Department of Medicine Annual Report 2018-2020

McMaster University | BRIGHTER WORLD

Cover: Dr. Verdu and her Research Team
Top row: Dr. Heather Galipeau, Dr. Elena Verdu
Middle row: Dr. Xuanyu Wang, Dr. Alba Santiago
Bottom row: Dr. Marco Constante, Dr. Josie Libertucci

A United Team with a common purpose:

Dr. Verdu's Research Team investigates diet-microbiota interactions in chronic intestinal disorders. The team's line of research includes: the metabolic activity of gut bacteria on the digestion of the dietary protein and gluten, the role of proteolytic imbalance in ulcerative colitis, and the contribution of proteolytic bacteria to colonic inflammation. The team also explores mechanisms through which microbes can modulate intestinal inflammation and mechanisms that could help develop therapies to treat celiac disease, and ulcerative colitis.

In addition to being committed to research excellence, this team is committed to each other and to the wellbeing of others. The members of this high performing team have been consistent supporters of charity events to raise awareness and funds for the "Canadian Digestive Health Foundation" and "Crohn's and Colitis of Canada" research, recently surpassing their target fundraising goal at the last virtual GUTSY Walk 2021event. As a collective team, they have weathered the COVID-19 pandemic and have come together on this cover to illustrate that their common purpose and "united team" approach has not wavered even in this virtually connected world.

Our Goals

To facilitate the provision of the highest possible quality of care of the medical diseases of adults, giving appropriate consideration to costs and utilities.

To take responsibility for the quality of the education programs offered by McMaster University for physicians in training and practice in the disciplines of general internal medicine and the medical subspecialities and to provide many of the planners and teachers for this broad undertaking. To be involved as appropriate in the education programs offered by McMaster University for non-physician scientists working in health-related fields and non-physician health professionals.

To develop and critically evaluate new knowledge across a wide range of disciplines from basic science to the clinical disciplines of general liternal medicine and its subspecialities, to the health care system itself. The Department of Medicine will set priorities for its research endeavours, based upon excellence, societal relevance, the availability of collaborative links, the opportunity for national and international significance, and additional criteria as judged appropriate.

Our Mission

We are a Department of Medicine, characterized by a collegial, interprofessional, and interinstitutional cooperation, working to achieve our goals of excellence in health education, research and clinical care which embraces the continuum from the basic science laboratory to the individual patient to the health care system.

Welcome to the 2018-2019 and 2019-2020 Annual Report

This report is a special one as it captures the Department of Medicine's extraordinary contributions to our local community and the world over the past two years. As well as showcasing the achievements of the department's leaders, faculty, and clinicians, this report also highlights the personal stories of some of the outstanding individuals within the department. You'll hear our faculty describe their groundbreaking research projects; their deep commitment to improving global health; their innovative education methods; and their passion for advocating for some of the most vulnerable members of our community.

As you read the report and extraordinary stories highlighted throughout, you will find evidence of our faculty's commitment to excellence in learning, research and clinical care.

Contents

FACULTY OF HEALTH SCIENCES | ACADEMIC YEARS 2018-2020 | DEPARTMENT OF MEDICINE

Message from the President and Vice-Chancellor 4
Message from the Dean and Vice-President 6
Message from the Chair 8
Publication highlights 16
Faculty awards and highlights 19
Groundbreaking research:
- Dr. Teresa Chan 26
- Dr. Salim Yusuf 60
- Dr. Elena Verdu 78
- Dr. Matthew Lanktree 116

Excellence in care:
- Dr. Tim O' Shea and Dr. Leslie Martin 12
- Dr. Alistair Ingram 128

Leadership in teaching:
- Dr. Jill Rudkowski 22
- Dr. Lori Whitehead and Dr. Azim Gangji 130

Gift Report: Charles and Margaret Juravinski 18
Gift Report: Walter Schroeder and family 25
General Internal Medicine textbook, app + website 36
Global connections:
- Dr. Ally Prebtani and Dr. Zahira Khalid 119

Reports: Co-ordinators 29
Reports: Research Institutes 62
Reports: Endowed Chairs 80
Reports: Canada Research Chairs 120
Reports: Division Directors 134
30th + 31st Annual resident research day in medicine 170
Our faculty 177

A MESSAGE FROM THE

President and Vice-Chancellor

> "The Department's high-quality teaching, *excellence in research and clinical impact* are a driving force IN MCMASTER'S consistent ranking AMONG THE TOP universities in the world."
>
> — Dr. David Farrar

Congratulations to the Department of Medicine on its significant achievements in research, education and clinical care over the 2018-2019 and 2019-2020 academic years.

As the largest department within the Faculty of Health Sciences, the Department of Medicine's faculty and staff possess talent and expertise in a vast array of specialties. The Department's collaborative approach to improving people's lives, contributing to global knowledge, and to advancing the health and well-being of individuals locally and around the world is extremely impressive.

Over the last two years, faculty members have achieved extraordinary success in publishing their work, and are frequently cited in the medical field's most prestigious journals. Their world-renowned research attracts millions of dollars in research grants and support from government, industry, charitable organizations, and private donors. In 2019-2020, generous donations were received from Hamilton philanthropists Charles and Margaret Juravinski, as well as McMaster alumnus Walter Schroeder and his family. We are extremely grateful for their contributions and commitment to McMaster.

The Department's high-quality teaching, excellence in research, and clinical impact are a driving force in McMaster's consistent ranking among the top universities in the world. McMaster remains one of only four Canadian universities ranked among the top 100 in the world by major global ranking systems. It is also not surprising that the 2020 list of the world's most highly cited researchers includes 16 scientists from the Faculty of Health Sciences at McMaster University. The Clarivate Analytics Highly Cited Researcher List included eight from the Department of Medicine. The Department's influence can be found in its publications and also through faculty members' active participation in both national and international media.

David Farrar

President and Vice-Chancellor
McMaster University

Beyond the tireless commitment to leading-edge research and innovation, as well the exemplary instruction and mentoring of students, I would also like to congratulate the Department's faculty and staff for your tremendous work in managing and working to combat COVID-19. Your curiosity, innovation and strong purpose in advancing the health and well-being of patients and the world's population has generated new knowledge and has advanced care, even in these personally and societally challenging times.

Thank you to all faculty and staff of the Department of Medicine for your unwavering commitment to providing outstanding education, unparalleled research and excellence in clinical care, and increasing the profound impact the Department of Medicine is having on Canada and the world. Congratulations on all that you have achieved over the past two academic years and my very best wishes for the future. ■

David Farrar
President & Vice-Chancellor

McMaster University

BRIGHTER WORLD

A MESSAGE FROM THE

Dean and Vice-President

> "The Faculty... ranked 11th overall in the world for clinical, pre-clinical and health subjects for 2020."
>
> — Dr. Paul O'Byrne

As Dean and Vice-President of the Faculty of Health Sciences, it gives me great pleasure to reflect on the many accomplishments of the Department of Medicine over the last two years.

While the COVID-19 pandemic has shifted the culture of our institution, our community and our world, as our Faculty's largest department, you have continued to make very meaningful contributions to our world's health. In my role as dean, I have witnessed an incredible amount of resilience, creativity and commitment to excellence among all of the faculty members, students and staff of the Department of Medicine and I am especially proud of the many important initiatives that are aimed at keeping our communities and our world healthy and safe.

The Department of Medicine's pioneering educational advances and excellence in world-class research continues to place McMaster among the top 50 universities in the world for health and medicine, and one of Canada's top research-intensive university for the past three years. We also ranked 11th in the world for clinical, pre-clinical and health subjects by the Times Higher Education World University Rankings 2021, a remarkable achievement made possible by the extraordinary efforts of the members of the Department of Medicine. The Department's impact is further recognized by the fact that 16 researchers in the Faculty of Health Sciences are among 18 McMaster University affiliated scientists recognized among the top one per cent of scientists in the world, according to their citations.

Indeed, McMaster's Faculty of Health Sciences has had many reasons to celebrate over the past two years. Most recently, we have led the world in COVID-19 research, through the newly established Canada's Global Nexus for Pandemics and Biological Threats, that brings together our world-class resources, elevates our capabilities and amplifies impact. This has included rapidly developing and testing new second-generation COVID-19 vaccine candidates, assisting the Public Health Agency of Canada in better understanding the spread of COVID variants of concern and making recommendations to inform Ontario's vaccine rollout.

Among our other noteworthy successes:

- In 2019, the Michael G. DeGroote School of Medicine celebrated its 50th anniversary, commemorating accomplishments in small group, problem-based education, and a focus on self-directed, life-long learning.
- The Department released the *McMaster Textbook of Internal Medicine*, the first comprehensive Canadian textbook of internal medicine. A full range of topics, such as allergy, hematology,

Paul O'Byrne

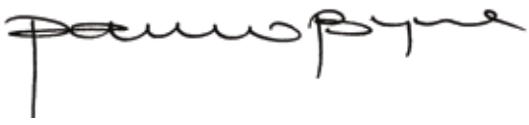
Dean and Vice-President
McMaster University

endocrinology, psychiatry, and rheumatology, is covered in its pages, almost all authored by McMaster faculty members who are considered leaders in their fields.

- We opened new, world-leading research centres, among these the David Braley Centre for Antibiotic Research and the Centre for Metabolism, Obesity and Diabetes Research.
- We celebrated the generous support of many of McMaster's friends, including a legacy gift from Hamilton philanthropists Charles and Margaret Juravinski, who pledged an endowment of more than $100 million to support researchers across Hamilton Health Sciences, McMaster University and St. Joseph's Healthcare Hamilton, and $10 million from McMaster alumnus Walter Schroeder and his family to fast-track treatment and prevention research for the search to cure allergies.
- We formed a networking think-tank focused on fostering success in entrepreneurship and innovation, called The College of Health Inventors. The College is an initiative of the Michael G. DeGroote Initiative for Innovation in Healthcare.

Congratulations to all members of the Department of Medicine for your dedicated approach, ongoing commitment to our patients, our mission, and our community and impressive achievements that have contributed to these and other successes within the Faculty of Health Sciences.

Although the past year brought forth challenges due to the pandemic, and tragic events involving systemic injustices and inequities, we should applaud our collective tenacity, creativity and resourcefulness that has allowed us to continue to make important contributions to our world, and remain steadfast in our ambition to advance human and societal health and well-being. ■



Dr. Paul O'Byrne
Dean and Vice-President
Faculty of Health Sciences
Michael G. DeGroote School of Medicine
Distinguished University Professor
McMaster University

A MESSAGE FROM THE

Chair of the Department of Medicine

> "COVID-19... highlighted the excellence of *our faculty, residents and staff...* illustrated by the Department's ability to pivot ... to online care and teaching *over a matter of weeks...*"

DR. BARRY LUMB
Physician-in-Chief HHS

DR. LORI WHITEHEAD
Program Director
Internal Medicine Residency
Training Program

DR. AZIM GANGJI
Chair of Subspecialty
Program Directors
Committee

2018/19 and 19/20 represented additional landmark years for the Department of Medicine at McMaster University. Spanning the breadth of excellent clinical care, world leading research and outstanding educational achievement, the Department of Medicine continues to lead the Faculty of Health Sciences and the broader University through its excellence. In 2019, the Michael G. DeGroote School of Medicine celebrated its 50th anniversary.

This golden anniversary was a time for us to reflect on the school's significant record of achievements and its world impact in education, research and, most importantly, improved outcomes in health care. Thanks to the visionary leadership of Drs. John Evans, James Anderson, Fraser Mustard, William Spaulding and William Walsh, McMaster is internationally recognized as a leader in medical education. Their legacies live on in the outstanding productivity of our faculty and learners.

At the end of the 2019/20 academic year, the Department had 283 full-time faculty, 43 professor emeriti, 31 joint and associate members, and 24 clinical scholars complemented by a total of 404-part-time faculty located in Hamilton, Kitchener-Waterloo, St. Catharines and elsewhere in Ontario. We also welcomed 41 new full-time faculty and 86 part-time faculty over these two academic years. Our regional program in Kitchener-Waterloo continued to grow under the leadership of Dr. Mountjoy, the Regional Associate Dean, as we had two more highly successful groups of medicine residents initiate training through our Waterloo Regional Campus. At the start of the 2018/19 academic year we had welcomed Dr. Mountjoy, and thanked Dr. Cathy Morris, the founding Dean of the Kitchener-Waterloo campus, as she came to the end of her term.

Our excellence in clinical care could only occur through work with our partner hospitals and community groups. At Hamilton Health Sciences and St. Joseph's Healthcare Hamilton,

Mark Crowther

Chair, Department of Medicine
McMaster University
Leo Pharma Chair in Thromboembolism Research

Dr. Barry Lumb and Dr. Alistair Ingram, respectively, carry our mission of academic and clinical excellence forward. I would like to personally thank Drs. Lumb and Ingram; their tireless support for the Department ensures that our academic mission is prominently featured to hospital administration on a day-to-day basis. Of note, at the end of the 19/20, Dr. Lumb stepped down as Physician-in-Chief at HHS after 12 years of dedicated service. During his tenure, Dr. Lumb oversaw dramatic changes in our clinical service delivery model including the implementation of Access to Best Care. Dr. Lumb always carried out his role with remarkable equanimity, fairness and a degree of enthusiasm that was remarkable given the workload associated with this role. He will be missed in this role, but is not going too far given his new leading role in the implementation of EPIC at HHS.

Dr. Lori Whitehead continued in her role as program director for the core Internal Medicine Residency Training Program and during these years has been leading the Department's response to various stressors while simultaneously maintaining our position as one of Canada's most desired training locations. Work on implementing Competency by Design continued as did work on adapting our coverage model to changing resident educational expectations and variable availability of some of our international educational colleagues. Also, as Chair of the Subspecialty Program Directors Committee, Dr. Azim Gangji continued his long-standing work to increase the visibility of our subspecialty training programs and clinical fellowships. Advanced training and clinical fellowships are an area into which we continue to invest significant resources. We see excellence in post-residency subspecialty training as an area of significant growth and opportunity, and an area within which we can highlight how McMaster implements its leading-edge research observations into day-to-day clinical practice.

I would be remiss if I did not mention the impact of COVID-19. I cannot even begin to delineate the footprint that the pandemic has had on the Department other than to say that it brilliantly highlighted the excellence of our faculty, residents and staff. This excellence has been illustrated by the Department's ability to pivot to working at home, provide excellent patient care

under continued stress, transition from face-to-face to online care and teaching over a matter of weeks, while also having to deal with greater than usual impacts on home life.

World-leading research remains the fundamental cornerstone of the Department. The Department continued its remarkable track record of publication and grant funding success. It is a rare week when there is not at least one research publication from a McMaster Department of Medicine researcher featured in one of the leading general internal medicine journals. Critical papers in cardiology, gastroenterology, respirology, hematology and thromboembolism, and many other disciplines have been published by our faculty within the last year. It is not an exaggeration to say that McMaster's Department of Medicine continues to fundamentally alter the research and clinical landscape through its outstanding productivity. COVID-19 again highlighted this, with Department of Medicine faculty leading the way both in basic science and clinical research, as well as guideline promulgation for the pandemic.

The success of our faculty is reflected in the awards that they achieved; rather than list these awards here I would suggest that you read through this report where these achievements are highlighted and, in many cases, explored in further depth.

I look forward to contributing to and celebrating our future successes. ■

Mark Crowther MD MSc FRCPC
Chair, Department of Medicine
Leo Pharma Chair in Thromboembolism Research

International Influence

DEPARTMENT OF MEDICINE: INVITED PRESENTATIONS 2018-2020

Locations where Department of Medicine faculty presented during 2018-20, showing the Department's international influence.

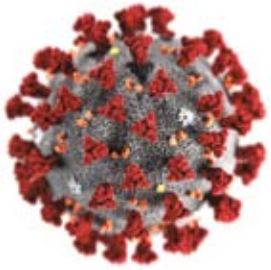

Dr. Tim O'Shea
Hamilton Social Medicine Response Team
HAM SMaRT
Peer Support Workers
Community Organizers
Physicians

A PASSION FOR CARE

Excellence in care

research
care
learning

Dr. Tim O' Shea and Dr. Leslie Martin: Providing care, outreach, and advocacy for some of Hamilton's most vulnerable residents



Tim O'Shea believes that even the most excellent medical care isn't enough to treat some of Hamilton's sickest, most marginalized patients.

For Dr. O'Shea – associate professor, an infectious diseases and internal medicine specialist, and a physician with the Hamilton Shelter Health Network and The Hamilton Social Medicine Response Team (HAMSMaRT) – patients dealing with homelessness, substance abuse, and mental illness need not only medical care, but social supports.

"If looking after a patient's health means looking after whatever infections they may have, or whatever medication needs they may have, and then ignoring that they have no place to sleep -- that seems very weak," he said.

It was this philosophy that compelled Dr. O'Shea to begin HAMSMaRT along with Co-founder Dr. Christian Kraeker. A coalition of physicians, peer support workers and community organizers, HAMSMaRT was borne out of a desire to connect with homeless individuals in the community, and to provide excellence in clinical care to those who are often excluded from the traditional medical system.

"It started from an experience of seeing patients in the hospital coming in over and over again with similar issues," he said. "There was a bit of a sense that when they walked out the hospital doors, who knows what happened at that point - and then they would come back again. It was just sort of a recognition that we were not really engaging in the community side of things at all."

Dr. O'Shea says that part of what makes HAMSMaRT unique is an explicit recognition that much of what makes and keeps their patients sick is the result of political or policy decisions. Actively working to address those issues is part of the HAMSMaRT mandate. As a result, Dr. O'Shea has become an vocal advocate and an active ally for Hamilton's homeless population.

Since Covid-19 hit in 2020, much of his work focused on Covid-19 in the shelter system and mitigating the risk for both staff and shelter patrons. He has also become a central voice in the debate surrounding homeless encampments in the community.

"With HAMSMaRT, we've always had the belief that health care is political," he said. "We're trying to acknowledge the fact that ignoring the political side of things really is doing our patients a disservice."

Dr. O'Shea points to one particular patient to demonstrate the devastating effects homelessness has on health – and the limitations of medical care that doesn't address the root cause of the issue.

"This patient was very unwell, living on the streets, in a very precarious setting. We had the expertise from a medical perspective to deal with the medical problems, but the best that we did was keep that person alive for a year. We didn't really make much impact on their health," he said.

As soon as that patient became housed, within three months, their health improved dramatically.

"Just to see the impact of that – the difference between somebody being homeless and hustling all day long to survive, versus being housed in a place where they feel safe and comfortable – the impacts on health were so huge," he said.

"And I think that's just a little bit humbling from a medical perspective. We feel like, 'Come to us and we're going to help you' – but not if we don't address these other issues."

Dr. Leslie Martin began her work with the homeless population after being mentored by Dr. O'Shea. Dr. Martin, a general internist with the department of medicine, first began her work with inpatients with substance use disorders after noticing that there were no official protocols for individuals who were suffering from withdrawal symptoms while in hospital.

"We would be seeing patients in hospital who would be going through severe withdrawal, and we didn't really have ways to help them locally," she said. "It just wasn't within anybody's realm of expertise."

As the opioid crisis intensified, in February of 2018, Dr. Martin became co-chair of the Inpatient Addictions Medicine Service. This service, co-chaired by Dr. Robin Lennox, a family physician, is seeking to transform the health care experience for people who use drugs by: providing compassionate wraparound care; integrating harm reduction and evidence-based approaches; building capacity and understanding amongst healthcare teams; working to eliminate stigma; and empowering people who use drugs. In the past three years, this service has seen over 600 patients.

Dr. Martin points out that the first challenge of treating patients who use drugs is often getting them to stay in hospital, as the environment is often a very challenging place for this population. Often, they've had previous traumatic experiences accessing the healthcare system. It's also an institutional setting, which can trigger memories of negative experiences. There can also be power dynamics in terms of administering medication, as patients in this population are used to controlling their own intake.

However, the main challenge for many patients who have opioid use disorder is withdrawal. There is a very high rate of people with substance abuse problems leaving the hospital against medical advice, in large part due to trying to mitigate withdrawal symptoms. If those symptoms are managed in hospital, that can become a gateway to providing more fulsome and meaningful care.

"If we can prevent the withdrawal and ensure that people are not going through severe withdrawal, hopefully we can keep them in the hospital longer, as a first step to treat the medical reason for their presentation. And the next step from there is, how do we work on getting those wraparound services," she said.

Dr. Martin says there is still work to do when it comes to attitudes towards people who use drugs in an inpatient setting. For example, she points out that healthcare providers are very familiar with housing concerns in aging patients, adding that there is a "well-oiled machine" within the hospital system to ensure that aging patients are supported and well-housed once they leave hospital. The same is not true for homeless patients.

"We would never discharge an older person to the street, or to an underserved home, but we do that with homeless patients all the time," she said. "I think that has been a real shift in trying to understand how can we wrap services around this patient population."

While Dr. Martin says she sees many places where care can improve, she knows that the Inpatient Addictions Medicine Service has made a positive impact on patients' lives.

"Overwhelmingly, the feedback we get is that our presence has made a difference," she said. "So that inspires us to try to continue to make change." ■

Dr. Leslie Martin

Publication highlights JULY 2018 — JUNE 2019

July 2018

Drs. R. Hart, M. Sharma, M. O'Donnell, J. Weitz, A. Shoamanesh, and S. Connolly et al *NEJM* Rivaroxaban for Stroke Prevention after Embolic Stroke of Undetermined Source. NEJM. 2018 Jun 7;378(23):2191-2201.

August 2018

Drs. I. Nazy, M. Larche, J.C. Moore, J.W. Smith, J.G. Kelton and D.M. Arnold et al *J Thromb Haemost* Cellular immune responses to platelet factor 4 and heparin complexes in patients with heparin-induced thrombocytopenia. J Thromb Haemost. 2018 Jul;16(7):1402-1412.

September 2018

Drs. P.J. Devereaux, G. Guyatt, V. Tandon, W. Szczeklik, P. Magloire, J. Neary, J. Eikelboom, C. Kearon, M. Sharma, S. Connolly, S. Yusuf et al *Lancet* Dabigatran in patients with myocardial injury after non-cardiac surgery (MANAGE): an international, randomised, placebo-controlled trial. Lancet. 2018 Jun 9;391(10137):2325-34.

October 2018

Dr. P. Moayyedi et al *Lancet* Esomeprazole and aspirin in Barrett's oesophagus (AspECT): a randomized factorial trial. Lancet. 2018 Aug 4;392(10145):400-408.

November2018

Dr. M. Kolb et al *NEJM* Nintedanib plus Sildenafil in Patients with Idiopathic Pulmonary Fibrosis. NEJM. 2018 Nov 1;379(18):1722-31.

December 2018

Dr. J. Douketis, M. Tiboni, M. Crowther, D. Siegal et al *J Thromb Haemost* Weight-adjusted tinzaparin for the prevention of venous thromboembolism after bariatric surgery. J Thromb Haemost. 2018 Oct;16(10):2008-15.

January 2019

Dr. K. Teo, S. Anand, S. Yusuf et al *Lancet* Association of dairy intake with cardiovascular disease and mortality in 21 countries from five continents (PURE): a prospective study. Lancet. 2018 Nov 24;392(10161):2288-97.

February 2019

Dr. Z. Punthakee, H. Gerstein et al *Diabetes Care* Hypoglycemia and Incident Cognitive Dysfunction: A Post Hoc Analysis from the ORIGIN Trial. Diabetes Care. Epub 2018 Nov 13. pii: dc180690.

March2019

Dr. J. Stearns, N. Khalidi, P. Nair et al *Am J Respir Crit Care Med* Sputum Antineutrophil Cytoplasmic Antibodies in Serum Antineutrophil Cytoplasmic Antibody-Negative Eosinophilic Granulomatosis with Polyangitis. Am J Respir Crit Care Med. 2019 Jan 15;199(2):158-70.

April 2019

Drs. J. Vrbensky, J. Moore, D. Arnold, J. Smith, J. Kelton, and I. Nazy *J Thromb Haemost* The sensitivity and specificity of patelet autoantibody testing in immune thrombocytopenia: a systematic review and meta-analysis of a diagnostic test. J Thromb Haemost. Epub 2019 Feb 23.

Dr. S. Mehta NEJM Refining Antithrombotic Therapy for Atrial Fbirillation and Acute Coronary Syndromes or PCI. *NEJM*. Epub 2019 Mar 17.

Dr. J. Healey et al *NEJM* The RACE to Treat Atrial Fibrillation in the Emergency Department. NEJM. Epub 2019 Mar 18.

Drs. P. Nair and P. O'Byrne *Eur Respir J* The interleukin-13 paradox in asthma: effective biology, ineffective biologicals. Eur Respir J. 2019 Jan 31;53(12).

May 2019

Dr. S. Connolly, M. Crowther, J. Eikelboom, D. Siegal et al *NEJM* Full Study Report of Andexanet Alfa for Bleeding Associated with Factor Xa Inhibitors. NEJM. 2019 Apr 4;380(14):1326-35.

June 2019

Drs. C. Kearon, F. Spencer, S. Schulman, J. Douketis, J. Ginsberg et al *J. Thromb Haemost* Long-term risk of recurrence in patients with a first unprovoked venous thromboembolism managed according to D-dimer results; a cohort study. J Thromb Haemost. Epub 2019 Apr 29.

Publication highlights JULY 2019—JUNE 2020

July 2019

Drs. D. Chu, S. Waserman, J. Brozek, H. Schunemann et al Lancet Oral immunotherapy for peanut allergy (PACE): a systemic review and meta-analysis of efficacy and safety. *Lancet*. 2019 Jun 1;393(10187):2222-32.

August 2019

Drs. D. Douketis, P. Gross, S. Bates, F. Spencer, D. Arnold, K, Moffat, S. Schulman et al JAMA Internal Medicine Perioperative Management of Patients With Atrial Fibrillation Receiving a Direct Oral Anticoagulant. JAMA Intern Med. Epub 2019 Aug 5.

September 2019

Dr. H. Gerstein et al Lancet Dulaglutide and cardiovascular outcomes in type 2 diabetes (REWIND): a double-blind randomised placebo-controlled trial. Lancet. 2019 Jul 13;394(10193):121-130.

October 2019

Drs. S. Yusuf, P. Joseph, S. Rangarajan, K. Teo, D. Leong, M. O'Donnell et al Lancet Modifiable risk factors, cardiovascular disease, and mortality in 155 722 individuals from 21 high-income, middle-income, and low-income countries (PURE): a prospective cohort study. Lancet. E-pub 2019 Sep 2.

Drs. S. Mehta, T. Sheth, N. Pinilla-Echeverri et al NEJM Complete Revascularization with Multivessel PCI for Myocardial Infarction. NEJM. Epub 2019 Sep1.

November 2019

Drs. JD Schwalm, S. Yusuf et al Lancet A community-based comprehensive intervention to reduce cardiovascular risk in hypertension (HOPE 4): a cluster-randomized controlled trial. Lancet. 2019 Oct 5;394(10205):1231-42.

December 2019

Drs. H. Gerstein, G. Paré et al Diabetes Care Novel Biomarkers for Change in Renal Function in People with Dysglycemia. Diabetes Care. Epub 2019 Nov 14.

January 2020

Drs. C. Kearon, K. de Wit, S. Schulman, F. Spencer, S. Bates et al. NEJM Diagnosis of Pulmonary Embolism with D-Dimer Adjusted to Clinical Probability. N Engl J Med. 2019 Nov 28;381(22):2125-34.

Drs. A. Patel, F. Borges, G. Guyatt, W. Szczeklik, A. Garg, M. Walsh, S. Yusuf, PJ Devereaux et al. Ann Intern Med Preoperative N-Terminal Pro-B Type Natriuretic Peptide and Cardiovascular Events After Noncardiac Surgery. 2020 Jan 21;172(2):96-104.

February 2020

Dr. G. Steinberg et al. Nat Rev Drug Discov AMP-activated protein kinase: the current landscape for drug development. Nat Rev Drug Discov. 2019;18(7):527-551.

March 2020

Dr. I. Walker et al. *Lancet Hematology* Addition of anti-thymocyte globulin to standard graft-versus-host disease prophylaxis versus standard treatment alone in patients with Haematological malignancies undergoing transplantation from unrelated donors; final analysis of a randomised, open-label, multicentre, phase 3 trial. Lancet Hematol. 2020 Feb;(7)2:e100-e111.

Drs. M. Pigeyre, S. Yusuf, H. Gerstein, G. Paré et al. Diabetes Care ACE and Type 2 Diabetes Risk: A Mendelian Randomization Study. Diabetes Care. 2020 Feb 4. pii: dc191973.

April 2020

Drs. S. Anand, K. Schulze, K. Teo, S. Yusuf Stroke Reduced Cognitive Assessment Scores Among Individuals With Magnetic Resonance Imaging-Detected Vascular Brain Injury. Stroke. 2020 Apr;51(4):1158-1165.

May 2020

M. Mukherjee, A. Bhalla, J. Cherukat, H. Al-Hayyan, A. Ayoub, P. Nair et. al. Eur Respir J Sub-optimal Treatment Response to anti-IL-5 Monoclonal Antibodies in Severe Eosinophilic Asthmatics With Airway Autoimmune Phenomena. Eur Respir J. 2020 May 22;2000117.

June 2020

S. Mithoowani, A. Cervi, N. Shah, E. Sirotich, I. Nazy, D. Arnold et al. J Thromb Haemost Management of Major Bleeds in Patients With Immune Thrombocytopenia. 2020 Jul;18(7):1783-1790.

GIFT REPORT

$100M+ endowment to fund health research in perpetuity

Charles and Margaret Juravinski's gift one of Canada's largest legacy gifts ever.

In 2019, Charles and Margaret Juravinski made an estate gift of $100 Million to support researchers across McMaster University, Hamilton Health Sciences and St, Joseph's Healthcare Hamilton. Their estate gift is one of Canada's largest legacy gifts ever. The proceeds will fund the Juravinski Research Institute, a partnership of the three organizations. Each organization will receive up to $5 million annually, in perpetuity, for health research that will continue to improve life in Hamilton. In their letter released to the community the Juravinskis stated:

"We want to be sure our remaining resources are able to do as much good for as many people for as long as they can. It brings us great pleasure to think that when we are gone, our legacy to this community may be measured in the good health of those who come after us."

The legacy gift will be used to fund research in aging & related diseases, cancer, lung health & respiratory care and mental health. The Research Institute is currently funding many projects including one led by Dr. Alexandra Papaioannou. The GERAS Frailty Rehabilitation at Home Virtual-bundled care for seniors to build strength and resilience during COVID-19 is an ongoing study that is working to build resilience in vulnerable seniors through at-home rehabilitation services, including exercise, nutrition, socialization and support with medication.

