x Epub 2023 Oct 26. PMID: 37884787; PMCID: PMC 10922936.
- Vlasschaert C, Akwo E, Robinson-Cohen C, Cook EK, Lanktree MB, Rauh MJ, Bick AG. Infection risk associated with clonal hematopoiesis of indeterminate potential is partly mediated by hematologic cancer transformation in the UK Biobank. Leukemia. 2023 Nov;37(11):2306-2308. https://doi.org/10.1038/s41375-023-02023-7 Epub 2023 Sep 9. PMID: 37689824.
- Huang Z, Vlasschaert C, Robinson-Cohen C, Pan Y, Sun X, Lash JP, Kestenbaum B, Kelly TN. Emerging evidence on the role of clonal hematopoiesis of indeterminate potential in chronic kidney disease. Transl Res. 2023 Jun;256:87-94. https://doi.org/10.1016/j.trsl.2022.12.009 Epub 2022 Dec 28. PMID: 36586535; PMCID: PMC10101890.
- Kestenbaum B, Bick AG, Vlasschaert C, Rauh MJ, Lanktree MB, Franceschini N, Shoemaker MB, Harris RC Jr, Psaty BM, Köttgen A, Natarajan P, Robinson-Cohen C. Clonal Hematopoiesis of Indeterminate Potential and Kidney Function Decline in the General Population. Am J Kidney Dis. 2023 Mar;81(3):329-335. https://doi.org/10.1053/j.ajkd.2022.08.014 Epub 2022 Oct 11. PMID: 36241009; PMCID: PMC9974853.
- Hung AM, Assimon VA, Chen HC, Yu Z, Vlasschaert C, Triozzi JL, Chan H, Wheless L, Wilson O, Shah SC, Mack T, Thompson T, Matheny ME, Chandrasekar S, Mozaffari SV, Chung CP, Tsao P, Susztak K, Siew ED, Estrada K, Gaziano JM, Graham RR, Tao R, Hoek M, Robinson-Cohen C, Green EM, Bick AG; Million Veteran Program. Genetic Inhibition of APOL1 Pore-Forming Function Prevents APOL1-Mediated Kidney Disease. J Am Soc Nephrol. 2023 Nov 1;34(11):1889-1899. https://doi.org/10.1681/ASN.0000000000000219 Epub 2023 Oct 6. PMID: 37798822; PMCID: PMC10631602.
- Yu Z, Fidler TP, Ruan Y, Vlasschaert C, Nakao T, Uddin MM, Mack T, Niroula A, Heimlich JB, Zekavat SM, Gibson CJ, Griffin GK, Wang Y, Peloso GM, Heard-Costa N, Levy D, Vasan RS, Aguet F, Ardlie KG, Taylor KD, Rich SS, Rotter JI, Libby P, Jaiswal S, Ebert BL, Bick AG, Tall AR, Natarajan P. Genetic modification of inflammation and clonal hematopoiesis-associated cardiovascular risk. J Clin Invest. 2023 Sep 15;133(18):e168597. https://doi.org/10.1172/JCI168597 PMID: 37498674; PMCID: PMC10503804.

→ Weeks LD, Niroula A, Neuberg D, Wong W, Lindsley RC, Luskin M, Berliner N, Stone RM, DeAngelo DJ, Soiffer R, Uddin MM, Griffin G, Vlasschaert C, Gibson CJ, Jaiswal S, Bick AG, Malcovati L, Natarajan P, Ebert BL. Prediction of risk for myeloid malignancy in clonal hematopoiesis. NEJM Evid. 2023 May;2(5):10.1056/evidoa2200310. https://doi.org/10.1056/evidoa2200310 Epub 2023 Apr 25. PMID: 37483562; PMCID: PMC10361696.

→ Nakao T, Yu Z, Vlasschaert C, Uddin MM, Lindsay ME, Ellinor PT, Ebert BL, Bick AG, Pirruccello JP, Natarajan P. Increased Risk of Thoracic Aortic Aneurysms With JAK2 V617F. J Am Coll Cardiol. 2023 May 30;81(21):2128-2130. https://doi.org/10.1016/j.jacc.2023.03.413 PMID: 37225367; PMCID: PMC10321138.

→ Kestenbaum B, Bick AG, Vlasschaert C, Rauh MJ, Lanktree MB, Franceschini N, Shoemaker MB, Harris RC Jr, Psaty BM, Köttgen A, Natarajan P, Robinson-Cohen C. Clonal Hematopoiesis of Indeterminate Potential and Kidney Function Decline in the General Population. Am J Kidney Dis. 2023 Mar;81(3):329-335. https://doi.org/10.1053/j.ajkd.2022.08.014 Epub 2022 Oct 11. PMID: 36241009; PMCID: PMC9974853.

→ Amancherla K, Schlendorf KH, Vlasschaert C, Lowery BD, Wells QS, See SB, Zorn E, Colombo PC, Reilly MP, Lindenfeld J, Uriel N, Freedman JE, Shah RV, Moslehi J, Bick AG, Clerkin K. Clonal hematopoiesis of indeterminate potential and outcomes after heart transplantation: A multicenter study. Am J Transplant. 2023 Aug;23(8):1256-1263. https://doi.org/10.1016/j.ajt.2023.04.028 Epub 2023 May 6. PMID: 37156299; PMCID: PMC10524751.

→ Verschoor CP, Vlasschaert C, Rauh MJ, Paré G. A DNA methylation based measure outperforms circulating CRP as a marker of chronic inflammation and partly reflects the monocytic response to long-term inflammatory exposure: A Canadian Longitudinal Study on Aging analysis. Aging Cell. 2023 Jul;22(7):e13863. https://doi.org/10.1111/acel.13863 Epub 2023 May 4. PMID: 37139638; PMCID: PMC10352553

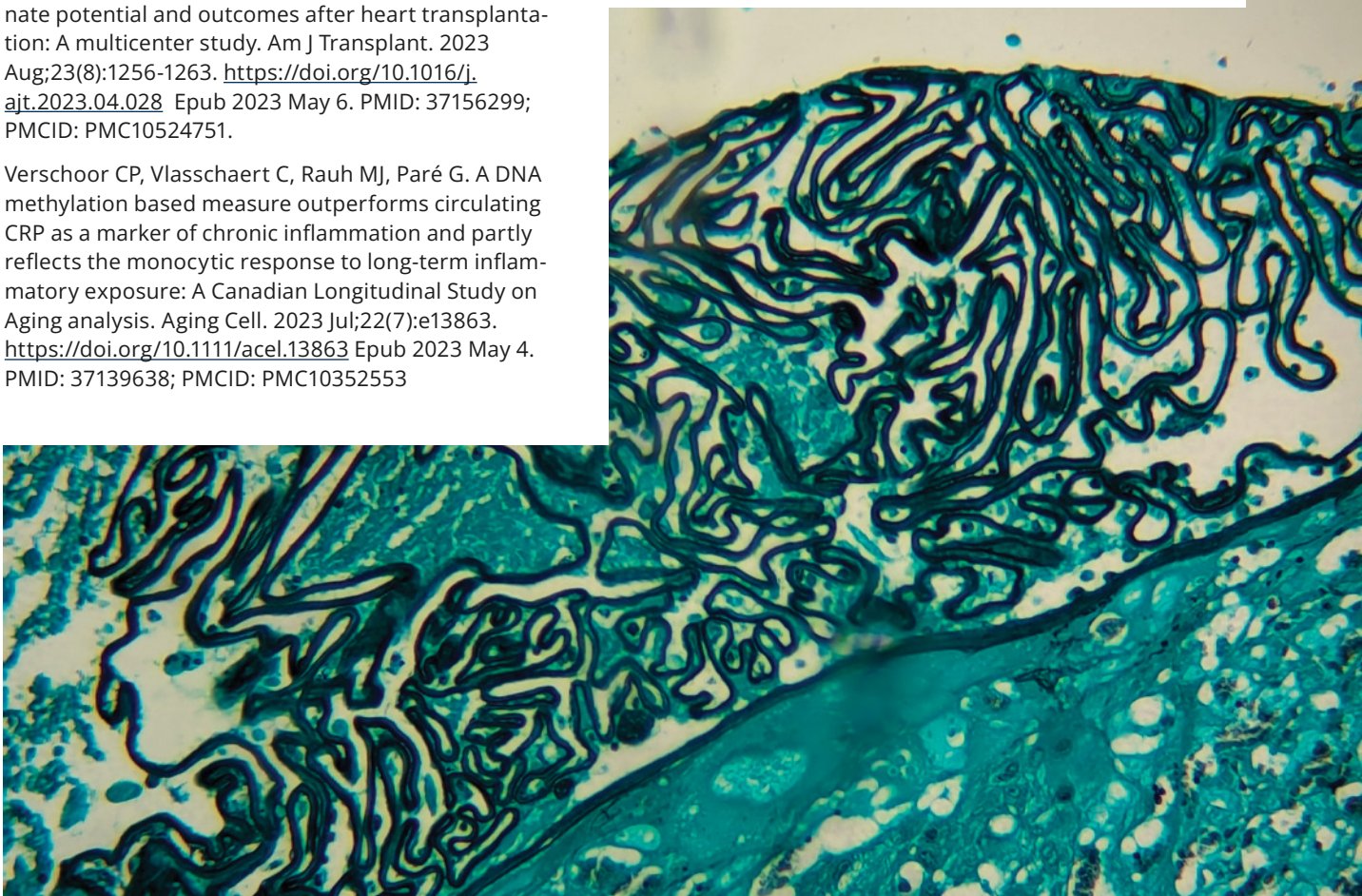
→ Wilken, B.; Zaman, M.; Asai, Y. Patient Education in Atopic Dermatitis: A Scoping Review. *Allergy, asthma, and clinical immunology* 2023, *19* (1), 1–89. https://doi.org/10.1186/s13223-023-00844-w