Faculty awards and highlights

Dr. Rick Adachi	Herbert A. Fleisch ESCEO-IOF Medal	2019
Dr. Sonia Anand	McMaster University Scholar	2020
	Canadian Academy of Health Sciences Fellow Award	2019
Dr. Marla Beauchamp	Annals of Internal Medicine, Top Reviewer Recognition	2019
	Archives of Physical Medicine and Rehabilitation, Elite Reviewer (top 1% of reviewers)	2018
Dr. Birubi Biman	Best Academic Teacher in Internal Medicine at NOSM - Faculty of Internal Medicine, McMaster University 2018-2019	2018
Dr. Dawn Bowdish	Canada Research Chair in Aging and Immunity- Tier 2, renewed	2019
	McMaster Student's Union (MSU) Community Engagement Award	2019
	University Scholar	2018
Dr. Alberto Caminero	Early Career Investigator Award by The American Gastroenterology Association (AGA)	2019
	Basmajian Award for Excellence in Research Work, McMaster University	2018
Dr. Teresa Chan	2020 Ian Stiell Researcher of the Year Award	2020
	2020 Medical Education Critic's Choice Award	2020
	2019 Academic Medicine Master Reviewer Award	2019
	2019 CAME Meridith Marks New Educator Award	2019
	Young Alumni of Distinction Award, Western University	2018
Dr. Deborah Cook	Lifetime Achievement Award, Society of Critical Care Medicine	2020
	Mission Legacy Award: 3 Wishes Project Team, St. Joseph's Healthcare Hamilton	2020
	Family Centered Award: The 3 Wishes Project, Society of Critical Care Medicine	2019
	Gold Leaf Award for Impact, Canadian Institutes for Health Research	2019
Dr. PJ Devereaux	Elected as the 2020 Fellow of the Canadian Academy of Health Sciences (CAHS)	2020
	Inaugural David Sackett Mentorship & Supervision Award in the full-time and joint category	2020
	Distinction for Best Practice for the 2019 UNIVANTS of Healthcare Excellence Award	2019
	MacOrtho Award of Excellence	2019
	American Society of Anesthesiology Honorary Member Award	2018
Dr. James Ducharme	Society for Emergency Medicine India Excellence Award for International Emergency Medicine	2019
Dr. Azim Gangji	Chair of the CST 2020 Virtual Forum Recognition Award	2020
	Canadian Society of Nephrology, CSN Clinical Nephrology Teaching Award 2019	2019
	Teaching Excellence Award in Medicine Subspecialty Clerkship, McMaster University	2019
	Pioneer, Innovator, Leader and Caregiver Award - Kidney Foundation of Canada	2018
	St. Joseph's Hospital Miracle Care Award, St. Joseph's Healthcare Hamilton	2018
Dr. Hertzel Gerstein	Fellow of the Canadian Academy of Health Sciences	2019
Dr. Gordon Guyatt	Hamilton Gallery of Distinction Award	2019
Dr. Jeff Healey	Hamilton Health Sciences Cardiology Advisory Committee Fellowship Award	2019
	CANet Mentoring Award	2018
	Cardiac Society of Australia and New Zealand (CSANZ) "Preventative and Clinical Cardiology Prize"	2018

Dr. Anne Holbrook	Inaugural William Walsh Award for Outstanding Educational Achievement. Department of Medicine, McMaster University	2019
	Department of Medicine Teaching Award, Postgraduate, McMaster University	2018
Dr. John Kelton	Honorary Member, McMaster Alumni Association	2019
	Distinguished Lecturer, William H. Kane, Duke University, North Carolina	2018
	William G. Bensen Distinguished Faculty Award, McMaster University	2018
Dr. Aliya Khan	Fellow of the American Society For Bone and Mineral Research (ASBMR) in recognition of distinguished accomplishments and contributions to the musculoskeletal field	2020
	Lindy Fraser Osteoporosis Canada Award for outstanding contributions to research and education	2020
	Recognized as being in the top 0.1% of the world experts in hyperparathyroidism by Expertscape	2019
	Appointed Canadian Ambassador for American Society of Bone and Mineral Research	2019
Dr. Paul Kim	CanVECTOR Emerging Research Leaders Initiative Award	2019
Dr. Matthew Lanktree	Hamilton Health Sciences New Investigator Fund	2019
	Kidney Research Scientist Core Education National Training Program (KRESCENT) New Investigator Award	2019
Dr. Grigorios Leontiadis	Canadian Association of Gastroenterology Fellow	2020
Dr. Maura Marcucci	McMaster Medical Student Research Excellence Scholarship (MAC RES) -2020 - Supervisor	2020
	PSI-50 Mid-Career Clinical Research Award	2019
Dr. John Marshall	Canadian Association of Gastroenterology Visiting Clinical Professorship	2020
	Fellowship in the Canadian Association of Gastroenterology (CAGF)	2020
Dr. William McIntyre	McMaster Faculty of Health Sciences Graduate Programs Outstanding Achievement Award	2020
	Canadian Cardiovascular Society (CCS) Trainee Excellence in Education Award	2018
Dr. Karen Moffat	International Journal of Laboratory Hematology (IJLH) Top 10% most downloaded article. Title: Update on diagnostic testing for platelet function disorders: What is practical and useful? [doi: 10.1111/ijlh.12995]	2020
	Journal of Thrombosis and Haemostasis Top 10% most downloaded article. Title International Society on Thrombosis and Haemostasis core curriculum project: Core competencies in laboratory thrombosis and hemostasis [doi: 10.1111/jth.14601]	2020
	McMaster University Hematology Residency Teaching Award - Laboratory	2019
Dr. Manali Mukherjee	Frederick Hargreave Clinical Research Award, First runner-up	2020
	CIHR/CAAIF Emerging Researcher in Allergic Asthma	2019
Dr. Parameswaran Nair	Fellow of the European Respiratory Society	2020
Dr. Wieslaw Oczkowski	Dr. Stephen Garnett Distinction Award	2019
Dr. Maria Ines Pinto Sanchez	Early Career Award, Department of Medicine, McMaster University	2018
Dr. Simerpreet Sandhanwalia	MSA Community Action Award	2020

Dr. Imran Satia	American Thoracic Society Best Abstract Award	2020
	European Respiratory Society Marie-Curie Award	2019
	American Thoracic Society Asthma, Allergy and Immunology Best Abstract Award	2018
	European Respiratory Society Marie-Curie Award	2018
Dr. Malcolm Sears	Canadian Thoracic Society Research Excellence Award	2019
	McMaster Faculty of Health Sciences Community of Distinction	2019
Dr. Sameer Sharif	CAEP CanVECTOR Research Abstract Award	2020
	McMaster University PGME Resident Mentor Award	2020
	McMaster/Western Critical Care Research day - 1st Place Award	2020
Dr. Jonathan Sherbino	Visiting Professor - Department of Emergency Medicine, Indiana University	2019
	Visiting Professor - Department of Emergency Medicine, Stanford University	2019
	National Emergency Medicine Teacher of the Year - Canadian Association of Emergency Physicians	2018
Dr. Suneel Upadhye	Canadian Association of Emergency Physicians - Choosing Wisely Canada Abstract Award 2020	2020
Dr. Harriette Van Spall	Women as One Escalator Award	2020
Dr. Elena Verdu	Canadian Association of Gastroenterology Excellence in Research Award	2020
	Education Excellence Award, Canadian Association of Gastroenterology; CAG	2019
Dr. Jeffrey Weitz	David Rosenberg Memorial Lecture Series in Clinical Thrombosis, Northwell Health System	2020
	Earl Davie Symposium & Naiman-Vickars Visiting Professorship, University of British Columbia	2020
	Elected to Sigma Xi, The Scientific Research Honor Society	2020
	Ernest Beutler Lecture and Prize, American Society of Hematology	2019
	High Citation Award, ATVB	2018
	CIHR Canadian Society of Atherosclerosis, Thrombosis and Vascular Biology Distinguished Scientist Award	2018
Dr. Geoff Werstuck	Heart and Stroke Foundation of Canada (HSFC) Ontario Mid-Career Investigator Award	2019
Dr. Ahraaz Wyne	Laureate Award American College of Physicians Ontario	2019
	Department of Medicine Clinical Teaching Award General Internal Medicine, McMaster University	2018
	Internal Medicine Clerkship Program Faculty Award, McMaster University	2018
Dr. Salim Yusuf	19th World India Diabetes Foundation (WIDF) Oration, Mumbai, India	2020
	Neufeld Lecture, ISCP: International Society of Cardiovascular Pharmacotherapy, Lugano, Switzerland	2019
	Stokes Lecture, Irish Cardiac Society, 70th Annual Scientific Meeting, Dublin, Ireland	2019
	Alberto Zachetti Lecture, XVI Latin American Society of Hypertension, Cartagena, Colombia	2018

A PASSION FOR KNOWLEDGE

Excellence in teaching

{ research
care
learning

Dr. Jill Rudkowski: Adapting the Clerkship program during Covid-19

On March 16, 2020, during the earliest stages of the Covid-19 pandemic, the DeGroote School of Medicine at McMaster made the difficult decision to pull its undergraduate medical students out of the clinical learning environment.

"The system was in crisis and nobody knew what they were dealing with. We didn't have a good understanding of safety. That was a decision across the country – all students in all provinces were pulled out of the clinical environment at the same time," said Dr. Jill Rudkowski, the Chair of Clerkship and Concept Integration and Review for the DeGroote School of Medicine at McMaster.

"We had to consider the safety of the students, the safety of the patients, the safety of the faculty, and the capacity of the system to host learners."

It was up to Dr. Rudkowski and her Clerkship team to figure out a way to continue to train medical students while not having access to learning in the clinical environment. In response, in the span of just two weeks, she led the creation of an 11-week curriculum to replace some of the learning they would have experienced had it not been for Covid-19.

"I've never faced a bigger challenge," she said. "It was very intense."

While the class of 2020 was only a few weeks away from graduation, they were able to complete their remaining clerkship rotations relatively smoothly. However, Dr. Rudkowski points out that it quickly became apparent that the class of 2021 was not going to get back into the clinical environment before July. Dr. Rudkowski was faced with the challenge of helping students at all three McMaster Medicine campuses – Hamilton, Waterloo and Niagara— stay on track towards graduation in May 2021 in order to begin their postgraduate residency training on time.

The curriculum Dr. Rudkowski created, called the Virtual Longitudinal Clerkship, provided a mix of learning opportunities reflecting some of the learning students would have done during their clinical rotations. This included live virtual teaching sessions with Faculty across many McMaster Departments (Family Medicine, Pediatrics, Surgery, Anesthesia, Obstetrics and Gynecology, and Psychiatry).

Photo taken pre-COVID

Photos taken pre-COVID

"We had faculty from across the Departments at McMaster who hosted those live teaching sessions and created the content very last minute. It was really incredible to see such strong collaboration," Dr. Rudkowski said.

Dr. Rudkowski also curated online resources for students to use for self-study, and every student was introduced to the skills needed for virtual patient care through online sessions with faculty and standardized patients. Dr. Rudkowski points out that these skills became crucial, as students would need to have the skills to properly assess patients' health virtually when they returned to in-person learning – something that few learners or physicians had any experience with prior to the pandemic.

The Class of 2021 was ultimately able to return to the clinical environment full-time in July. However, that created a ripple effect for the Class of 2022, which would usually have started pre-clerkship electives over the summer. As a result, Dr. Rudkowski worked with the undergraduate medical team to develop a new "Transition to Clerkship" 12-week curriculum for the class of 2022 so that they would be on track for Clerkship in January 2022. This was a hybrid course comprised of virtual small and large group sessions, the virtual patient care course, in-person skills training, and clinical electives.

"I think it was the best success we could have had with the challenges that we faced," she said. "It was just an unbelievable year of having to just completely rethink how we delivered content for clerkship and pivot on a dime. I have never been more grateful for the collaboration and dedication of the people I work with."

Dr. Rudkowski was also able to rely on the support of and ingenuity of colleagues across Canada as the Chair of the Clerkship Network of the Association of the Faculties of Medicine of Canada.

"It's been really neat to be able to collaborate and liaise with colleagues across the country who are charged with running Clerkship at all 17 medical schools, especially with the pandemic," she said. "We've been able to create a really solid network of communication, idea-sharing, and support so that nobody feels like they're in it alone." ■

GIFT REPORT

$10M funding accelerates search for allergy cure

Gift from McMaster alumnus Walter Schroeder and his family

In 2020, McMaster University was fortunate to receive a generous gift of $10 million from McMaster University's alumnus Walter Schroeder and his family. This significant gift was provided to the university to fast-track treatment and prevention research for the search to cure allergies. The funding is two-pronged, and will establish the Schroeder Allergy and Immunology Research Institute, which will support senior scientists and scholars in allergy investigation. The proposed Schroeder Institute at McMaster will be home to an Endowed Chair in allergy and immunology research, and the inaugural holder will help set the vision for a world-class program in immunology and allergy over the next five years. The investment will also support several postdoctoral fellows in allergy bioinformatics as well as graduate students and scholars.

"We are grateful for Charlie and Margaret's and Walter and his family's confidence in McMaster's researchers' ability to positively impact the health outcomes of people here in Hamilton and across the world. Their remarkable gift will enhance the lives of many today and for years to come."

— Dr. Mark Crowther

Groundbreaking research

Dr. Teresa Chan: Supporting doctors as learners

Dr. Teresa Chan has always been interested in helping others learn.

Even as a high school student, Dr. Chan acted as a mentor and a peer tutor for her classmates, including teaching her fellow students how to follow Robert's Rules of Order during model United Nations. It was this fascination with learning and with education systems that led her to pursue a teaching degree, before attending medical school at Western University.

Today, Dr. Chan blends her passion for teaching and her love of medicine as an emergency physician, an educator, and an education scientist.

Much of Dr. Chan's research has focused on training doctors to handle the busy and stressful environment of the emergency room. One of her recent research projects focused on how physicians teach and learn in multi-patient environments, and the creation of cognitive modelling on how to prioritize patients.

"I really try to understand how people are taught and learn the process of handling the busy department – and what is the thinking model that's really underpinning that," she said.

"In a clinic room – maybe you're bouncing between two and thee different rooms, but you're doing one thing at a time," she said. "In emergency medicine – you're not really only doing one thing at time. There's a whole bunch of different things going on at once. We probably also have the highest acuity, and therefore the highest amount of turnover."

This program of research led to the development of Dr. Chan's most well-known projects, a board game about emergency department flow called GridlockED.

The game requires players to direct patients to the appropriate area of the hospital – the resuscitation zone, step-down zone, intermediate zone, minor zone and waiting room – and earn points for completing tasks. The three goals of the game are to achieve 500 points, "survive" an eight-hour shift, and keep patients safe.

The board game allows doctors to learn how to manage the emergency department in a low-stakes, low-risk environment before being put in charge of the entire unit on their own.

"How do people go from seeing one patient at a time as a med student to handling a whole department of 16 patients at the same time? That skill set wasn't clearly articulated," she said.

Dr. Chan's other programs of research have focused on how doctors can use social media to enhance their learning, including how doctors can use apps like Slack to form tight research teams that aren't dependent on location. Her next project will likely focus on how "to bring out the best in people," she says, and what it means to be "excellent" in health care.

Each of her research projects have acknowledged that while healthcare providers are incredibly driven and talented, "We're not perfect, and we need to be supported in our development," she said.

"To be a more inclusive teacher, you really have to understand that some of these skills are not obvious to everyone. It is to some people – the easy learner who just gets everything – but to be honest, those people don't really challenge me in learning. They're a privilege to teach, but you don't have to do very much," she said. "For me as an educator, the thing that drives me are the people that struggle. Helping those students succeed makes being an education researcher and teacher fulfilling." ■

COORDINATOR REPORT

Associate Chair, Research

The mandate of the associate chair, research is to promote and facilitate research within the department. To meet this mandate, the associate chair has focused on the following activities:

(1) ensuring the success of junior faculty involved in research activities through advice and mentoring,

(2) continuously updating and refining the scoring system that was implemented to quantify research output of faculty for purposes of remuneration and promotion and tenure,

(3) ensuring that adequate departmental resources are earmarked for research, and

(4) coordinating internal peer review of tri-council grant submissions.

RESEARCH FUNDING IN MILLIONS

The associate chair, research meets with all new recruits and provides feedback to the department chair regarding their research potential. Those selected for faculty appointments in the research stream meet with the associate chair on a regular basis for mentorship and advice regarding grant applications, funding, and career planning. The associate chair also provides advice to department members regarding new funding opportunities and research strategies.

Dr. Jeffrey Weitz

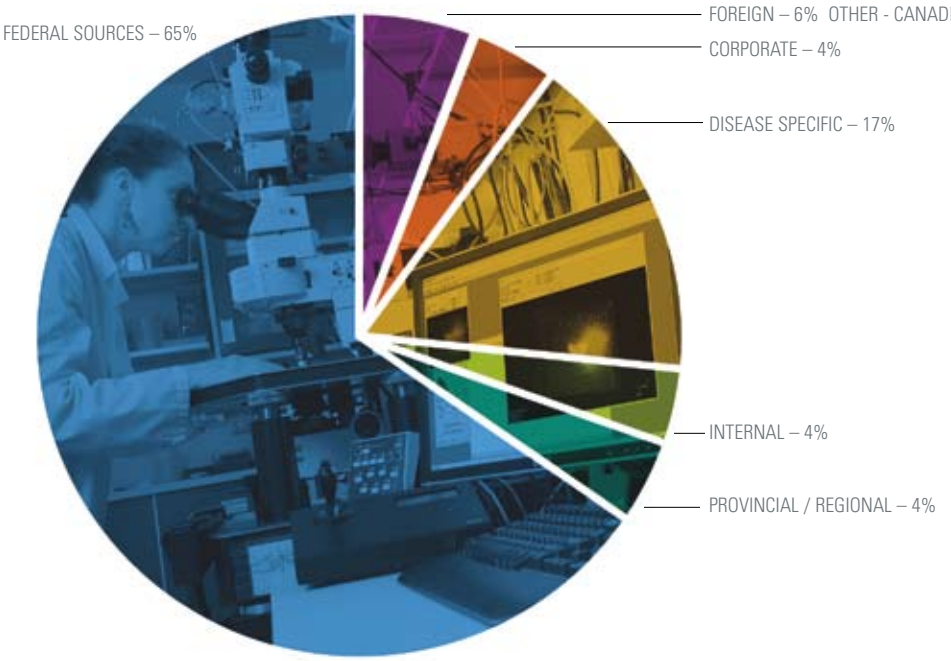
MD, FRCP(C), FACP, FCCP
Associate Chair, Research
Professor of Medicine and Biochemistry & Medical Sciences, McMaster University
Executive Director, Thrombosis and Atherosclerosis Research Institute
HSFO/J. Fraser Mustard Chair in Cardiovascular Research
Canada Research Chair in Thrombosis (Tier 1)

The associate chair, research serves as a member of the Departmental Executive, Research Executive, Tenure and Promotion, Executive Finance, and Alternate Funding Plan Committees. The role of the associate chair on these committees is to advise and advocate for research.

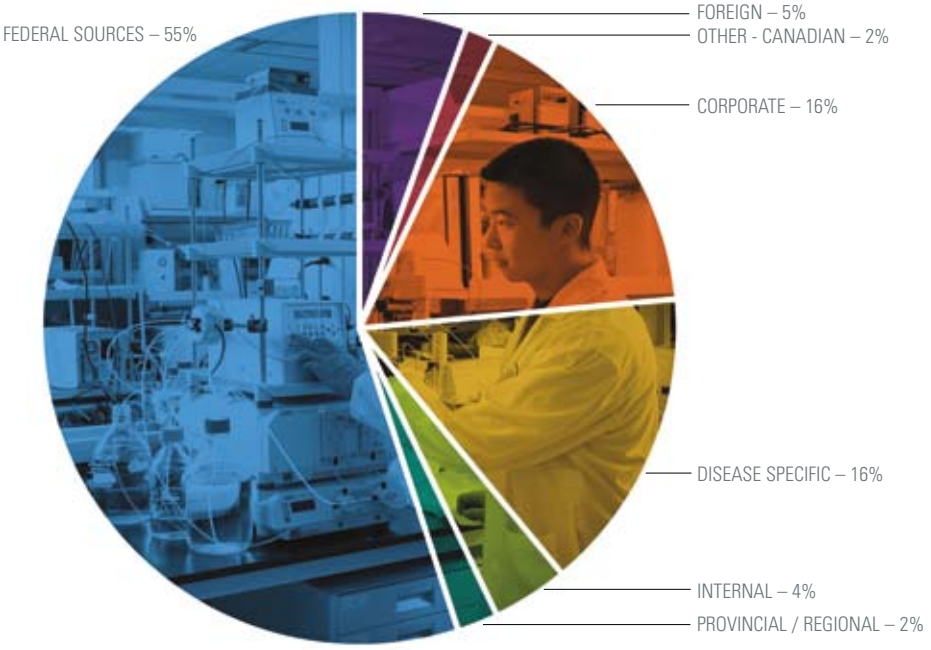
The Department of Medicine offers Internal Career Awards for new faculty members as well as mid-career awards. These awards can be held for up to three years and are granted on a competitive basis. The early career awards are available for both research and education and are aimed at fostering the next generation of researchers and educators. The associate chair, research is a member of the committee that reviews and prioritizes the application for Internal Career Awards.

The Department of Medicine continues to be a major contributor to the research productivity of the Faculty of Health Sciences, McMaster University. The amount of research funding for 2019-20 was $32.4 million, which represents an 8% decrease from the $35 million that was received in 2018-2019. Most of the funding came from peer-reviewed sources, with 60% from the federal government (tri-council), 17% from disease-specific funding agencies, 10% from provincial/regional/internal funds, 10% from corporate sponsors, and 6% from foreign sources such as the National Institutes of Health (see Table). The modest decrease in funding from last year likely reflects the pressures of the COVID-19 pandemic, which has curtailed clinical research activities and limited the time available for clinical faculty to focus on research. ■

RESEARCH FUNDING BY SOURCE
2018-2019 $35,312,323

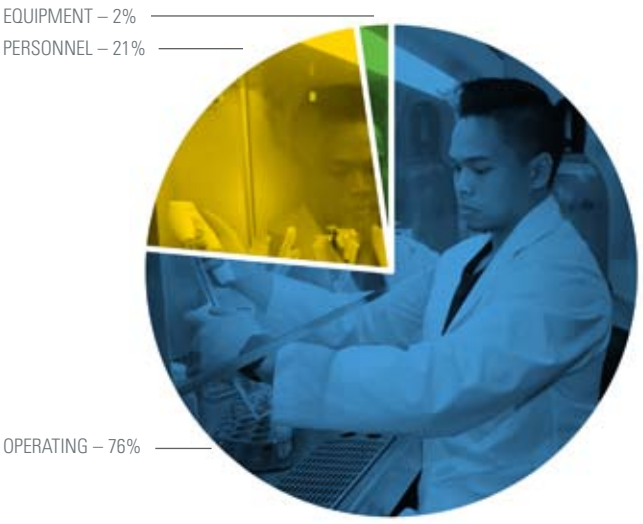


RESEARCH FUNDING BY SOURCE
2019-2020 $32,427,518

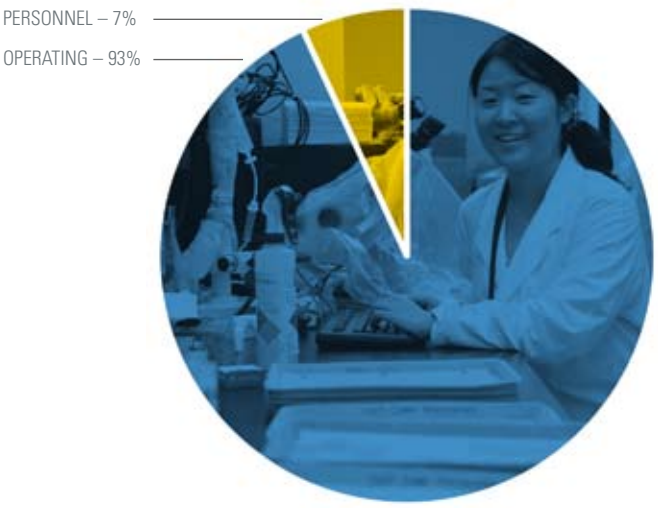


> *It is a rare week when there* is not at least one **research publication** for a **McMaster Department of Medicine** researcher *in one of the* **leading general interest medicine** *journals.*
>
> — Dr. Mark Crowther

RESEARCH FUNDING BY TYPE
2018-2019 $35,312,323



RESEARCH FUNDING BY TYPE
2019-2020 $32,427,518



COORDINATOR REPORT

Associate Chair, Education

The Associate Chair, Education (ACE) and the Department Education Coordinator (DEC) plays a fundamental role in recruitment, mentoring, reappointment and promotion, and oversight of the education component of the Department's academic contributions.

The Department Education Coordinator is a member of the Department of Medicine Council and holds the position as Associate Chair, Education. The Associate Chair, Education (ACE) and the Department Education Coordinator (DEC) are leadership positions within the Department of Medicine with the mandate to promote excellence and leadership in education, coordinate and assist with the development of departmental educational activities and processes across all divisions and represent the Department locally and externally. The ACE/DEC plays a fundamental role in recruitment, mentoring, reappointment and promotion, and oversight of the education component of the Department's academic contributions.

The ACE/DEC will coordinate and assist with the development of departmental educational activities and processes within the areas of undergraduate, postgraduate, graduate and continuing education, and faculty development. For the 2018/2019 and 2019/2020 academic years, Department of Medicine faculty contributed over 61,000 hours of teaching in the Undergraduate Medical Program. This included over 32,000 hours in the Undergraduate Medical Pre-clerkship Program and over 26,000 hours in the Undergraduate Medical Clerkship Program. Department members contributed over 3,300 hours of teaching in the Undergraduate Physician Assistant Program. The Department's contribution to postgraduate teaching in Internal Medicine and its subspecialties for the 2018/2019 and 2019/2020 academic years totaled over 113,000 hours. For these two years, department members contributed over 9,600 hours to continuing education, over 5,600 hours to teaching in the Undergraduate Bachelor of Health Sciences Program, over 3,800 hours of teaching to the Undergraduate Biochemistry Program, over 3,500 hours to teaching in the Biochemistry Graduate Program and over 4,500 hours of teaching to the Health Research Methodology Program in the Department of HEI. Department members contributed over 800 hours of teaching in the Masters of Science in Health Education Program.

The ACE/DEC interviews all potential full-time and part-time recruits and provides a recommendation to the Chair. After recruitment has been approved, the ACE/DEC will meet with all candidates to provide a detailed orientation on scholarship expectations: teaching, education and clinical scholarship, evaluations, MacFACTS CV, faculty development and leadership opportunities. The ACE/DEC will also meet with all full-time and part-time faculty within the first six months after they have started their academic appointment, as well as prior to reappointment and promotion, and on an as-needed basis during the first four years of their academic appointment. In 2018, 37 members were successfully reappointed or promoted. This included 14 members who were successful in promotion to Associate Professor with CAWAR and four who were successful in attaining full Professorship. In 2019, 37 members were successfully reappointed

Teaching Hours	Program
9,600	Continuing Education
5,600	Bachelor of Health Sciences
3,800	Biochemistry (Undergraduate)
3,500	Biochemistry Graduate
4,500	Health Research Methodology
800	Masters of Science in Health Education

or promoted. There were 13 members who were successfully promoted to Associate Professor with CAWAR and six who were successfully promoted to full Professorship. In 2020, there were 35 members who were successfully reappointed or promoted including 19 who were promoted to Associate Professor with CAWAR and four to full Professor status.

The ACE/DEC promotes and encourages Department members to apply for internal career awards and is a member of the Department Internal Career Awards Grant Committee.

Dr. Ameen Patel

MB, FRCP(C), MACP, FRCP(Edin), FRCP (Glasg)
Professor, Department of Medicine
Associate Chair, Education

In the last two years, led by the ACE/DEC, Dr. Crowther and Dr. Lumb, Department members have developed a robust Community of Practice in Quality Improvement and Safety. The Department's congratulations and appreciation to Drs. Amna Ahmed, Shawn Mondoux, Dominik Mertz and Seychelle Yohanna for leading this very important initiative. This group has gathered an impressive cohort of contributors and are welcoming members from other clinical faculties. The mandate of the Quality Improvement and Patient Safety Community of Practice is to improve the outcomes and experiences of patient partners by accelerating the impact of all those working across McMaster University's healthcare organizations who are passionate about quality improvement and patient safety. The vision is to build the Department of Medicine Quality Improvement and Patient Safety Community of Practice to become a national and international leader in quality improvement and patient safety. The Quality Improvement and Patient Safety Community of Practice will work to build capacity for improvement, support scholarly activity and foster collaboration. The leaders of this initiative have had a major positive impact on quality improvement and patient safety through the creation and delivery of curriculum for multiple postgraduate training programs and faculty.

The Department has undertaken a similar initiative to establish a Community of Practice of Education. This initiative is being led by Drs. Meera Luthra and Teresa Chan and Sarrah Lal. The growth and advancement of the Community of Practice and Education has been impacted by the pandemic; however, I am confident it will grow and have significant positive impact beyond the Department of Medicine. This group's most recent webinar on how gaming and gamification can be infused into teaching practice is an example of the group's dedication to sharing innovations in education.

The Department of Medicine established the Division of Education and Innovation in 2019. This division is the vision of Drs. John Kelton, Paul O'Byrne and Mark Crowther and was created to bring together faculty members who are exploring innovative pedagogical approaches in Health Sciences education and/or using their work to generate socioeconomic value. The Division is comprised of clinician and

113,000+

Total number of weighted teaching hours that Department of Medicine faculty contributed to Postgraduate Internal Medicine and subspecialties in 2018-20

OTHER MAJOR ACHIEVEMENTS

Dr. Paul Moayyedi 2018/2019
Dr. Paul O'Byrne 2019/2020
Recipients of the Jack Hirsh Award for Outstanding Academic Achievement

Dr. Anne Holbrook 2018/2019
Dr. Roman Jaeschke 2019/2020
Recipients of the William Walsh Award for Outstanding Educational Achievement

non-clinician educators and has affiliated members from multiple faculties. The Division and its members are closely aligned with the Michael G. DeGroote Health Innovation, Commercialization and Entrepreneurship initiative, the Integrated Biomedical Engineering Program, Program for Faculty Development, MERIT and the McPherson Institute.

I encourage you to read more about the clinic and the +Mac, Health Venture Program (HVP) and Innovators in Scrubs Program, initiatives of the MGD Health ICE.

In closing, I would like to thank all members of the Department of Medicine who have led by example with enormous dedication, commitment, and passion to ensure that healthcare delivery, teaching and scholarship continued at its usual high level during a challenging 2019. As is tradition, the Department of Medicine led from the front with members demonstrating flexibility, innovation and passion in establishing new safe methods to meet its teaching and education commitments and to deliver an enormous amount of frontline health care under challenging circumstances. On behalf of the Department of Medicine, my sincerest gratitude and appreciation to all of you

---

Since the last Department of Medicine Annual Report, several members of the Department have been successful in landing senior education leadership positions. Length restrictions will not allow me to recognize all members but I would like to acknowledge the following faculty:

SENIOR EDUCATION LEADERSHIP POSITIONS

Dr. Teresa Chan
Assistant Dean, Program for Faculty Development

Dr. Sonia Anand
Associate Chair, Equity and Diversity

Dr. Jonathan Sherbino
Assistant Dean of MERIT

RECIPIENTS OF THE DEPARTMENT OF MEDICINE INTERNAL CAREER AWARDS

W. Watson Buchanan Clinician Educator Award: **Dr. Shawn Mondoux** and **Dr. Leslie Martin**

E. J. Moran Campbell Internal Career Research Award: **Dr. Om Kurmi** and **Dr. Emilie Belley-Cote**

AFP Internal Career Research Award: **Dr. Maura Marcucci** and **Dr. Marie Pigeyre**

AFP Clinician Educator Award: **Dr. Nathan Hambly**

Internal Career Research Award: **Dr. Neeraj Narula, Dr. Kanjana Pereira** and **Dr. Flavia Borges**

Mid-Career Research Award: **Dr. David Conen** and **Dr. Mike Walsh.**

The new textbook and app for McMaster Internal Medicine.

PROGRAM DIRECTORS

Dr. Meera Luthra, Endocrinology

Dr. Zahira Khalid, General Internal Medicine

Dr. Eva Piessens, Infectious Diseases

Dr. Simran Basi, Physical Medicine and Rehabilitation

Dr. Kim Legault, Rheumatology

Dr. Mino Mitri, Palliative Medicine

ENDOWED CHAIRS

Dr. Alberto Caminero Fernandes
Douglas Family Chair in Gastroenterology Research 2018/2019

Dr. Alfonso Iorio
Bayer Chair for Clinical Epidemiology Research in Bleeding Disorders 2018/2019

DIVISION DIRECTORS

Dr. Susan Waserman, Clinical Immunology and Allergy

Dr. Jeff Healey, Cardiology

Dr. William Harper, Endocrinology and Metabolism

Dr. John Neary, General Interna Medicine

Dr. Joye St. Onge, Geriatric Medicine

Dr. Dominik Mertz, Infectious Diseases

Dr. Nora Cullen, Physical Medicine and Rehabilitation

Dr. Tim Karachi, Critical Care

Dr. Michelle Welsford, Emergency Medicine

Dr. Ameen Patel, Division of Education and Innovation ■

Total number of weighted teaching hours that Department of Medicine faculty contributed to the Faculty of Health Sciences in 2018-20 in the Undergraduate Medical programs

— 61,000

SPECIAL REPORT

New Media Textbook and International Partners

ROMAN JAESCHKE, PIOTR GAJEWSKI, PAUL M O'BYRNE

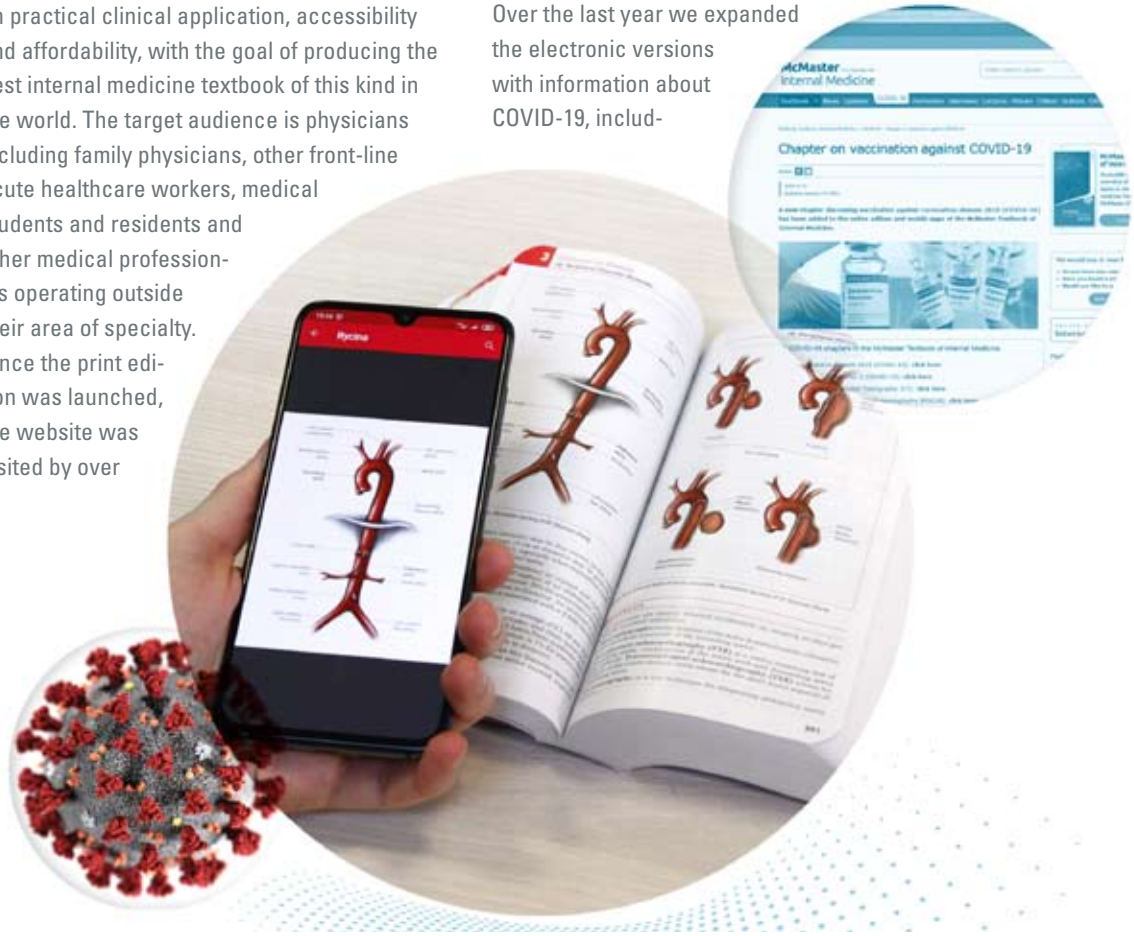
The first edition of the McMaster Textbook of Internal Medicine made its formal debut in time for the 50th anniversary celebrations of the Michael G. DeGroote School of Medicine in October 2019. It is the first comprehensive Canadian textbook of internal medicine, written with contribution of over 200 McMaster authors. The textbook exists in print, as a website (www.mcmastertextbook.com) and in the form of a (highly popular) mobile app (mcmastertextbook.com/app or search for 'mcmaster textbook' via Google Play or App Store). The editors and authors placed emphasis on practical clinical application, accessibility and affordability, with the goal of producing the best internal medicine textbook of this kind in the world. The target audience is physicians including family physicians, other front-line acute healthcare workers, medical students and residents and other medical professionals operating outside their area of specialty. Since the print edition was launched, the website was visited by over

Number of individual users visiting the website

200,000

200,000 individual users from over 60 countries and the app was downloaded over 25,000 times. Most users are based in the United States, with Canada, India and Saudi Arabia following.

Over the last year we expanded the electronic versions with information about COVID-19, includ-



ing COVID 19–focused chapter updated at least monthly, interviews with leading medical experts and a series of short videos on medical problems for non-specialists, all compiled in a central COVID-19 resource hub. For the future, the plan is to make the textbook a complete resource, including a drug database and a section for patients to learn more about their health issues.