→ Mia S Wilkinson & Kimberly J Dunham-Snary. (2023). Blood-based bioenergetics: a liquid biopsy of mitochondrial dysfunction in disease. Trends in Endocrinology and Metabolism. 34(9): 554-570. http://dx.doi.org/10.1016/j.tem.2023.06.004

→ Mia Wilkinson, Emily Ferguson, Justin Bureau, Jennifer Veeneman, Chris McGlory, Kimberly Dunham-Snary. (2023). Platelet Bioenergetics as a Liquid Biopsy for Cardiometabolic Disease. Free Radical Biology and Medicine. 208(S01):S80. https://doi.org/10.1016/j.freeradbiomed.2023.10.180

→ Xie, J., Stockley, D., Hastings Truelove, A., Marlin, S., Zand, R., Payne, J., Miller, M., & Soleas, E. (2023). Needs and preferences of REB members in the development of a new TCPS 2 training program in Canada. *Research Ethics, 0*(0). https://doi.org/10.1177/17470161231218173

→ Zhao, D., Robinson, S., Pozzar, R. et al. The Evolving Roles and Expectations of Inpatient Palliative Care Through COVID-19: a Systematic Review and Meta-synthesis. J GEN INTERN MED (2023). https://doi.org/10.1007/s11606-023-08564-y



TMED FACULTY

Program Involvement Legend

- Graduate Program Director / Co-Director
- Graduate Program Committee
- Course Chair
- Supervisor
- TMED 800 Lecturer
- TMED 801 Speaker
- TMED 802 Lecturer
- Observerships

Anne Ellis

Paula James

Mark Ormiston

Che Colpitts

David Reed

Teresa Purzner

Karen Yeates

Mackenzie Bowman

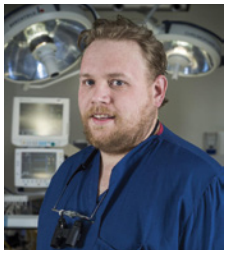
Asish Das Gupta

Stephen Archer

Yuka Asai

Gord Boyd

David Berman



DJ Cook

Susan Crocker

Kerstin de Wit

Sarah Dick

Genevieve Digby

Nicolle Domnik

Kimberly Dunham Snary

Katie Goldie

Timothy Hanna

Charlie Hindmarch

Amer Johri

Matthew Lanktree

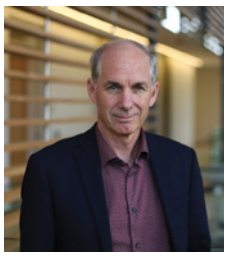
Alan Lomax

Christopher Lohans

Diane Lougheed

Don Maurice

Chris McGlory



Stephen Vanner

Parvin Mousavi

Alberto Neder

James Purzner

Amber Simpson

Michael Rauh

Jacob Rullo

John Rudan

Prameet Sheth

Tara Baetz
Jenna Healey
Matthew James
David Lillicrap

Jennifer Flemming
Annette Hay
Mala Joneja
Marie Clements-Baker

Jennifer Flemming
Mike Fitzpatrick
Lawrence Hookey
Janet Lui
Victor Neira Vidal
Ana Wing

Husam Abdel-Qadir
Pat Armstrong
Jason Berman
James Downar
Hugh Guan
Melissa Kelley

Bogdan Momciu
Bethany Monteith\ John Parker
Garima Shukla
Michael Yacob
Husam Abdel-Qadir
Santiago Martinez-Cajas

Message from the TMED President

It was a pleasure to serve as the president of the Translational Medicine Graduate Program (TMED) Student Council this past year. TMED is an integral part of the Translational Institute of Medicine (TIME) at Queen's University. It provides students with an incredible opportunity to lead innovative research, gain clinical experience and practice the bench-to-bedside approach to academic medicine.

The TMED Student Council consists of seven students who work to build a strong sense of community while creating a supportive and inclusive space for our students. In the summer prior to starting the program, each student has the opportunity to join our TMED mentorship program. Over 85% of incoming TMED students partake in this program and are matched with an upper year student to help ease the transition to graduate school. Thanks to our secretary and organizer of the mentorship program, Maria Korovina, our first-year students were well supported from an academic, social, and professional standpoint throughout the year. Thank you to all our wonderful mentors.

Indigeneity – Equity, Diversity, Inclusivity, Accessibility and Anti-Racism (I-EDIAA) was a key focus of the council this year. Our I-EDIAA representative, Kana Ogawa, was instrumental in spearheading several initiatives this year to benefit our community. During the holiday season, TMED raised ~$1500 worth of non-perishable food items for the local Partners in Mission Foodbank. We also collaborated with Good Times Diner, a Queen's initiative that aims to address food insecurity on campus by cooking and serving ~60 meals (twice a week) for Queen's students. In April, we held an I-EDIAA in Health Sciences Research symposium where several faculty members and students presented their research on topics such as improving access to cancer screening and treatment and addressing gender inequalities in research. Thank you to everyone who presented and attended. This was truly an inspiring event.

This year, we held another successful TMED clothing sale led by our treasurer, Abbey Politeski. From hoodies to windbreakers, Abbey made sure that the TMED community was representing the program in variety of styles and colours. Thank you to everyone who purchased items this year.

We had another successful year of monthly TMED newsletters that were crafted by our MSc and PhD Representatives, Sofia Skebo and Tarrah Ethier, with creative assistance from Lubnaa Hossenbaccus, TMED's Social Media Coordinator.

On the social side, we held an introductory orientation day, a Halloween themed night with movies and pumpkin painting, a TMED trivia night at The Grad Club, a skating night in Springer Market Square and a bowling night at Splitsville.

Finally, thanks to the hard work of my Vice-President, Matti McFarlane, as well as the rest of the team, we hosted a wonderful celebratory year-end banquet with delicious food, honourable awards, heartfelt speeches, and a beautiful slideshow.

Thank you to TIME, TMED and the Department of Medicine for the continuous support this past year. It was an honour to lead this dedicated and compassionate group of individuals.

Isaac Emon, MSc'24,
President of the TMED Society

Research in our lab investigates placental development, in the context of both normal pregnancies and those complicated by different factors, including fetal growth restriction, preeclampsia, maternal diabetes, cannabis use, etc. A large part of our work is with cell culture models and QCPU has been instrumental in moving it forward beginning about two years ago and ongoing today. Our experiments have made use of their exceptional facilities in imaging and flow cytometry as well as for histology and bioinformatics. More importantly though, Dr, Patricia Lima and Curtis Noordhof have been outstanding in helping us to design our experiments to address the questions that we want to ask. They have worked enthusiastically and have consistently gone above and beyond to support our studies and develop new approaches in collaboration with our students to refine their protocols to generate new and exciting data. We are thrilled with the collaborative and supportive environment offered by everyone at the QCPU and look forward to our continued successes moving forward!"

DR. DAVID NATALE

Associate Professor in Department of Biomedical and Molecular Sciences and Obstetrics & Gynaecology

1) **Skating night on January 25, 2024. Students skating in Springer Market Square** (left to right): Isaac Emon, Matti McFarlane, Lindsay Jefferson, Cassidy Laub, Dalia Miller, Abbey Politeski, Sofia Skebo, and Tarrah Ethier

2) **Students at Orientation Scavenger Hunt** (front to back): Linnea Soon, Alex McDonald, Lindsay Jefferson, and Sofia Skebo)

1

2

3) **Program Orientation Day August 31, 2023. Students at Orientation Scavenger Hunt** (left to right): Declan Gainer, Kaytlin Andrews, Jiale Xie,Cassidy Laub, and Abbey Politeski

4) **Students at Orientation Scavenger Hunt** (left to right): Dylan Zhao, Kana Ogawa, Rachel Di Iorio, and Dalia Miller

5) **Halloween Pumpkin Carving Night on October 19. Students with their pumpkins** (back row left to right): Cassidy Laub, Kana Ogawa, Noah James, Maria Korovina, Jana Livingston, Abishek Shastry, Mia Wilkinson. (Front row left to right): Sofia Skebo, Kaytlin Andrews, Isaac Emon, and Matti McFarlane

6) **I-EDIAA Health Sciences Research Symposium April 18, 2024** Students their Poster Presentations at the TMED led I-EDIAA in Health Sciences Research Symposium.