The McMaster Textbook of Internal Medicine represents just one of the areas of successful collaboration between McMaster University and its Polish partner: the Polish Institute for Evidence Based Medicine. Other examples include MIRCIM – the McMaster International Review Course in Internal Medicine (www.mircim.eu), which is currently in its 6th (this year virtual) annual reiteration (the 5th edition attracted participants from 56 countries), and MEF – the Medical Education Forum (www.medforum.eu), one of the prime international events for medical educators. MIRCIM has attracted the partnership of over 40 national societies of internal medicine from around the world as well as of the International Society of Internal Medicine and European Federation of Internal Medicine.

The future looks bright!

Dr. Paul O'Byrne speaking at the McMaster International Review Course in Internal Medicine in Kraków, Poland.

Second from left: Dr. Akbar Panju, Dr. Christine Ribic and Dr. PJ Devereux.
Photo taken pre-COVID

COORDINATOR REPORT

Internal Medicine Residency Training Program

The McMaster Internal Medicine Residency Program supports 118 Internal Medicine residents across 4 years of training within a central campus located in Hamilton and a distributive site in Waterloo. Many residents from other postgraduate programs rotate within our Clinical Teaching Units as a required component of their training.

I am incredibly impressed by the dedication and resilience of our residents and faculty who have been partners in facing recent challenges in health care. With the test of adversity comes opportunity and growth. The events having the most impact on the Internal Medicine Program over the past 2 years are the transition to Competency Based Medical Education (CBME) and the response to the COVID-19 pandemic. I believe our residents will look back on the events of the last few years with pride, knowing they have been active participants in educational transformation and in response to a healthcare crisis.

CBME

Since July 2019, incoming residents to the Internal Medicine program have been trained under a new CBME curriculum. The CBME transition has stimulated a flurry of scholarly activity across the campus resulting in a renewed focus on bedside teaching, development of new methods/tools for assessment, faculty development in CBME, partnership with Postgrad and other residency programs, and the practice of resident reflection as a key component of independent lifelong learning.

PANDEMIC RESPONSE

COVID-19 has impacted all aspects of health care and has affected professionals working in hospital and community-based services. Training programs have implemented rapid changes in their curricula to preserve the educational mandate for learners.

The Internal Medicine residents and faculty have responded with incredible flexibility to accommodate new policies and the ever-changing service demands. I believe our program has grown stronger because of the crisis. Virtual learning/ambulatory care, modules to guide independent learning, enhanced skills in infection control practices, and exposure to new innovations such as the science of the COVID vaccination are exciting discoveries. The residents stepped up by developing a learning platform, "The Virtual Ward" for McMaster Medicine undergraduate students displaced from clinical training experiences. Other residents are working on a project to fortify Boot Camp using simulation for incoming PGY1 residents who may have missed opportunities to acquire skills as a clinical clerk on the CTU. Our Wellness Committee developed new ways to connect residents and to build team spirit. As active participants, the Internal Medicine residents have borne witness to the power of partnerships in managing a healthcare crisis of extraordinary magnitude.

118 — Internal Medicine residents across 4 years of training

“I believe our residents will **look back** on the events of the last few years *with pride.*”

Dr. Lori Whitehead

MD, FRCPC

Director, Internal Medicine Residency Program

WHAT IS ON THE HORIZON FOR THE FUTURE?

The learning curve for CBME has been steep and is ongoing. It is an iterative process requiring a Continuous Quality Improvement lens and a receptive approach to program modification. The trajectory and downstream effects of the pandemic cannot be predicted. The Internal Medicine program will pivot with the changes that are ahead, taking full advantage of lessons learned in the process. Strong alliances between residents and the healthcare team will continue to support education and patient care. The health and wellness of our residents and teaching faculty will continue to be a high priority, as this is foundational for our ongoing success as a national leader in Internal Medicine residency training.

Special thanks for the support of:

All faculty educators

Dr. Mark Crowther, Chair, Department of Medicine

Dr. Parveen Wasi, Associate Postgraduate Dean

Dr. Barry Lumb/Dr. Khalid Azzam - Physician-in-Chief HHS

Dr. Alistair Ingram - Chief of Medicine SJHH

Dr. John Neary, Division Director, GIM

Annette Rosati/Graeme Matheson – Chair’s Office

Deputy Program Directors - Dr. Leslie Martin, Dr. Joshua Wald, Dr. Haroon Yousuf

Sub-program director, R4 Internal Medicine residents – Dr. Ameen Patel

Regional Education Lead, Waterloo Regional Campus – Dr. Rebecca Kruisselbrink

CTU Directors – Dr. Andrew Cheung, Dr. Samir Raza, Dr. Marianne Talman, Dr. Mohamed Panju (ACTU)

Director of Research – Dr. Christine Ribic

Chair of Assessment - Dr. Naufal Mohammed

Internal Medicine residency administrative support – Jan Taylor, Sharlene Honaizer, Christine Knight, Susan Serro, Andrea Mitchell ■

COORDINATOR REPORT

Medical Specialties Residency Programs

The Department of Medicine programs have continued to work collaboratively to support and enhance medical education at McMaster University and the academic health sciences centres. Although, 2019 and 2020 have been challenging years that have stretched residency programs due to various factors including, Competency-By-Design Medical Education (CBME) roll out, Saudi residents' withdrawal and the COVID-19 pandemic, these circumstances proved to demonstrate how resilient and innovative the Medical Specialties residency programs have become. Collaboration has brought about innovation and sharing of novel ideas, financial and human resource stability, and enhancement of all the Medical Specialties residency programs.

The Medical Specialties Central Office has been pivotal in developing processes, providing structure and in promoting innovation to support all aspects of Medical Specialty education including:

1. Residency Programs
2. Fellowship Programs
3. Undergraduate Specialty Selective Clerkship Program
4. Undergraduate Specialty Electives Clerkship Program
5. Physician Assistants Program

The Medical Specialties Central Office has also played a major role in collaborating with the core Internal Medicine (IM) Residency Program to enhance and support our core IM residents in education and exam preparation.

The Medical Specialties program has introduced numerous awards and grants, developed a combined academic half day curriculum to further resident education, initiated resident-led activities in promoting resident wellness and developed new partnerships as well as solidified existing ones. These are detailed below.

1. **Medical Specialty Residency Programs**
   a. Medical Specialties Residency and Fellowship Grants

   The Medical Specialty residency and fellowship programs are committed to providing a broad educational experience to McMaster trainees by enhancing and supporting scholarly activity. The aim of the Medical Specialties grants is to:

   - promote original research and innovation between programs,
   - develop grant application skills and,
   - to encourage collaboration between divisions and, supervisors and trainees.

Dr. Azim Gangji

MD MSC FRCPC FACP

Associate Professor of Medicine,

Chair, Medical Specialties Program Directors

Grants are awarded for clinical research, medical education research, basic science research or quality improvement and patient safety. Grants were awarded to the following recipients:

YEAR	RESIDENT	SUPERVISOR
2020	Dr. Ankit Garg (Cardiology)	Dr. Sanjit Jolly
Title: Development and validation of medical device to measure jugular venous pressure for purpose of remote monitoring for heart failure.		
2020	Dr. Paula Pop (Geriatrics)	Dr. Alexandra Papaioannou
Title: Association between sarcopenia and post-operative outcomes among older adults undergoing elective hip or knee arthroplasty		

b. Medical Specialty Program Resident Awards

i. Medical Specialties Resident Research Awards

A separate award has been established for Medical Specialties residents for presentation at the Department of Medicine Residents Research Day. The aim is to recognize our residents' scholarly contributions. Clinical and scientific abstracts are reviewed by the Medical Specialties faculty who have been invited to judge and select top trainees in poster or oral presentations.

The following residents were recipients of MS Resident Research Awards:

AWARD	YEAR	RESIDENT	PROGRAM
Medical Specialty Scientific Poster presentation	2019	Dr. Michael Wang	GIM
Medical Specialty Clinical Poster presentation	2019	Dr. Ola Tarabzuni	Nephrology
DOM Residency Oral Presentation (Gold)	2020	Dr. Anasuiya Surendran	Endocrinology
DOM Residency Oral Presentation (Bronze)	2020	Dr. Jason An	Rheumatology
Medical Specialty Scientific Poster Presentation	2020	Dr. Megan Guay	Neurology
Medical Specialty Clinical Poster Presentation	2020	Dr. Xena Li	Infectious Disease

ii. Dr. Jeff Ginsberg Award

The Dr. Jeff Ginsberg award is presented to Medical Specialties residents who consistently demonstrate professionalism, collaboration, leadership, and commitment to academic achievement. The following residents were recipients of this award:

YEAR	RESIDENT	PROGRAM
2018	Dr. Zeeshan Ahmed	Cardiology
	Dr. Siraj Mithoowani	Hematology
2019	Dr. Derek Chu	Clinical Immunology & Allergy
	Dr. Andrew Kelly	Cardiology
2020	Dr. Andrea Cervi	Hematology
	Dr. Kenji Onizuka	Rheumatology

c. Critical Appraisal Sessions

The Medical Specialties residency and fellowship programs identified a need to add critical appraisal sessions for the combined academic programs. These sessions are designed to familiarize residents with fundamental concepts regarding critical appraisal, medical research design and implementation. Additionally, residents gain more understanding about research and increase their ability to synthesize research data which is vital as a basis for developing an evidence-based approach practice. This course has been led by Dr. Mark Inman since January 2020 and I am deeply appreciative of his time dedicated in running this highly successful course.

d. Resident Leadership

The Medical Specialties Central Office has been working collaboratively with Medical Specialty residents to promote residency education. This was made possible by implementing resident committees to oversee the Combined Academic Half Day curriculum, resident wellness events and facilitate Mock OSCE sessions and post CBL sessions. I would like to recognize the following resident co-chairs who have provided outstanding leadership and dedication to the Medical Specialties resident committees:

ACADEMIC YEAR	RESIDENT CO-CHAIRS
2018/2019	Dr. Chenchen Hou (Hematology)
	Dr. Arani Sathiyapalan (Medical Oncology)
2019/2020	Dr. Shivani Dadwal (Medical Oncology)
	Dr. Dr. Marissa Laureano (Hematology)
2020/2021	Dr. Meera Joseph (Nephrology)
	Dr. Dana Trafford (Geriatrics)

e. Medical Specialties Combined Academic Half Day Sessions

The Medical Specialty residency programs are committed to prepare residents to be successful physicians

after completing their training. Combined academic half day sessions are organized for all Medical Specialty residents in alignment with the intrinsic CanMEDS roles such as communication, leadership, collaboration and professional.

The annual curriculum consists of separate sessions for PGY4 and PGY5/6 residents with respect to the training required for each level and to help support residents transition into practice. This was acknowledged by the Royal College at the last accreditation as a novel and unique format to educate residents and promote collaboration.

f. Resident Social and Wellness Committee

The Medical Specialty residency programs are involved in promoting resident wellness within the programs and as a group. Combined Specialty residency programs established a resident-led wellness and social committee in 2018. This committee organizes events and sessions to support resident mental, emotional, physical, and psychological health. Some of the events organized have included drive-in movie nights and virtual cooking sessions. I would like to acknowledge and thank Dr. Meera Joseph, Dr. Dana Trafford, Dr. Olivia Green and Dr. Laiya Carayannopoulos, the committee leaders for their efforts and organization of these events and in ensuring resident and fellow wellness as a priority.

g. Standardized Training of Program Coordinators

Medical Specialties Central Office implemented standardized training of new program coordinators to ensure application of best practices across all UGME and PGME programs. To date the program has trained 8 program coordinators.

h. Establishment of the new Residency and Fellowship Programs Website

The Medical Specialties residency and fellowship programs websites were transitioned to a new platform that is easier to navigate for potential learners. The websites were rolled out in 2020.

i. Partnerships in Global Health

The Medical Specialties residency and fellowship programs as a part of global health have developed partnerships with several organizations to help support residency and fellowship training at McMaster University. I would like to acknowledge Ms. Mary Ann Breitigam and the St. Joseph's Healthcare International Outreach Program (SJHIOP) who have helped in providing financial and housing support for residents from around the globe including Uganda, Somalia, Guyana, Haiti, Pakistan, Philippines and many other nations. On behalf of all of the program and fellowship directors, I would like to thank SJHIOP for all of their assistance and we look forward to our ongoing collaboration.

j COVID-19 Support

2020 was a difficult year to navigate for most residency programs due to disruptions caused by the COVID-19 pandemic. The Medical Specialties residency programs implemented innovative strategies to ensure that medical education continued while adhering to government guidelines regarding physical distancing in the clinical settings. Innovations included introducing the first Zoom OSCEs at the university, organization for Zoom academic half days for all medical specialty programs and implementation of reverse classrooms. In addition, the Medical Specialties assisted PGME in planning for redeployment and supported the coverage of program coordinators who were on leave.

As I complete my term as Chair of the Medical Specialties Program Directors, I would like to acknowledge and thank all of the program directors who I have worked with and who have supported our vision and achieved our mutual goal in assisting each other, ensuring all of our residency programs in our department are supported both financially and from a human resource perspective. It is due to their collaboration that our programs are of even higher quality. At our last accreditation, the Royal College identified our collaboration as "unique and one for other universities to model." As a united group, we have enhanced the training of our residents and provided opportunities for them to have a strong voice in their education and have promoted collaboration and overall resi-

dent wellness. We have also introduced and supported new training programs, built new collaborations in Global Health in supporting resident training in Hamilton and have provided our residents an opportunity to learn abroad. Our centralized structure has allowed us to weather through crisis situations and we have come out stronger and more unified as a group. It has truly been a pleasure to work with all of the program directors, program coordinators and our residents over the years and I look forward to more innovations in our Medical Specialties group in the years to come. ■

COORDINATOR REPORT

Medical Specialties Fellowship Programs

The Medical Specialties programs established a Fellowship Directors committee comprised of at least one director from each division and including all departmental Royal College accredited Area of Focused Competency Fellowships. The Medical Specialties Fellowship Directors Committee, now as an organized body, has developed multiple processes, templates and forms as well as provided administrative support for the establishment and approval of new fellowship programs in the Department of Medicine. To date the Department has 51 fellowship programs and we recently introduced the first inter-divisional co-lead fellowship between Nephrology and Geriatrics. The fellowship programs are an integral part of education as they support the overall education mandate and provide trainees the opportunity to further their careers in designated areas in their sub-speciality. The fellowship programs also play a fundamental role in supporting our clinical scholars in developing an area of expertise.

Below are the representatives of the Medical Specialties Fellowship Directors Committee:

DIVISION	FELLOWSHIP DIRECTOR
Cardiology	Dr. Darryl Leong Dr. Omid Salehian Dr. Shamir Mehta Dr. Syam Divakara Menon Dr. Tej Sheth
Dermatology	Dr. Mohannad Abu Hilal
Endocrinology	Dr. Aliya Khan
Gastroenterology	Dr. Neeraj Narula
General Internal Medicine	Dr. Maria Tiboni
Geriatrics	Dr. Mona Sidhu
Hematology	Dr. Graeme Fraser Dr. Madeleine Verhovsek Dr. Vinai Bhagirath
Infectious Disease	Dr. Dominic Mertz
Nephrology	Dr. Azim Gangji (Chair)
Neurology	Dr. Jim Sahlas
Physical Medicine & Rehabilitation	Dr. Agnes Chmiel
Respirology	Dr. Muntasir Saffie Dr. Nathan Hambly
Rheumatology	Dr. Stephanie Garner

The Medical Specialties Central Office has focussed on supporting our current fellowship programs as well as establishing new programs and encouraging and assisting in the development of Royal College Area of Focussed Competency programs. The Medical Specialties Fellowship Directors Committee has developed a structure for developing formalized fellowships within the department. The Central Office has developed a centralized fellowship application process and workflow for fellow applications that have significantly reduced processing time.

In promoting our fellowships, we have created and redesigned fellowship websites to provide more information for potential applicants. Lastly, in conjunction with PGME, we have developed a workflow for establishing new fellowship programs. This has provided guidelines for fellowship directors to use when developing new programs and has facilitated the development of new programs in a systematic format.

The Medical Specialties Fellowship programs have been leaders in the University in establishing Royal College accredited Area Focused Competency (AFC) fellowship programs. There are 5 programs that have received this designation with the first one being established in 2015. The AFC programs include:

AFC FELLOWSHIP	FELLOWSHIP DIRECTOR	DIVISION
Solid Organ Transplantation	Dr. Azim Gangji	Nephrology
Thrombosis	Dr. Vinai Bhagirath	Hematology
Echocardiography	Dr. Omid Salehian	Cardiology
Interventional Cardiology	Dr. Shamir Mehta	Cardiology
Electrophysiology & Cardiac Pacing	Dr. Syam Divakara Menon	Cardiology

The Department of Medicine also continues to be a leader in the number of Non-AFC fellowship programs and with our new structure, we have ensured our programs meet high quality education standards.

The following are Non-AFC Fellowship Programs:

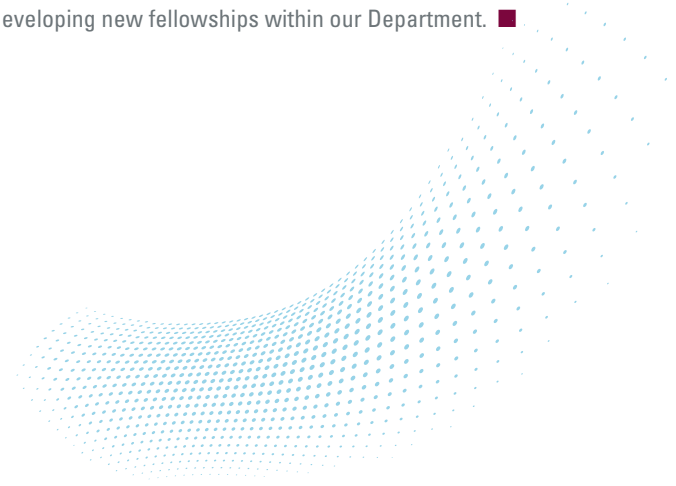
NON-AFC FELLOWSHIP	FELLOWSHIP DIRECTOR	DIVISION
Advanced Coronary Imaging	Dr. Tej Sheth	Cardiology
Heart Failure	Dr. Eva Lonn	Cardiology
Nuclear	Dr. Alison Montgomery	Cardiology
Peri-Operative	Dr. Vikas Tandon	Cardiology
Transcatheter Aortic Valve	Dr. Tej Sheth	Cardiology
Transcatheter Mitral and Tricuspid Valve	Dr. Shamir Mehta	Cardiology
Vascular Medicine	Dr. Sonia Anand	Cardiology
Cardio-Oncology	Dr. Darryl Leong	Cardiology
Advanced Clinical Dermatology	Dr. Mohannad Abu Hilal	Dermatology
Metabolic Bone Disease	Dr. Aliya Khan	Endocrinology
Advanced Endoscopy	Dr. Frances Tse	Gastroenterology
Hepatology	Dr. Marco Puglia	Gastroenterology
Inflammatory Bowel Disease	Dr. John Marshall Dr. Neeraj Narula	Gastroenterology
Motility	Dr. Stephen Collins	Gastroenterology
Nutrition	Dr. David Armstrong	Gastroenterology
Geriatric Clinical Pharmacology	Dr. Joanne Ho Dr. Tricia Woo	Geriatrics
Geriatric Nephrology	Dr. Mona Sidhu Dr. Azim Gangji	Geriatrics
Bariatric Medicine	Dr Maria Tiboni	General Internal Medicine
Bleeding Disorders	Dr. Madeleine Verhovsek	Hematology
Red Cell Disorders	Dr. Alfonso Iorio	Hematology
Infection Prevention Control	Dr. Dominic Mertz	Infectious Disease

NON-AFC FELLOWSHIP	FELLOWSHIP DIRECTOR	DIVISION
HIV	Dr. Shariq Haider	Infectious Disease
AST Renal Transplant	Dr. Azim Gangji	Nephrology
Geriatric Nephrology	Dr. Azim Gangji Dr. Mona Sidhu	Nephrology/ Geriatrics
Glomerulonephritis	Dr. Azim Gangji	Nephrology
Home Dialysis	Dr. Azim Gangji	Nephrology
Nephrology Genetics	Dr. Matt Lanktree	Nephrology
Epilepsy	Dr. Joseph Perumpillichira	Neurology
Interventional Neuroradiology	Dr. Brian Van Adel	Neurology
Multiple Sclerosis	Dr. Suresh Menon	Neurology
Neurophysiology	Dr. Ammar Gilani	Neurology
Stroke	Dr. Luciana Catanese	Neurology
Neuromuscular	Dr. Steven Baker	PM+R
Neurorehabilitation	Dr. Simran Basi	PM+R
Spinal Cord Injury	Dr. Agnes Chmiel	PM+R
MSK Rehabilitation	Dr. Agnes Chmiel	PM+R
Airway Diseases	Dr. Parameswaran Nair	Respirology
Cystic Fibrosis	Dr. Andy Freitag	Respirology
Interstitial Lung Disease	Dr. Nathan Hambly	Respirology
Pulmonary Hypertension	Dr. Nathan Hambly	Respirology
Rehabilitation/ COPD	Dr. Martin Kolb Dr. Rebecca Amer	Respirology
Sleep Medicine	Dr. Juliana Li	Respirology
Lupus	Dr. Mark Matsos	Rheumatology
Scleroderma	Dr. Maggie Larché	Rheumatology
Rheumatology Point of Care Ultrasonography	Dr. Maggie Larché	Rheumatology
Vasculitis	Dr. Stephanie Garner	Rheumatology

Due to our unique centralized model, the Medical Specialties Central Office has provided invaluable support to fellowship directors who are looking to establish new fellowship programs. The following new fellowships were launched since 2020:

1. Advanced Coronary Imaging
2. Advanced Clinical Dermatology
3. Geriatric-Nephrology
4. Nephrology Genetics
5. Pulmonary Hypertension
6. Scleroderma
7. Spinal Cord Injury
8. Rheumatology Point of Care Ultrasonography

This is an opportunity for me to thank our outstanding Fellowship Directors for all of their hard work, ongoing collaboration and commitment in ensuring our learners receive high quality education. I look forward to working with you in further developing our fellowship processes and in supporting faculty in developing new fellowships within our Department. ■



COORDINATOR REPORT

Medical Specialties Undergraduate Programs

UNDERGRADUATE MEDICAL ELECTIVES CLERKSHIP PROGRAM

The Medical Specialty Undergraduate Elective Coordinators are committed in increasing and enhancing elective opportunities for clerks in a fair and transparent manner. The Medical Specialties Central Office identified a gap in ensuring fair access to electives for all clerks from all campuses and in processing timeliness for clinical elective clerks (which varied between days to months). This led to variable clerkship elective options and exposure. The Medical Specialties Central office consolidated the processing of elective requests to one central person who ensured that all requests were processed within 48 hours. Additionally, we surveyed and implemented a process that obtained real-time capacity from all programs. This identified an approximate 40% increase in overall capacity in the department for clinical clerks. The improved system provided clerks greater opportunities and ensured fairness and transparency. With the disruptions due to COVID-19, this process was vital in ensuring accommodation of clerks whose visiting electives were cancelled. The UGME electives office acknowledged the Medical Specialties Central Office's project implementation and has now adopted this system centrally for all clerkship placements.

Medical Specialties Clerkship Electives Coordinators Committee is comprised of the following programs:

PROGRAM	FACULTY COORDINATOR
Cardiology	Dr. Matt Sibbald
Clinical Allergy & Immunology	Dr. Mike Cyr
Dermatology	Dr. Mohannand Abu Hilal
Endocrinology	Dr. Reema Shah
Gastroenterology	Dr. Robert Spaziani
Geriatrics	Dr. Mimi Wang
Hematology	Dr. Rick Ikesaka (SJHH) Dr. Graeme Fraser (JH)
Infectious Disease	Dr. Eva Piessens
Nephrology	Dr. Azim Gangji (chair)
Neurology	Dr. Barbara Connolly
Peri-Operative Medicine	Dr. Ameen Patel Dr. Vikas Tandon
Physical Medicine & Rehabilitation	Dr. Tatjana Zdravkovic
Respirology	Dr. Madhu Chari
Rheumatology	Dr. Maggie Larché

PHYSICIAN ASSISTANT PROGRAM

In association with the Physician Assistant (PA) program, the Medical Specialty Central Office has established clinical placement opportunities for PA students. Capacity was created in the Medical Specialty programs and PA students are now able to secure placements in Gastroenterology, Nephrology and Neurology programs. In addition, a pre-entry clerkship exposure for PA students was accommodated by the Division of Nephrology. Thus far, the feedback from the PA program has been very positive and the plan moving forward is to develop additional opportunities for PA students to gain clinical exposure in all of the medical specialty programs.

ACKNOWLEDGEMENTS

The Medical Specialty Programs have made significant gains, and this would not have been possible without the creation of the Medical Specialties Central Office that supports and helps oversee administrative aspects of education in UGME, the PA program, residency and fellowship programs. The diagram below highlights the broad support provided by the Medical Specialties Central Office. I would be remiss if I did not acknowledge the outstanding contributions of the Medical Specialties Central Office and the individuals that make all of this happen. I would like to extend my gratitude to Joyce Munga, Rachelle Dyment, Vanessa Munford, Judy Mosher and Robin Carroll for their dedication to our mission of being open to innovation, enhancing collaboration, improving organization and efficiency and to the advocacy of learners. ■

COORDINATOR REPORT

Specialty Selectives Clerkship Program

DR. ROB SPAZIANI

I am happy to report that despite the challenges posed by the COVID-19 pandemic, the Specialty Selectives (SEL) Clerkship Program has had a very productive year at all three of our campuses. I stepped into the role of SEL Clerkship Director in October 2019, after serving three years as the Gastroenterology Faculty Co-ordinator.

Amidst the background of the pandemic, we have been preparing to transition the Specialty Selectives program to accommodate exciting new changes in the undergraduate medicine curriculum. In response to the new curriculum introduced in the Fall of 2020, the Medical Subspecialties Selectives (MSS) took on a new name: Speciality Selectives (SEL). As part of the new curriculum, we have doubled our capacity to accommodate additional learners as the Selectives rotations will move to the later phase of clerkship titled "transition to residency". Positioning the Selectives this way will afford the students the opportunity to have completed their core medicine rotation before the start of their Selective rotation, allowing them to glean even more from the Specialty rotations.

In the past year, we expanded the SEL program and were happy to welcome two new specialities, adding both Infectious Diseases and Respirology to our roster. We also expanded the Cardiology Selective across all three Hamilton Sites. We welcomed several new faculty coordinators: Dr. Ali Iqbal (Nephrology), Dr. Aiman Alak (Cardiology) and Dr. Dina Khalaf (Hematology). We are extremely grateful to those who served in those roles previously: Dr. Christine Ribic (Nephrology), Dr. Syam Divakaramenon (Cardiology) and Dr. Kylie Lepic (Hematology). Their enthusiasm and passion for teaching fostered positive and productive learning experiences for our students.

We have continued the process of streamlining the organization of the SEL Program in response to student and faculty feedback, moving to a centralized orientation video format (established 2019), and introducing on-demand (established 2018) and point-of-contact evaluations to ensure timely feedback to students. Transitioning the centralized orientation and tutorials to a virtual format has reduced travel time for students who no longer need to move between sites to attend in-person learning.

The pandemic also marked the need to provide alternative learning opportunities for the students after they were pulled from the clinical learning environment. I am extremely grateful to the many residents, fellows and faculty who committed their time to reviewing and evaluating the Critical Appraisal Topic (CAT) assignment the Selectives team was asked to oversee.

CAMPUSES

I would like to acknowledge Dr. Theresa Liu, Regional Education Lead (REL) of the Waterloo campus, and Dr. Adnan Hameed, REL of the Niagara campus, for their continued efforts in partnering with the SEL committee in faculty recruitment and faculty development. Their hard work, creativity, and commitment to education and clinical teaching maintained the students in the clinical environment in the regional campuses despite the reduced capacity caused by the pandemic.

ACKNOWLEDGEMENTS

I would like to acknowledge the numerous individuals who have been incredibly supportive of the Specialty Selectives Program. In particular, I would like to thank the RELs and their

administrators: Drs. Adnan Hameed and Hayley Sicard (NRC), Theresa Liu and Michelle Lamontagne (WRC) for their leadership and support at their respective campuses in helping engage faculty and continued curriculum development, the selective coordinators at the Hamilton campus who have been a major support in providing educational experiences for clinical clerks, and the administrative support of the Medicine Specialties Central Office by Rachelle Dyment, assisted by Robin Carroll, who have worked tirelessly to provide and organize an efficient and supportive framework for both the student and faculty experience in the Selective program. I would like to take this opportunity to thank Dr. Azim Gangji for his mentorship and guidance as I took on the role of Clerkship Director.

Finally, I would like to thank Dr. Mark Crowther for his continued support and enthusiasm for the Selectives program. With his leadership and support, the program has continued to grow and flourish as one of the core components of the clerkship experience making it an integral part of undergraduate education delivery in the Department of Medicine.

AWARDS

In 2019 we established the addition of a new Selectives award, the Dr. Deborah Marcellus, Academic Achievement Award for Specialty Selective in Hematology.

We are also happy to announce the establishment of an Academic Achievement Award for Specialty Selective in Respirology in 2021.

The following SEL Program awards were presented to the following students, residents, and Faculty:

SPECIALTY SELECTIVE CLERKSHIP PROGRAM FACULTY AWARDS

Year	Name	Campus
2019	Dr. Kylie Lepic	Hamilton
	Dr. Subhas Ganguli	Hamilton
	Dr. Khaled Ibrahim	Niagara
	Dr. Joanna Graczyk	Kitchener-Waterloo
2020	Dr. Tricia Woo	Hamilton
	Dr. Mark Matsos	Hamilton
	Dr. Lara Gunton	Niagara
	Dr. Natalie Needham-Nethercott	Kitchener-Waterloo

DR. MARK CROWTHER RESIDENCY TEACHING AWARD

Year	Residents	
2019	Dr. Sarah Patterson	Dr. Zhaowei Gong
2020	Dr. Rebecca Rosart	Dr. Naif Alghamdi

DR. ALAN NEVILLE SPECIALTY SELECTIVE ACADEMIC ACHIEVEMENT AWARD

Year	Clerk	Campus
2019	Adam Eqbal	Hamilton
	Aaron Prosser	Niagara
	Victoria McKinnon	Kitchener-Waterloo
2020	Tyler McKechnie	Hamilton
	Bilal Bagha	Niagara
	Tyler Pitre	Kitchener-Waterloo

AWARD

Dr. Irene Turpie, Academic Achievement Award for Specialty Selective in Geriatrics	Jasneet Dhaliwal (2019) Raechelle Gibson (2020)
Dr. Fred Bianchi, Academic Achievement Award for Specialty Selective in Rheumatology	Matei Stoian (2019) Shama Khattak (2020)
Dr. David Russell, Academic Achievement Award for Specialty Selective in Nephrology	Maylynn Ding (2019) Shannon Brent (2020)
Dr. Doug Holder, Academic Achievement Award for Specialty Selective in Cardiology	Tina Nham (2019) Charlotte Fuller (2020)
Dr. Jan Irvine, Academic Achievement Award for Specialty Selective in Gastroenterology	Arden Azim (2019) Sama Anvari (2020)
Dr. Deborah Marcellus, Academic Achievement Award for Specialty Selective in Hematology	Giuliana Guarna (2019) Partha Sharma (2020)

COORDINATOR REPORT

Faculty Undergraduate Director

The Internal Medicine Clerkship Program is mandatory for all McMaster medical students and consists of a 6-week core rotation attached to the inpatient medicine units in Hamilton and at the regional campuses in Waterloo and Niagara. The Internal Medicine Clerkship Program has continued evolve to meet the changing needs of the students. The Internal Medicine Curriculum Committee meets monthly and the enthusiasm and contributions from the members of this committee are the biggest strengths of this program. This committee is composed of the Site Coordinators for the Hamilton Hospitals, the Regional Education leads at Waterloo and Niagara, student and resident representatives.

We saw changes in the members of the clerkship team. Dr. Mary Jackson at the Waterloo regional campus left her role as Regional Education Lead after many years of supporting education. We all benefited from her experience and advice and thank her for her contributions. Dr. Stephen Giilck took over this role and has continued to build on the strong foundation left by Dr. Jackson. Dr. Shervin Zandi stepped down as Regional Education Lead at the Niagara Regional Campus, and Dr. Faraz Masood has shown great enthusiasm as he has taken over this role. Dr. Daniel Brandt Vegas left the site coordinator role at St Joseph's Hospital to pursue other opportunities and Dr. Sergio Mazadi has taken on this important role.

AWARDS

The Medicine Clerkship Program has been privileged to offer a number of awards to students and faculty. These awards are given to a student from each of the five training sites: Hamilton General Hospital, Juravinski Hospital, St Joseph's Hospital, Niagara, and Waterloo. One medical student from each of the five training sites are chosen to receive the Dr. Paul O'Byrne Award for Outstanding Clinical and Academic Achievement. The award is given to acknowledge a student who has excelled in the Internal Medicine Clerkship in the domains of clinical acumen and knowledge of internal medicine. The Dr. Akbar Panju Award for Professionalism is awarded to a student who exemplifies the practice of medicine in the areas of compassion, service, altruism, and trustworthiness. Faculty from the Department of Medicine are also recognized for their excellence in teaching during the clerkship rotations.

The Dr. Paul O'Byrne Award is given to a student who has excelled in the Internal Medicine Clerkship in the domains of clinical acumen and knowledge of internal medicine.

Dr. Helen Neighbour

MB BS MRCP(UK) PhD

Faculty Undergraduate Director,

Internal Medicine Clerkship Programs

2019

DR. PAUL O'BYRNE AWARD FOR ACADEMIC ACHIEVEMENT

For the Class of 2019 the **Dr. Paul O'Byrne Award for Academic Achievement** during the internal medicine core clerkship rotation was awarded to the following students:

Hamilton Campus - Sites
HGH – Anvita Kulkarni
JH – Ryan Peters
SJH – Cameron Henry

Waterloo Regional Campus
Jaymee Shell

Niagara Regional Campus
Kim Moore

2020

DR. PAUL O'BYRNE AWARD FOR ACADEMIC ACHIEVEMENT

For the Class of 2020 the **Dr. Paul O'Byrne Award for Academic Achievement** during the internal medicine core clerkship rotation was awarded to the following students:

Hamilton Campus - Sites
HGH – Avery Bibby
JH – Edward Koo
SJH – Shamal Khattak

Waterloo Regional Campus
Tyler Pitre

Niagara Regional Campus
Karun Tandon

2019
DR. AKBAR PANJU AWARD FOR PROFESSIONALISM

For the Class of 2019, the **Dr. Akbar Panju Award for Professionalism** during the internal medicine core clerkship rotation was awarded to the following students:

Hamilton Campus - Sites
HGH – William Tsang
JH – Allison Ouellette
SJH – Wajahat Syed

Waterloo Regional Campus
Breanne Golemiec

Niagara Regional Campus
Aaron Prosser

2020
DR. AKBAR PANJU AWARD FOR PROFESSIONALISM

For the Class of 2020, the **Dr. Akbar Panju Award for Professionalism** during the internal medicine core clerkship rotation was awarded to the following students:

Hamilton Campus - Sites
HGH – Kristen Salena
JH – Bilal Ahmadi
SJH – Mikko Mason

Waterloo Regional Campus
Brian Lee

Niagara Regional Campus
Kristen Viaje

The Akbar Panju Award is given to a student who exemplifies the practice of medicine in the areas of compassion, service, altruism, and trustworthiness.

2019
TEACHING EXCELLENCE AWARDS

The Medicine Clerkship Program awarded **Teaching Excellence Awards** to the following faculty:

Hamilton Campus
HGH – Dr. Steven Sovran
JH– Dr. Samir Raza
SJH – Dr. Andrew Cheung

Waterloo Regional Campus
Dr. Michael Wang

Niagara Regional Campus
Dr. Sultan Chaudhry

2020
TEACHING EXCELLENCE AWARDS

The Medicine Clerkship Program awarded **Teaching Excellence Awards** to the following faculty:

Hamilton Campus
HGH – Dr. Haroon Yousuf
JH– Dr. Samir Raza
SJH – Dr. Joshus Wald

Waterloo Regional Campus
Dr. Marcel Parent

Niagara Regional Campus
Dr. Lucas Ciprietti

PROGRAM UPDATES

The 6-week Internal Medicine rotation is intense with a significant amount of knowledge to be acquired and a demanding call schedule. With the support of the Clinical Teaching Unit directors and the Chief medical residents, we were able to combine teaching into an academic half day for the students. Previously, the students had a 2-3 hour tutorial and a clinical skills teaching session lead by the Chief Medical Residents. These were scheduled at different times during the week and the students had to combine these with their clinical duties for the day. We combined these educational activities into an academic half-day to allow students to have a focused time of study during the week. The feedback received through our student representatives indicated that this would improve student wellness and reduce some of the pressure of the rotation. Following the successful introduction of MacDOTS, a direct observational tool for clinical encounters, we continued to build on the foundation of bedside teaching in medicine.

Internal Medicine continues to play a role in the clerkship orientation. Dr. Zahira Khalid leads a well-received session on paging including simulated paging scenarios. We have now added a session on insertion of nasogastric tubes supervised by Department of Medicine faculty.

The onset of the pandemic in March of 2020 necessitated rapid and significant changes to way we taught medicine. The class of 2021 was removed from the clinical environment and entered into a virtual longitudinal clerkship that enabled students to work on the objectives of clerkship in a virtual setting. Department of Medicine faculty delivered interactive large group sessions on a variety subjects that the students found engaging and beneficial to their learning.

In addition to the monthly meetings of the Internal Medicine Clerkship Committee, we hold an annual retreat to perform a more in-depth review of the program and to have a personal development session for faculty and student representatives. We had a great opportunity to work with Colleen Aynn to get guidance on how to improve our presentation skills and engage our audience, and also heard from Kim Ades on how changing our beliefs around the problems we encounter can lead to success.

“The class of 2021 was removed from the clinical environment and entered into a virtual longitudinal clerkship that enabled students to work on the objectives of clerkship in a virtual setting.”

ACKNOWLEDGEMENTS

On behalf of the Internal Medicine Clerkship Program and the students, I would like thank the following people and groups without whom these programs would not be possible: Ms. Tina Laporte, internal medicine clerkship administrative program coordinator; Medicine Clerkship Committee members and their administrative assistants; Dr. Mark Crowther; the Clinical Teaching Unit directors and their assistants; Dr. Lori Whitehead and Ms. Jan Taylor of the Internal Medicine Residency Program, its residents and administrative staff. Without the engagement and support of these people, we would not have a successful program. I am also grateful to the Clerkship Directors in other programs who are always willing to share ideas and successes from their own programs and to Dr. Rob Whyte and Dr. Rudkowski for their leadership.

The students continue to inspire us with their dedication to their education and we are particularly grateful to our student representatives who ensure that students are involved in our program decision making. ■

COORDINATOR REPORT

Director of Administration

As Director of Administration for the Department of Medicine, I continue to work closely with many exceptional and talented faculty and staff. The Department of Medicine is continually expanding and recruiting new faculty.

With the addition of approximately 20 faculty recruits and 20 clinical scholars annually, the number of staff also increases, consistent with this growth. These dedicated and talented individuals span across all hospital sites including Hamilton Health Sciences (McMaster University Medical Centre, Juravinski Hospital and Cancer Centre, Hamilton General Hospital and St. Peter's) and St. Joseph's Healthcare, Hamilton. The department has been financially strong during 2018-19 and 2019-20 fiscal years, ending with clinical practice plan surpluses. These surplus funds have enabled the department to support essential educational activities as well as other leadership initiatives. Faculty and staff development also remained a key priority as we identify talented faculty to be mentored for future leadership positions within the department.

> "... leadership and management teams *are committed to supporting the* university's initiatives AND TO ADVOCATE THE merits of change to our faculty, students and staff."

McMaster University continues to be committed to developing its management team and to providing the team the necessary tools to be as effective and successful as possible during these challenging times. Several departmental managers are working towards Masters of Business Administration degrees, which will ultimately strengthen and enhance their skills set within the administrative team. The commitment of the The Management Team and staff have significantly contributed to the Department of Medicine's success.

The Department of Medicine's management team consists of dedicated and hardworking managers responsible for faculty and staff at each of the hospital sites. Ms. Gail LaForme is the Site Coordinator for the Juravinski Hospital and Cancer Centre. Leslie Steinberg is the Manager, Staff and Operations at the McMaster hospital site as well as the Hamilton General Hospital. Tanja Petrovic and Mallory Freed were responsible for faculty and staff at the St. Joseph's Hospital sites. These dedicated business managers are "hands on" and liaise closely with hospital leadership to ensure an engaged, collegial and collaborative university-hospital relationship. They are invaluable and a direct link to new faculty recruits as they get settled in their new surroundings. They also serve as our liaison with our administrative and research support in all geographic locations.

Other equally important members of the department's management team include Lorrie Reurink (Human Resources Manager), Lisa Geer (Finance Manager) and Graeme Matheson

Annette Rosati

BA, EMBA (candidate)
Director of Administration
Department of Medicine

(AFP Budget Manager). Graeme continues to work closely with the AFP Executive and Finance Management Committees, including Dr. Ameen Patel (Associate Chair, Education) and Dr. Jeff Weitz (Associate Chair, Research) with regard to the AFP academic merit process. Mr. Matheson is also spearheading advances to the Department's IT systems – creating databases allowing readily accessible information.

The university continues to make essential and necessary changes to its key functional areas, such as Human Resources, Finance, and Information Technology Systems. Relaying these changes to faculty and staff requires effective and regular communication. The Department of Medicine's leadership and management teams are committed to supporting the university's initiatives and to advocate the merits of change to our faculty, students and staff.

The tail end of the 2019-20 academic year saw the beginning of the Covid-19 pandemic. On March 20, 2020, the Department of Medicine's administrative staff began working remotely to help curb the transmission of the virus. Faculty and staff have diligently followed the direction and guidance of the University, the Faculty of Health Sciences and our partner hospitals with regard to the pandemic. ■

COORDINATOR REPORT

Department of Medicine at Hamilton Health Sciences

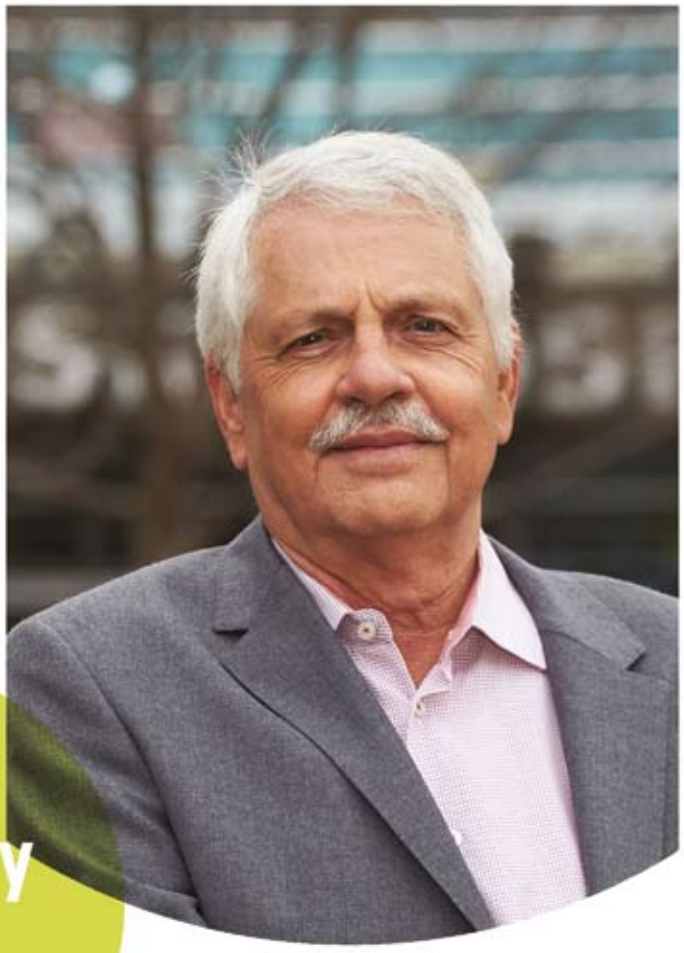
As I write this report, covering two years from the last report, it is truly staggering to see how our world has changed. Many of the issues that have been part of our ongoing activities in the Department continue to be extremely challenging and important. However, all of this is dwarfed by the impact of COVID-19 on every aspect of our lives.

I would begin by acknowledging the massive spirit of collegiality and cooperation together with the resilience of our colleagues in the Department and across all of the physician community. Our members have made huge contributions locally, provincially, and internationally at the bedside, in education and research.

At the time of my last report, I noted that I had been approved for a two-year extension to my term as Physician in Chief. I have now stepped down as the PIC and handed the reigns to an outstanding colleague. Dr. Khalid Azzam will be a fantastic PIC and carry the Department forward with humility and skill.

The never-ending issue of Clinical Teaching Unit resident and staff shortages has not gone away. Beginning in late 2019 it became clear that we would be very challenged to have enough resident support to provide both day and night time coverage in all of our sites. This issue extends well beyond Medicine affecting many other disciplines. With the help of external consultants and many meetings, a strategy to move forward was established. One of the most important aspects of this was to much more fully engage Physician Assistants as part of our care teams. The addition of three PAs to the medicine teams at each site has been very successful and indeed, critical in helping to deal with the waves of COVID patients. In General Medicine, we were fortunate to also recruit a

> "THANK YOU DR. LUMB
> for 12 years of
> dedicated service
> *as the* Physician in Chief
> *at* HHS.
> You have always
> carried out your role
> *with* equanimity,
> fairness *and* excellence.
> Through your
> strong leadership
> *and* deep commitment
> to others,
> you have *enhanced*
> clinical care, learning,
> *and* education."
>
> — Dr. Mark Crowther



Dr. Barry Lumb

MD, FRCP(C)
Physician-in-Chief,
Hamilton Health Sciences,
Professor of Medicine

higher number of international trainees as well as a couple of transfers from other programs. As a result, we have enjoyed a very good year in terms of resident numbers. However, this will not last, and I expect that further changes will need to be developed. These discussions will likely be on the agenda of our leaders as long as we are a teaching institution.

Hamilton Health Sciences has committed to implement Epic as the new enterprise-wide electronic health record. This will be the largest single project in the history of HHS and finally bring HHS into the modern digital world. Every aspect of the day-to-day care of our patients will change. Although HHS is implementing its' own instance of the Epic platform, the interoperability capabilities of Epic will allow patients to seamlessly move across all of our hospital sites and truly establish a single source of truth for a patients' care. The Department has embraced this project and we are fortunate to have several members involved at the leadership level. I am privileged to be the HHS Executive Lead for this project.

In my last report, I mentioned the importance of the Department moving ahead on the Quality and Patient Safety dimension of academic work. I am delighted to see that a group of very dedicated colleagues have now established a Quality Community of Practice for the Department and are planning their first QIPS Symposium for May 2021.

As I step away from my PIC role, I want to very gratefully acknowledge the help and support of our many colleagues who contribute every day to make us a highly successful academic department providing the very best care, education, and research. In particular, I need to thank Paul O'Byrne, Mark Crowther, Alistair Ingram, Annette Rosati, and Lori Whitehead. It has been an incredible privilege to hold this position for the last 12 years. I have truly gained much more than I was able to give.

As I noted above, Khalid Azzam is now the Physician in Chief. He brings extensive leadership experience to the role and is already showing us that he will be an outstanding leader going forward. You are in very good hands. ■

COORDINATOR REPORT

Department of Medicine at St. Joseph's Healthcare

It is difficult for me to put into words the admiration that I have for the medical staff and how they have performed during the pandemic... I particularly want to give a "shout out" to those Department of Medicine colleagues who volunteered to work in the covid unit during the 9 months before vaccination was available.

I have been asked to report on activities in the Department of Medicine at St. Joseph's Healthcare Hamilton (SJHH) for the period July 1 2018 to June 30 2020. Whilst it seems to me that pre and post roughly March 1 2020 might be a more appropriate construct, I will do my best.

General Internal Medicine continues to be very clinically busy at SJHH, with average daily inpatient census routinely exceeding 160 patients before COVID. This remarkably busy clinical service is led by Dr. Joe McMullin. Prior to covid, SJHH, along with other Ontario hospitals, was challenged by very large numbers of alternate level of care (ALC) patients admitted to the hospital, often with long stays due to a lack of bed capacity in other programs or community facilities. This has been somewhat ameliorated by the creation of a temporary "satellite Health Facility" at the former Crowne Plaza Hotel downtown, funded by the Ministry until June 2022 per current plans. Sadly, we are also seeing a reduction of ALC pressures in the hospital as capacity in LTC becomes available, partly as a result of the terrible loss of life in the LTC sector secondary to COVID.

It is difficult for me to put into words the admiration that I have for the medical staff and how they have performed during the pandemic. My office has created an exhaustive "surge" schedule every 4 months or so during the pandemic; whilst we have rarely had to use it almost every member of the Department indicated without hesitation their willingness to participate according to their skills. I particularly want to give a "shout out" to those Department of Medicine colleagues who volunteered to work in the covid unit during the 9 months before vaccination was available. SJHH has performed remarkably to date during the pandemic, with very few outbreaks. This has allowed us to maintain capacity to support the Region throughout the pandemic. I attribute this to a culture of attention to infection control practices by the medical, nursing and professional staff- indeed it seems by everyone who works in the hospital. It has been impressive.

The new Epic corporation electronic medical record, "Dovetale", has been the rails on which this organization runs now since December 2 2017. Although we expected a battle, most of us have no idea how we functioned in the antebellum period now. We continue to learn about and optimize Dovetale, and Dan Perri (our CIO) continues to lead us in this evolution, as well as deal with endless queries with considerable aplomb. Steve Wong and Andrew Cheung are leading a very exciting individual physician feedback program based on Dovetale data, meant to give Department members (starting with GIM) insight into their individual practices vis a vis their peers. All Department of Medicine out-patient areas are on Dovetale now too. Dovetale's ability to allow virtual visits has been a blessing of immeasurable proportions, and many of us will never have out-patient practices that look quite the same as before March 2020 again. We look forward to being "Happy Together" (a propriety epic program that joins two instances of Dovetale) when HHS finishes their "Odyssey" and goes live on Epic. The city and region will greatly benefit.

When I last wrote I highlighted some *New England Journal of Medicine* publications from the Firestone, this time I would like to highlight the largest ever clinical trial in vasculitis, the Pexivas

Dr. Alistair Ingram

MD, FRCPC
Chief of Medicine
St. Joseph's
Healthcare Hamilton

study, also in the NEJM, led by our own Mike Walsh in Nephrology. Other exciting developments are happening on the research front at SJHH; Lehana Thabane has just assumed the role of VP Research and a new Integrated Care Research Centre, which will use Dovetale "big data" to guide identification of and interventions for high-use GIM patients will open its doors in July 2021.

Major changes have occurred in the executive suite at SJHH. Melissa Farrell is our new President, and she cannot say that her new job has been without interest! Winnie Doyle assumed the role of interim CEO of the Health System and is bringing her characteristic sharp insight into evaluating how the system can best operate to meet the needs of its component organizations and patients going forward. Azim Gangji has assumed the new role of VP research here at SJHH; his unique energy is already being felt. David Russell has provided stability throughout the pandemic in his role as interim Chief of Staff and many of us have found his presence quite a comfort.

I would again like to close by thanking SJHH Medicine physicians for continuing to provide exemplary clinical care, lately at some peril to themselves but never missing a beat. It will be interesting to see what aspects of medicine, and our lives, have changed irrevocably when the pandemic is over. ■

160+

The average daily number of patients the GIM Service routinely served before COVID.


gairdner

Groundbreaking research

Dr. Salim Yusuf: Using big-picture thinking to improve global health

When Dr. Salim Yusuf was attending Oxford University as a Rhodes scholar, he received a piece of advice that changed his life: get the big picture right and every detail right.

While a student at Oxford, Dr. Yusuf was part of a team of cardiologists and epidemiologists that developed the idea of conducting large simple studies to detect or exclude whether treatments reduced death, or other major complications, by involving tens of thousands of patients around the world.

"We developed the concept and the approaches of doing very large studies internationally. Until then, it was very uncommon to do studies internationally. Most studies until that time included just a few hundred patients, and occasionally a few thousand," he said.

"We recognized that we may not have discovered the true benefits of several treatments because the studies done to evaluate them were too small. So we proposed that we needed much larger studies, and in order to make them feasible, they had to be much simpler than the studies usually conducted."

This led to the development of large simple trials: a concept that has transformed the management and outcomes of patients with cardiovascular diseases, and that has defined Dr. Yusuf's long and distinguished career – including his current position as director of the Population Health Research Institute (PHRI), recognized as one of the top clinical research groups in the world.

Dr. Yusuf and the 350-strong team at PHRI have been performing massive studies with long-term follow up in several conditions, encompassing 1,500,000 participants in 102 countries on 6 continents. Most of the studies at PHRI take an average of five to ten years, while some can continue for as long as 15 to 20 years.

PHRI's recent landmark research projects include:

- The discovery by Shamir Mehta that the likelihood of death and permanent heart damage in heart attack patients can be reduced by opening all the narrowings in their coronary arteries, rather than just the blocked artery that caused the heart attack.
- The discovery by Richard Whitlock that removing the left atrial appendage during cardiac surgery in patients with atrial fibrillation reduced the risk of stroke substantially.
- A translational research program headed by Guillaume Paré that relies on PHRI's database of over 4 million units of blood and urine to identify new blood biomarkers. This program has identified new biomarkers and genetic markers to improve the prediction of coronary artery disease, stroke, heart failure, kidney diseases and diabetes.
- A study on global nutrition, encompassing about 160,000 participants in 21 countries, showing that eating too many refined carbohydrates is associated with higher mortality and cardiovascular problems, while a moderate amount of fats, including saturated fats, is actually good for you.

These studies are only a sliver of the ground-breaking research currently underway at PHRI, including a major 20-year study on identifying the causes of dementia. The goal for every project, Dr. Yusuf says, is to definitively solve an important problem.

"At PHRI we often ask of a particular study, "Will this win us the gold medal at the high school meet, or at the Olympics?" he said.

What Dr. Yusuf takes the most pride in is PHRI's team itself, and its culture of sharing, mentoring, and excellence.

"What I'm most proud of is the team we've developed, the contributions we've made in terms of improving human health, but most importantly, making global collaborations, global friends, and developing a new generation of researchers in different parts of the world , that will make an impact well into the future," he said.

"You cannot realize big dreams and major projects by one individual alone – it requires a team that has a culture of reaching for the stars and working extraordinarily hard ." ■

Reports: Research Institutes

POPULATION HEALTH RESEARCH INSTITUTE

Photo taken pre-COVID

Population Health Research Institute

1999 - 2019

Successful global collaboration

In November 2019, PHRI celebrated its 20th anniversary by hosting more than 200 researchers from 24 countries on six continents at The Future of Global Health symposium in Hamilton. Topics over two days ranged from Oxford's Sir Richard Peto reviewing the first half-century in population health, to new directions including advanced data analytics and technology discussed by Robert Califf of Google Health. This event was a tribute to past and present collaborations, and gave momentum to ideas and strategies for new international efforts.

PHRI: Transformative global health research

As a world leader in high-impact, large clinical trials and population studies, entering its third decade of operations, PHRI continues to strengthen local, national and international collaborations and broaden the scope of research including in arrhythmia and heart failure, brain health and stroke, cancer survivorship, CVD prevention, diabetes and GI, global and population health, infectious diseases, ACS and interventional cardiology, perioperative and surgery, renal, thrombosis and more.

Advanced program in translational research to identify new mechanisms that cause heart attacks, strokes, heart failure and kidney disease

The Biomarker Discovery Partnership Program was initiated in November 2019 with substantial funds from Bayer, grants from CIHR and investments from Hamilton Health Sciences Research Institute. Led by Drs. Guillaume Paré, Director of the Genetic and Molecular Epidemiology Laboratory (CRLB-GMEL), and Salim Yusuf, Executive Director of PHRI, the program aims to identify novel blood biomarkers to predict coronary artery disease, stroke, heart failure, kidney diseases and diabetes, and link them to genetic markers using sophisticated analysis conducted in the lab. Detailed clinical information is integrated with investigations including proteomics (>1,000 proteins per sample), high-throughput genotyping and DNA sequencing, epigenetics and metabolomics. Using advanced analytic and bioinformatics tools including Mendelian randomization and artificial intelligence, this large effort is expected to identify new mechanisms for the causation of various diseases.

First study to demonstrate the importance of blood thinners in preventing future death and complications in high-risk people after surgery

Management of myocardial injury after noncardiac surgery (MANAGE), an RCT conducted in 19 countries, showed that the blood thinner, dabigatran, reduced deaths, heart attacks, strokes and other vascular complications in patients who suffered MINS. Dr. PJ Devereaux presented the findings at the European Society of Cardiology (ESC) Congress in Munich, Germany August 2018, the world's largest meeting on cardiovascular disease, and published in *The Lancet* in 2018.

Dr. Shamir Mehta

Heart attack treatment breakthrough

COMPLETE is the first large RCT to definitively show a reduction in death and myocardial infarction by opening all narrowings in coronary arteries with angioplasty, rather than just the blocked artery that caused a heart attack. The results were presented by Dr. Shamir Mehta at ESC Congress in September 2019 in Paris, France and published in *The New England Journal of Medicine* (2019) and named that year's *NEJM* Notable (original research) Article.

On the heels of this landmark trial, COMPLETE TIMING and OCT substudies were presented at two other major conferences: the timing of staged non-culprit revascularization (at Transcatheter Cardiovascular Therapeutics meeting in late 2019, published in *Journal of American College of Cardiology*); and non-culprit lesion plaque morphology by optical coherence tomography (at American Heart Association meeting in 2019, *Circulation CV Intervention* in 2020).

Janette Panhuis

Best of teams – at the worst of times

When the pandemic struck, herculean obstacles faced PHRI's Chief Operating Officer, Janette Panhuis. Janette and the heads of the operations departments and study teams pivoted quickly to ensure that all research programs ran successfully using virtual communications and meetings, upgrading infrastructure, security, remote capacity and more. It meant that PHRI's global studies continued without major disruptions.

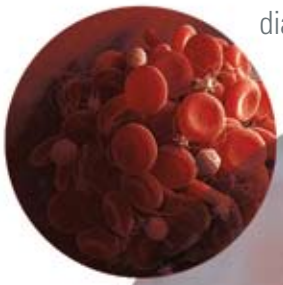
Near the start of the pandemic, three new initiatives were launched – the ACT trials evaluating treatments for COVID-19 (Dr. John Eikelboom, Sumathy Rangarajan and others), a large sub-study of 40,000 people in PURE to understand the factors contributing to the development of COVID-19 in the community from 13 countries (Dr. Darryl Leong), and innovative trials in virtual care for post-surgery patients using remote automated monitoring technology, PVC-RAM (Dr. PJ Devereaux) at nine sites across Canada.

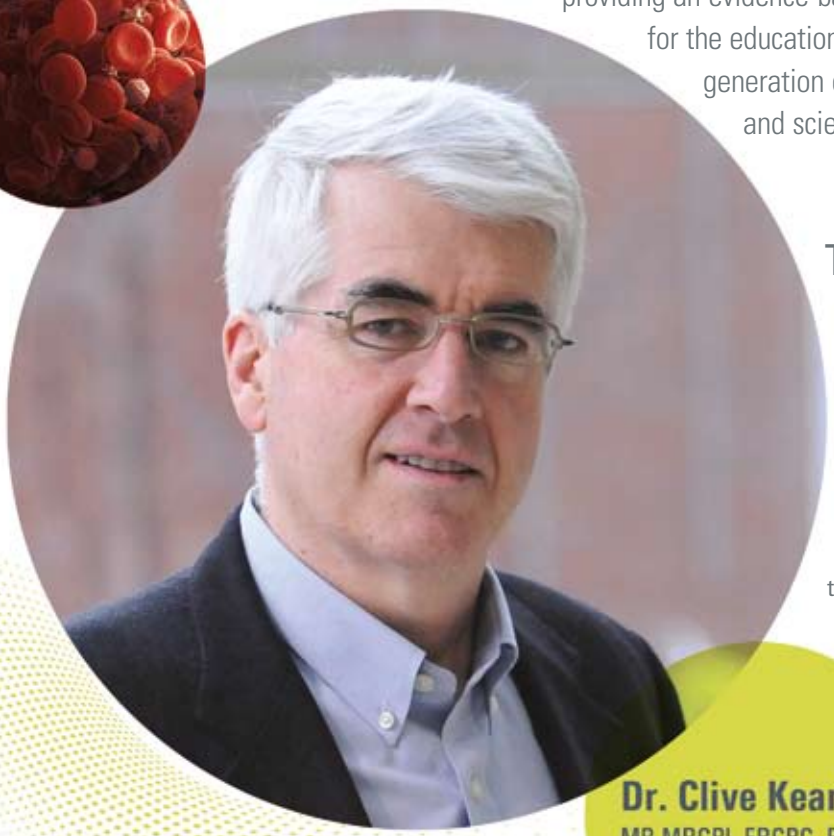
Global diet insights, and disparities in gender and LMIC health outcomes

New information on healthy diets emerged from the Prospective Urban Rural Epidemiology (PURE) study encompassing about 160,000 participants in 21 countries. In a diverse multinational cohort, dairy consumption was associated with lower risk of mortality and major cardiovascular disease events (*Lancet*, 2018) and higher nut intake was associated with lower mortality risk from both cardiovascular and non-cardiovascular causes in low-, middle-, and high-income countries (*Am J Clinical Nutrition, 2020*). PURE found consistently better outcomes in women than in men among people with and without cardiovascular disease and, for both genders, larger gaps were observed in disease management and worse outcomes in poorer countries than in richer countries (*Lancet*, 2020).

THROMBOSIS & ATHEROSCLEROSIS RESEARCH INSTITUTE (TAARI)

The Thrombosis & Atherosclerosis Research Institute (TaARI), located at the state-of-the-art research facility at the David Braley Research Building (DBRB) at the Hamilton General Hospital campus, has continued to maintain excellence in education and research over the past two academic years under the leadership of Dr. Jeffrey Weitz, Executive Director. The DBRB is shared with the Population Health Research Institute with the goal of creating synergies between basic and clinical research, thereby enabling a seamless "bench to bedside and back again" approach to complex healthcare problems. Our laboratories have enabled new collaborations that extend to all hospital sites as well as national and international research collaborations. TaARI remains focused on its mission to reduce death and disability from thrombotic diseases by conducting research into the pathogenesis, prevention, diagnosis and treatment of thrombosis and vascular disease and by providing an evidence-based platform for the education of the next generation of clinicians and scientists.



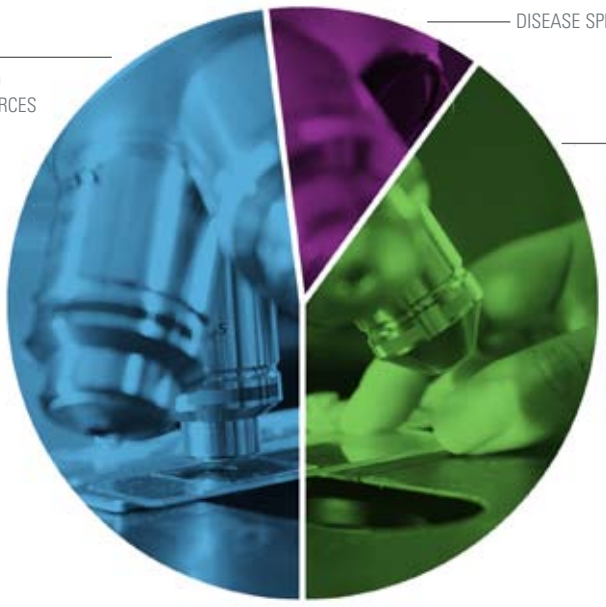


Dr. Clive Kearon
MB,MRCPI, FRCPC, PhD

Transitions

Dr. Clive Kearon, a Professor in the Department of Medicine and Director of the Clinician Investigator Program died after a courageous battle with cancer. Dr. Kearon will be remembered for the impact he has had on the lives of many and for his deep commitment to research, teaching and clinical care. Work is ongoing to establish a thrombosis fellowship and professorship in his name.

RESEARCH FUNDING $12M



TaARI has two research streams. The **Experimental Thrombosis and Atherosclerosis (ETA) Program** conducts fundamental and translational research on the interplay between thrombosis, atherosclerosis, diabe and inflammation, while the **Clinical Thromb Research Program (CTP)** performs research that informs optimal prevention, diagnosis and treatment of patients with thrombotic disorders, as well as research in health outcomes and knowledge translation aimed at optimal transfer of this information to the bedside. The clinical program, which is regional in nature and includes all Hamilton Health Sciences (HHS) sites as well as St. Joseph's Healthcare, also provides clinical care to patients in the hospital and in the community who have or are at risk for thrombotic disorders.

Continued funding from HHS provided support for research infrastructure, thereby enabling excellent research productivity and fostering a superb learning environment. Over the past two fiscal years, TaARI raised $12 million in research funding. Of these funds, 40% were derived from Tricouncil funding and 12% from disease specific funding agencies. The remainder of the funding came from provincial, regional, and internal sources. Of the TaARI faculty, 8 hold Endowed Chairs and the expendable interest from these chairs contributes 20% of the research funding.

TaARI faculty significantly contribute to the Department of Medicine's educational mission and provide a rich learning environment for trainees. Learners span the spectrum from undergraduate thesis students to M.Sc. and Ph.D. candidates and on to Postdoctoral Fellows. In 2019-20, TaARI faculty supervised 43 undergraduate students, 18 M.Sc. candidates, and 20 Ph.D. candidates and Postdoctoral Fellows. Therefore, TaARI remains the major off campus hub for undergraduate and postgraduate learning at McMaster University.

TaARI Faculty supervise:

- 43 Undergraduate students
- 18 M.Sc. candidates
- 20 Ph.D. candidates

FIRESTONE INSTITUTE FOR RESPIRATORY HEALTH

In 2019, the Firestone Institute for Respiratory Health (FIRH) celebrated its 40th anniversary as a world-renowned centre for the investigation and treatment of respiratory diseases. More than 100 guests gathered to celebrate the past achievements of the institute and listen to a vision for its future. FIRH scientists and clinicians continue to contribute to ground-breaking respiratory research with global impact. FIRH provides comprehensive in-patient and out-patient respiratory care as the regional respiratory centre for the City of Hamilton and the Hamilton Niagara Haldimand Brant Local Health Integrated Network. FIRH has a unique Chest Program that encompasses the spectrum of respiratory medicine together with affiliated head-and-neck and thoracic surgery services; all are located on one site. Clinical, research and educational activities are integrated and collaborative within FIRH. The intent is to provide exemplary clinical care, in tandem with basic and translational research inquiry, while educating and mentoring healthcare professionals to treat, research, teach, and lead. The strength of FIRH continues to be its focus on improving patient outcomes.

Highlight for this year - FIRH Respiratory Rehabilitation Day Program (RRDP)

Accomplishments:

The RRDP program has had to make a number of changes over the past few years, initially due to the loss of funding for inpatient beds, and more recently to adapt to the new world of a respiratory pandemic. The program has weathered both of these storms through guidance and expertise from Dr. Stewart Pugsley as well as the new leadership of Dr. Natya Raghavan and the recruitment of Dr. Joshua Wald and Dr. Terence Ho.

Currently the program continues to provide exemplary multidisciplinary care to complex chronic lung disease patients. We recently received a grant to help launch virtual respiratory rehabilitation both in our existing program as well as to expand our program to patients post exacerbation of COPD. Dr. Ho has received an early career award recognizing and supporting his work with rehabilitation as well as with the COPD care path. Dr. Wald sits on the CTS COPD steering committee and has collaborated on five timely guidelines to guide optimal care during COVID.

Dr. Kjetil Ask,
Pleural Space Clinic

Dr. Jeremy Hirota
Photo taken pre-COVID

What makes McMaster University and FIRH the perfect environment to conduct research?

The support for multidisciplinary care is the cornerstone of rehab. Our collaborations with the School of Rehabilitative Sciences, FIRH basic scientists, Psychology, PT, RT, OT, SW and Geriatrics help us provide outstanding clinical care while always striving to validate our interventions and advance the knowledge base in Respiratory Rehabilitation. Working in the Division of Respirology at McMaster also allows us to work in conjunction with our world-renowned colleagues across all respirology subspecialties who refer patients with complex chronic disease to our program.