7) **Preparing Meals with the Good Times Diner on January 14, 2024. Students with the meals they prepared at the Good Times Diner** (back row left to right): Aryaman Sharma, Declan Gainer, Kaytlin Andrews (front row left to right): Isaac Emon, Kana Ogawa

8) **TMED Awards Banquet on May 2, 2024. 2023/24 TMED Council Executive Members.** (right to left): Kana Ogawa,EDI/SGSPA Rep, Sofia Skebo, MSc Rep, Maria Korovina, Secretary, Isaac Emon, President, Matti McFarlane, Vice-President, Abbey Politeski, Treaurer and Tarrah Ethier, PhD Rep

9) **TMED Bowling Night on March 7, 2024**

10) **TMED 2023-2024 Student Council Members** (front row from left to right): Kana Ogawa, MSc'25 (Candidate) I-EDII/SGPS RepresentativeMaria Korovina, MSc'24 (Candidate), Secretary Isaac Emon, MSc'24 (Candidate), PresidentMatti McFarlane, MSc'24 (Candidate) Vice-President Abbey Politeski, MSc'25 (Candidate) Treasurer, (back row from left to right): Sofia Skebo, MSc'25 (Candidate), MSc Student Representative/GPC Representative Tarrah Ethier, PhD'26, PhD Student Representative/GPC Representative

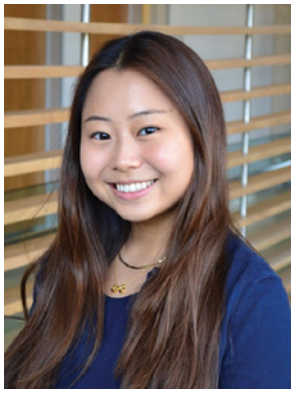
11) TMED Virtual Open House for Prospective Students on January 17, 2024

12) Open House event hosted by Queen's Health Sciences for prospective graduate students on November 22, 2023.

13) **Food Bank Drive on December 21, 2023** Isaac Emon with the compiled Food Drive Donations

14) **Dr. Michael Rauh receives the Excellence in Graduate Supervision Award presented by lead nominator Alexandra McDonald, MSc'25**

15) **Dr. Paula James receives recognition for outstanding leadership and dedication as the inaugural Graduate Program Director presented by Dr. Stephen Archer**



A message from the TMED I-EDIAA Representative

As the I-EDIAA representative for the TMED Student Society, my focus has been on highlighting and addressing critical issues within our community through outreach and awareness initiatives.

One major initiative this year was addressing food insecurity, a significant concern for both the Kingston population and our graduate students. In December, we partnered with the local non-profit organization, Partners in Mission Food Bank, to organize a Holiday Food Drive. Thanks to the generous contributions from the TMED community, we collected 256 pounds of food and raised $220 in cash donations. This effort underscores our commitment to fostering a culture of support and responsibility.

Additionally, to address food insecurity on campus, our team volunteered for Good Times Diner, a take-out meal service for students run by the Arts and Science Undergraduate Society (ASUS) of Queen's University in collaboration with Chalmers United Church. Operating bi-weekly, Good Times Diner provides free nutritious meals to students to help alleviate food-related financial burdens. During our service, we provided 60 meals to students and introduced Good Times Diner as a valuable resource, raising awareness among graduate students about its availability for their future needs.

Our work also included creating open dialogues around I-EDIAA principles and implementing actions to promote inclusivity and support within our academic environment. On April 19th, we hosted the Society's first in-person "I-EDIAA in Health Sciences Research Symposium," a half-day conference highlighting inspiring health-related I-EDIAA research and initiatives at Queen's University. The symposium featured keynote presentations from Department of Medicine faculty members Dr. Genevieve Digby, and Dr. Karen Yeates, and Dr. Sari van Anders from the Department of Psychology and Gender Studies. Also, TMED PhD Candidate Kyla Tozer presented her research on *Closing the Gap in Sex-disparities in Animal Research*. The conference also featured undergraduate poster presentations, and an interactive I-EDIAA workshop led by Dr. Giselle Valarezo, EDI Program Manager, Faculty of Health Sciences EDI Office. We extend our heartfelt appreciation to all the speakers and participants who contributed to the success of this event.

As we look to the future, we are dedicated to sustaining these initiatives and strengthening our ties with local organizations and the TMED community. By continually enhancing our efforts of outreach and raising awareness, we aim to ensure that I-EDIAA principles remain at the forefront of our efforts. Thank you for all your continued support!

Kana Ogawa, MSc'25
(Candidate), I-EDIAA/SGSPA Representative

"My project in aims to understand how traumatic spinal cord injury disrupts physiology throughout the body. This research requires access to cutting-edge imaging technologies and specialised expertise to effectively process, analyse, and interpret the data.

QCPU's small animal imaging laboratory has played a crucial role in my research. Using the VECTor4CT system (from MILabs; Netherlands), we were able to non-invasively monitor in vivo development of pathology that occurs after neurotrauma and obtain high-resolution ex vivo data of individual organs and tissues.

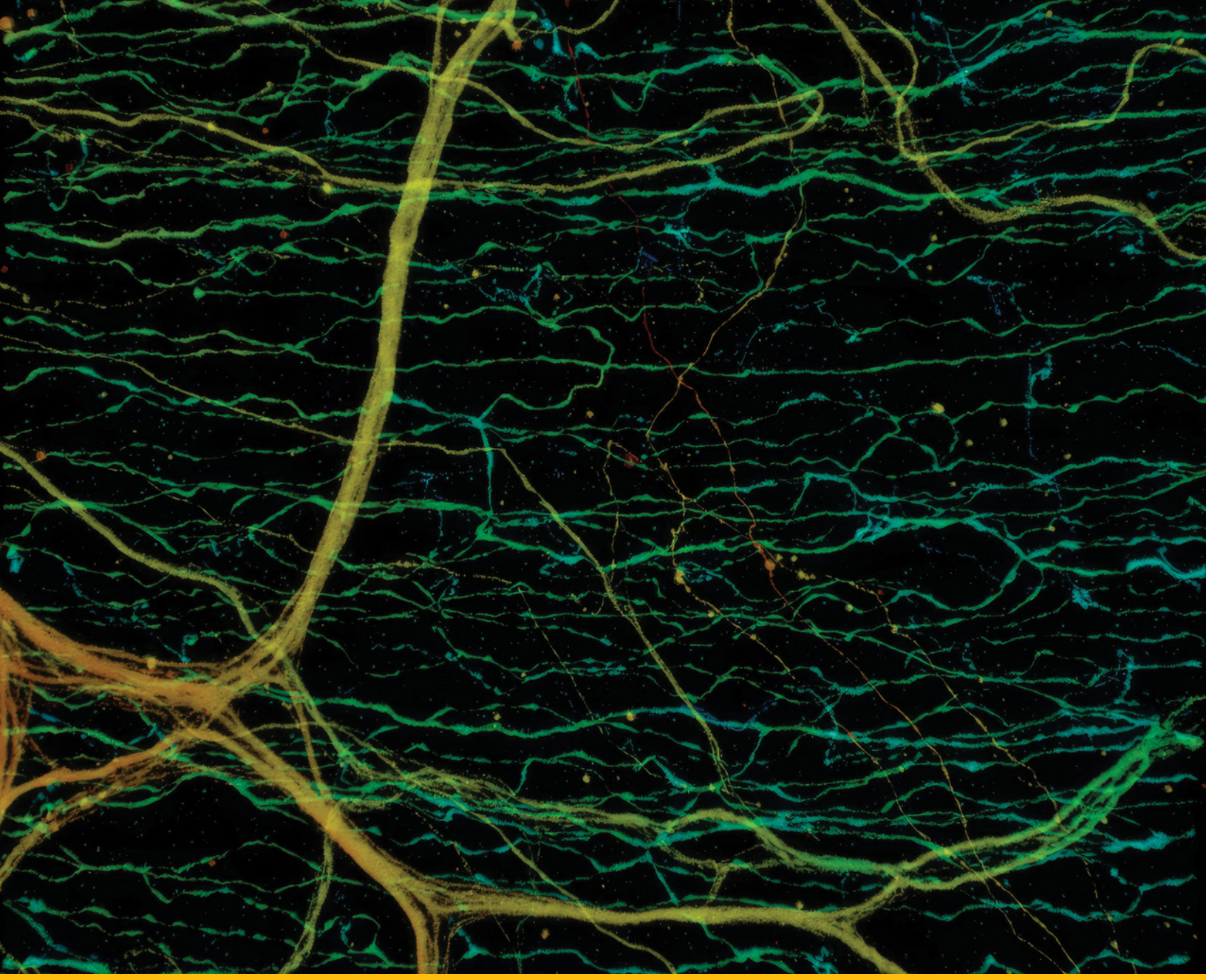
The guidance and consultation provided by the QCPU team has been invaluable. In particular, the dedication and expertise of Dr. Elahe Alizadeh has fully enabled our research vision to be realized. Her exceptional support with image acquisition, volumetric reconstruction, and advanced radiology techniques, including troubleshooting and innovating exciting new analysis approaches, has been instrumental in accomplishing our research objectives."

JULIE ZIELONKA

Master Candidate in Brennan Lab, Department of Biomedical and Molecular Sciences

DR. FAITH BRENNAN

Assistant Professor in Department of Biomedical and Molecular Sciences



Queen's CardioPulmonary Unit | QCPU

SECTION III

Queen's CardioPulmonary Unit | QCPU

The Queen's CardioPulmonary Unit (QCPU) is an $8 million, 8000ft2 translational research facility, opening in 2017 with Dr. Stephen Archer as the founding scientific director. Housed within the Bioscience Complex we are strategically located in the heart of Queen's campus, QCPU is within a short walk to the School of Medicine Building, KHSC and the many departments within QHS. The centre has a Bench-to-Bedside philosophy, meaning it endeavours to advance human health by connecting patient care with discovery science. QCPU was funded by a CFI grant, with matching funds from the Ontario government. Although it initially had an emphasis on heart, lung, blood and vascular diseases, QCPU has evolved into a broad, full-service, translational research facility which provides three faculties of the Queen's research community access to an expert team of scientists and many state-of-the-art research platforms, while providing training for dozens of graduate students each year.