Future directions

The advent of virtual rehabilitation in the post pandemic world will allow us to expand our reach to more complex and frail patients. This will provide unique opportunities and challenges to determine how to provide safe and effective virtual rehabilitation. We are also excited to work with Dr. Ciaran Scallan who is setting up a satellite lung transplant centre locally. We will expand our rehabilitation program to support this endeavor. We are also exploring collaborations with Physiatry to address the complex rehabilitative needs of post COVID 19 patients.

> "We are also exploring collaborations with **Physiatry** to address *the complex rehabilitation* needs of **post-COVD 19 patients.**"

DR. STEWART PUGSLEY

DR. NATYA RAGHAVAN

DR. JOSHUA WALD

DR. TERENCE HO

AllerGen NCE INC.

Helping Canadians living with allergies and asthma

One in three Canadians lives with allergic disease; nearly three million Canadians suffer from asthma; and 50% of the nation's households are directly or indirectly affected by food allergy.

In 2004, the Allergy, Genes and Environment Network (AllerGen) was established at McMaster University to unite Canada's allergic and respiratory disease communities with the goal of improving the lives of Canadians living with asthma, allergies, anaphylaxis and related immune diseases.

Led by Dr. Judah Denburg (William J. Walsh Chair in Medicine, Professor of Medicine), AllerGen received the full 14 years of federal Networks of Centres of Excellence (NCE) funding, as well as an additional two years of support to mobilize knowledge and commercialize research results.

Dr. Judah Denburg

"While AllerGen concludes its term as NCE in March 2021, this Network has provided novel and enduring discovery capacity and translational clinical, policy and commercial legacies for Canada with global impact," says Dr. Denburg. "AllerGen has invested over $51M in 220 research projects; trained 1,763 Highly Qualified Personnel (HQP) students and trainees; partnered with 651 organizations across sectors to leverage $128.6M; generated 6,730 scientific publications; and had our Network's research featured in major national and international media over 4,000 times."

Legacy Initiatives

Through its strategic research investments, AllerGen catalyzed three ongoing, self-sustaining Legacy Initiatives that benefit those living with – or caring for people affected by – allergy, asthma and related immune diseases.

- The **CHILD Cohort Study (CHILD)**, with four recruitment sites across Canada and an administrative core at McMaster, is a general population birth cohort study of nearly 3,500 Canadian children and their families being followed from pre-birth through childhood and beyond. CHILD has "already made important discoveries about the long-term health impacts of early childhood exposures, including breastfeeding, nutrition and foods, microbiome, maternal stress, and air pollution," says Dr. Denburg.

- The **Clinical Investigator Collaborative (CIC)**, operating at eight universities across Canada and one abroad, and led by investigators at McMaster, is a Phase II clinical trials group that evaluates potential drug candidates for the treatment of allergic and severe asthma. Since 2005, the CIC has undertaken 29 clinical trials and attracted nearly $28 million in R&D investment to Canada, according to Dr. Denburg. "Developing new drugs is an extremely expensive business for pharmaceutical and biotechnology companies. The CIC is expert at predicting if a potential new asthma drug will work."

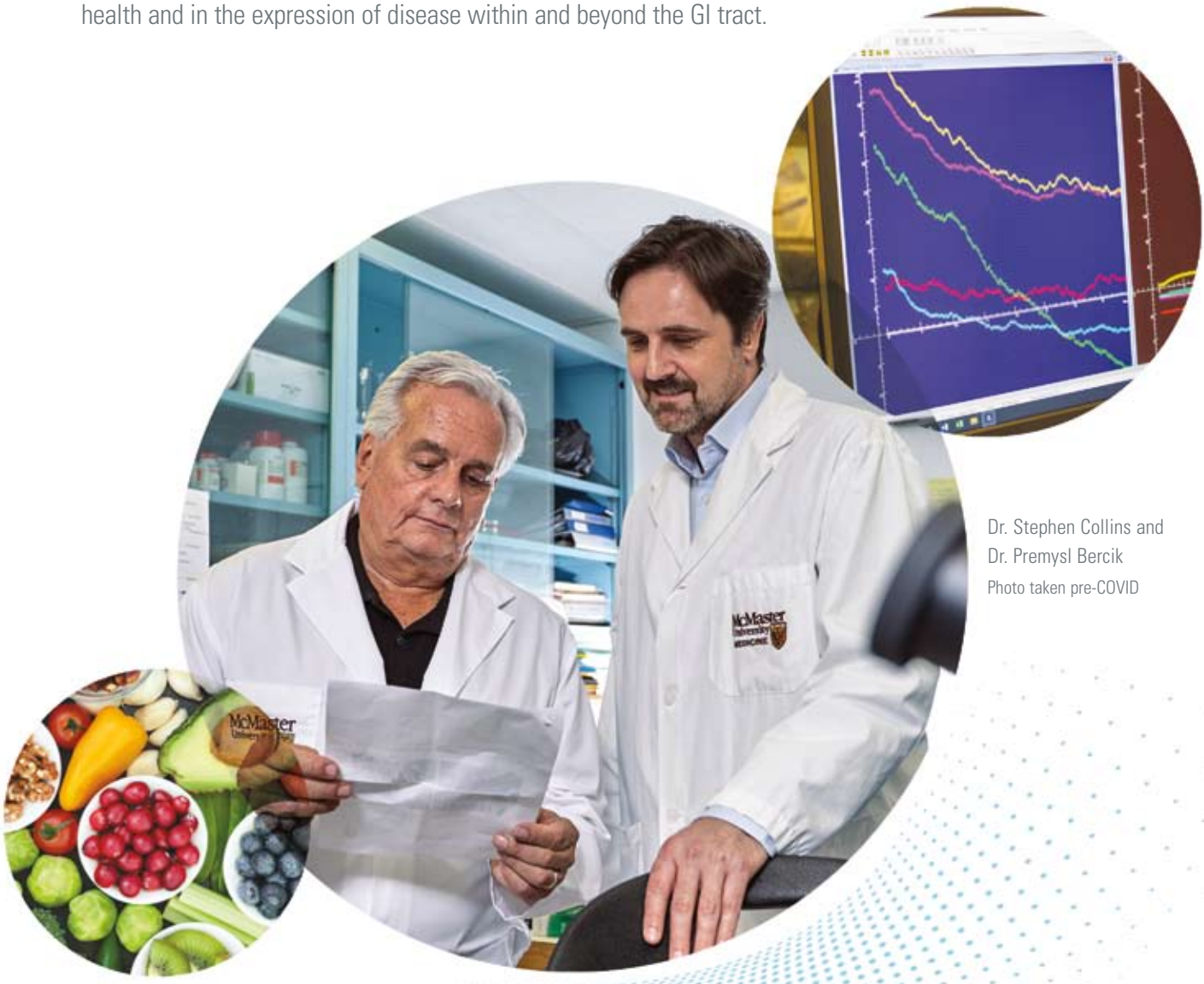
- The **National Food Allergy Strategic Team (NFAST)**, a transdisciplinary food allergy consortium, studies the biology of food allergy/anaphylaxis and translates that knowledge into clinical and public health practice. NFAST research teams, which include McMaster allergists, have conducted Canada's first studies on food allergy and anaphylaxis prevalence, management, and economic burden, and have contributed to food labelling reforms, developed evidence-based guidelines for the management of food allergies in schools, and produced new findings on the genetic basis of peanut allergy.

"Over the past 16 years, AllerGen has united the country's top allergy/asthma researchers and provided added-value funding for research, knowledge mobilization, trainee development, networking and partnerships," adds Dr. Denburg. "Together with our researchers, trainees, partners, advisory committees, and host institution McMaster University, we have truly transformed the landscape of allergic and respiratory disease in Canada and beyond for decades to come."

Read AllerGen's Outcomes & Impacts Report (2004-2021) at https://impacts.allergen.ca/

FARNCOMBE FAMILY DIGESTIVE HEALTH RESEARCH INSTITUTE

The Institute was founded in 2008 and has 20 full-time faculty members including active clinicians and PhD scientists. Dr. Stephen Collins is the Director and Dr. Elena Verdu is its Associate Director. Its research encompasses the bench-bedside spectrum with emphasis on translational research. An important component of its mission is to investigate and exploit the role of the intestinal microbiota in the maintenance of health and in the expression of disease within and beyond the GI tract.



Dr. Stephen Collins and Dr. Premysl Bercik
Photo taken pre-COVID

The Institute includes two important research facilities: The McMaster Genomic and Metagenomic Sequencing Facility and The Axenic-Gnotobiotic Mouse (AGU) Facility. Each facility is utilized by researchers within and beyond McMaster University. The AGU facility was the first of its kind in Canada in the molecular era. These facilities enable studies on host-microbiota interactions under carefully controlled environmental conditions, and culture-dependent and -independent molecular profiling of microbes. In addition, we are developing a bacteriophage library that will assist in manipulating the microbiota for investigative and possible therapeutic gain.

Currently, the institute has 7 endowed chairs, two of which are rotating "junior chairs" that are held for 6 years by promising young investigators, providing them sufficient time to secure external salary support. In addition, Farncombe members hold one Tier I and one Tier II Canada Research Chairs.

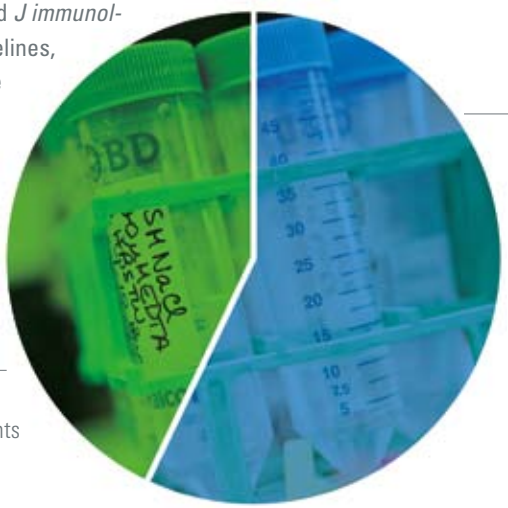
Between 2019-20 Institute members collectively held a total of $43,128,527 in external peer reviewed funds of which $18.5M are CIHR team grants (2) or CIHR SPOR grant (1). The remaining $24.6M are from CIHR, NIH, NSERC, Crohns Colitis Canada, Genome Canada and the W Garfield Weston Foundation as well as from the private sector (Nestle, Biocodex, Gilead).

The Institute has a very strong educational program and provides limited funding towards the training of graduate and post-doctoral students. During the 2019-20 period, Institute members supervised 28 PhD and 23 MSc students, 17 post-doctoral fellows and 2 clinical fellows – a total of 70 trainees. In addition, Institute members supervised 13 undergraduate students.

Between 2019-20, Institute members have published 192 papers listed on Pub Med and these include publications in high impact journals that include *Nature Communications, Science Translational Medicine, Nature Microbiology, Gastroenterology, Nature Reviews Gastroenterology* and *J immunology*. The published work ranges from meta-analyses and guidelines, clinical trials to basic mechanistic or translational studies. The latter include understanding factors that influence microbial colonisation of the gut at birth, microbial exposure in utero, bacteriophage-bacterial interactions, host-microbial interactions in the contexts of Irritable Bowel Syndrome, Inflammatory Bowel Diseases and Celiac Disease. Work on the microbiota-brain axis has identified a probiotic bacterium that improves depression in humans and ongoing work examines the role of the microbiota in the expression of generalised anxiety disorders and major depressive disorders. Work on motility focuses on developmental aspects and the role of the microbiota, understanding colonic motility in the context of severe constipation.

An increasingly dominant theme of the Institute's work is the relationship between ingested nutrient, the microbiota and the host. For example, our studies have demonstrated how the proteolytic activity of duodenal bacteria determine whether or not we digest wheat (gluten) in a harmful immunogenic manner, thus explaining the rising prevalence of gluten sensitivity that occurs not only in the context of coeliac disease but other disorders including Irritable Bowel Syndrome and IBD. Work also examines the role of bacteria in determining responses to fermentable carbohydrate in the diet, and the role of food additives in promoting intestinal inflammation. Based on these findings, we propose to develop a new basic science and clinical initiative that integrates nutrition science with gastroenterological research and practice in the coming year.

PEER REVIEWED FUNDS



$18.5M
CIHR team grants

$24.6M
CIHR, NIH, NSERC, Crohns Colitis Canada, Genome Canada and the W Garfield Weston Foundation

CHANCHLANI RESEARCH CENTRE

Jaya and Vasu Chanchlani provided foundation funding for the Chanchlani Research Centre.

The Chanchlani Research Centre (CRC) was established in 2011 after a generous donation was made by Vasu and Jaya Chanchlani to McMaster University. The Chanchlani Research Centre pursues research studies seeking to add to the collective knowledge in the areas of genetics, genomics, and environmental risk factors for chronic diseases across the life course, with special emphasis on high risk groups including ethnically-diverse populations, those of low socioeconomic status and women.

The objectives of the CRC are:

1) To provide a stimulating environment to create new research collaborations which culminate in acquiring peer review grants, industry funding and private/corporate funding;
2) To provide core faculty with infrastructure to acquire and analyze their data, and,
3) To promote mentoring and training of students at all levels including undergraduate, graduate, and post-doctoral fellows.

Faculty Members who participate in centre research include: Dr. Sonia Anand (Director, Departments of Medicine and Health Research Methods, Evidence, & Impact), Dr. Joseph Beyene (Department of Health Research Methods, Evidence, & Impact), Dr. Russell de Souza (Department of Health Research Methods, Evidence, & Impact), Dr. Guillaume Paré (Department of Pathology), Dr. Zena Samaan (Department of Psychiatry), Dr. Jennifer Stearns (microbiome), Dr. Gita Wahi (Pediatrics)

Featured Projects: The transdisciplinary group of researchers brought together in the Chanchlani Research Centre are involved in a wide array of innovative initiatives from investigating the social determinants of health to genomics.

Featured Researcher: Gita Wahi

Dr. Gita Wahi is an Associate Professor of Pediatrics and is in her final year of completing her PhD in Health Research Methodology under the supervision of Dr. Anand. Dr. Wahi is lead co-PI the Indigenous Birth Cohort (formerly ABC) and in partnership with the Birthing Centre on the Six Nations reserve aims to identify the causes which lead to an increased risk of obesity among Indigenous infants in their first three years of life. In partnership with the Six Nations of the Grand River Birthing Centre, the team works with community members to learn about the traditional knowledge, beliefs, and priorities towards the health of children and their families.

An award-winning video about this work can be seen at: https://youtu.be/EYvfqcGKAiw
Dr. Wahi has been awarded a NEIHR CIHR development grant to work with Indigenous midwives to understand how to optimize and promote the care they deliver to Indigenous pregnant women.

Dr. Wahi has recently published a systematic review to better understand the effectiveness of programs aimed at childhood obesity prevention among Indigenous communities.

An impact report was recently published, highlighting the work of the research centre.

CHANCHLANI GLOBAL HEALTH RESEARCH AWARDS

February 10, 2020

Eighth Annual Chanchlani Global Health Research Award Recipient: Dr. Jonathan Patz

Past Recipients include:

February 4, 2019

Seventh Annual Chanchlani Global Health Research Award Recipient: Dr. Camara Phyllis Jones

February 12, 2018

Sixth Annual Chanchlani Global Health Research Award Recipient: Dr. Dariush Mozaffarian

February 6, 2017

Fifth Annual Chanchlani Global Health Research Award Recipient: Dr. John Ioannidis

February 24, 2014

Second Annual Chanchlani Global Health Research Award Recipient: Dr. Hans Rosling

February 29, 2016

Fourth Annual Chanchlani Global Health Research Award Recipient: Vikram Patel

November 27, 2012

First Annual Chanchlani Global Health Research Award Recipients: Dr. Madhukar & Dr. Nikika Pant Pai

February 25, 2015

Third Annual Chanchlani Global Health Research Award Recipient: Professor Dr. Ab Osterhaus

GERIATRIC EDUCATION AND RESEARCH IN AGING SCIENCES (GERAS) CENTRE

GERAS Centre for Aging Research

The aging population is the biggest challenge facing our healthcare system today. In Canada we expect that 25% of our population will be over the age of 65 by 2041, almost doubling the population from 2016. To ensure the sustainability of our healthcare system during this profound demographic shift, we need to examine innovative solutions and models of care that meet the needs of older Canadians. During the COVID-19 pandemic, this work has never been more critical. GERAS is leading the way in practical innovations, new models of care and clinical interventions and tools for seniors who are at "at-risk", their caregivers and healthcare professionals.

The GERAS Centre for Aging Research has grown to become a CIHR recognized Research Center of Excellence. The research at the GERAS Centre is inspired by seniors and is working alongside the largest network of geriatricians and specialized geriatric teams in our region. We lead in research and innovation in the Geriatric 5Ms: mind, mobility, medications, multi-complexity building on a framework of what matters most for older adults.

Our projects and programs focus on individual components of the Geriatric 5Ms and are the biggest challenges facing our seniors and our healthcare system today: frailty, dementia, falls and fractures, and empowering patients. Our research can make a difference to seniors every day in meaningful ways.

L-R: Courtney Kennedy, Charles Juravinski, George Ioannidis Photo taken pre-COVID

Dr. Alexandra Papaioannou

GERAS Virtual Frailty Rehabilitation at Home during COVID-19

The McMaster COVID-19 Research Fund, the Juravinski Research Institute (JRI), and donors, generously funded the GERAS Virtual Frailty Rehabilitation at Home study. Built on the CIHR-funded Frailty Rehabilitation trial, Dr. Papaioannou and colleagues have pivoted to meet the needs of frail older adults during the COVID-19 pandemic. The decrease in physical, cognitive and social stimulation can accelerate functional decline, increase the risk for negative events such as depression and injurious falls/fractures that may result in hospital admission. The study is examining the benefits of frailty rehabilitation delivered virtually. Given the uncertain timeframe for returning to in-person non-urgent rehabilitation, our long-term objectives are the seamless implementation of a new model for multimodal frailty rehabilitation that closes the care gap in rehabilitation for frail seniors in the immediate and foreseeable future.

Detecting Frailty in Routine Clinical Practice: The Senior-Friendly Fit-Frailty App

Comprehensive assessment of frailty is a timely and often difficult process, which has been further complicated during COVID-19. The GERAS Fit-Frailty App, which has been funded by the GERAS Centre for Aging Research, the Centre for Aging and Brain Health Innovation, the Hamilton Health Sciences Foundation, and the Chair in Aging, is an innovative technology solution that could have wide applicability within clinical and research settings.

The GERAS Fit-Frailty App is an interactive tool that helps determine interventions to prevent and manage frailty in older adults. Dr. Courtney Kennedy and co-authors (Drs. Ioannidis, Papaioannou, Adachi and Rockwood) and Dr. Sarah Park (geriatrics resident) are examining the reliability/validity and testing the usability of this tool with patients and healthcare professionals. The tool will be launched internationally, on the App store, and available for download on phones and iPads. The standard version includes a cognitive screen and guided assessments for upper and lower extremity function (with instructional videos). A completely self-reported version is also being examined for phone and virtual assessment.

Courtney Kennedy

Sarah Park

Pauline Fisher (left)
Photo taken pre-COVID

Patricia Hewston
Photo taken pre-COVID

GERAS DANCE to reduce falls in older adults

Falls are the leading cause of injury among older Canadians. Every 13 seconds an older adult is treated in the emergency department because of a fall. The good news is that falls are preventable, and new research shows dance may reduce fall-risk.

"Dance is a mind-body activity of purposeful rhythmic and coordinated movement to music, and older adults who walk slower with less rhythm and coordination are at increased falls-risk" says Dr. Patricia Hewston, an occupational therapist and inaugural recipient Labarge Postdoctoral Fellowship in Mobility in Aging, funded by McMaster's past chancellor Ms. Suzanne Labarge.

430 Older adults dancing for good health with GERAS DANCE

Dr. Hewstons' post-doctoral research explored if dance improves walking patterns in older adults. Older adults participated in the GERAS DANcing for Cognition and Exercise (DANCE) program at the YMCA (2x weekly, 1-hour classes). Walking patterns were measured using a ProtoKinetics Zeno Walkway at the beginning and end of the study. After 12-weeks of GERAS DANCE older adults walked faster with improved rhythm and coordination indicative of reduced fall-risk. The GERAS DANCE program of research currently has 28 certified GERAS DANCE instructors with 430+ older adults dancing for good health.

Caitlin McArthur

Preventing fractures in home care residents: The Facture Risk Scale Home Care (FRS-HC)

Dr. Caitlin McArthur, a postdoctoral fellow with the GERAS Centre, led work about fracture risk for vulnerable older adults receiving home care. Fractures cause devasting consequences for older adults including pain, disability, and death. It is essential to identify who is at high risk for fracture to put preventive strategies in place to decrease the risk of fracture. Dr. McArthur led development and validation of the Fracture Risk Scale for Home Care (FRS-HC) which predicts how likely someone is to break a hip in the next year. The FRS-HC can also predict how likely someone is to experience other major osteoporotic fractures (i.e., wrist, spine, humerus, and pelvis) within the next year and has been validated across four Canadian provinces. The FRS-HC is derived from routinely collected comprehensive home care assessments, is specific to the home care population, and does not require any additional documentation or testing (e.g., bone mineral density tests). The tool helps identify who is at high risk so that strategies like nutrition, exercise, and medication can be put in place to prevent the fracture from happening. This work has been published in the Journal of the American Medical Director's Association and BMC Musculoskeletal Disorders.

Groundbreaking research

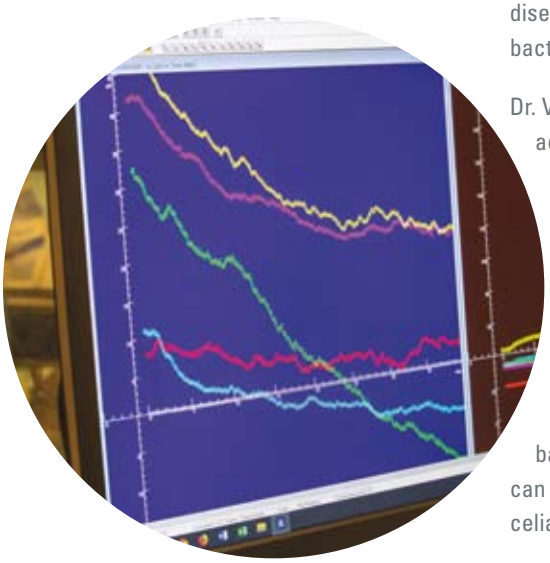
Dr. Elena Verdu: Unlocking the mysteries of our gut bacteria

Dr. Elena Verdu's fascination with gut bacteria has led her around the world.

Initially trained in Internal Medicine at the University of Buenos Aires, Dr. Verdu travelled to Switzerland in 1991 to receive further training in gastroenterology and clinical research at the University of Lausanne.

The move from her native Argentina to Switzerland helped inspire Dr. Verdu to pursue the line of research that she continues today.

"I came from a medical background, and suddenly I was exposed to this fundamental interaction between gut microbes, dietary antigens, and how they impact the host at the basic level," she said.



"At that time, the exciting discovery in gastroenterology was that there was a bacterium that was found to cause peptic ulcer disease. You have to imagine the times – the question in the wind really was, "What else could bacteria cause in gastroenterology?," she said.

Dr. Verdu was drawn to McMaster in 1996 due to its Intestinal Diseases Research Program, and what she calls the "cross pollination" of scientists and clinicians – a rarity at that time.

"This program was looking at gastrointestinal disease from so many different angles. This was the beginning of the maturation for me as a scientist in gastrointestinal diseases," she said.

Today, Dr. Verdu's research largely focuses on two diseases – celiac disease and inflammatory bowel disease (IBD). Recently, her research has uncovered that there is a link between celiac disease and IBD involving how our gut bacteria reacts to the foods we eat.

Dr. Verdu explains that certain amino acids, like tryptophan, are metabolized by our gut bacteria – and when that happens, they release certain substances called metabolites that will protect our intestinal lining. Dr. Verdu's research has shown that patients with celiac disease can't easily process tryptophan, but adding good gut bacteria that can process tryptophan can ultimately help treat patients with celiac disease. The major discovery of this program of research showed that this same pathway is also seen in IBD.

This particular research project could have major implications for the way we treat these diseases – both of which are becoming more common among Canadians.

"What interests me is whether there is a common pathway between these two diseases – and could bacteria be the link between the two of them?," she said. "If we understand the root causes of these diseases, and why this increase is happening, we can then intervene preventively – or we can devise therapies that are going to be more efficacious."

Dr. Verdu's research is continuing to focus on investigating the root causes of chronic intestinal inflammation, and looking at how nutrition can factor into this.

Her biggest piece of advice about maintaining healthy gut bacteria? Do your own cooking, eat a variety of foods, and avoid foods that come in a box.

"In general, if I have to give one piece of advice, I would say do what my grandmother or great grandmother said, which is to eat a little bit of everything," she said. "Eat a variety of food that can stimulate richness and variety in your gut microbiota." ■

Reports: Endowed Chairs and Professorships

ABBVIE CHAIR IN EDUCATION IN RHEUMATOLOGY

Dr. Alfred Cividino

Dr. Alfred Cividino's focus for the chair position continues to be the expansion of awareness and education about rheumatic diseases to physicians, residents, and students.

The chair continues to participate in undergraduate and postgraduate teaching.

Educational activity in the Division of Rheumatology has been recognized by The Arthritis Society with a grant from the rheumatic disease unit's annual competition.

In continuing the commitment to education in rheumatology, Dr. Cividino co-chaired the fifth 'Annual Clinical Day in Rheumatology'. The virtual event was very well received and attended by nearly 500 family physicians and allied health professionals. Funds raised at the virtual event will help support ongoing research activity in the Division of Rheumatology.

Nationally, the chair's efforts in our "Become a hero, become a rheumatologist" campaign continues to attract great interest with many students and residents seeking clinical opportunities in rheumatology. Training programs across the country have many excellent candidates applying for training in rheumatology. At McMaster, we have increased training to three residents per year. We continue to attract the finest candidates.

Our division has added Dr. Tselios and Dr. Garner with expertise in Lupus and Vasculitis, respectively. Additional recruitment is underway for Education and Quality Improvement roles. ■

Endowed Chairs or Professorships

40

ACTAVIS CHAIR IN RHEUMATOLOGY FOR BETTER BONE HEALTH

Dr. Jonathan D. Adachi

The scope of our rheumatology scholarship and research continues to grow and thrive in an effort to meet the need to enhance care for our patients, increase training opportunities for our undergraduate, graduate and medical trainees, and improve our understanding of disease processes. Our key goals have always focused on building research capacity, fostering existing collaborations, and expanding our research network. In building research capacity, we have significantly increased the quantity and quality of our research training programs which include trainees at the undergraduate, undergraduate medical, resident, and fellowship levels. We have increased both the depth and breadth of our rheumatologic research through linkages with colleagues in respirology, geriatrics, nephrology, and pediatrics at the local, national and international levels. Through these collaborations and training programs we have increased and improved our knowledge about the effects of aging and frailty on various rheumatological conditions, the use of apps and other technology in caring for patients and assessing health, and understanding the true impact of rheumatologic disease on activities of daily living and physical functioning. Our research has contributed to our improved understanding of the effects of aging on rheumatic diseases. We have explored new areas of research and quality improvement to ultimately have positive impacts on our patients affected by rheumatologic conditions. Over the past years, we have improved care for our patients, improved and increased our ability to train experts in the field, and have produced high-quality research that has been recognized nationally and internationally.

With the increasing size of the aging population, rheumatologic diseases associated with aging continue to be a major stress on individuals, our society and healthcare systems. None of these diseases are curable, yet we know that chronic conditions like osteoporosis, rheumatoid arthritis, lupus, osteoarthritis, and scleroderma significantly negatively impact quality of life and the abilities of people to perform activities of daily living. The loss of bone mass, muscle mass and strength can lead to a cascade of negative health consequences. Our research focuses on the development and improvement of methods to detect and assess changes in outcomes at a basic science and clinical level. In turn, this improves our understanding, recognition and diagnosis of rheumatologic diseases and associated conditions such as frailty, which enable us to measure the impact of treatments or other interventions with potential to interrupt these processes. Using valid and rigorous research methodology, we have the ability to improve our understanding of disease and effectively evaluate the influence of potentially disease-modifying interventions. This research has significant and widespread relevance at a national and international level.

Over the next year, we will focus on sustaining all the progress we have made in terms of research education and training, conducting research studies, building research capacity, submitting research grants, and increasing our collaborations nationally and internationally. We will expand our research in education and continue to increase patient involvement and engagement in research. We will collaborate with patient groups and partner with national organizations to build on our reputation in research and education with patients and caregivers. We will increase our capacity for Quality Improvement work and submit operating and catalyst grants that build on our current research. We will continue to collect and analyze data from projects currently underway with a goal towards increasing knowledge translation in terms of presentations at meetings and publications. ■

AMGEN CANADA CHAIR IN NEPHROLOGY

Dr. Richard C. Austin

Dr. Austin currently holds the Amgen Canada Chair in Nephrology which supports biomedical research aimed at better understanding the underlying cellular mechanisms that drive cardiorenal disease. Although it is well established that patients with chronic kidney disease are at high risk of developing heart disease, the underlying mechanisms are relatively unknown. The overall goal of Dr. Austin's research program is to elucidate the underlying cellular stress pathways that contribute to cardiorenal disease, including vascular calcification. This has led to the discovery of several novel cellular factors that influence the development of vascular calcification, the underlying cause of heart disease in patients with impaired kidney function.

Some of the major discoveries in Dr. Austin's laboratory include:

(i) defining the role of endoplasmic reticulum (ER) stress in cardiorenal disease,
(ii) demonstrating a causal role of TDAG51 in driving vascular calcification, and
(iii) identifying novel therapeutic approaches for the treatment of chronic kidney disease and its cardiovascular complications.

The Austin laboratory has recently reported the existence of unique circulating autoantibodies, termed anti-GRP78 autoantibodies, that accelerate the development of atherosclerosis, the underlying cause of heart disease. Studies are now underway to determine whether these autoantibodies contribute to chronic kidney disease. Finally, Dr. Austin has recently reported the novel finding that human variations in the PCSK9 gene modulate kidney function and contribute to heart disease. These important findings may allow for the development of new medicines that are able to treat the development and progression of both chronic kidney disease and cardiovascular disease.

Dr. Austin's role as Research Director is to foster the interaction between biomedical scientists and clinicians/nephrologists in the Divisions of Nephrology and Urology. We have now implemented a translational research program that encompasses a bench to bedside approach. Formal research meetings are now underway to identify important and relevant research areas in nephrology that directly impact patient care and treatment. This will allow both clinician scientists and researchers to develop a dynamic and relevant research program that will tackle the major issues relevant to cardiorenal function and pathology. This combined translational and pre-clinical approach represents a major initiative for the development of novel therapeutic strategies directed against chronic kidney disease and its cardiovascular complications. ■

ANDREW BRUCE DOUGLAS CHAIR IN NEUROLOGY

Dr. John Turnbull

The Andrew Bruce Douglas Chair in Neurology was established in March 2006 to further the clinical, educational, and research aspects of Amyotrophic Lateral Sclerosis (ALS) at McMaster, and this report is for the year 2018-20. As with all tertiary clinics, the Covid pandemic has impacted our activities. With respect to clinical activity, we remain a premier clinical site in Canada for the treatment of ALS, and follow about 350 patients with motor neuron diseases, which places us among the largest ALS clinics in Canada and indeed, North America. Over the last year (2020), much clinical activity has been by videoconference, which has been helpful in many situations and less satisfactory in others. We remain grateful to Hamilton Health Sciences for their ongoing support of the clinic, which includes respiratory technology, speech and language support, social work, seating and mobility support, equipment loans (with the ALS Society of Ontario), and is ably coordinated by Ms Barbara Miller. Ms Shelley Curry provides the logistic and administrative support. We have close collaborations with Dr Siwar Albashir and Dr Andy Freitag for gastrointestinal and ventilation issues, respectively, and Dr Peter Varey for Physiatry support. With respect to education, medical students, residents, and fellows rotate through the clinic. One undergraduate student has undertaken senior thesis projects this last year, with the research component again impacted by Covid. Dr Daniela Trapsa and Mrs Jane Allan coordinate our clinical research activities. We have 6 clinical trials presently ongoing, ramped up from spring 2020 when nearly all our clinical research was stopped. Locally, we are collaborating with Dr Venina Bello Hass in developing a quality of life scale for ALS patients, with Dr Yingfu Li in developing an unbiased test for ALS, and Dr Matt Miller for viral factors influencing ALS progression. We have identified a significant limitation of placebo-controlled trials which has achieved a measure of international recognition and has resulted in the re-interpretation of one therapeutic for ALS. Our basic research continues as we explore the possibility that ALS terminally involves de-differentiation of motor neurons, which may have therapeutic implications. We have examined the possibility that heat is beneficial in ALS model mice, and it is, and may be due to the induction of heat shock proteins. Unfortunately, in spite of our work here and elsewhere, advances that fundamentally affect ALS (and indeed all neurodegenerative diseases) remain elusive. ■

ASTRAZENECA CHAIR IN RESPIRATORY EPIDEMIOLOGY

Dr. Malcolm Sears

Dr. Sears has focused his research interests on the developmental origins of asthma and allergy, as Founding Director of the Canadian Healthy Infant Longitudinal Development (CHILD) Study funded by CIHR and the Allergy, Genes and Environment (AllerGen) Network of Centres of Excellence. This large national longitudinal epidemiological study, involving 3,455 families and numerous investigators across Canada, is now internationally renowned for its research findings. He also continued to participate in analyzing and publishing data from his first longitudinal birth cohort study of 1000 children in New Zealand, commenced in 1972-1973, and now analyzing data from assessments at age 45 years.

The CHILD Cohort Study was initiated at McMaster in 2008 as an intensive investigation of factors responsible for development of allergy and asthma, with emphasis on gene-environment interactions. A very broad definition of the environment included not only indoor and outdoor air, but psychosocial environment including maternal stress, infections, and nutrition. This has allowed expansion of the scope of the study to include the early origins of obesity, metabolic diseases including diabetes, cardiovascular disease, and neurodevelopment. A particular focus of the study has been the influence of the gut microbiome on a wide range of childhood health outcomes. Other work identified early introduction of 'allergenic' foods as effective in reducing sensitization to these foods and reducing the risk of the "atopic march" in children. Numerous analyses in the full cohort and in sub-cohorts are now in progress in multiple institutions across Canada, with increasing involvement of international collaborators. These include studies of environmental pollutants, sleep disorders, neurodevelopment, metabolic disorders, nutrition including sophisticated analyses of components of breast milk, and development of Genetic Risk Scores for several diseases. A great strength of the study is having collected data and biological samples from mothers and most fathers, in addition to that collected in serial assessments of the children from birth to the most recent visits at 8-9 years of age.