Built on existing institutional investments by Queen's University, QCPU enhances existing links between clinical and basic investigators at Queen's and fosters new collaborations between researchers in other faculties and at other universities. QCPU is funded by the Department of Medicine, the Queen's Faculty of Health Sciences (QHS) and through cost-recovery for services provided. QCPU's mission includes growing the externally funded research enterprise for the Department of Medicine and QHS, while assisting our faculty and trainees in their efforts to produce cutting-edge research publications and competitive grants. QCPU aspires to embody research excellence and to ensure that Queen's University is recognized internationally as a center for translational research. QCPU also has a partnership with Kingston Health Sciences Center and we are proud to be home to a growing satellite cardiac ultrasound laboratory for clinical echocardiography and several small clinics.

QCPU Clinic

In 2023 we continued to provide a vital space for the paediatric congenital cardiology clinic, led by cardiologists Dr. John Smythe and Dr. Mahmoud Alsalehi. After 40 years of service to the community, Dr. Smythe retired in the fall, and his practice was put in the care of Dr. Josh Pensular. In the spring, QCPU's clinic welcomed the establishment of a paediatric respirology clinic for asthma screening, led by Dr. Michael Deryncks. This enterprise is advancing patient care in Kingston and the surrounding areas, as well as establish exciting new research projects.

Dr. Michael Derynck

Paediatric Cardiologist | Assistant Professor, Department of Paediatrics

Dr. Michael Derynck is an Assistant Professor of Pediatrics and Pediatric Respirologist at Queen's University. He joined the department in September 2019 and was cross appointed to the Department of Medicine in 2021. Dr. Derynck follows patients with asthma, interstitial lung disease, congenital lung abnormalities and sleep disordered breathing. Dr. Derynck is also the medical director of the Pediatric Cystic Fibrosis (CF) Clinic and CF Newborn Screening programs at KHSC. Dr. Derynck also provides inpatient coverage of the pediatric ward and critical care unit.

Dr. Derynck completed medical school at the University of Western Ontario in 2013. He completed pediatric residency at Queen's University in 2017 and subspecialty training in pediatric respirology at the University of Calgary in 2019.

Dr. Derynck collaborates in research focused on CF genetics, CF newborn screening, and pediatric tracheostomy care. He enjoys teaching pediatric and pediatric respiratory medicine to medical students and postgraduate trainees. Dr. Derynck enjoys kayaking, choral singing and travelling when away from the hospital.

QCPU Translational Research Unit

THIS PORTION OF QCPU IS STAFFED BY 7 SCIENTISTS AND IS COMPRISED OF 5 DIFFERENT LABORATORIES INCLUDING:

- → Physiology and experimental therapeutics
- → Molecular and cellular imaging
- → Cell culture and cytometry
- → Genomics, transcriptomics and molecular medicine
- → Mass cytometry, histology and proteomics

The centre offers the research community across the university access to expertise, education and state-of-the-art equipment, much of which exists only within QCPU. Notably, our model is innovative in that services are provided for the researchers by QCPU's scientists on a cost-recovery basis by a cadre of expert staff scientists.

KEY EQUIPMENT INCLUDE:

- → MILabs tri-modality micro-CT/SPECT/PET nuclear imaging platform (VECTor4CT)
- → Scan-RAM Radio-TLC Scanner from LabLogic
- → NanoDrop Spectrophotometer
- → The AtomlabTM 500 Dose Calibrator
- → Radiation shielding and monitoring equipment (Berthold and Geiger counters)
- → Tabletop and standard rodents' anesthesia machines
- → Illumina NextSeq550 Sequencing for next-generation sequencing services
- → Sony SH800S flow sorter and cytometer
- → Leica SP8 confocal and super-resolution microscope upgraded with the 2-photon laser and the OkoLab live imaging system
- → XCelligence cell culturing system
- → Lonza nucleofactor transfection system
- → Histology services and electron microscopy
- → Luminex MagPix multianalyte analyzer
- → Queen's only BioRender license distributor

QCPU Highlights

- QCPU team attended the CoLD Summit 2023. Dr. Lima was invited to represent QCPU in a 5-minute presentation/discussion alongside three other exemplary core facilities in Canada. In this meeting, managers, scientists, directors and advocators engaged in a discussion about the importance of core facilities in accelerating and maintaining high standards of research in Canada. This discussion led to the formation of work groups that developed action plans addressing how best to operate and ensure the longevity of science core facilities. Our QCPU scientist is actively engaged in this national workforce activity.
  - Curtis Nordhoof was awarded with the "Scientist Travel Award" to participate in the 2023 CCMA/CoLD Summit 2023.
- Dr. Hindmarch promoted to Assistant Professor in the Department of DBMS and Medicine.
- Dr. Alizadeh presented at two international meeting:
  - MILabs' Users Annual Meeting - Prague, Cheque Republic – Sep. 2023.
  - Poster at the World Molecular Imaging Congress (WMIC), Prague, Czech Republic – Sep. 2023.
- A summer of outreach! QCPU hosted multiple events for youth public outreach include tours for the Canadian Medical Hall of Fame's 'Health Sciences Research Day' as well as workshops on introduction of X-rays and CT scanning, and DNA for Queen's Connections for Girls camps and Black STEM in Youth camps.
- Dr. Lima was invited to speak for the BMED 828 (Advanced Histology and Staining Techniques Course) about Confocal Microscopy Imaging.
- Dr. Lima presented her work on the sex dimorphism in PAH and inflammation at the American Heart Association (AHA) meeting 2023 (Philadelphia, USA).
- Dr. Lima taught the Cell Imaging Analysis course (BMED 865; August) using QCPU facilities and microscope.
- QCPU Flow Cytometry Core hosted a demo ZE5 flow cytometer from BioRad.

QCPU BY THE NUMBERS SINCE 2017

22
SuperUsers

94
Users

3
Faculties

29
Departments

6
External Partners

120
Trainees

QCPU Metrics

In 2023, QCPU had 11 SuperUsers, defined as users who purchase service in blocks of 208 hours/year (SuperUser A plan) or 104 hours/year (SuperUser B plan) hours/year. SuperUsers also include recipients of an incubator grant from the Translational Institute of Medicine (TIME) competition. In 2023 we served 51 research groups across 29 departments, and three faculties, 15% of which are Early Career Researchers. QCPU scientists also have assisted or mentored over 67 trainees, including research staff, medical students, post-doctoral fellows, graduate students and undergrads.

Brooke Ring

Manager, Facilities & Operations QCPU | Research Scientist at QCPU
ringb@queensu.ca

Brooke has 10 years of research experience specializing in molecular biology, cytometry, microscopy and laboratory management. She graduated with a BSc. Hons In Biochemistry and Molecular Medicine and a MSc. in Life Sciences from Trent University. She managed a virology laboratory at Trent University and taught Virology and Infectious Diseases before coming to Queen's University in 2012.

Prior to joining QCPU, Brooke worked as the research assistant for clinician-scientist Dr. Michael Rauh in Pathology and Molecular Medicine and provided lab management for multiple research labs in the Pathology department, including the Queen's Laboratory for Molecular Pathology (QLMP). She has expertise running confocal microscopy, flow cytometry, NanoString Technology and Next-Generation Sequencers.

In 2019, she became the Manager of Operations and Facilities at QCPU. Brooke oversees the operation of both the KHSC satellite clinic's daily operations, as well as the state-of-the-art research centre. She not only lends her strong background in lab management to QCPU, but her significant bench experience as a Research Scientist, performing research in the Genomics, Molecular Imaging and Cytometry labs.

[Brooke Ring] lends her strong background in lab management to QCPU, and significant bench experience as a Research Scientist.

Dr. Elahe Alizadeh

Assistant Professor (Adjunct) | Imaging & Radiation Physics Specialist
elahe.alizadeh@queensu.ca

Dr. Elahe Alizadeh is QCPU's Imaging and Radiation Physics Specialist. Elahe graduated with a BSc in Applied Physics and a MSc. in Medical-Radiation Physics Program, both from Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran. She then obtained her PhD in Nano-Bio-Physics from the University of Innsbruck, Austria. In 2010, she joined Prof. Sanche's lab at the Department of Radiobiology (at Université de Sherbrooke, QC, Canada) as a postdoctoral research fellow; where she designed and constructed a new X-ray apparatus to investigate the radiation damage on DNA complexed with radiosensitizer agents for chemoradiation therapy.. Her achievement was recognized with the Radiation Research Society Jack Fowler Award in 2013 for outstanding research in medical physics and radiobiology. She has more than 50 publications with 1600 citations an H-index = 20, i10 = 32).

Since July 2018, Elahe has implemented and run the small animal imaging laboratory within QCPU. She is responsible for the coordination and performance of pre-clinical imaging projects using tri-modality micro-PET/SPECT/CT scanner (VECTor4CT from MILabs; Utrecht, Netherlands). She also oversees the quality assurance and trouble-shooting of radiation equipment. She has developed many innovative approaches for *ex vivo* and *in vivo* imaging techniques including multi-modality imaging of animal models of cancer, gated-imaging and contrast-enhanced microCT imaging for cardiovascular diseases. Her collaborations with investigators in various fields of research have closely involved her in a broad spectrum of medical and engineering research projects. She is a member of the Canadian Radiation Protection Association (CRPA) and serves as a member of the Queen's Radiation Safety Committee in the Department of Environmental Health and Safety.