In 2017, Dr. Sears passed the Director's role on to Associate Professor Padmaja Subbarao, based at The Hospital for Sick Children, but with a cross-appointment at McMaster. He remained heavily involved in the study, chairing the Publications Committee and editing the many publications emerging from this highly productive study until retiring in September 2019. In April 2019, the Canadian Thoracic Society presented Dr Sears with their Research Excellence Award and in November 2019, he was inducted into the McMaster University Faculty of Health Sciences Community of Distinction, in recognition of his lifetime work in understanding asthma and allergy. ■

AUDREY CAMPBELL CHAIR IN ULCERATIVE COLITIS RESEARCH

Dr. Paul Moayyedi

Established in 2010 via a generous gift from the daughters of the late Audrey Campbell (Linda Campbell, Gaye Farncombe and Susan Grange) via the Crohn's and Colitis Foundation of Canada, the goals of the Audrey Campbell Chair in Ulcerative Colitis Research are to provide leadership in research relevant to improving the health of persons with ulcerative colitis, promote collaborative research across disciplines, and attract outstanding students, research associates and faculty to McMaster University.

Canada has the highest incidence of inflammatory bowel disease (IBD) in the world and it is rising rapidly. It is estimated that almost 1% of Canadians will suffer from IBD in the next 10 years with preteens and adolescents having a particular increase in incidence.

Over the past year, Dr. Moayyedi was the principal applicant on a $12.5 million CIHR grant to study how gut bacteria as well as how diet might interact to cause ulcerative colitis and Crohn's disease. Another important component of this grant is understanding why patients with these diseases are particularly prone to suffer from anxiety and/or depression. We have attracted a further $20 million from various sources to conduct this work. We have formed the IMAGINE network, which involves 17 centres across Canada including all major universities and multidisciplinary researchers such as gastroenterologists, paediatricians, epidemiologists, immunologists, microbiologists, psychiatrists and psychologists. This study is being coordinated at McMaster University and the Farncombe Family Digestive Health Research Institute under his leadership. This is a five-year study that promises to find cures for at least a subset of patients with these diseases, as well as ways to better personalize the treatment of Crohn's disease and ulcerative colitis. Currently, we are in year four of the study with over 4,500 participants recruited. The last year has been particularly challenging with COVID-19 slowing recruitment but we are still on target to complete recruitment by the end of the funding period.

We published the first randomized trial in the world that evaluated transplanting healthy stool into patients with ulcerative colitis, which could bring them into remission. This trial was positive with a success rate similar to current therapies. This is proof of concept that changing gut bacteria can improve ulcerative colitis. We now have up to 4-years follow-up on some patients who have remained in remission, on no medication other than fecal transplants with no relapse of their disease. This paper has been cited over 629 times and was among the top 1% cited articles in its field. Our work has been repeated by others and so far three research centres have replicated our findings with similar studies. We still need to understand better why it is successful in some patients and not others so we can improve the effectiveness of this approach - this will be achieved through the IMAGINE network.

Dr. Moayyedi has 429 publications that have been cited over 58,500 times. This places him as the top 10 most cited authors in gastroenterology in the Google Scholar database. He is also on the ClarivateTM Highly Cited ResearchersTM list of the top 0.1% of world researchers from the last decade. He published 30 peer-reviewed papers and with a total of 6,122 citations in 2020. He presented virtually at the American College of Gastroenterology meeting in 2020.

Paul Moayyedi is Assistant Dean of Research and is promoting clinical research at McMaster University and across Hamilton. He has attracted the inflammatory bowel disease Cochrane Review Group to Canada and now all systematic reviews published in gastroenterology in the Cochrane Library are supported by the Cochrane Gut Group based at Farncombe Family Digestive Health Research Institute. This supports all gastroenterology guidelines in Canada, as well as many US clinical guidelines that guide doctors on how to best treat patients using evidence-based medicine principles. Dr. Moayyedi was a methodologist on the Canadian guidelines on the management of fistulizing Crohn's disease in adults and a separate guideline for pediatric Crohn's disease both published in 2020. He was also instrumental in the development of the first IBD quality guidelines worldwide and this was also published in 2020. This will improve the care of all IBD patients in Canada. He is the President-Elect of Canadian Association of Gastroenterology and was also Chair of Clinical Practice at the American Gastroenterology Association Institute. He was responsible for organizing the clinical part of Digestive Diseases Week – the main research meeting for gastroenterologists worldwide.

In the coming year we plan to:

1. Continue to develop the IMAGINE network to coordinate research across Canada for new approaches to treating patients with IBD. We will also better understand how to manage anxiety and depression that is associated with these diseases.
2. Improve our understanding of how fecal transplant therapy works in ulcerative colitis.
3. Continue to support Canadian and US guidelines on the management of IBD and other GI diseases.
4. Further develop quality measures that will improve the care of IBD patients across Canada. ■

BAYER CHAIR FOR CLINICAL EPIDEMIOLOGY RESEARCH IN BLEEDING DISORDERS

Dr. Alfonso Iorio

Established in 2017 via a generous gift from Bayer Inc., the goal of the Bayer Chair for Clinical Epidemiology Research in Bleeding Disorders is to contribute significantly to the body of scholarship in the area of bleeding disorders through research, teaching and clinical work at McMaster. The Bayer Chair is an integral part of the institutional vision towards establishing and maintaining a world-class program in bleeding disorders research.

Over the first three years as inaugural chairholder, Dr. Iorio has published 41 scientific papers, was awarded a CIHR grant and has been leading the following projects:

1) Expanding the Web Accessible Population PK service (WAPPS-Hemo) research network to include over 500 centers worldwide and delivering approximately 20,000 individualized PK profiles. The tool is recognized worldwide as the reference standard for providing tailored treatment to hemophilia patients. Its use is recommended by the World Federation of Hemophilia guidelines, and it is adopted and integrated into world leading organizations in the field, like UKHCDO, and ATHN.

2) Bringing to McMaster University all the cutting-edge phase III clinical trials in the field of hemophilia, including 4 different gene therapy trials (for we act as Canadian hub, offering enrollment opportunities to patients from all over the country), the novel VWF-decoupled FVIII, bi-specific antibodies, anti-TFPI.

3) Re-establishing the prevalence of hemophilia and estimating for the first time the prevalence of hemophilia at birth, with a landmark paper published on Annals of Internal Medicine. The project was based on an innovative epidemiological approach leveraging the Canadian Bleeding Disorders Registry hosted at McMaster.

4) Expanding the capacity of the McMaster hemophilia research group with the addition of Dr. Davide Matino, a rising star in the field and directing a wet lab research project in factor VIII tolerance and extravascular role of factor IX. As well, Noella Norhona and Suzanne Bajkor have been hired to triple up the research associates running clinical trial in hemophilia. ■

BORIS FAMILY CHAIR IN EDUCATION AND INTERNAL MEDICINE

Dr. Akbar Panju

It gives me great pleasure to provide report on the Boris Family Chair in Education and Internal medicine for the 2018-2019 and 2019-2020. This will be my last report since I have completed my tenure as the holder of this chair. As of July 2020, Dr John Neary is the holder of this chair. I have resumed to be the holder of Medard DeGroote Chair, which I held prior to taking on the Boris Family Chair.

At the outset, I would like to extend my thanks and gratitude for being given the opportunity to be the Boris Family Chair for the last 5 years. My major task, when I took the Chair, was to create a state-of-the-art Ambulatory Medical Clinic and I am happy to say that we now have a vibrant and functional academic ambulatory clinic. The clinic provides exemplary clinical care and an exceptional research and learning environment.

The Boris Clinic has an Executive Committee which oversees the functions of the four components of the Clinic. The Diabetes Care and Research Center, headed by Dr Hertzel Gerstein, continues to provide secondary and tertiary care for patients with diabetes. The Diabetes team also carry out major research activities. The multi-specialty component of Boris Clinic, headed by Dr Martha Fulford, has multiple physicians from multiple specialties providing secondary and tertiary care. In the last 2 years, we have added more physicians in clinics. We were able to achieve this by creating innovative work models for allied health professional and by creative scheduling. I am happy to say that the clinic now works more efficiently. Our Medical Day Care component, headed by Dr Mark Matsos, has been very busy and able to accommodate a large number of patients requiring intravenous infusions and blood tranfusions. Lastly, our General Internal Medicine Rapid Assessment Clinic (GIMRAC) and our Ambulatory Clinical Teaching Unit (A-CTU) , headed by Dr Mohamed Panju, have been very busy. We have internal medicine residents from different levels of training and residents from Family Medicine Training Program rotate on a regular basis. The feedback and evaluation we receive from learners has been very positive. I would like to thank Drs Gerstein, Fulford , Matsos, and Panju for their leadership.

Over the last 2 years, I continued to plan and organize Internal Medicine Review Course which attracted more than 1000 attendees. The speakers at the Review Course are all members of the Department of Medicine. This Review Course which occurred over a 3-day period had over 50 topics in Internal Medicine. The feedback we received was very positive. For the present year, we have started the Virtual Review Course.

I would be remiss if I did not mention the impact that the COVID-19 pandemic has had on the clinic. Despite the challenges it posed, we were able

to continue providing care to our patients and keep the clinic functioning. We were not able to provide on-site visits in most areas and had to rely on virtual visits. As part of our visioning for the clinic, we had already started to adopt virtual visits in certain specialties and therefore, we were well prepared for the transition.

Overall, I feel I was able to accomplish the major task given to me when I took on as a holder of the Boris Family Chair in Education and Internal Medicine. It was a great privilege and I thoroughly enjoyed it. I wish my successor, Dr John Neary, all the best. ■

DAVID BRALEY AND NANCY GORDON CHAIR IN THROMBOEMBOLIC DISEASE

Dr. Jeffrey Ginsberg

Established in 2004 via a generous gift from Mr. David Braley and Mrs. Nancy Gordon, the goal of the David Braley and Nancy Gordon Chair in Thromboembolic Disease is to contribute significantly to the body of scholarship on thromboembolic disease; to mentor and train the next generation of physician scientists in thrombosis research; to develop, implement and evaluate curricular innovations in undergraduate (MD), postgraduate and Continuing Education; and to undertake quality research in thromboembolic disease.

The major foci of my research have evolved over the years. I continue to co-supervise, along with Drs. Eikelboom and Hirsh, the research fellows that have come to McMaster. The fellows include not only local trainees but also trainees from Australia, China, Belgium, Holland, etc.

During 2018-2020, a number of articles were published in peer-reviewed journals. As well, several meetings with trainees have been held to provide focused support on their research. With my upcoming retirement, I would like to congratulate Dr. Jim Douketis, the new Chairholder of this Endowed Chair. I am confident that under his leadership the program will continue to flourish. ■

DOUGLAS FAMILY CHAIR IN GASTROENTEROLOGY RESEARCH

Dr. Alberto Caminero

Dr. Caminero transferred to the Department of Medicine as an assistant professor in the Fall of 2019. As part of the Farncombe Family Digestive Health Research Institute, Dr. Caminero studies mechanisms by which intestinal microbes participate in food sensitivities and chronic disorders such as inflammatory bowel disease (IBD). It is estimated that one fifth of the population worldwide experience adverse reactions to food and IBD affects around 1.6 million people in the USA and 270,000 in Canada. Although the role of the intestinal microbiota in the pathogenesis of these conditions have been proposed, the mechanisms are not well understood. Specifically, the central aim of Dr. Caminero's research program is to identify diet-microbiota interactions for the treatment or prevention of food sensitivities and IBD. The human gut microbiota implies a vast catalog of metabolic pathways that will participate in the digestion of dietary components, even those that are difficult to digest by human digestive enzymes. Dr. Caminero studies the metabolism of dietary components by intestinal microbiota and the determination of the immune and physiological pathways induced in the host by the products of that metabolism. Indeed, he has shown that human intestinal microbiota modifies the immunogenicity of common dietary antigens in vivo, and in this manner may influence risk for food sensitivity and inflammation in genetically predisposed people. His research is supported by the Canadian Institutes for Health Research Foundation (CIHR), Canada Foundation for Innovation (CFI) and a Tri-agency Program award. Dr. Caminero has shown a fruitful publication record with 21 peer-reviewed original publications, 10 reviews, 5 book chapters and 2 editorials, in prestigious journals including Gastroenterology, Nature Communications and Nature Gastroenterology & Hepatology. He is also a member of the Committee of Research Affair of the Canadian Association of Gastroenterology and actively speaks to both the scientific community and the public about his main research program. Dr Caminero has been invited to give 4 national and 8 international talks between 2019 and 2021. ■

ELI LILLY CANADA CHAIR IN OSTEOPOROSIS

Dr. Alexandra Papaioannou

The support of the chair has been vital to build resilience and empower people living with osteoporosis to age with dignity and independence. As a consequence of the COVID-19 pandemic's impact on the social determinants of health for adults living with osteoporosis and fractures, our rapidly aging population, and with more people living with the disease, her work has never been more critical.

Dr. Papaioannou is a national and international leader in osteoporosis research. Her research is informed by real-life environments where she works with patients, families, researchers, policymakers, and industry partners to co-create innovative solutions to improve patient care and quality of life. Her collaborative, user-centric approach bridges the gap between research and clinical practice. She is recognized in the 95th research percentile in the Department of Medicine at McMaster University, has 107 first or senior author peer-reviewed publications, 17 book chapters and 374 research presentations/ abstracts.

She has established the largest regional network of geriatricians with meaningful connections to older adults and embedded her research directly in clinical care. She is actively involved in five national training programs that support her osteoporosis and fracture prevention research program: (1) Canadian Institutes of Health Research (CIHR) Drug Safety and Effectiveness across Cross-Disciplinary Training (DSECT), to teach how to effectively bridge scientific domains for drug safety; (2) Natural Science and Research Council Canada (NSERC) sMAP CREATE training program, to foster a world-class, collaborative training environment and provide high qualified personnel with unique experiential training opportunities in a multi-university, multidisciplinary program centered around technologies and best practices for smart mobility for the aging population; (3) Canada's technology and aging network at AGE-WELL training and mentorship program, to train innovators of tomorrow as they accelerate the delivery of technology-based solutions to make a meaningful difference to the lives of Canadians; (4) Canadian Frailty Network Interdisciplinary Fellowship program, to provide mentorship on how to conduct transformative frailty research; and (5) Canadian Geriatrics Society Mentor, to connect with trainees with experienced clinicians to provide guidance towards a career in geriatric medicine. Dr. Papaioannou is committed to providing trainees from undergraduate students to post-doctoral fellows and early-career researchers with innovative research, mentoring and training opportunities within her osteoporosis research program.

As lead of the Fracture Risk Scale (FRS) program of research, Dr. Papaioannou has the opportunity to make a significant impact on developing service delivery models and health policy changes that will impact vulnerable residents living in long term care worldwide. The FRS predicts hip fracture over a 1-year duration (a 90% reduction in the timeframe of the current gold-standard assessments, the FRAX and CAROC). The FRS is a standardized instrument that automatically generates fracture risk assessments for residents as part of the Resident Assessment Instrument Minimum Data Set Version 2.0. The FRS is currently available in 1200 long-term care homes across Canada that use Point Click Care electronic medical record software and has international recognition from our partner institute in Australia: Australian Institute for Musculoskeletal Science. Dr. Papaioannou will continue to develop tools to use the FRS to its full capability and provide support, strategies, and instruments to enhance uptake.

Dr. Papaioannou is committed to take a leading role in reducing health inequities in osteoporosis research, identify knowledge or research gaps, implement knowledge translation activities, and continue to examine multicomponent fracture prevention models for long term care. She is dedicated to advancing the health and well-being of older adults with osteoporosis. ■

ELI LILLY CANADA/MAY COHEN CHAIR IN WOMEN'S HEALTH

Dr. Shannon Bates

I am very honored to have held the Eli Lilly Canada/May Cohen Chair in Women's Health since January 2014. Dr. Cohen, a former Associate Dean and Professor in the Faculty of Health Sciences well known for her leadership in the field of women's health and contributions to gender equality within the medical profession, is an important role model for me and for other women in medicine. The Eli Lilly Canada/May Cohen Chair in Women's Health was established in 1998 with funding from Eli Lilly Canada Inc. The Chair is responsible for developing an awareness of the current activities in women's health that are in place in the broader academic and health network and for the promotion of McMaster as a leader in women'shealth. The chair will make contributions to the education programs of the faculty, remain a leader in the field and, where appropriate, be involved in clinical work that informs the research agenda.

The support of the Eli Lilly Canada/May Cohen Chair in Women's Health has been instrumental in allowing me to pursue my interests related to women's health. My clinical and academic work focuses on women's issues in thrombosis and anticoagulant therapy, especially as they relate to pregnancy, assisted reproduction, and hormonal therapy. My goal is to enhance the care of women in these settings through physician and patient education, development and dissemination of evidence-based practice guidance, advocacy, and participation in related research.

I hold six half-day clinics per month devoted to issues in women's health and thrombosis. During these clinics, I see women from throughout the region and supervise medical students, local and elective internal medicine and hematology residents, residents in general internal medicine, and thrombosis fellows. Despite the COVID-19 pandemic, no clinics were missed as we were able to pivot seamlessly to a virtual format.

I am a co-investigator and steering committee member for three CIHR-funded studies examining the diagnosis of suspected deep vein thrombosis in pregnancy, the potential use of Aspirin for postpartum thrombosis prophylaxis, the role of complement activation among pregnant patients with obstetrical antiphospholipid antibody syndrome. I continue as a member of a PhD Supervisory Committee for a thesis examining shared decision-making and improving decision-making, particularly in pregnant women facing a decision about thrombosis prophylaxis. The protocol paper for our sequential explanatory mixed methods pilot study protocol has been submitted for peer review.

Between July 1, 2018 and June 30, 2020, I had the opportunity to present sessions on thrombosis and women's reproductive issues at the Annual Meeting of the American Society of Hematology, the American Heart Association Scientific Sessions, the inaugural McMaster University Women's Health Review, and the 15th Annual McMaster Update in Thromboembolism.

I conducted a Master Class on thromboprophylaxis in pregnancy at the XVII Congress of the International Society on Thrombosis and Haemostasis, led a webinar on the prevention and management of venous thromboembolism for the Foundation for Women & Girls with Blood Disorders and delivered a lecture on gender inequities in health research for the Master of Science program in Global Health. The international panel I chaired that was tasked with developing evidence-based guidelines on the diagnosis, prevention, and treatment of venous thromboembolism in pregnancy for the American Society of Hematology, completed its work and these guidelines were published in the Fall of 2018. I was lead or co-author on two additional publications and two book chapters related to women's health and thrombosis. I used my platform as a newly appointed Co-Editor-in-Chief for *Thrombosis Research* to initiate a process to address gender inequities on the journal's Editorial Board and Associate Editor panel. I continued to serve on the Medical Advisory Committee of the Foundation for Women and Girls with blood disorders. ■

FARNCOMBE FAMILY CHAIR IN DIGESTIVE HEALTH RESEARCH

Dr. Stephen Collins

The holder of this chair is Dr. Stephen Collins, Director of the Farncombe Family Digestive Health Research Institute. The support from this chair enables Dr. Collins to direct the research of the Institute and to facilitate its operation. The Institute is focused on digestive health with a particular focus on the role of the intestinal microbiota in the maintenance of health and in the expression of diseases within and beyond the gastrointestinal tract, including the brain. Support from this chair also enables Dr. Collins to pursue his own research program that examines how the intestinal microbiota influences the gut-brain axis in the context of functional gastrointestinal disorders with or without associated psychiatric morbidity. To date, his research program has established a bi-directional interaction between the intestinal microbiota and the gut-brain axis and has demonstrated that the microbiota from patients with functional intestinal disorders have the capacity to induce dysfunction in both the gut and in the brain, and to alter behavioural profiles in ex-germ free mice colonised with microbiota from these patients. In addition, the research team has shown that selected probiotic bacteria can influence brain activity and behaviour in both mice and humans. This work will be continued with the support of the chair. It is expected that this program of research will help identify subsets of patients in whom the microbiota is relevant to the disease phenotype and to offer novel therapeutic strategies for these patients. ■

FARNCOMBE FAMILY CHAIR IN MICROBIAL ECOLOGY AND BIOINFORMATICS

Dr. Jennifer Stearns

Dr. Stearns studies how microbial communities are formed in the gut in early life and what impact the microbiota has on health outcomes and disease risk. To study these questions, she is combining basic microbiology, bioinformatics and epidemiology. In close collaboration with clinical researchers nationally and internationally, Dr. Stearns is studying the interaction of the gut microbiota with metabolic disease and infant development with publications in Gut, Pediatric Obesity, Nature Communications and Frontiers in Microbiology, and received a CIHR Early Career Investigator Award in Maternal, Reproductive, Child & Youth Health. She is most interested in how to maintain a healthy gut microbiota throughout development with a special interest in pregnancy, early life exposures, diet and probiotics. She has recently published on how the persistence of probiotic bacterial strains administered during preterm infant in-hospital stay can have a lasting effect many weeks later. She has also recently uncovered the connection between the gut microbiome in Mexican children and pre-obesity phenotypes such as insulin resistance and high circulating triglycerides. In the field of microbiome research, Dr. Stearns has 4,400 total citations, with over 500 citations per year since 2018 (H-factor of 20) and is invited to speak to both the scientific community and the public about what shapes the gut microbiome and the impact of microbes on human health. ■

FARNCOMBE FAMILY CHAIR IN PHAGE BIOLOGY

Dr. Alexander Hynes

Dr. Hynes joined the Department of Medicine as an assistant professor in the Fall of 2017. His arrival and the creation of the Farncombe Family Chair in Phage Biology follow a renewed global interest in bacteriophages (bacteria-specific viruses) as tools to control and manipulate bacterial populations, especially in the face of the growing antimicrobial resistance crisis. With his lab opening its doors in January 2018, Dr. Hynes rapidly built up his team with seven graduate students (two now graduated), a postdoc, and 12 undergraduate trainees in various capacities. To support his team, in the 2018-2020 academic years, Dr. Hynes was awarded four research operating grants totalling over $750 000, and with his students, over $200 000 in student funding was secured. In that same period, he and his team have presented their research 44 times, seven of which were awarded prizes for their presentation. While building his research group, he has published an important first-author article in Nature Communications in July 2018, which

has already been cited 98 times, as well as two international patents and a notice of disclosure.

The public (and even internal) perception of his field was that it was small, with articles regularly claiming there were only a handful of scientists conducting phage research in Canada. Addressing this critical gap, especially as the applications of phage therapy will require coordinated efforts across a broader base of stakeholders, in early 2020 Dr. Hynes founded "Phage Canada". Its goal is to create a network of researchers, industry, and government in the field. The inaugural symposia were attended by 150 members spanning 43 research teams across 23 different Canadian institutional/governmental/industrial affiliations, connecting many of them for the first time. ■

FREDERICK HARGREAVE / TEVA INNOVATION CHAIR IN AIRWAY DISEASES

Dr. Parameswaran Nair

In the fourth and fifth years of this endowed chair, our research program has continued to grow and attract funding from governmental agencies, biotechnology and pharmaceutical industry. The research program has been recognized by invitations to a number of national and international scientific societies, university, and pharmaceutical industry scientific review committees. The success of the research program is reflected in funding of close to $3.5M, recruitment of four international trainees, two salary support awards from CIHR, 52 peer-reviewed publications some in major medical journals such as the *New England Journal of Medicine*, and 85 national and international invited lectures. A major achievement has been bringing on faculty three of my post-doctoral trainees. Dr. Terence Ho, Dr. Mukherjee and Dr. Svenningsen were appointed to our division as assistant professors, leading their own programs. Dr. Ho is directing a program that investigates mechanisms of exacerbations of COPD and strategies to decrease hospitalizations and health care utilization, through grants from CIHR and HAHSO. Dr. Manali Mukherjee is funded by a CIHR/CAAIF/AllerGen/AZ career award in translational airway immunology, and Dr. Sarah Svenningsen has been awarded a tier-2 Canada Research Chair in Airway Imaging Research, to continue to lead Canada's leading translational pulmonary imaging MRI program. ■

HAMILTON HOSPITALS ASSESSMENT CENTRE ENDOWED PROFESSORSHIP IN NEUROMUSCULAR DISEASE

Dr. Steven Baker

The Hamilton Hospital Assessment Centre Endowed Professorship in Neuromuscular Disease has permitted continued productivity in the Peripheral Neuropathy Clinic. Charcot-Marie-Tooth Disease (CMT) continues to be a focus. I have recently participated in an international Delphi survey addressing the topic of pediatric CMT management. This was the first collaboration to address the knowledge gap in this area of medicine. Additionally, we have shown that a home-based series of balance exercises in CMT patients can improve both static and dynamic balance.

Chronic inflammatory demyelinating polyneuropathy (CIDP) continues to be a focus for the Peripheral Nerve Clinic. I am collaborating with Dr. Hans Frykman from the BC Neuroimmunology Laboratory and investigating novel antibodies that are proving to be pathogenic (i.e., NF-186, NF-155, CNTN1). I presented a talk on CIDP (Chronic Inflammatory Delaminating Paranodopathy) at the 53rd Annual Canadian Neurological Sciences Federation (CNSF) Congress. I have one of the largest databases of seropositive CIDP cases in Canada. Dr. Adrian Opala, a fellow working under my supervision, has published the effects of IVIg therapy with regards to nerve conduction studies and strength data in a cohort of CIDP patients. This work has shown that peak strength occurs after three to six months of treatment, suggesting that Ig-based treatments may require greater persistence than initially thought.

I continue to work with AKCEA and Alnylam with regards to their anti-sense oligonucleotide drugs which target transthyretin (TTR) as a treatment for hereditary amyloidosis. I am the only physiatrist in Canada to be participating in the rollout of these medications. As such, I am McMaster's point physician for the neurological evaluation of these patients in collaboration with Dr. Katie Connolly.

Collaborations with Dr. Stuart Phillips continue with regards to muscle metabolism and strategies to minimize sarcopenia and disuse atrophy. My goal is to explore the effects of strength training on muscle protein synthesis in patients with CMT. ■

HEART AND STROKE FOUNDATION / J. FRASER MUSTARD CHAIR IN CARDIOVASCULAR RESEARCH

Dr. Jeffrey Weitz

Dr. Weitz has held this endowed chair since 2000, with renewals granted in 2005, 2010, 2015 and 2020. With a $1 million endowment from the Heart and Stroke Foundation of Ontario and a matching amount from McMaster University, the interest from this chair has been used to support the Thrombosis and Atherosclerosis Research Program. Funds have been used to supplement the salaries of new investigators.

With this Chair, the thrombosis group has expanded over the past five years with the recruitment of Drs. Noel Chan and Davide Matino. The increase in critical mass has expanded research, educational and clinical capabilities. Currently, the thrombosis research group oversees research projects that span the spectrum from basic research, to translational studies that link basic science with patient-oriented research, to clinical trials, to health outcomes research, and on to knowledge translation. In addition, the group has supervised 20% of all of the MSc and PhD candidates who have received degrees under the supervision of faculty members within the Department of Medicine over the past five years. ■

HEART AND STROKE FOUNDATION / MARION W. BURKE CHAIR IN CARDIOVASCULAR DISEASE

Dr. Salim Yusuf

Established in 1997 via a gift from the Heart and Stroke Foundation of Ontario, the goal of the Heart and Stroke Foundation/Marion W. Burke Chair in Cardiovascular Disease is to focus on the field of cardiovascular disease and address scientific uncertainty and contribute significantly to the body of scholarship through teaching and research.

The goals of the chair are to develop the evidence base and strategies that will reduce premature CVD deaths globally by 30% by 2030 (compared to the rates in 2000). In addition, we are working with basic scientists to build new bridging programs in translational research.

ACCOMPLISHMENTS

1. Improving outcomes in cardiovascular diseases and identifying new therapies through randomized clinical trials.
2. Understanding the societal, the environmental, behavioural and genetic causes of cardiovascular disease globally.

3. Documenting the clinical course of cardiovascular diseases that have been less well studied.
4. Improving the implementation of strategies for the control of cardiovascular risk factors.
5. A new program of studies in COVID-19.

FUTURE DIRECTION

The future focus is mainly related to building upon existing studies and completing several ongoing major activities and studies within the above themes. In addition, we have embarked on a major initiative on identifying new pathways for CVD using stored samples with the new technologies of proteomics, genomics and metabolomics, combined with new analytic approaches (such as Mendelian randomization and Artificial Intelligence). In addition, we are planning new initiatives on brain health with a focus on vascular dementia and cognitive decline, as well as a new translational research program in molecular epidemiology.■

HEART AND STROKE FOUNDATION / MICHAEL G. DEGROOTE CHAIR IN POPULATION HEALTH RESEARCH

Dr. Sonia Anand

Dr. Anand received the Heart and Stroke Foundation / Michael G. DeGroote Chair in Population Health Research at McMaster University in 2008, and it was renewed in 2013 and 2018. The mandate of this chair is to improve research in population health as it relates to cardiovascular disease. Dr. Anand's research focuses on understanding the contribution of environmental and genetic factors on the development of cardiovascular risk factors and cardiovascular disease. She has a particular interest in conducting intersectoral research including ethnicity, sex/gender, and social factors.

The two major themes of Dr. Anand's work include:

1. Understanding the environmental and genetic causes of cardiovascular risk factors including type 2 diabetes, and cardiovascular disease among high-risk groups including people of South Asian origin, Indigenous people, and women.
2. Developing and evaluating health behaviour interventions to modify risk in high-risk groups.

Dr. Anand is leading the Canadian Alliance of Healthy Hearts and Minds (CAHHM) study funded by the Canadian Partnership Against Cancer and the Heart and Stroke Foundation. CAHHM recruited > 10,000 people living in Canada including the establishment of a new Indigenous cohort recruiting > 1,000 men and women from 8 Indigenous communities.

In the COVID-19 pandemic response, Dr. Anand and her colleagues are investigating vaccine hesitancy, immunogenicity, and effectiveness in the South Asian population in Canada

Key publications include:

1. **Anand SS**, Abonyi S, Arbour L, Balasubramanian K, Brook J, Castelden H, Chrisjohn V, Cornelius I, Davis AD, Desai D, De Souza R, Griedrich MG, Harris S, Irvine J, L'Hommecourt J, Littlechild R, Mayotte L, McIntosh S, Morrison J, Oster RT, Picard M, Pictou Landing First Nation, Poirier P, Schulze KM, Toth EL. Explaining the variability in cardiovascular risk factors among First Nations communities in Canada: a population-based study. Lancet Planetary Health 2019 Dec;3(12):e511-20.

3. **Anand SS**, Tu J, Desai D, Awadalla P, Robson P, Jacquemont S, Dummer T, Le N, Parker L, Poirier P, Teo K, Lear SA, Yusuf S, Tardif JC, Marcotte F, Busseuil D, Despres FP, Black SE, Kirpalani A, Parrage G, Noseworthy MD, Dick A, Leipsic J Kelton D, Vena J Thomas M, Schulze KM, Larose E, Moody AR, Smith EE, Friedrich MG on behalf of the Canadian Alliance for Health Hearts and Minds Cohort. Cardiovascular risk scoring magnetic resonance imaging detected subclinical cerebrovascular disease. Eur Heart J Cardiovasc Imaging 2020 Jun 1;21(6):692-700.

4. **Anand SS,** Friedrich MG, Desai D, Schulze KM, Awadalla P, Busseuil D, Dummer T, Jacquemont S, Dick A, Kelton D, Kirpalani A, Lear SA, Leipsic J, Noseworthy MD, Parker L, Parraga G, Poirier P, Robson PJ, Tardif JC, Teo K, Vena J, Yusuf S, Moody AR, Black SE, Smith EE. Canadian Alliance for Healthy Hearts and Minds Cohort. Reduced Cognitive Assessment Scores Among Individuals with Magnetic Resonance Imaging-detected Vascular Brain Injury. Stroke 2020 Apr:51(4):1158-1165.

5. Gerstein HC. Smith, EE, Ramasundarahettige C, Desai D, Awadalla P, Broet P, Balck S, Dummer TJB, Hicks J, Moody A, Tardif JC, Teo KK, Vena J, Yusuf S, Lee DS, Friedrich MG, **Anand SS**. Diabetes, Brain Infarcts, Cognitive Impairment and Small Vessel Disease in the Canadian Alliance for Healthy Hearts and Minds Study. J Clin Endocrinol Metab Jan 23;106(2):e891-e89. ■

JACK HIRSH/PHRI CHAIR IN THROMBOSIS AND ATHEROSCLEROSIS RESEARCH

Dr. John Eikelboom

John Eikelboom is a Professor in the Department of Medicine, McMaster University, haematologist in the Thrombosis Service, Hamilton General Hospital, and Senior Scientist, Population Health Research.

Over the past four years since being awarded the Jack Hirsh/PHRI Chair in Thrombosis and Atherosclerosis, he has obtained further peer reviewed funding support from the Canadian Institutes for Health Research and the National Health and Medical Research Council of Australia to support his research into the prevention and management of thromboembolism and bleeding. More recently, he has received support for a multicentre randomized trial testing promising therapies for COVID-19. During this time, he has published >200 papers peer reviewed papers, including first and senior authored papers in the *New England Journal of Medicine* and *Lancet*, and his work has been cited in national and international treatment guidelines and consensus conferences.

Since 2014, he has been listed annually among the top 1% of most cited researchers in clinical medicine (Recipients - Highly Cited | Researcher Recognition (webofscience.com)) and in 2018, he received the Jack Hirsh Award for Outstanding Academic Achievement from the Department of Medicine. ■

J. BRUCE DUNCAN CHAIR IN METABOLIC DISEASES

Dr. Greg Steinberg

A disparity between cellular energy demand and nutrient availability is a key factor contributing to metabolic diseases including obesity, non-alcoholic steatohepatitis (NASH), type 2 diabetes, as well as cardiovascular disease and many cancers. Dr. Steinberg's research into mechanisms regulating energy sensing has formed the basis for the development of several new classes of therapeutics. Specific highlights from 2018-2020 included the approval of the ATP citrate lyase (ACLY) inhibitor bempedoic acid for the lowering of LDL-cholesterol and small molecules targeting AMP-activated protein kinase (AMPK) and Acetyl-CoA Carboxylase (ACC) entering phase 2/3 clinical trials for non-alcoholic steatohepatitis (NASH).