Elahe is also a handcraft designer specializing in Amigurumi (handmade crochet / knitting stuffed animals and toys). Still in her spare time, she grows collectible houseplants, like different varieties of African violets, succulents and sansevierias.

Dr. Patricia Lima

Assistant Professor (Adjunct) | Molecular Imaging & Cytometry Specialist

pdal@queensu.ca

Dr. Lima is a scientist and an Assistant Professor of Medicine (Adjunct) at QCPU. She is an microscopy and flow cytometry specialist, and the director of the Molecular Imaging Lab and the Cell Culture and Cytometry Lab (biosafety level 2+ facility) at the QCPU. Dr. Lima collaborates and provides scientific assistance for over 30 ongoing research projects. Driven by the philosophy of "let's get this done and get it right", Dr. Lima is well known for her enthusiasm, competence, organization skills and scientific knowledge. She co-supervises graduate students focusing on developing their scientific skills and critical thinking, as well as delivery graduate courses focusing on imaging technologies

Dr. Lima graduated with a degree in Biological Sciences and obtained her Ph.D. in one of the top universities in Brazil – UNICAMP. She has focused her graduate studies on Reproductive Immunology, specifically looking into the regulatory mechanisms of Natural Killer cells (NK) during pregnancy and the role of these cells in complications such as miscarriages and preeclampsia. During her postdoctoral training (Queen's University and Ottawa Hospital Research Institute), Dr. Lima focused her research on the study of the immunological and metabolic aspects of women's health, with an emphasis on diabetes during pregnancy and infertility related to endocrine and metabolic disorders, such as polycystic ovarian syndrome (PCOS). Dr. Lima has 38 publications with 1,439 citations and an H-index of 20. She has received several awards recognizing her excellence in research. Her own research program, in collaboration with Dr. Archer, focuses on the role of mitochondria in activating the NLRP3 inflammasome and causing right ventricular failure in pulmonary arterial hypertension (PAH). She is co-PI with Dr. Archer on a CIHR grant to support this research which was ranked #1 in the CVB committee.

Aside from science, Dr. Lima dedicates her time giving back to the community. She is also a volunteer firefighter at the Athens Fire Department where she is a member of the executive, a fire prevention officer, and part of the training and rapid intervention teams. She also leads the Muscular Dystrophy Canada (MDC) fundraising for research ("The Boot Drive"). In 2023, Dr. Lima was awarded with the "Dr. David Green Award" for her work on fund raising for MDC and for her intellectual contribution during research grant reviewing.

At Queen's, Dr. Lima is the founder of the Women in Science at Queen's (WiSQ), which is one of the most active employee resource groups (ERG) at Queen's, with outreach power amongst the scientistic community. In 2023, Dr. Lima was selected (and completed) from Queen's (peer-reviewed application) to participate on the "From Lab 2 Fulfillment" (FL2F) program.

Oliver Jones

Histologist and Electron Microscopist

oj3@queensu.ca

Oliver Jones the Histology and Transmission Electron Microscope specialist at QCPU. In 2005, Oliver graduated from Lancaster University (United Kingston) with a degree in Biochemistry with Biomedicine. After completing his degree, he was employed as a trainee in histopathology at Manchester Royal Infirmary. He completed a Post Graduate Certificate (PGC) in Biomedical Sciences, which allowed for his formal registration with the Institute of Biomedical Scientists in the UK. While in this position, he was trained to operate the on-site Transmission Electron Microscope and was able to receive samples, process them for imaging and the generation of electron micrographs for pathologist review; his training here was conducted by clinical scientists working with the UK Health Protection Agency.

In 2010, he joined Dr. Elaine Petrof's research laboratory at Queen's University, as a histologist, performing image analysis on murine tissues. This role allowed Oliver to complement his clinical research background with experience within a non-clinical, laboratory research environment, working with academic faculty and graduate students to achieve research goals. He then secured a position within the Queen's Laboratory for Molecular Pathology (QLMP) within the Pathology and Molecular Medicine department. Between 2013 and 2019, he performed a range of histological and microscopy services to the Queen's research community within the scope of a cost recovery model. He also provided electron microscopy services for researchers at Queen's University, KHSC, and Canadian Cancer Trials Groups (CCTG). Oliver is now one of a few authorized electron microscope operators and performs this service for QCPU users. He also taught a Medical Laboratory Assistant (MLA) course at St. Lawrence College, where he was recruited to teach histopathology to students undertaking the. He joined the QCPU in the summer of 2020 as the Histology and Transmission Electron Microscope specialist.

[Oliver] provides electron microscopy services for researchers at Queen's University, KHSC, and Canadian Cancer Trials Groups (CCTG). Oliver is now one of a few authorized electron microscope operators and performs this service for QCPU users.

Curtis Noordhof

Molecular Imaging & Cytometry Specialist
nordhoof@queensu.ca

Curtis Noordhof graduated with a degree in Biological Technology from St Lawrence College. He has 17 years of research experience at Queen's University. During this time, he has been involved in designing and implementing a Health Canada-approved research lab, has inventorship on a patent pending discovery (therapeutic use of bacterial derived proteins) and managed research projects funded by the National Institute of Health (NIH) and the Bill and Malinda Gates Foundation. He previously worked as a research assistant at the Department of Biochemistry and senior research assistant at the Gastrointestinal Disease Research Unit (GIDRU). At GIDRU, Curtis had the crucial role of maintaining and operating the "robo gut" bioreactor.

In 2021, Curtis decided to join the QCPU team to follow his passion for technology and applied science. He saw QCPU as an opportunity to work with state-of-the-art technology and improve his scientific skills while offering his long-term expertise to the Queen's community. In the past two years, Curtis has gained tremendous experience in molecular imaging, flow cytometry and sorting. He has already helped several QCPU users to build panels and run and troubleshoot experiments, therefore assisting in their scientific progress. Examples include cell sorting of various stem-cell populations and absolute quantification of biofilm-forming bacteria in Kingston drinkable water using flow cytometry. His extensive experience perfectly aligns with his role at QCPU, assisting Dr. Patricia Lima in managing the Cell Culture and Cytometry and the Molecular Imaging laboratories.

Outside of the lab, Curtis is a dog-lover and appreciator of the country lifestyle. He is a talented and passionate musician that has gained Kingston nights as a professional guitar player and vocalist! His weekends are filled with fun band practices, music composition and family. His sense of humour and positivity at the QCPU are contagious, which makes him a perfect team player.

QCPU USERS & SUPERUSERS

	2023	ECR *2024	SuperUser	Hourly	BioRender	Animal Care	Anatomy	Research Services	QSEA Connections	Medicine	DBMS	PMM	GIDRU	CRI	CNS	Surgery	Urology	ObsGyn	Critical Care	Paediatrics	Opthomology	PM&R	SKHS	Psychiatry	Civil Eng	Chemical Eng	E&CE	GeoEng	Mechanical Eng	Biology	Chemistry	Geological Sci	Computing	Psychology	External (Academic)	External (No-academic)
Archer Stephen	●		●		●					●																										
Abraham Sheela	●	●	●	●	●						●																									
Dunham-Snary Kimberly	●	●	●		●					●	●																									
Holden Rachel	●		●							●	●																									
James Paula	●		●	●	●					●		●																								
Johri Amer			●		●					●																										
Lillicrap David	●		●	●	●							●																								
Lomax Alan			●	●						●	●		●		●																					
Maslove David	●		●		●					●									●																	
Maurice Donald	●		●	●							●																									
McGlory Chris	●	●	●	●						●													●													
Mulder Dan	●	●	●		●						●		●							●																
Natale David	●			●							●							●																		
Ormiston Mark	●		●	●	●						●					●																				
Petkovich Martin	●		●	●							●			●																						
Postovit Lynne	●		●	●							●																									
Reed David		●	●		●					●			●																							
Rullo Jacob	●	●	●	●							●										●															
Rutka James			●																															★	
Seimens Robert			●								●			●																						
Sheth Prameet	●		●									●	●																							
Vanner Stephen	●		●		●					●			●																							
Adams Michael	●			●							●																									
Allingham John					●						●																									
Amsden Brian				●	●																					●									
Andrew RD					●						●																									
Appireddy Ramana		●			●					●																									
Asai Yuka	●			●						●																									
Bale Logan	●	●		●			●				●																									
Banfield Bruce				●	●						●																									
Bardana Davide				●												●																				
Bendena William					●																															
Brennan Faith	●	●		●							●																			●						
Boehnke Susan		●		●							●				●																					
Chaivisuthangkura Parin				●																														★	
Champagne Pascale	●			●																					●						●				
Chin-Sang Ian					●																									●					
Colautti Robert					●																									●					

★ *UOFT* ★ *BioTechThailand*

QCPU Users & SuperUsers (cont.)

	2023	ECR *2024	SuperUser	Hourly	BioRender	Animal Care	Anatomy	Research Services	QSEA Connections	Medicine	DBMS	PMM	GIDRU	CRI	CNS	Surgery	Urology	ObsGyn	Critical Care	Paediatrics	Opthomology	PM&R	SKHS	Psychiatry	Civil Eng	Chemical Eng	E&CE	GeoEng	Mechanical Eng	Biology	Chemistry	Geological Sci	Computing	Psychology	External (Academic)	External (No-academic)
Colpitts Che		●		●	●						●																									
Compeau Scott	●	●		●										●											●				●							
Cottrell Tricia		●		●	●							●		●																						
Craig Andrew	●				●						●																									
Crocker Susan					●							●																								
Davies Peter				●	●						●																									
DeFelice Fernanda					●						●				●									●												
Dick Sarah		●			●						●																									
Doirion Christopher																	●																			
Feilotter Harriet	●				●							●		●																						
Fillion Yves	●			●																					●											
Fitzpatrick Lindsey	●	●			●						●														●											
Gallivan Jason					●						●																						●			
Gee Katrina					●						●																									
Ghasemlou Nader	●			●	●						●																									
Graham Charles	●			●	●						●			●																						
Hebert Sebastian	●			●																														★	
Hendry Michael	●			●												●																				
Hesp Simon				●																											●					
Hindmarch Charlie	●	●																																		
Iftene Felicia	●			●																				●											
Jia Zongchao	●			●							●																									
Kan Frederick	●			●							●																									
Kawaja Michael	●			●	●						●																									
Kontopoulou Marianna				●																						●					●					
Koti Madhuri	●			●							●			●			●	●																		
Lingard Andrew	●	●		●																																●
Melanson Michael	●			●						●												●														
Menard Janet	●			●											●																			●		
Milev Roumen	●			●											●									●										●		
Monaghan Jacqueline																																				
Moorhead Mayron								●																												
Mousavi Parvin				●																							●					●				
Mulligan Lois	●			●							●	●		●																						
Munoz Doug	●			●											●																					
Nakamura Akihiro	●	●		●						●	●																									
Neuractas Neuractas				●																																
Oleschiuk Richard	●			●																											●					

★ *UofMontreal*

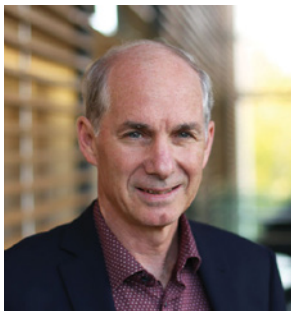
QCPU Users & SuperUsers (cont.)

	2023	ECR *2024	SuperUser	Hourly	BioRender	Animal Care	Anatomy	Research Services	QSEA Connections	Medicine	DBMS	PMM	GIDRU	CRI	CNS	Surgery	Urology	ObsGyn	Critical Care	Paediatrics	Opthomology	PM&R	SKHS	Psychiatry	Civil Eng	Chemical Eng	E&CE	GeoEng	Mechanical Eng	Biology	Chemistry	Geological Sci	Computing	Psychology	External (Academic)	External (No-academic)
Oko Richard				●							●																									
Ozolins Terence				●							●																									
Panchenko Anna					●						●			●																						
Pang Stephen				●							●																									
Payne Sarah Jane		●		●																					●										
Ploeg Heidi	●			●																									●						
Prins Kurt				●																														★	
Purzner James		●		●							●					●																			
Rauh Michael					●							●		●																					
Renwick Neil	●				●							●																							
Sangemo				●																															●
Snedden Wayne					●																														
Spencer Christopher				●																							●				●				
Stamplecoskie Kevin				●																															
Szewczuk Myron	●			●							●																			●					
Tayade Chandra	●				●						●																								
Walia Jagdeep	●			●								●								●															
Winterborn Andrew	●			●		●		●																											
Yang Xiaolong				●	●							●																							

★ *UofM*

Dr. Stephen Archer

A CIHR funded cardiologist and clinician-scientist. His research focus is on defining molecular mechanisms of oxygen sensing, defining mechanisms of disordered mitochondrial metabolism and dynamics and development of mitochondrial metabolic and mitochondrial dynamic therapies for pulmonary hypertension, cancer, congenital heart disease and COVID-19.



Dr. Stephen Vanner

A CIHR funded researcher and is the scientific director of the Gastrointestinal Diseases Research Unit (GIDRU) and Translational Institute of Medicine (TIME). Dr. Vanner has expertise in gastrointestinal motility disorders. He has an established translational research program that examines mechanisms underlying pain signaling and motility in the gastrointestinal tract, relevant to irritable bowel syndrome (IBS) and inflammatory bowel disease (IBD).

Dr. Daniel Mulder

A pediatric gastroenterologist who studies the effects of the immune system on the gastrointestinal tract, his research program aims to use laboratory-based immunophenotyping techniques to create molecular "fingerprints" of individual IBD patients to improve patient outcomes

Dr. David Reed

A researcher with a clinical interest is in gastrointestinal motility disorders. His research interest is how the interaction of luminal factors (e.g. dietary components) with stress or the microbiota modulates pain signaling and motility in disorders such as irritable bowel syndrome.

Dr. Kimberly Dunham-Snary

An early career research who established the MitoMetaLab. Her lab investigates the links between mitochondrial genetics, mitochondrial dynamics (the shape/structure of the mitochondria in different tissues), metabolomics - large-scale studies of small molecules that are the products of caloric intake (*metabolites),* and the cell signalling pathways that control *proliferation* (cell growth). They use preclinical models of CMDs and patients with differing mitochondrial genetic ancestry to elucidate how these key players are linked. Their longterm goal is to identify *circulating biomarkers* of CMD and develop a *mitochondrial-metabolomic fingerprint* for CMDs that can be deployed in the clinic. Using this interdisciplinary approach, we strive to i) improve early intervention for subpopulations at increased risk for CMDs; ii) identify new therapeutic targets to ease the current healthcare burden; and iii) provide new tools to advance the initiative of *precision/personalized medicine*.

Dr. David Natale

Our laboratory investigates the development of the placenta in pregnancies that result in fetal growth restriction, many of which are complicated by maternal disease, such as pre-eclampsia or diabetes or by maternal exposure to substances, such as marijuana. We study placenta-specific trophoblast cells from their stem cell state, through differentiation and their interactions with other placental cell types. Our use of mouse/rat *in vivo* and *in vitro* models of fetal growth restriction as well as a collaboration with the human placenta group allows us to focus on how trophoblast populations and/or their interactions are altered in the compromised placental environment.

Dr. Prameet Sheth

A clinical microbiologist, his research laboratory aims to identify bacteria to define bacterial communities that can be used to treat colitis as well as other illnesses linked to dysfunctions in the gut microbiota.

Dr. Martin Petkovich

A senior researcher whose lab's focus is on understanding the role of hormone receptor signalling in health and disease. Current efforts of investigation include retinoic acids effects on osteoblast differentiation in diseases such as chronic kidney disease (CKD) which can result in inappropriate ectopic phosphatemic activation of osteochondrogenic pathways, resulting in mineralization of cardiovascular tissues.

Dr. Jacob Rullo

A SEAMO-funded translational clinician-scientist in the Department of Ophthalmology, cross-appointed to DBMS and Medicine. His primary focus is neuro-ophthalmology, which deals with diseases of the eye-brain axis, more specifically his research focuses on characterizing differences in the ocular microenvironment with respect to the discovery of novel biomolecules/biomarkers, understanding intraocular immune mechanisms, and the immune biology of the external ocular surface.

Dr. David Maslove

A NSERC-funded early career investigator and clinician-scientist with the Department of Medicine and Critical Care Department. His research focuses on informatics, genomics, and the use of biomedical Big Data to address current challenges in Critical Care Medicine. The Maslove lab leverages the power of randomization in a clinical trial of vitamin C in sepsis to ask: Are there molecular subtypes of sepsis that portend a positive response to treatment, and why do certain subtypes respond to vitamin C better than others?

Dr. Chris McGlory

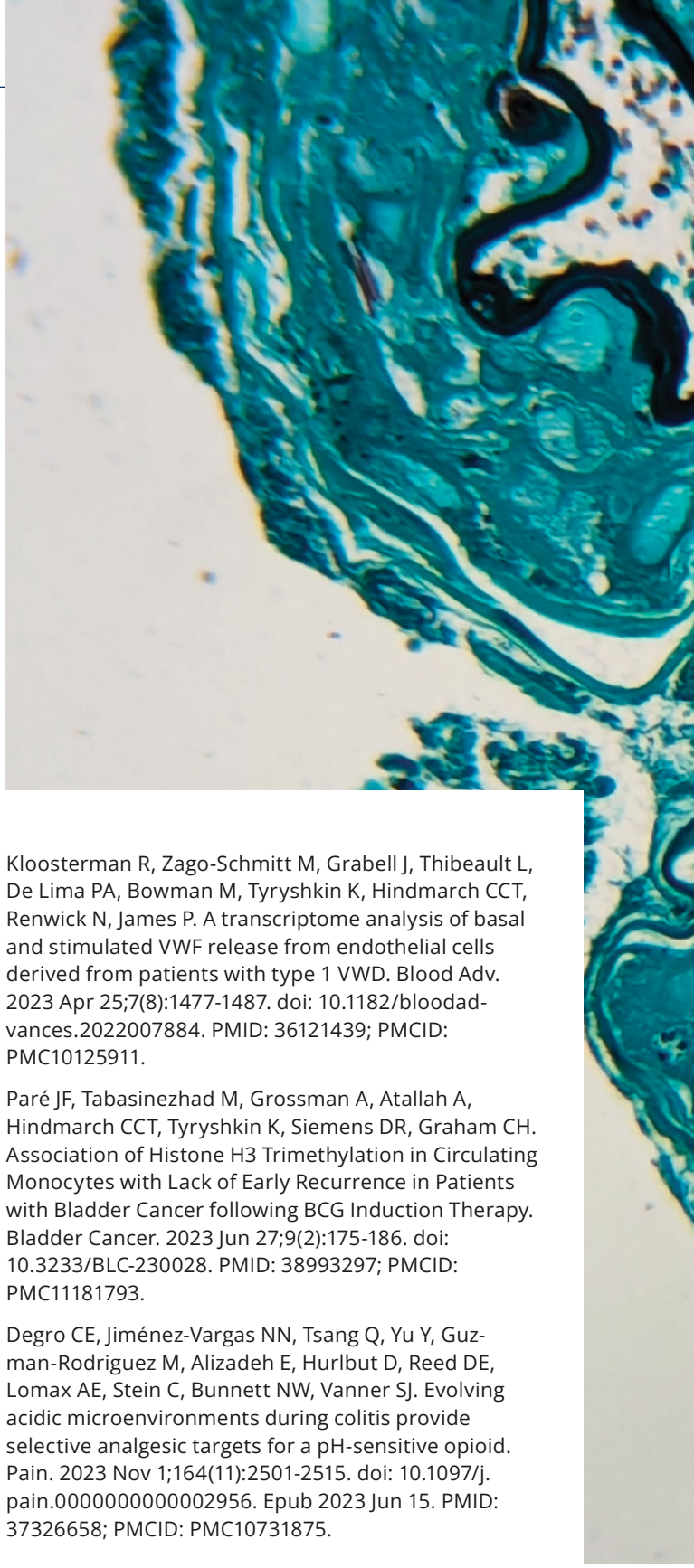
An early career researcher whose program aims to understand the cellular and molecular mechanisms underpinning the adaptive response of skeletal muscle to nutrition, exercise training, and immobilization. His program specializes in the use of stable isotopic tracers to track skeletal muscle protein turnover combined with a variety of molecular biology techniques for measurement of enzyme activity, protein expression, and post-translational modification.