Additional research accomplishments from 2018-2020 included: the graduation of 5 PhD and 5 MSc. students, receiving funding for a Tier 1 Canada Research Chair and a CIHR Foundation Grant, and delivering over 30 invited presentations at national and international meetings (including 3 plenaries). During this time period, our research team also published 26 peer-reviewed manuscripts highlighted by:

1. A comprehensive invited review article on the physiological significance and therapeutic targeting of the AMP-activated protein kinase (Steinberg and Carling *Nature Reviews in Drug Discovery* 2019).
2. The discovery that inhibiting lipid synthesis, by targeting two key phosphorylation sites on acetyl-CoA carboxylase, can reduce liver cancer in mice (Lally et al. *Cell Metabolism* 2019).
3. The discovery that the type 2 diabetes medication metformin reduces body mass and blood glucose, in mice and humans, by enhancing the production of a hepatocyte derived endocrine factor called growth differentiation factor 15 (Day et al. *Nature Metabolism* 2019). ■

JOHN G. KELTON CHAIR IN TRANSLATIONAL RESEARCH

Dr. Donald M. Arnold

Dr. Donald M. Arnold holds the John G. Kelton Chair in Translational Research. He is the Director of the McMaster Centre for Transfusion Research.

Dr. Arnold's team is focused on clinical and laboratory-based research in blood transfusion and bleeding disorders. Priority research areas include optimal utilization of blood products and novel tools to identify trends in blood product use over time. The McMaster Centre for Transfusion Research is at the forefront of large clinical trials and patient registries that support a research platform spanning from blood donors to blood recipients. The Centre continues to advance clinical and immunology research and innovative clinical trials, with collaborators across Canada and internationally.

Translational studies in immune-mediated platelet diseases have influenced treatment guidelines for patients and advanced research methods in rare disease research. Dr. Arnold's team is leading several multicentre studies in therapeutics related to bleeding disorders, which will have direct clinical impact on patient care. New diagnostic strategies, novel biomarkers, and the role of cellular immunity are current areas of active research. The team's research in blood transfusion ranges from biomarkers to clinical outcomes with the goal of improving blood product use and sustainability. Dr. Arnold's team is dedicated to expanding existing research databases to create province-wide and ultimately, national registries. This data platform will enable research across Canada that will ensure a safe and sustainable blood supply.

In response to the COVID-19 pandemic, Dr. Arnold's team launched a large international trial to evaluate the efficacy and safety of COVID-19 convalescent plasma as a potential treatment for COVID-19. The CONCOR-1 trial enrolled patients from across Canada, New York City and Brazil. Under Dr. Arnold's leadership, the trial team quickly mobilized investigators, collaborators, and three large blood suppliers to access this new potential treatment. The trial included a community-led advisory committee, and a novel plasma distribution program that will inform future trials. The CONCOR-1 trial was stopped in January 2021 on the recommendation of the independent data safety monitoring committee, and the team is now gathering the final data to analyze and publish the results rapidly. Tied to the clinical research program, Dr. Arnold's team also shifted to study the immune response to COVID-19 infection. In collaboration with Dr. Ishac Nazy and the platelet immunology laboratory, Dr. Arnold's team developed novel antibody tests and cell-based assays to understand protective immunity and determine how long it lasts. The translational focus of this research program combined both clinical and laboratory research goals to address the COVID-19 pandemic.

Dr. Arnold's group is funded by Canadian Institutes of Health Research, Canadian Blood Services, the Ontario Ministry of Health, Health Canada and McMaster University. ■

JOSEPH E. DESROCHES CHAIR IN BONE MARROW TRANSPLANTATION

Dr. Irwin Walker

Established in 2015 via a generous gift from Mr. E.J. DesRoches and funding from McMaster University, the goal of the Joseph E. DesRoches Chair in Bone Marrow Transplantation is to contribute significantly to the body of scholarship in the area of bone marrow transplantation as a treatment for cancer.

FOCUS

The focus of the Chair's research continues to be on graft-versus-host disease, which is the most frequent and serious complication of bone marrow transplantation (also known as stem cell transplantation).

ACCOMPLISHMENTS

The main activity for the last few years has been to investigate the use of anti-thymocyte globulin (ATG) in preventing graft-versus-host disease. A multicentre and multi-national randomized trial headed by the Chair has established ATG as standard therapy in all transplant centres across Canada and elsewhere. The final results of this trial were published in Lancet Haematology during this year.

ONGOING ACTIVITIES

Though the incidence of graft-versus-host disease has now decreased through the use of ATG, it still remains a problem for many patients, so more research is needed. To this end and continuing the focus of the Chair on randomized trials, an investigation has been started into the efficacy of a newly proposed preventive measure - the injection of cyclophosphamide to recipients after receiving their transplant graft. This procedure is called Post-Transplant Cyclophosphamide, or PTCy. Cyclophosphamide kills those immune cells that cause graft-versus-host disease. While a comparison of ATG with PTCy would be a reasonable option to pursue, Canadian centres did not wish to withhold ATG, our recently proven therapy, from half of the patients. Instead, they were in favour of a bolder design - to randomize patients to receive or not to receive PTCy. while still receiving ATG. On the other hand, Canadian centres counselled caution in favour of a small pilot trial. The design of the trial is as a "randomized pilot (syn. feasibility) trial", following methodologies described predominantly by McMaster researchers and adopted by the international journal editors' organization (CONSORT). Funding and ethics approval for this trial have been obtained, and six centres have signed agreements to participate.

FUTURE

The vision for the future is a full-scale phase III randomized controlled trial as an expansion of the pilot trial described in the previous paragraph. Such a trial poses the challenge of recruiting a much larger cohort of participating patients. To facilitate this, the Chair with the assistance of the Clinical Trials Committee of Cell Therapy and Transplantation Canada has signed an agreement between McMaster University and the Australasian Leukaemia

and Lymphoma Group to conduct this trial as a partnership. This will allow some major Australian centres to participate and has kicked off discussions toward a broader CTTC-ALLG research alliance.

PUBLICATIONS IN 2020

1 Walker I, Panzarella T, Couban S, Couture F, Devins G, Elemary M, et al. Addition of anti-thymocyte globulin to standard graft-versus-host disease prophylaxis versus standard treatment alone in patients with haematological malignancies undergoing transplantation from unrelated donors: final analysis of a randomised, open-label, multicentre, phase 3 trial. The Lancet Haematology. 2020 Jan;S2352302619302200.

2 Bonifazi F, Rubio M-T, Bacigalupo A, Boelens JJ, Finke J, Greinix H, et al. Rabbit ATG/ATLG in preventing graft-versus-host disease after allogeneic stem cell transplantation: consensus-based recommendations by an international expert panel. Bone Marrow Transplant. 2020 Jun;55(6):1093–102. ■

LEO PHARMA CHAIR IN THROMBOEMBOLISM RESEARCH

Dr. Mark Crowther

Dr. Crowther is currently Chair and a Professor in the Department of Medicine. He also holds the positions of co-chair, Senior Research Committee, Heart and Stroke Foundation of Canada, and Treasurer of the American Society of Hematology. Dr. Crowther completed the Career Investigator Award Program from the Heart and Stroke Foundation of Canada in 2016 and holds the Leo Pharma Chair in Thromboembolism Research at McMaster University. His research focus is on studies designed to improve the quality of anticoagulant care and his endeavors include a wide variety of projects examining the optimal methods to prevent and treat both arterial and venous thrombosis. Working closely with a large group of collaborators, Dr. Crowther continues to lead systematic reviews and meta-analyses examining various aspects of anticoagulant care and control. His work also extends to other areas of benign hematology, including evaluation of patients with immune mediated hematologic disorders. Dr. Crowther was inducted into the Royal Society of Canada in 2017 and is on Clarivate Analytics' list of most cited scientists in Health Research. ■

MARTA AND OWEN BORIS CHAIR IN STROKE RESEARCH & CARE

Dr. Ashkan Shoamanesh

Dr. Shoamanesh's main research focus is the characterization of hemorrhage-prone cerebral small vessel disease (CSVD), namely, hypertensive arteriopathy and cerebral amyloid angiopathy, and the optimization of clinical care in this patient population. The risk-benefit analysis of antithrombotic and fibrinolytic therapy in patients who have previously suffered hemorrhagic strokes, or have underlying hemorrhage-prone CSVD, is of particular interest. His personal and collaborative research in the last two academic years has shown that:

i) Patients with acute ICH and cerebral microbleeds or white matter hyperintensities on MRI respond similarly to intensive blood pressure lowering in subgroup analyses of the NIH-funded ATACH-2 randomized trial,

ii) Patients with cerebral microbleeds on MRI are associated with a 2-fold increased risk of future ischemic stroke, 4.5-fold increased risk of intracerebral hemorrhage and 1.35-fold increased risk of both incident dementia and all-cause mortality,

iii) There is an overrepresentation of the apolipoprotein E epsilon 2 allele in cerebral amyloid angiopathy patients with cortical superficial siderosis on MRI, iv) racial/ethnic disparities in ICH recurrence with greater risk of recurrence in Asian and Black patients,

iv) A reduced incidence of covert cerebral infarcts with statin treatment,

v) There exists broad variability in physician practice and equipoise surrounding optimal stroke prevention in intracerebral hemorrhage survivors with atrial fibrillation, and

vi) Systemic delays in the administration of intravenous thrombolysis to acute ischemic stroke patients during the 1st wave of the COVID-19 pandemic.

As principal investigator (PI) of the Non-Vitamin K Antagonist Oral Anticoagulants for Stroke Prevention in Patients with Atrial Fibrillation and Previous Intracerebral Hemorrhage (NASPAF-ICH) trial, he led the first completed pilot trial establishing the feasibility of a multicenter main phase randomized trial assessing optimal antithrombotic therapy in patients with atrial fibrillation and previous intracerebral hemorrhage. On the basis of these preliminary findings, he now leads the ongoing Edoxaban for Intracranial Hemorrhage survivors with Atrial Fibrillation (ENRICH-AF; NCT03950076) trial that is being activated at a target of over 300 sites in 21 countries. He is the Canadian National PI of the NIH-funded SATURN (NIH-StrokeNet; NCT03936361) assessing the effect of statin continuation compared with discontinuation on recurrent hemorrhage in patients with lobar ICH, and also serves on the Steering and/or Executive Committees of several public and industry funded international randomized trials, including

the ASPIRE (NIH-StrokeNet; NCT03907046), ANNEXA-I (Portola pharmaceuticals; NCT03661528), PACIFIC-Stroke (Bayer AG; NCT04304509), and NAVIGATE ESUS (Bayer AG; NCT02313909) trials. He is the Adjudication Committee Co-Chair of INVICTUS (Bayer AG; NCT0283253), and on the Data Safety Monitoring Board of CONVERT (Bayer AG; NCT04523220) and RE-THINc ESRD (Bayer AG; NCT04534114). Moreover, he continues in his role as Chair of the Canadian HEmorrhagic Stroke trIals initiatiVE (CoHESIVE; www2.phri.ca/cohesive).

His work was recognized by the 2019 Heart and Stroke Foundation of Canada Henry J.M. Barnett Scholarship (recognizing the highest ranked National New Investigator in cerebrovascular disease research), the 2019 American Heart/Stroke Association Robert G. Siekert New Investigator and Paul Dudley White International Scholar Awards, and the 2020 American Academy of Neurology Michael S. Pessin Stroke Leadership Prize. He has been awarded over $28.3 million CAD in operational research funding as PI during this time. ■

MCMASTER UNIVERSITY / GLAXOSMITHKLINE CHAIR IN LUNG IMMUNOLOGY AT ST. JOSEPH'S HEALTHCARE

Dr. Mark Larché

Dr. Mark Larché was appointed to the McMaster University/GSK Chair in Lung Immunology at St. Joseph's Healthcare in March 2008. This chair was renewed in 2013 for a further 5-year term. Funding in 2018-2020 to support research activities associated with this Chair came from CIHR, the National Institutes of Health (USA), Hamilton Scleroderma Group, and Adiga Life Sciences Inc. Active areas of research within the laboratory were:

1 The role of T lymphocytes in the pathogenesis of asthma/allergic airways disease (together with Dr. Gail Gauvreau, Dr. Paul O'Byrne, Dr. Helen Neighbour and Dr. Mark Inman, NIH). Investigation of chemokine receptor usage by allergen-specific T cells provides insight into why chemokine receptor antagonists for asthma have been disappointing in the clinic

2 Mechanisms of peptide-induced immune tolerance (with Dr. Elena Tonti, NIH, Adiga Life Sciences). Inhibition of IL-8-secreting T cells following peptide immunotherapy;

3 The pathogenesis and treatment of scleroderma (with the Hamilton Scleroderma Group, Dr. Boyang Zhang, Dept. Chemical Engineering). Assessing pro-fibrotic properties of patient serum in 3-D microvascular networks

4 Development of peptide immunotherapy for peanut allergy (together with Dr. Manel Jordana, and Dr. Susan Waserman; Aravax Pty Australia). Evaluation of efficacy and mechanism of action of a peanut allergy vaccine now in clinical trials

5 Pathogenesis and treatment of rheumatoid arthritis (with Dr. Maggie Larché, Dr. Derek Haaland & Dr. Elena Tonti; CIHR, Adiga Life Sciences). A pre-clinical model of RA has been developed, and is being investigated for signs of interstitial lung disease

6 The role of complement proteins in the pathogenesis of pulmonary fibrosis in graft versus host disease. A Crispr-Cas9-based intervention has been developed for experimental GvHD

Collaborative projects are currently underway with other faculty at McMaster University and St. Joseph's Healthcare within the Firestone Institute for Respiratory Health, the Division of Nephrology, the Division of Hematology & Thromboembolism, the McMaster Immunology Research Centre within the Department of Pathology & Molecular Medicine, and the Department of Chemical Engineering at McMaster University. ■

MICHAEL G. DEGROOTE CHAIR IN INFECTIOUS DISEASES

Dr. Mark Loeb

Dr. Loeb has completed the third year of a cluster randomized controlled trial to assess whether adjuvanted influenza vaccine in children leads to greater herd immunity. The trial is being conducted in a unique setting: Hutterite colonies in Alberta and Saskatchewan. In 2020, Dr. Loeb received funding from CIHR to conduct a longitudinal cohort study of COVID-19 in Hutterite colonies to better under understand the impact of pre-existing antibiotics to elicit protection in both individuals as well as the impact of herd immunity against COVID-19 at the community level. Dr. Loeb is the principal investigator of a trial funded by Joint Global Health Trials competition of UK MRC Wellcome Trust to assess whether inactivated vaccine can reduce adverse vascular events. This is an international trial being conducted in 10 countries and in collaboration with Dr. Salim Yusuf and other colleagues at PHRI. There have been about 5,000 participants enrolled in this study which is currently in progress. Dr. Loeb obtained funding from CIHR in 2020 to conduct a randomized trial of surgical masks versus N95 respirators to protect healthcare workers against COVID-19. This is an international trial which has been cited by WHO as a critically important study. Dr. Loeb is also leading a cohort study of Lyme disease which is funded by CIHR. Dr. Loeb was named a Fellow of the Canadian Academy of Health Sciences in 2019 and a Fellow of the Royal Society of Canada in 2020. ■

MICHAEL G. DEGROOTE CHAIR IN STROKE PREVENTION

Dr. Mukul Sharma

Dr. Sharma's research focus remains on stroke prevention in the subacute phase of stroke and TIA and the prevention of covert infarcts – imaging defined infarcts which are not recognized acutely due to subtle or non-acute deficits. These infarcts are more common than clinically recognized stroke and are associated with cognitive, motor and possibly psychiatric manifestations. Following on the success of COMPASS, which demonstrated the benefit of combining an anticoagulant and antiplatelet in stroke prevention, a new trial is underway using this combination in the acute period following minor stroke and TIA. Critical to future developments in this area is the need for careful dose development in stroke patients. AXIOMATIC SSP is a large international trial whose aim is to establish a safe and effective dose of a new class of anticoagulants in stroke prevention. The design of this trial owes much to the insights gained from the MRI substudies in COMPASS and NAVIGATE. Combining imaging derived outcomes with clinical events comprehensively captures damage to the brain and increases trial efficiency. Previously, antithrombotic doses were developed in models of venous thrombosis for use in stroke populations. AXIOMATIC SSP represents the vanguard of a new design of trials to address this issue in stroke patients. COVID-19 has significantly slowed the pace of clinical research and modification of our trial methods was required to ensure safety of participants and staff. These changes have mirrored the sweeping move to virtual care in stroke prevention and acute treatment throughout the regional and provincial networks. Dr. Sharma has assumed leadership in the Regional Stroke Program and now serves as its Medical Director and will lead the medical initiatives adapting to this reality while continuing to improve quality of care. ■

MICHAEL G. DEGROOTE PROFESSORSHIP IN STROKE MANAGEMENT

Dr. Demetrios (James) Sahlas

Dr. Sahlas has continued to promote interprofessional collaboration with respect to quality improvement research in the management of stroke. His work on carotid revascularization pathways brings together stakeholders from Neurology, Neurosurgery, Interventional Neuroradiology, and Vascular Surgery, as well as nursing and administrative leadership to optimize patient outcomes. He continues to serve as the clinical stroke prevention lead at Hamilton Health Sciences and as a member of the Central South Ontario Regional Stroke Steering Committee.

The stroke research group based at the Hamilton General Hospital was able to retain its research personnel and continued to recruit into several important stroke clinical trials, despite the COVID-19 pandemic. The support and leadership of research administration at Hamilton Health Sciences played a critical role in this accomplishment. As a result, Dr. Sahlas and his colleagues are well-positioned to maintain McMaster University's prominent national and international role as leaders and key collaborators on the success of multicentre stroke trials. ■

MORAN CAMPBELL CHAIR IN RESPIRATORY MEDICINE

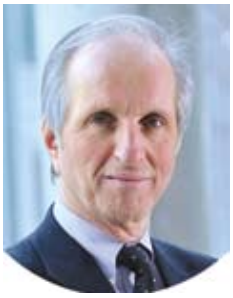
Dr. Martin Kolb

Dr. Martin Kolb's major research area is focused on mechanisms of lung injury, repair and fibrosis, particularly in Idiopathic Pulmonary Fibrosis (IPF). He has a strong interest in growth factor biology (e.g. TGFß and IL-1), extracellular matrix, and mesenchymal cell progenitors (mesenchymal stem cells and fibrocytes). In his lab, he uses a variety of animal models to study disease mechanisms as well as the efficacy of novel drugs in the preclinical setting. Further, Dr. Kolb leads activities in biomarker development for lung fibrosis and he participates as a principal investigator and steering committee member on numerous clinical trials on interstitial lung disease. Dr. Kolb has over 240 peer-reviewed publications in journals such as *New England Journal of Medicine* (2 papers since 2018), *Journal of Clinical Investigation, American Journal of Pathology, American Journal of Respiratory and Critical Care Medicine, Journal of Immunology, European Respiratory Journal* and many others. His H-factor is 60. He is/was funded by CIHR, NIH, CFI, OTS and different Pharmaceutical companies over the years. He has received career awards from the Parker B. Francis Families Foundation, the Department of Medicine at McMaster, and the New Investigator Award from the Canadian Institute for Health Research.

Dr. Kolb is very active in scientific publications. He was a deputy editor for *Respirology*, the official journal of the Asian Pacific Society for Respirology, and associate editor for *Thorax* — journal of the British Thoracic Society. Since 2018, he is a chief editor for the *European Respiratory Journal*, ranked number 3 amongst more than 60 specialty journals in respiratory medicine globally, with a current impact factor of 12.44. ■

POPULATION HEALTH INSTITUTE CHAIR IN DIABETES RESEARCH AND CARE

Dr. Hertzel Gerstein



This chair was established in 2001 to provide broad support for research activities focused on the prevention and treatment of dysglycemia and its serious consequences. Dr. Gerstein is pursuing these goals through a broad range of research-related activities at the international, national and local levels. These activities include (but are not limited to):

a) International PI and leader of the 4000-person AMPLITUDE O trial of the effect of an injected GLP-1 receptor analog on cardiovascular and renal outcomes in people with diabetes and either cardiovascular or renal disease

b) Ongoing analyses of the recently completed 9901-person REWIND trial of a GLP-1 analog on serious health outcomes in people with diabetes that he led as international PI, and in which he published that the intervention reduced a first and recurrent cardiovascular outcomes, strokes, renal outcomes, and cognitive impairment

c) Collaboration on proteomic and genomic analyses of 8000 participants followed for up to 8 years in the ORIGIN trial that identified several causal protein mediators of cardiovascular and renal diseases, and targets for novel drug therapy in people with and without dysglycemia,

d) Collaboration with basic scientists to determine that metformin's metabolic effects are mediated by metformin-mediated GDF15 secretion – a relationship he discovered during analyses of the ORIGIN trial data

e) Epidemiologic and ancillary analyses of data collected in a variety of these and other completed global trials and epidemiologic studies that have identified capillary disease as a mediator of the cardiovascular consequences of dysglycemia

f) Conceptualization and chair of a program of research including four multi-centre trials focused on testing therapies that could induce remission of type 2 diabetes

In addition to these clinical research activities, he continues to collaborate with colleagues at McMaster in research using animal and cellular models of dysglycemia to identify the mechanisms underlying the development of diabetes, and the relationship between dysglycemia and cardiovascular diseases, mortality, cognitive decline, and cancers. Dr. Gerstein's research is currently funded by peer-review agencies and industry, and is conducted through the Population Health Research Institute, where he is deputy director.

During the two academic years ending in June 2020, Dr. Gerstein published more than 48 articles and editorials in major peer-reviewed journals and

presented data and perspectives as an invited guest speaker, commentator, or faculty member at 39 national and international scientific meetings. In 2019, he was elected to and inducted as a fellow of the Canadian Academy of Health Sciences. Based on his research contributions from 2010-2020, ExpertScape ranks Dr. Gerstein in the top 20 of all type 2 diabetes experts in the world (expertscape.com). ■

RICHARD HUNT / ASTRAZENECA CHAIR IN GASTROENTEROLOGY

Dr. Premysl Bercik

Growing evidence suggests that the gut microbiota is a major player in health and disease, affecting the function not only of the digestive tract, but also of distant organs, including the central nervous system. Dr. Bercik's research focus remains on the microbiota-gut-brain axis, a bidirectional communication between the digestive system and the brain, and its role in chronic gastrointestinal diseases.

His current research in animal models investigates how gut bacteria modulate visceral sensitivity, gastrointestinal motility, and mouse behavior through the production of immunomodulatory and neuroactive metabolites. Dr. Bercik's research is highly translational, providing proof of concept studies, from bench to bedside. Using microbiota transplantation into germ-free mice, his team studies how specific bacteria obtained from patients with Irritable Bowel Syndrome (IBS), chronic constipation or patients diagnosed with anxiety or depression, affect mouse gut and brain function. His clinical research applies the finding from animal models by investigating the mechanisms underlying pain signaling and motility regulation by specific microbial strains, and their modulation by dietary components. Ongoing clinical trials study the role of wheat proteins in patients with IBS, or those with type 1 diabetes that suffer with severe dyspepsia and gastroparesis.

His basic research is supported by the Canadian Institutes for Health Research and the National Institutes of Health (USA) grants, with additional funding from the W. Garfield Weston Foundation, the Biocodex Foundation, the Canadian Digestive Health Foundation and the Society for Study of Celiac Disease. He is also co-principal investigator of a pan-canadian CIHR SPOR grant investigating the role of gut microbiota and diet in patients with chronic gastrointestinal illnesses, including Inflammatory Bowel Disease and IBS.

For his research achievements, Dr. Bercik was awarded the 2021 Canadian Association of Gastroenterology Research Excellence Award. ■

STUART CONNOLLY CHAIR IN CARDIOLOGY RESEARCH

Dr. Jeff Healey

Dr. Healey is a professor in the Department of Medicine at McMaster University, and is an associate faculty in the Department of Health Research Methods, Evidence and Impact. He is the director of division of cardiology at McMaster University, and is a senior scientist at the Population Health Research Institute. Dr. Healey is the principal investigator and chair of the Canadian Stroke Prevention Intervention Network (CSPIN), which is conducting a series of clinical trials related to atrial fibrillation and stroke prevention and will support the development of new Canadian researchers in this field. He is also the Chair of the Canadian Cardiovascular Society's (CCS) development committee, a member of the CCS guidelines committee and a member of the executive committee of the international AF-Screen collaboration. Dr. Healey serves on the editorial boards of the Canadian Journal of Cardiology, Heart Rhythm, and is an associate editor of Heart Rhythm-O2. He is also a member of the research committee and scientific program committees for the Heart Rhythm Society.

Dr. Healey was the lead author of the ASSERT trial, which was published in the *New England Journal of Medicine* in 2012, and demonstrated the increased stroke risk associated with sub-clinical atrial fibrillation detected by pacemakers. He went on to conduct the ASSERT-II trial, which demonstrated that sub-clinical atrial fibrillation is present in over a third of older individuals with cardiovascular conditions, but without pacemakers, and published the results in *Circulation* in 2017. Dr. Healey now leads the 4000-patient ARTESiA trial, which will determine if treatment with direct anticoagulants can prevent stroke in patients with sub-clinical atrial fibrillation.

Dr. Healey also continues to study outcomes for patients receiving implantable defibrillators, specifically to find ways to reduce the morbidity associated with these life-saving devices. He was the lead author of the SIMPLE trial, published in the *Lancet* in 2015, which demonstrated that implantable defibrillators could be safely inserted without performing intra-operative defibrillation testing. He is currently leading the ATLAS trial comparing a new, totally sub-cutaneous defibrillator against the traditional defibrillator which requires a lead to be placed through a vein and into the heart.

In his role as Chair in Cardiology Research, Dr. Healey supervises students in the Health Research Methodology Program, and mentors several young researchers starting programs in the field of cardiac arrhythmia. Dr. Jorge Wong has established a research program examining the impact of sub-clinical AF on heart failure, and is studying the role of bariatric surgery to improve outcomes in patients with AF. Dr. Bill McIntyre has also completed his PhD and is continuing his work in the field of atrial fibrillation occurring with stress, specifically, at the time of surgery or hospitalization for medical reasons. ■

ST. PETER'S / MCMASTER CHAIR IN AGING

Dr. Sharon Marr

The impact of COVID-19 on frail older adults has been unprecedented and the need to reduce the gaps in care and improve the attitudes towards older adults has been critical. The Chair's vision and focus has been to accelerate the development of optimal care for older adults by supporting clinical and research programs which focus on innovative evidence-based care. Ongoing support for future scientists in the field of geriatrics and initiatives to enhance human resources, training, and access to specialized geriatric services has remained a priority. The Chair has also been committed to the development of equitable and inter-professional geriatric educational programs nationally and internationally. Proudly, the Chair has supported the Geriatric Certificate Program (GCP) and its expansion of its e-learning programs. There have been over 1,000 healthcare workers registered across Canada and internationally, and of those, approximately 350 have graduated.

The Chair has supported the recognition of essential care providers and the inaugural Senior Community Development Investment fund in partnership with the Division of Geriatric Medicine, Hamilton Health Sciences and the Regional Geriatric Program Central. The Chair has continued to promote and support many educational programs such as the Annual Geriatric Education day and the Department of Medicine, Division of Geriatric Medicine Life-Long Achievement Award. In 2018, Dr. Christopher Patterson was the recipient and other distinguished recipients included Dr. John Kelton in 2019. In recognition of essential workers, the Chair partnered with the Planning Committee in 2020 for the 10th Annual Geriatric Education Day to recognize the following healthcare workers in the Hamilton, Niagara, Haldimand, and Brant and Waterloo/Wellington regions, for their exemplary care and compassion during the COVID-19 pandemic: Sherry Fjell is a Personal Support Worker, Team Lead at Acclaim Health and Community Services; Michelle Barclay is a Victim Support Coordinator at Halton Regional Police – Victim Services Unit; and Sandy Croley is the Executive Director of Foxridge Care Community.

The Chair has proudly supported scientists including: Drs Courtney Kennedy, George Ioannidis, Patricia Hewston, and Justin Lee, and their research to reduce frailty and improve the mental health, mobility, medication use and independence of older adults, as well as Dr. Sarah Sztramko and her scholarly activities on empowering older adults and healthcare workers. In addition, the Chair has supported the research activities of our future scientists at the McMaster University Undergraduate Medical School Research Day and in the McMaster Phone-a-Friend Program.

The accomplishments of the current St. Peter's/McMaster Chair of Aging would not have been possible without the leadership, mentorship, and support by the following: Drs Paul O'Byrne, John Kelton, Mark Crowther, Barry Lumb, Khalid Azzam, Alexandra Papaioannou, Ameen Patel, Parveen

Wasi, Rob Whyte, Christine Ribic, Samaan Constantine, the Department of Medicine Administration Staff, St. Peter's Hospital Foundation/ Hamilton Health Sciences, Pearl Veenema, Sharon Pierson, Estate of Lindsay Thompson, Division of Geriatric Medicine, Geriatric Certificate Program (GCP) and Regional Geriatric Program Central and its partners including older adults and their caregivers, Continuing Health Science Education Program, Kevin Sulewski, Clare Mitchell, Graeme Matheson, GERAS team, Loretta Hillier, Stephanie Morrow, Brandon Van Dam, Lynn Pacheco, Lily Consoli, Jane McKinnon-Wilson, Jenny Siemon, Michelle Doherty, and David Jewell. ■

WILLIAM J. WALSH CHAIR IN MEDICINE

Dr. Judah Denburg

Dr. Denburg continues to actively contribute to clinical, educational, and research endeavours in academic internal medicine. He attends to one of the largest and most intensive specialist academic internal medicine practices in Canada, with a focus on immune aspects of disease affecting many organ systems. Dr. Denburg's patients present with complex medical problems, continuing to provide a rich resource for teaching medical trainees and other health professionals. Dr. Denburg has helped to form a growing, multidisciplinary Lupus Group, which is building pioneering patient-centred databases and clinical trials capacity in autoimmune disorders at McMaster.

Dr. Denburg's longstanding research interest has been in the mechanisms of allergic inflammation, with particular emphasis on hemopoietic cytokines and their role in activating the differentiation and recruitment of inflammatory cells such as eosinophils, basophils, and mast cells. He has established world-renowned expertise in the growth and differentiation of human basophil and eosinophil progenitors in relation to allergic responses in allergic rhinitis, nasal polyposis and asthma, pinpointing the biological importance of hemopoietic mechanisms in allergic inflammation, and the now globally-recognized links among rhinitis, asthma, and other allergic disease manifestations ("allergy as a systemic disease"). Recently, Dr. Denburg has pivoted his lab's capabilities in immunophenotyping to investigate the immune correlates of SARS-CoV2 infection and vaccination in several clinical and community settings, as a co-investigator on four new peer-reviewed grants, and mentor/colleague of basic and applied biomedical scientists at McMaster and across Canada.

As founder, former Scientific Director and CEO of AllerGen NCE Inc. from 2004-2019, Dr. Denburg created a strong and unified national research and training community in allergic disease, bringing together academics, researchers and students from 50 disciplines and 30 affiliated Network universities and hospitals into multi-sectoral partnered teams, which are still spawning national and international connections and visibility. The William J. Walsh Chair has been a critically important asset in support of Dr. Denburg's role in developing and maintaining these major international efforts and activities, which have translated his and his colleagues' discoveries and knowledge into novel biomarkers, therapies, and directions of research for the next generation. ■

Groundbreaking research

Dr. Matthew Lanktree: Predicting kidney disease before it starts

Dr. Matthew Lanktree says he feels a bit like a modern-day fortune teller.

Dr. Lanktree, a clinician scientist in nephrology genetics and the Medical director of the McMaster Kidney Genetics Clinic, focuses his research on understanding the genetic causes of advanced kidney disease. He's able to use imaging and biomarkers to predict which of his patients are likely to experience mild forms of the disease, and which patients are more likely to progress to kidney failure – even before they're symptomatic.

"They'll say, "I have no symptoms – what are you talking about?" But from looking at the amount of protein in their urine, and their kidney function estimate, and things like their blood pressure and their imaging, and putting that all together, I can say, "This is something we need to work on together." And it's really difficult to hear, because they can be completely asymptomatic at that point," he said.

Predicting the progression of kidney disease in various patients allows Dr. Lanktree to target treatments and therapies to each specific patient, based on the expected course of the disease.

"We can try to reassure people that are going to have mild courses, and inform people who are going to have aggressive courses, to do both the conservative therapies that are good for everybody, but then also pick out the people that are candidates for treatments that may be associated with a higher therapeutic burden," he said.

Dr. Lanktree's research is a game-changer for both patients and the healthcare system. Kidney disease is common – one in 10 Canadians will experience the disease – and debilitating, as patients are often asymptomatic until the disease becomes very advanced.

Kidney disease is also extremely expensive to treat, as dialysis for kidney transplantation costs Canadians $310 million each year. Preventing the progression of the disease for as long as possible – until a patient can retire or until their children have left the house, for example – can have major implications on patients' lives, as well as the healthcare system.

"Even delaying the onset of kidney failure by a few years can have enormous impact," Dr. Lanktree said.

Dr. Lanktree's research also focuses on why some patients are more likely to develop more serious forms of the disease, based on their genetics – a field of research that Dr. Lanktree says is "exploding."

"Why do some people have mild kidney disease, while other people progress to kidney failure? Using sequencing and whole genome analyses, I'm trying to identify the people that are at higher risk of going into kidney failure based on their genetic makeup," he said.

"We're just starting to appreciate that genetic mutations cause about 10 per cent of adult onset kidney failure. Even five years ago, people would not have thought it was that high." ■

Global Connections

Dr. Ally Prebtani and Dr. Zahira Khalid: Building healthcare capacity in the developing world

As McMaster faculty, both Dr. Ally Prebtani and Dr. Zahira Khalid focus their work here in Hamilton – but the scope of their care extends far beyond Canada's borders.

Both Dr. Prebtani and Dr. Khalid volunteer their time to train and collaborate with healthcare providers in developing countries – Dr. Prebtani as the founder and director of the Internal Medicine Residency International Health Program, which focuses on Uganda, and Dr. Khalid as program director of the first internal medicine residency program at Georgetown Public Hospital in Guyana.

Dr. Prebtani, who was born in Uganda and immigrated to Canada as a young child, says his interest in global health stems from a tradition of volunteerism that was instilled in him from an early age.