As an early career researcher (ECR) and clinician scientist working in both the clinic and the lab, QCPU has been vital to my success. Establishing a lab as an ECR is challenging due to limited funding and personal resources, but since moving to Queen's University, the support I've received from QCPU, under the leadership of Dr. Archer and his team, has been tremendous. I have already benefited from outstanding microCT images provided by Dr. Alizadeh and excellent histology slides prepared by Oliver Jones, a histopathologist at QCPU. Based on my experience, the greatest thing about QCPU is their constant availability and willingness to accommodate any adjustments to research plans. As a superuser of QCPU, I can access 104 hours of lab time at a significant discount, which is incredibly beneficial for ECRs. I highly recommend QCPU's high-quality, user-friendly services to scientists, particularly ECRs, seeking support to advance their research."

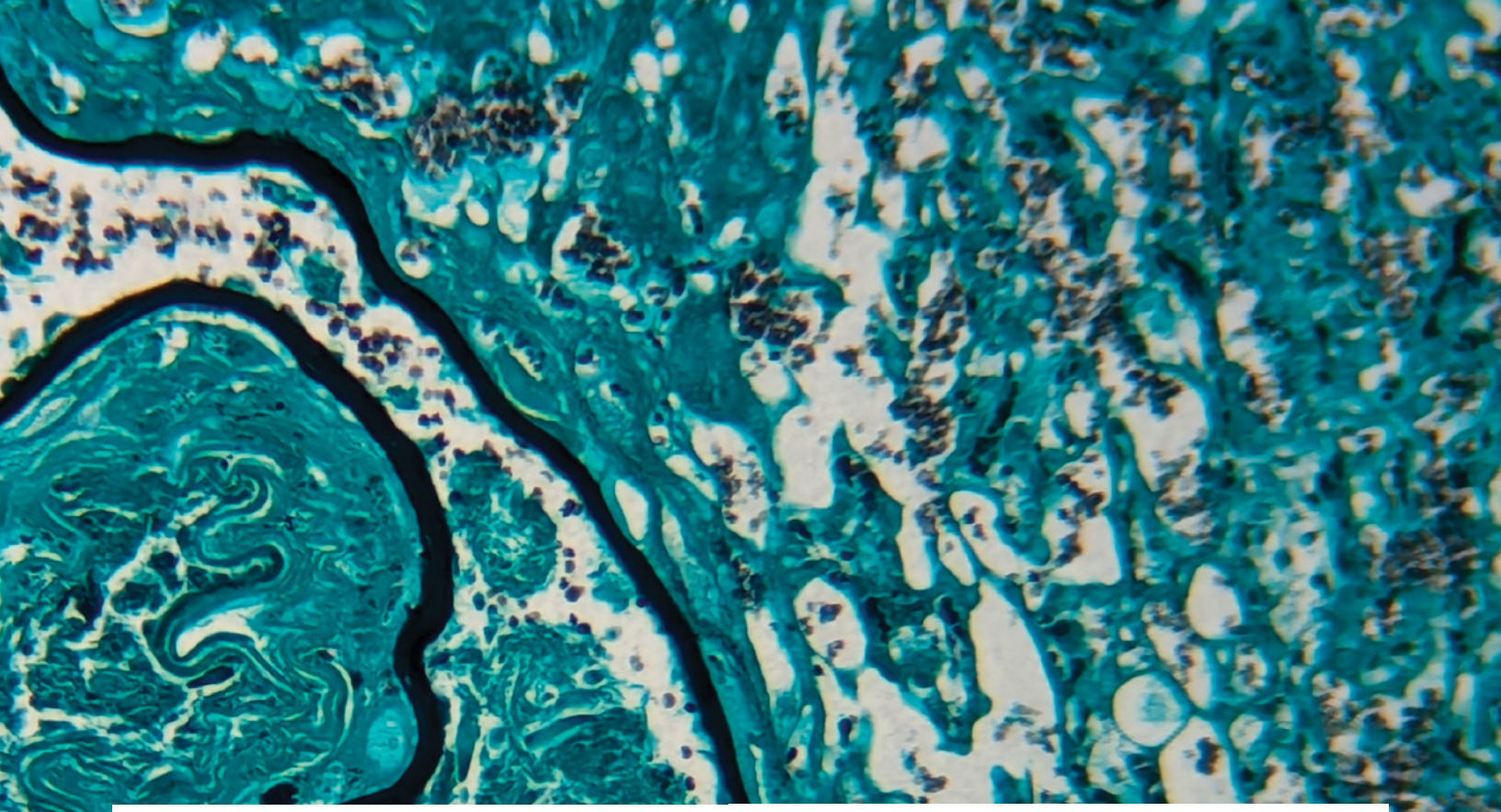
DR. AKIHIRO NAKAMURA

Assistant Professor in Department of Medicine,
Division of Rheumatology

QCPU PUBLICATIONS



- Mason E, Hindmarch CCT, Dunham-Snary KJ. Medium-chain Acyl-COA dehydrogenase deficiency: Pathogenesis, diagnosis, and treatment. Endocrinol Diabetes Metab. 2023 Jan;6(1):e385. doi: 10.1002/edm2.385. Epub 2022 Oct 27. PMID: 36300606; PMCID: PMC9836253.
- Cotechini T, Jones O, Hindmarch CCT. Imaging Mass Cytometry in Immuno-Oncology. Methods Mol Biol. 2023;2614:1-15. doi: 10.1007/978-1-0716-2914-7_1. PMID: 36587115.
- Mendelson JB, Sternbach JD, Doyle MJ, Mills L, Hartweck LM, Tollison W, Carney JP, Lahti MT, Bianco RW, Kalra R, Kazmirczak F, Hindmarch C, Archer SL, Prins KW, Martin CM. Multi-omic and multispecies analysis of right ventricular dysfunction. J Heart Lung Transplant. 2024 Feb;43(2):303-313. doi: 10.1016/j.healun.2023.09.020. Epub 2023 Oct 1. PMID: 37783299; PMCID: PMC10841898.
- Bentley RET, Hindmarch CCT, Archer SL. Using omics to breathe new life into our understanding of the ductus arteriosus oxygen response. Semin Perinatol. 2023 Mar;47(2):151715. doi: 10.1016/j.semperi.2023.151715. Epub 2023 Mar 2. PMID: 36906478.
- Mendelson JB, Sternbach JD, Doyle MJ, Mills L, Hartweck LM, Tollison W, Carney JP, Lahti MT, Bianco RW, Kalra R, Kazmirczak F, Hindmarch C, Archer SL, Prins KW, Martin CM. A Multi-omic and Multi-Species Analysis of Right Ventricular Failure. bioRxiv [Preprint]. 2023 Feb 8:2023.02.08.527661. doi: 10.1101/2023.02.08.527661. Update in: J Heart Lung Transplant. 2024 Feb;43(2):303-313. doi: 10.1016/j.healun.2023.09.020. PMID: 36798212; PMCID: PMC9934613.
- Choi SJ, Dwyer CN, Rapkin L, Cormier M, Hindmarch CCT, Nesbitt K, Michels A, Hopman W, Swystun LL, Lillicrap D. The mechanistic and structural role of von Willebrand factor in endotoxemia-enhanced deep vein thrombosis in mice. J Thromb Haemost. 2023 Mar;21(3):586-598. doi: 10.1016/j.jtha.2022.11.022. Epub 2022 Dec 22. PMID: 36696220.
- Farcas A, Hindmarch C, Iftene F. BDNF gene Val66Met polymorphisms as a predictor for clinical presentation in schizophrenia - recent findings. Front Psychiatry. 2023 Oct 11;14:1234220. doi: 10.3389/fpsyt.2023.1234220. PMID: 37886115; PMCID: PMC10598753.
- Kloosterman R, Zago-Schmitt M, Grabell J, Thibeault L, De Lima PA, Bowman M, Tyryshkin K, Hindmarch CCT, Renwick N, James P. A transcriptome analysis of basal and stimulated VWF release from endothelial cells derived from patients with type 1 VWD. Blood Adv. 2023 Apr 25;7(8):1477-1487. doi: 10.1182/bloodadvances.2022007884. PMID: 36121439; PMCID: PMC10125911.
- Paré JF, Tabasinezhad M, Grossman A, Atallah A, Hindmarch CCT, Tyryshkin K, Siemens DR, Graham CH. Association of Histone H3 Trimethylation in Circulating Monocytes with Lack of Early Recurrence in Patients with Bladder Cancer following BCG Induction Therapy. Bladder Cancer. 2023 Jun 27;9(2):175-186. doi: 10.3233/BLC-230028. PMID: 38993297; PMCID: PMC11181793.
- Degro CE, Jiménez-Vargas NN, Tsang Q, Yu Y, Guzman-Rodriguez M, Alizadeh E, Hurlbut D, Reed DE, Lomax AE, Stein C, Bunnett NW, Vanner SJ. Evolving acidic microenvironments during colitis provide selective analgesic targets for a pH-sensitive opioid. Pain. 2023 Nov 1;164(11):2501-2515. doi: 10.1097/j.pain.0000000000002956. Epub 2023 Jun 15. PMID: 37326658; PMCID: PMC10731875.



- Read AD, Bentley RET, Martin AY, Mewburn JD, Alizadeh E, Wu D, Lima PDA, Dunham-Snary KJ, Thébaud B, Sharp W, Archer SL. Electron Leak From the Mitochondrial Electron Transport Chain Complex I at Site IQ Is Crucial for Oxygen Sensing in Rabbit and Human Ductus Arteriosus. J Am Heart Assoc. 2023 Jul 4;12(13):e029131. doi: 10.1161/JAHA.122.029131. Epub 2023 Jun 22. PMID: 37345832; PMCID: PMC10356098.
- Minnassian, L, Sanwalka, D, Pare, JD, MacDonald-Goodfellow S, Sutherland L, Ghaffari A, Margerum CL, Koti M, Craig AWB, Cotechini T, Siemens DR, Chan E, Graham CH. Autophagy mediates cancer cell resistance to doxorubicin induced by the Programmed Death 1/Programmed Death Ligand 1 immune checkpoint axis. Biorxiv [Preprint]. 2023. Jan 17. https://doi.org/10.1101/2023.01.17.524124
- Ferrone CK, McNaughton AJM, Rashedi I, Ring B, Buckstein R, Tsui H, Rauh MJ. A Lower Frequency of Spliceosome Mutations Distinguishes Clonal Cytopenias of Undetermined Significance From Low-Risk Myelodysplastic Syndromes, Despite Inherent Similarities in Genomic, Laboratory, and Clinical Features. Mod Pathol. 2023 Mar;36(3): 100068. doi: 10.1016/j.modpat.2022.100068. Epub 2023 Jan 10. PMID: 36788103.
- Al-Qazazi R, Emon IM, Potus F, Martin AY, Lima PDA, Vlasschaert C, Chen KH, Wu D, Gupta AD, Noordhof C, Jefferson L, McNaughton AJM, Bick AG, Pauciulo MW, Nichols WC, Chung WK, Hassoun PM, Damico RL, Rauh MJ, Archer SL. Germline and Somatic Mutations in DNA Methyltransferase 3A *(DNMT3A)* Predispose to Pulmonary Arterial Hypertension (PAH) in Humans and Mice: *Implications for Associated PAH*. medRxiv [Preprint]. 2023 Dec 31:2023.12.30.23300391. doi: 10.1101/2023.12.30.23300391. PMID: 38234783; PMCID: PMC10793539.
- Wu D, Jansen-van Vuuren RD, Dasgupta A, Al-Qazazi R, Chen KH, Martin A, Mewburn JD, Alizadeh E, Lima PDA, Jones O, Colpman P, Breault NM, Emon IM, Jedlovčnik L, Zhao YY, Wells M, Sutendra G, Archer SL. Efficacy of Drpitor1a, a Dynamin-Related Protein 1 inhibitor, in Pulmonary Arterial Hypertension. bioRxiv [Preprint]. 2023 Dec 23:2023.12.21.572836. doi: 10.1101/2023.12.21.572836. PMID: 38187628; PMCID: PMC10769396.
- Brand C. 2023. Evaluating the role of the ocular surface microbiome in dry eye disease mediated neural dysregulation. Master's Dissertation. Queen's University (Canada).

TIME'S FUTURE IS BRIGHT. HERE ARE SOME INITIATIVES THAT ARE UNDERWAY FOR THE COMING YEAR:

1. We anticipate building TIME Core which will almost double TIME's resources and renew existing infrastructure.

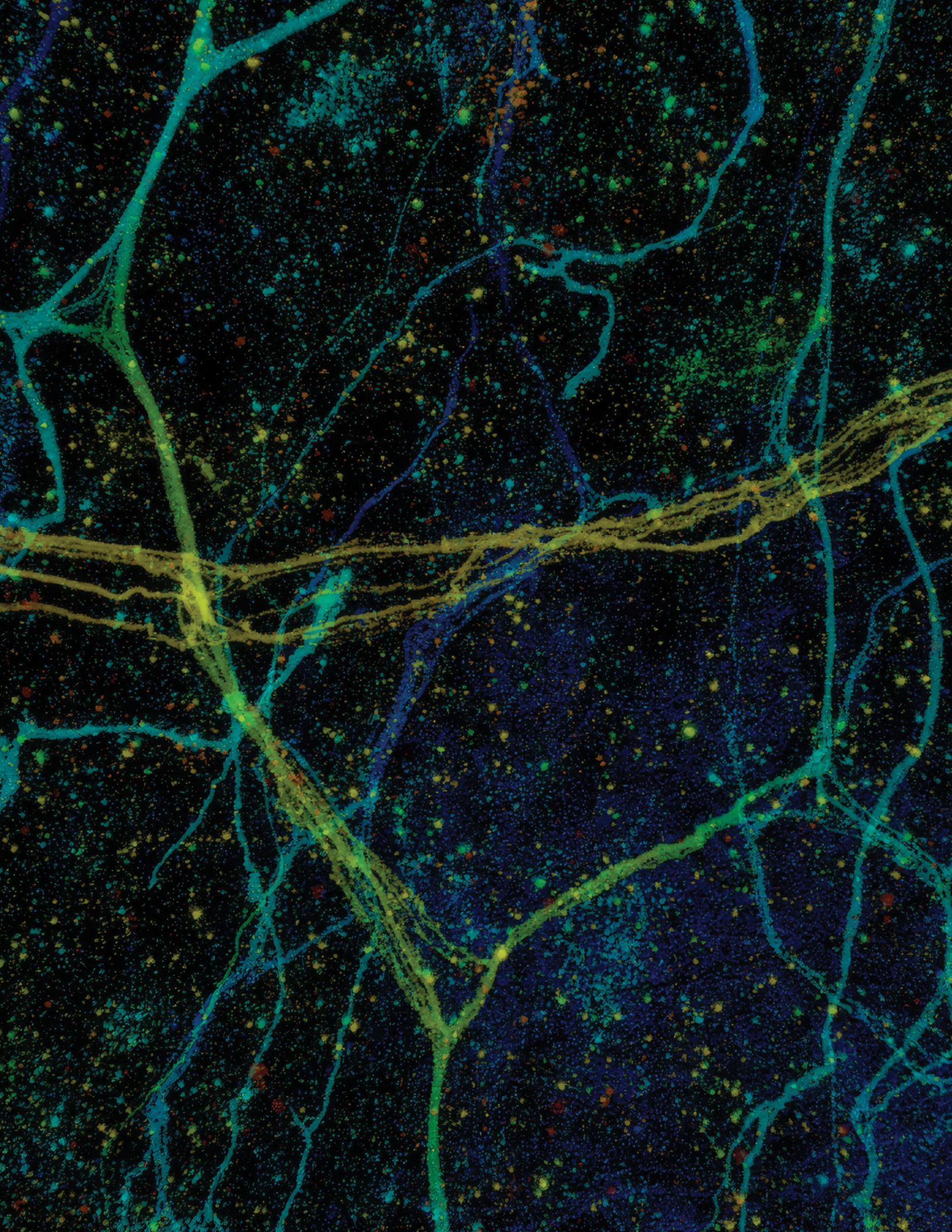
2. We look forward to hosting the 2023 TIME Symposium with our featured speaker Dr Bernard Thébaud, who will speak on his innovative program of pediatric lung regeneration using progenitor cells derived from the umbilical cord.

3. We also plan to run the first TIME incubator grant competition in two years and will assume responsibility for administering the DOM's research grant competitions. We will do this using a new, customized online grant submission, review and notification platform.

4. Due to increasing demand for Bioinformatics and Statistics analysis, we will be adding a new team member at QCPU in 2024, Benjamin Ott.

5. Drs. Smith and Archer are working on a novel funding model that will ensure the long-term financial stability of TIME and the TMED program.

6. In 2024, TIME will be positioning itself to apply for recognition as a Tier 1 Institute at Queen's University.



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