"In my community, there's a very strong sense of volunteerism – a lot of the things we do is based on voluntary service without expecting anything monetary in return," he said. "We try to instill it in our children, and it was also encouraged and nurtured by my parents."

Dr. Prebtani's work as founding director of the Internal Medicine Residency International Health Program focuses on building capacity in Uganda, where there can be a lack of infrastructure, physical resources, and human resources.

Dr. Prebtani points out that one of the biggest challenges for developing countries like Uganda is that there is a lack of advanced formal training programs. As a result, a key pillar of the program has been to take McMaster residents and faculty to Uganda to teach, research, and collaborate.

In turn, residents from Uganda are also invited to learn, train, and socialize here in Hamilton – a process that strengthens both the professional and social bonds between the two countries.

"A lot of the Ugandan leadership and the residents have said, "We're not your colleagues anymore - we're your friends"," said Dr. Prebtani.

The primary goal of the program is to empower and train local health care providers in order to foster self-sustaining growth in the Ugandan health care system.

"It's not a one-off, or medical tourism. We really want to build capacity and make this program sustainable – which has shown itself to be the case," said Dr. Prebtani. "It's been almost two decades that we've been doing this, and you see lots of quality improvement and lots of feedback from our counterparts in Uganda."

The drive for sustainability and longevity has also inspired Dr. Khalid's work in Guyana. Dr. Khalid has spent ten years working in the field of global health and has volunteered as a physician

Dr. Zahira Khalid

and clinical educator in Uganda, Peru, Cambodia and Namibia.

But during her first visit to Guyana, she felt drawn to the idea of creating a lasting program that would have major impacts on the level and quality of care.

"Once I went there, I just knew there was a lot that could be done, and a lot that could be sustainable, which was quite in contrast to where I had worked in previous places," she said. "Things just didn't seem to be sustainable. You went there, you'd work on something, and then it would be back to stage one. You could never leave something behind.

"Here, I saw an opportunity to do something, keep it sustainable, and hand it back to the people who could run it locally."

She took over leadership of the program in 2015 after the previous director unexpectedly had to return to the U.S. Prior to the Covid-19 pandemic,

Dr. Prebtani at foot of bed left.
Group photo taken pre-COVID

Dr. Khalid traveling to Guyana for two week intervals every six weeks to deliver curriculum, oversee exams, help with recruitment, coach, and mentor the residents – duties which continued virtually once pandemic travel limitations were put in place.

In her role as program director, Dr. Khalid has overseen the education of the first-ever locally trained Guyanese physicians and the establishment of a new department of medicine. Prior to the creation of this program, Dr. Khalid points out that there were three or four internists in the entire country – all of whom were trained outside of Guyana and worked in the private sector and didn't provide any teaching or mentorship.

Now, there have been 16 Guyanese graduates of the internal medicine residency program, all of whom are now working in the public sector, and 20 residents currently enrolled in the program. This has a huge impact on the availability and accessibility of care for the Guyanese population.

"Before, they would have to go outside the country to get specialized care," said Dr. Khalid. "One of the residents said that it kind of changed the history of how internal medicine is provided."

Dr. Khalid has just finished her role as program director, and has now handed over the leadership of the program to a former graduate. She continues to act as a mentor and assistant program director and helps to oversee programming – including helping to manage the response to Covid-19.

"I'm very proud of how they have come together to provide care for the patients – the person who provided most of the Covid testing and Covid care is recent graduate," she said. "I think they've done an amazing job controlling the pandemic and educating the public." ■

Reports: Canada Research Chairs

CANADA RESEARCH CHAIR IN ALLERGY AND IMMUNE TOLERANCE

Dr. Mark Larché

Dr. Larché was appointed Canada Research Chair in Allergy and Immune Tolerance in September 2006. This chair was renewed in 2013 and the second and final term completed in August 2020. Dr. Larché's group is based at both McMaster University Medical Centre and St. Joseph's Healthcare. For the 2018-2020 period, the group consisted of approximately 12 researchers including postdoctoral fellows, project managers, technicians, graduate students, undergraduate co-op/thesis students, and a part-time clinical study coordinator. The laboratory continued to investigate the pathogenesis and treatment of a variety of chronic inflammatory diseases including allergic rhinitis and asthma (NIH, CIHR, Adiga Life Sciences Inc), peanut allergy (Aravax Pty), rheumatoid arthritis (CIHR, Adiga Life Sciences Inc), scleroderma (Hamilton Scleroderma Group), the role of complement proteins in transplant rejection (graft versus host disease), and autoimmune thrombocytopenia. Funding has come from CIHR, the National Institutes of Health (USA), Aravax Pty (Australia) and Adiga Life Sciences Inc. Dr. Larché continued to develop and evaluate peptide therapies for allergic disease in close collaboration with Aravax Pty (Australia), and Adiga Life Sciences. Clinical efficacy of a peanut allergy vaccine was established in a pre-clinical model of anaphylaxis. A pre-clinical model of rheumatoid arthritis was established during this reporting period. Collaboration with colleagues at UBC and Queen's University led to the identification of potential biomarkers of efficacy in peptide immunotherapy. Dr. Larché's group continues active collaborations nationally and internationally (Australia, UK, USA, Canada (UBC)) and with other researchers based at McMaster University and St. Joseph's Healthcare including members of the Department of Biochemistry & Biomedical Science, the Department of Pathology & Molecular Medicine, the Department of Medicine (Divisions of Clinical Immunology & Allergy, Rheumatology, Nephrology, Respirology and Hematology & Thromboembolism), and the Department of Chemical Engineering. ■

Canada Research Chairs

CANADA RESEARCH CHAIR IN ETHNIC DIVERSITY AND CARDIOVASCULAR DISEASE

Dr. Sonia Anand

In April 2011, Dr. Anand received the Canada Research Chair in Ethnic Diversity and Cardiovascular Disease. This CRC was renewed in 2018. The goal of the chair includes:

1. Identifying health behaviours (dietary and activity) and genetic determinants of abdominal obesity in related cardiometabolic risk factors in adults of diverse ethnic origin,
2. Evaluating interventions aimed at lowering CV and diabetes risk in high risk ethnic groups.
3. Investigating the impact of the *in utero* environment, maternal fetal-genetics and epigenetics together with early life behaviours on the development of cardio-metabolic traits among South Asian and Aboriginal people.

Dr. Anand and her colleagues are conducting this work in two CIHR team grants (NutriGen and Metabolomics) aimed at understanding the early origins of chronic diseases by studying the nutritional, genetic, epigenetic, metabolomic, and microbiome associations with cardio-metabolic phenotypes and allergic disorders among 5,500 newborns from the CHILD, FAMILY, START and ABC birth cohort studies.

Dr. Anand supervises three post-doctoral fellows and two PhD students as part of this research program.

Key Recent Publications reflecting this work include:

1 De Souza RJ, Bilodeau N, Gordon K, Davis AD, Cranmer-Byng M, Stearns JC, Gasparelli K, Davis Hill L, **Anand SS**. Entsisewat'kari:teke (You Will Be Healthy Again): Clinical Outcomes of Returning to a Traditional Haudenosaunee Diet. Int J Indigenous Health 2021 (In Press)

2 Zulyniak MA, de Souza RJ, Shaikh M, Ramasundarahettige C, Tam K, Williams N, Desai D, Lefebvre DL, Gupta M, Subbarao P, Becker AB, Mandhane PJ, Turvey ST, Moraes TJ, Azad MB, Theo KK, Sears MR, **Anand SS**. Ethnic differences in variation in maternal diet in pregnancy and infant eczema. PLoS One May 14;15(5):e0232170.

3 Shanmuganathan M, Kroezen Z, Gill B, Azab S, de Souza RJ, Teo KK, Atkinson S, Subbarao P, Desai D, **Anand SS**, Britz-McKibbin P. The Maternal Serum Metabolome by Multisegment Injection-Capillary Electrophoresis-Mass Spectrometry: A High Throughput Platform and Standardized Data Workflow for Large-scale Epidemiological Studies. Nat Protoc 2021 Mar 5. Doi:10.1038/s41596-020-00475-0

4 De Souza RJ, Lamri A, Shanmuganathan M, **Anand SS**. Maternal diet and the serum metabolome in pregnancy: robust dietary biomarkers generalizable to a multi-ethnic birth cohort. Curr Dev Nutr 2020 Sep 2;4(10):nzaa144

5 Lamri A, Mao S, Desai D, Gupta M, Paré G, **Anand SS**. Fine-tuning of Genome-Wide Risk Scores and Prediction of Gestational Diabetes in South Asian Women. Scientific Reports June 2020;10(1):8941. ■

CANADA RESEARCH CHAIR IN INFLAMMATION, MICROBIOTA AND NUTRITION

Dr. Elena F. Verdú

Dr. Verdu's CRC program explores host-microbial and dietary interactions in gastrointestinal diseases. Her research aims at deciphering commensal and opportunistic pathogen metabolism of dietary antigens and how that process affects their inflammatory capacity in the host. In addition to her own research lab, Dr. Verdu is the director of the Axenic and Gnotobiotic facility at McMaster University that breeds and provides germ-free mice for investigators within McMaster University and beyond.

During 2019-20, Dr. Verdu has published **23** peer-reviewed papers (20 original papers, including one meta-analysis, and 3 reviews) in top journals of her field (*Gastroenterology*, IF:17,37 and *Gut*, IF:19,8) as well as in general journals (*Nature Communications*, IF:12,12 and *Science Translational Medicine*, IF:16,3). Work published during 2019-20 discovered that in celiac disease, bacterial elastase stimulates innate immunity through PAR-2 signaling in the small intestine. The results bear profound implications to the pathogenesis of celiac disease as it could provide a second signal, independent of gluten exposure, for the worsening of gluten-induced pathology in genetically predisposed hosts. A study published in *Science Translational Medicine* also identified that the essential amino acid, tryptophan, present in foods such poultry, bananas and chocolate, is poorly metabolized by gut microbes present in the duodenum of celiac patients, leading to impaired activation of the aryl hydrocarbon receptor in the intestinal mucosa and inflammation. She also identified lactobacillus strains capable of metabolizing tryptophan into indoles, which in mice, rescued the microbiota impairment to metabolize tryptophan, improving gluten immunopathology.

The novel pathways discovered by Dr. Verdu's work in celiac disease have stimulated significant food and pharma industry interest and investment in the form of grants and product pipelines (Nestle, Biocodex, Takeda), as well as international collaborations with highly renowned scientists such as Professor Harry Sokol, INRAe, France. A recent meta-analysis in collaboration with a recently recruited young talent, Dr. Ines Pinto-Sanchez, confirmed that there is a 4-fold increased risk to suffer from celiac disease in patients with a previous diagnosis of inflammatory bowel disease (IBD), and a 9-fold risk to suffer from IBD, in patients with a diagnosis of celiac disease. The results can impact clinical management, screening practices and development of novel therapeutic interventions. Not surprisingly, the study has triggered significant interest from patient associations (CCC, CCA), as well as investigation of common mechanisms that could be at play in both diseases. Indeed, recent work from Dr. Verdu's lab in collaboration with Professor Ken Croitoru at University of Toronto and the GEM study cohort (www.gemproject.ca) and published in *Gastroenterology* demonstrated that individuals at risk for IBD, exhibit a pre-disease phenotype characterized by increased microbial proteases. Key implications include the potential for a noninvasive early biomarker of disease progression as well as bacteriotherapy using next generation probiotics that produce anti-proteases. Dr. Verdu was honoured by the 2019 CAG Education Excellence Award, the 2020 CAG Research Excellence Award, and the 2020 Crohn's and Colitis of Canada (CCC)-Pfeizer Women in IBD: Outstanding Research Achievement Award. She continues to be funded by CIHR and CCC to industry grants by Biocodex (France), and Gilead (USA).). ■

CANADA RESEARCH CHAIR IN INTERDISCIPLINARY MICROBIOME RESEARCH

Dr. Michael Surette

The human microbiome, the collection of microbes that live on and in the human body, are now widely recognized as contributing to almost all aspects of human biology. Dr. Surette has established a broad and highly collaborative research program addressing the mechanisms by which the microbiota contribute to human health and disease throughout the course of life. This includes the development of the microbiome in infants, and changes that occur in the elderly. His lab has expertise in developing culture-independent and culture-based approaches to characterize and exploit the microbiome. The ability to culture the human microbiome is driving new research into bioprospecting the human microbiota's natural product diversity for bacteria/bacterial products with therapeutic applications. The lab is carrying our microbiome analysis for several cohort studies including two large national initiative CHILD Cohort Study and the IMAGINE SPOR network.

During the reporting period, Dr. Surette gave 21 presentations and the Surette lab contributed to 40 peer reviewed publications. The collaborative nature of his research is reflected in his co-author network which includes 34 different McMaster University faculty. In 2018, he was the Canadian Society of Clinical Chemists Travelling Lecturer for 2018. His research was supported by operating grants from Genome Canada, Canadian Institutes of Health Research, Cystic Fibrosis Canada, Crohn's and Colitis Canada, and the Weston Family Microbiome Initiative. Dr. Surette is a co-applicant on several CIHR funded team grants. Dr. Surette is co-director of McMaster's Farncombe Metagenomic Facility and with support from the Canadian Foundation for Innovation he has expanded the sequencing capacity and sequencing technologies in that facility. ■

Number of papers submitted by the Surette lab during the reporting period

CANADA RESEARCH CHAIR IN METABOLISM, OBESITY AND TYPE 2 DIABETES

Dr. Gregory Steinberg

Dr. Steinberg was awarded the Tier 1 Canada Research Chair in 2018 after 10 years as a Tier 2 Canada Research Chair during which time he was awarded several prominent national and international awards (*American Diabetes Association Outstanding Scientific Achievement Award, Diabetes Canada Young Scientist Award, Endocrine Society Richard E. Weitzman Award, CIHR Gold Leaf Prize for Early Career Research*).

Dr. Steinberg's research as Canada Research Chair in mechanisms regulating energy sensing has formed the basis for the development of several new classes of therapeutics. Specific highlights include the approval of the ATP citrate lyase (ACLY) inhibitor bempedoic acid for the lowering of LDL-cholesterol and small molecules targeting AMP-activated protein kinase (AMPK), and the approval for Acetyl-CoA Carboxylase (ACC) entering phase 2/3 clinical trials for non-alcoholic steatohepatitis (NASH).

Research and educational accomplishments since starting the Tier 1 CRC in 2018 include: the graduation of 5 PhD and 5 MSc. students, receiving funding for a CIHR Foundation Grant and the delivery of over 30 invited presentations at national and international meetings (including 3 plenaries). During this time period Dr. Steinberg's research team also published 26 peer-reviewed manuscripts highlighted by:

1) A comprehensive invited review article on the physiological significance and therapeutic possibilities of targeting the AMP-activated protein kinase (Steinberg and Carling *Nature Reviews in Drug Discovery* 2019).

2) The discovery that inhibiting lipid synthesis, by targeting two key phosphorylation sites on acetyl-CoA carboxylase, can reduce liver cancer in mice (Lally et al. *Cell Metabolism* 2019).

3) That the type 2 diabetes medication metformin reduces body mass and blood glucose, in mice and humans, by enhancing the production of a hepatocyte derived endocrine factor called growth differentiation factor 15 (Day et al. *Nature Metabolism* 2019). ■

CANADA RESEARCH CHAIR OF RESEARCH TRANSFER IN INTENSIVE CARE

Dr. Deborah Cook

An extraordinary ferment of courage and collaboration on the part of the interdisciplinary ICU team during the pandemic has been essential to understand and mitigate the ravages of COVID-19. The McMaster ICU community mounted a rapid, effective, multi-faceted clinical response to this devastating pandemic, and a renewed sense of purpose was avowed. In addition, while ICU research has always been important, it clearly became a global priority during the pandemic – despite innumerable barriers.

Rising to the pandemic challenge was the adaptive trial design, which accelerated the evaluation of COVID-19 therapies. Adaptive trials hold the promise of minimizing harm to participants by exposing fewer patients to the treatment burdens and risks, while maximizing treatment benefits for the greatest number of participants. Unlike conventional trials, protocol modifications are expected rather than discouraged, such as enriching, refining, or repressing enrollment of patients with particular genetic, physiological, or clinical profiles. Anticipated modification to the interventions in adaptive trials are additions (newly identified auspicious therapies); adjustments (changes to or deletion of unfavorable drugs or devices); and abandonment (for reasons of benefit, harm, futility, or supply shortages). The previous influenza A (H1N1) pandemic had taught the ICU community how to uphold research ethics, ensure staff safety, reduce regulatory redundancy, and develop protocols for "sleeper trials" in advance of when they would be required --- to accelerate the acquisition of answers once a pandemic arrives. For example, REMAP-CAP (Randomized Embedded Multifactorial Adaptive Platform Trial for Community Acquired Pneumonia) was augmented with a pandemic treatment domain.

Hundreds of critically ill patients in Hamilton ICUs were offered the opportunity to participate in many other randomized trials developed locally, nationally and internationally. The Canadian Treatment for COVID-19 (CATCO) Trial was launched – seamlessly woven into the adaptive World Health Organization SOLIDARITY Trial. Observational studies also advanced our knowledge of pathophysiology, immunology, diagnosis, prognosis, and palliation for patients with COVID-19. Infection control measures necessary during the pandemic heralded many adaptations to end-of-life care, generating practical and psychological consequences for all stakeholders. Restricted family presence and mandatory PPE motivated clinicians to make more intentional efforts to learn about their patients, affirm therapeutic presence, address communication barriers, and prevent unmarked deaths.

Concurrent with the flurry of trial activity to address COVID-19, directives emerged to shut down non-pandemic research. While clinical research was prioritized to advantage patients with COVID-19, we believed it should not unduly disadvantage patients without COVID-19. The pandemic required us to adopt a public health ethics approach, prioritizing community and population health as much as the health of individuals. Throughout each wave of the pandemic, timely, rigorous, and relevant clinical research has been needed to improve the care and optimize outcomes for patients with as well as those without COVID-19. Further, many critical care studies that were not exclusively focused on COVID-19 remained relevant to patients with COVID-19.

Accordingly, we developed criteria to pause or pursue non-pandemic research during the pandemic. Considerations acknowledged the status of the pandemic, and the capacity and safety of bedside and research personnel. Our framework evaluated aspects of the research process for each study - such as the consent

model, intervention complexity, data collection methods, research oversight, and infection control concerns such as use of PPE. Working with the Hamilton Integrated Research Ethics Board, hospital leadership and university scholars, we published criteria to guide continuation of non-pandemic research during the pandemic that were proportionate, transparent, informed by key stakeholders, and revisited as the pandemic abated. These have been used around the world.

The devastation of COVID-19 for humanity will be felt for years to come. Critical care will never be the same. The pandemic demanded responsiveness and resilience in critical care medicine, sparking ingenuity clinically, administratively, and academically. Reflecting on lessons learned, we emerge stronger, ready for the next challenge. ■

CANADA RESEARCH CHAIR IN RESPIRATORY MUCOSAL IMMUNOLOGY

Dr. Jeremy Alexander Hirota

Dr. Hirota, Assistant Professor of Medicine, was appointed Canada Research Chair in Respiratory Mucosal Immunology in April 2017. During the July 1, 2018 to June 30, 2020 period Dr. Hirota has supervised 9 undergraduate students, 10 graduate students (1 has received their degree – all others are actively enrolled) and 3 postdoctoral fellows. Dr. Hirota's directly supervised students are based at St. Joseph's Research Institute within the Firestone Institute for Respiratory Health and the McMaster Immunology Research Centre on main campus. Dr. Hirota co-supervises students at the University of Waterloo (Adjunct) and University of British Columbia (Affiliate) through appointments at these institutes.

Dr. Hirota's interdisciplinary lung immunology research program stems from molecule to population level projects, with the vision to study how the air that is inhaled impacts lung health and disease. From the basic science level, Dr. Hirota's group is exploring how 3D microenvironments impact lung cell biology and immune responses. As a member of the School of Biomedical Engineering, Dr. Hirota works with his colleagues to develop bespoke experimental systems to simulate mechanical forces experienced by lung cells and tissues. At a translational level, Dr. Hirota is establishing a cannabis research program that explores in cells, mice, and humans how combustion of this now legal plant impacts host immunity to viruses. Dr. Hirota functions as a lead of the lung working group within the McMaster University Centre for Medicinal Cannabis Research. At a population level, Dr. Hirota has taken his expertise and established a program in host-immunity to explore how an individual's response during early SARS-CoV-2 positivity could predict outcomes in COVID-19 patients. Digital health solutions are being explored to monitor host immunity in a scalable format that can have population reach. An overarching vision of all of these research programs is to achieve traditional academic metrics as well as commercialize any research outputs to ensure maximum socio-economic benefit is realized.

Support for Dr. Hirota's program comes from NSERC, CIHR, CFI, SickKids, Ontario Lung Association, Roche, Ontario Government, and the Thistledown Foundation. Dr. Hirota has an H-Index of 27 and 2481 total citations. ■

CANADA RESEARCH CHAIR IN THROMBOSIS

Dr. Jeffrey Weitz

Dr. Weitz has held this Tier 1 chair since 2001. The chair was renewed in 2008 and again in 2015. This chair provides salary support for Dr. Weitz and has been used to fund his research program. In addition to the chair, the Canada Foundation for Innovation has twice provided funds to purchase state-of-the-art equipment that is used by Dr. Weitz and other investigators at the Thrombosis and Atherosclerosis Research Institute. Focusing on thrombosis, this chair facilitated (a) the successful Canadian Institutes of Health Research (CIHR) Team Grant in Venous Thromboembolism that was awarded to Dr. Weitz and the McMaster Thromboembolism Group in 2006 and provided $4.2 million over seven years, (b) the $35 million Canadian Foundation for Innovation award for Large Scale Institutional Endeavors that provided one-third of the funding for the David Braley Research Institute at the Hamilton General Hospital site, (c) the CIHR Foundation Grant awarded to Dr. Weitz, which will provide $2.8 million over 7 years, and (d) Heart and Stroke Foundation awards that provide additional funds to Dr. Weitz's research program. Current research projects are focused on the characterization of new regulators of the contact system of blood coagulation, novel methods for rendering blood-contacting medical devices less thrombogenic and basic and clinical studies of inhibitors of factor XI and factor XII. ■

Canadian Foundation for Innovation Award for the Large Scale Institutional Endeavour

Excellence in care

Dr. Alistair Ingram: applying past lessons to stop the spread of COVID-19

When the COVID-19 pandemic began in March 2020, Dr. Alistair Ingram made contingency plans about how to replace doctors he expected could contract the virus.

"There was a great deal of anxiety and concern when the pandemic first broke out. Nobody was vaccinated. People were working directly with COVID patients," said Dr. Ingram, the Chief of Medicine at St. Joseph's Healthcare.

"When the pandemic first started, we made very exhaustive plans for how we would cover the large number of physicians we expected to get sick and be absent. But that never happened."

In fact, throughout the pandemic, Dr. Ingram says that while some St. Joseph's staff contracted COVID-19 in the community, almost no staff contracted the virus at work. The hospital also experienced fewer outbreaks compared to other hospitals.

"The number of outbreaks that we've had compared to other hospitals is not chance. We're doing something different," he said.

Dr. Ingram credits a few factors for St. Joe's success with containing COVID-19. The first, he says, can be traced back to the hospital's experiences with C. difficile outbreaks in 2010 and 2011 – an experience Dr. Ingram calls "a road to Damascus experience" that fostered a robust Infection Prevention and Control (IPAC) department.

"We have had a strong IPAC department since then, and a strong culture that IPAC continues to push in terms of care when it comes to infection control," he said.

"IPAC was able to move very quickly with COVID, on the back of what was a very strong culture, to really drill down about how we use PPE, how we could never take our minds off it. And I think they bear a large amount of credit for our success."

He also credits the 5,000 staff, residents, and students at the hospital for following protocols, using PPE properly, and paying attention to the tiny details that can either prevent or spread infection. Sticking to regular routines as much as possible was also crucial, he said.

"As soon as one of your main medical wards has a patient with COVID, and then that spreads to another patient with COVID – you're done. That ward is now closed for 2 weeks, and now you've got to find 50 beds somewhere else. The subsequent chaos that's created, I think, provides more opportunity for COVID to spread elsewhere," he said.

"The more you can continue to operate as you usually operate, with extraordinarily careful attention to PPE use and hand-washing et cetera, the more you are likely to be successful as time goes by – because the less you're going to create chaos and problems. And I believe that's been a huge part of our success."

Now that everyone has had an opportunity to be vaccinated, things have become somewhat calmer at the hospital, he said. In fact, the experience has served as a reminder about the joys and opportunities that come along with practicing medicine.

"The pandemic has served to help some of us reground and refocus ourselves on our reasons we're in medicine, which, after long years in practice, can kind of fade away from you a bit," he said.

"It really has led a lot of us to realize how fortunate we are to be in this profession, how much we enjoy taking care of patients, and how much we continue to enjoy learning about new things – even something as tragic as COVID – there's always something of interest you can find in it." ■

A PASSION FOR KNOWLEDGE

Excellence in teaching

{ research
care
learning

Dr. Lori Whitehead and Dr. Azim Gangji: Innovation in Education

If you ask Dr. Lori Whitehead about the most valuable skills students can acquire, she won't point to a specific lesson or hands-on experience.

Instead, Dr. Whitehead – the director of the Internal Medicine Residency Program – says some of the most valuable things students can learn at McMaster are innovation, creativity, and flexibility.

"We teach them about the importance of creative thinking. We try to do that at McMaster with our learners, but it threads through the entire university," Whitehead said.

Dr. Whitehead's work as director of the Internal Medicine Residency Program focuses on seeing 118 postgraduate students through the intensive, three-year stretch after medical school that allows students to hone their skills and zero in on a specialty.

Under Dr. Whitehead's tenure, one of the most exciting innovations to come to McMaster's residency program has been a new model of learning called reflective practice. This method, which stems from new teaching guidelines from the Royal College of Physicians, encourages residents to set goals, focus on their progress, and – along with the help and mentorship of academic advisors – seek advice and encouragement if they run into roadblocks along the way.

Dr. Whitehead says the move to the reflective practice model "has been a bit of a culture change for residents."

"I believe that what we've done is sort of inspired our residents to look at how reflective practice is a technique for lifelong learning and self-assessment," she said. "Lifelong learning very important to a physician. If you don't keep up with your learning and the trends in medicine you're not going to provide best practices."

This type of self-reflection can also be useful to residents when it comes to meeting the intense demands of balancing learning with their clinical schedules. Residents can spend 10 to 12 hours a day seeing patients, but are still required to complete their academic and research work – a schedule that can become grueling and overwhelming, Dr. Whitehead points out.

"Residents need to recognize when they're directly working with patients they need to take advantage of every opportunity to learn on the job," she said. "They should reflect on, "Even though I was busy and I ran around all day doing a hundred things, I kind of learned these different things." I think they need to keep their eye on that ball."

Ultimately, self-knowledge – including understanding how to balance work with personal time and to seek support when they're feeling overwhelmed – makes residents into better doctors, Whitehead says. Each student brings their own ideas and passions to their experiences as a resident.

"If someone is passionate about a certain subject matter or a project, they will probably get more traction from that -- even if initially the idea sounds like it may not be as high a priority as something else," she said. "But if a learner or a physician has passion and sees the need for something, and it does have merit, it's my job to inspire that resident to follow their dreams and to follow their passion – because that's going to make them happy, give them a lot of satisfaction, and teach them about the importance of creative thinking."

Just as Dr. Whitehead has ushered in new teaching models and philosophies as the director of the Internal Medicine Residency Program, Dr. Azim Gangji, the director of the Nephrology and Transplant Fellowship Program and the Vice President of Education at St. Joseph's Healthcare Hamilton, has introduced various innovative programs for internal medicine residents.

One of Dr. Gangji's biggest innovations in teaching was introducing a case-based learning curriculum for internal medicine residents along with

Photo taken pre-COVID


BOSS

Dr. Ted Xenodemotropolous, the first one of its kind in the country. This means that instead of learning in a lecture-based format, McMaster residents break into smaller groups and learn by reviewing specific scenarios that mirror real-world examples.

Dr. Gangji says that this model not only develops medical expertise, but also allows residents to build skills as collaborators, communicators, leaders, health advocates, scholars, and professionals (roles that are laid out by the Royal College of Physicians as part of the CanMEDS framework). This hands-on learning and collaboration has led to residents gaining a more well-rounded, contextualized understanding of the material, Dr. Gangji says.

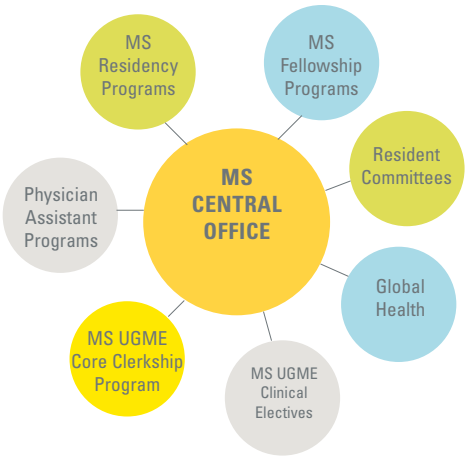
"As opposed to the traditional lecture-based style, which is more passive learning, case-based learning is more active learning and the residents participate and are encouraged to problem solve and address not only the medical aspects of the case but to address the patient's overall issues," he said.

"We always practice as a team, and the idea was to recognize that when you're working in a team, you're learning as a team as well – as opposed to lecture-based model, where information is just fed to you and you're not necessarily taking it in."

Since its inception, Dr. Gangji's case-based learning curriculum continues to involve, including incorporating standardized patients.

But Dr. Gangji says his true legacy of innovation in education lies with the incorporation of a Medical Specialties Central Office structure, which brought the 18 individual medical specialty residency programs and 51 fellowships under one umbrella in the Department of Medicine.

Dr. Gangji identified the need for a centralized hub to manage a range of programs through his leadership roles, which at one point ranged from overseeing undergraduate clerkships through to fellowship programs. He noticed that some programs were "have" programs, while others were "have nots" lacking human resources and basic financial supports.



Creating a centralized office structure allowed funding to be provided fairly between divisional residency programs, allowed for consistency in administrative staff, promoted collaboration between programs and furthered residency education by instituting a combined medical specialties academic half day as well as social and wellness committees.

"It really kind of harmonized these programs, enhanced efficiencies, and made sure the programs were well-resourced," he said. "The idea is to bring about unity and innovation."

Throughout his work enhancing, modifying, and transforming education systems, it's the concept of collaboration and partnership that drives Dr. Gangji.

"My theme always is to work together as a team, and to develop more harmony and build structure to enhance efficiencies," he said. "The legacy of building unity is really important to me." ■

Photo taken pre-COVID

DIVISION REPORT

Cardiology

Dr. Jeff Healey
MD, MSc, FRCPC
Division Director

EDUCATIONAL ACTIVITIES

Under the leadership of Dr. Matt Sibbald, the Cardiology Residency Program has accredited program status by the Royal College of Physicians and Surgeons. Dr. Nick Valettas continues in the role of Competency Committee Chair for our Cardiology Residency Program and Dr. Montgomery continues her educational roles at the university and at the Royal College. Our fellowship programs in echocardiography, electrophysiology, heart failure, interventional cardiology, and perioperative medicine continue to flourish under the leadership of Drs. Omid Salehian, Syam Divakaramenon, Eva Lonn, Shamir Mehta, and Vikas Tandon, respectively, and the division has approved sub-specialty programs for echocardiography, arrhythmia and interventional cardiology. We continue to attract outstanding residents and fellows from within and outside of Canada.

Dr. Matt Sibbald was recently selected as the Associated Dean for Undergraduate Medical Education.

RESEARCH PROGRAM

The research program of McMaster's division of cardiology continues to be world-leading. In the past year, Dr. Yusuf has published the results of the TIPS-3/Polycap study in the New England Journal of medicine, demonstrating a benefit for the

polypill among individuals with average cardiovascular risk. He also published data in the Lancet on modifiable risk factors among more than 150,000 participants in the PURE study. Dr. PJ Devereux published the results of the HIP-ATTACK trial in the Lancet, examining the timing of surgery for hip fracture. Members of the division were also instrumental in setting up the ACT program of trials, to search for therapies to treat COVID-19 infection.

Dr. Sanjit Jolly received a 2.75-million dollar grant from the CIHR for the CLEAR-SYNERGY study.

> *"Members of the division were also instrumental in setting up the* **ACT trials...** *for therapies to treat* **COVID-19 infection.**"

MAJOR ACHIEVEMENTS

Our ambulatory care clinic continues to grow under the leadership of Dr. Doug Wright, and is evolving to enter the new, post-COVID era of remote cardiac care. Many members of the division are active in launching the EPIC system at Hamilton Health Sciences (HHS) and managing the post-implementation phase at St. Joseph's hospital. Most members are active in virtual care and members of the St. Joseph's group are developing an outpatient clinic in Brantford. Many individuals, including Dr. Craig Ainsworth have taken a significant role in the management of COVID-related issues at HHS.

FUTURE DIRECTIONS

Over the past two years, the division of cardiology has recruited several outstanding individuals, who have developed strong, specialized programs. Dr. Jeremy Adams was recruited to the St. Joseph's site, where he anchors the cardio-renal program. Dr. Nazanin Aghel has joined the cardio-oncology program at the Juravinski Hospital where she is establishing a research program. Dr. Katherine Connolly has also joined at St. Joseph's, while serving the city in the field of heart failure and cardiac amyloidosis. Dr. William McIntyre has completed his PhD and is leading a large program of research at PHRI examining atrial fibrillation occurring with stress, and contributes clinically to St. Joseph's arrhythmia and perioperative services. Dr. Emilie Belley-Cote has transformed the management of patients following cardiac surgery; with the establishment of an inpatient and outpatient program for postoperative care. Dr. Jason Roberts has joined the arrhythmia service and is leading an exciting program of interventional trials for patients with genetic arrhythmia conditions. ■

DR. JEREMY ADAMS

DR. NAZANIN AGHEL

DR. KATHERINE CONNOLLY

DR. WILLIAM MCINTYRE

DR. EMILIE BELLEY-COTE

DR. JASON ROBERTS

DIVISION REPORT

Clinical immunology & allergy

EDUCATIONAL ACTIVITIES

Dr. Jaclyn Quirt is the director of the McMaster Clinical Immunology and Allergy Training Program, a highly integrated, accredited adult/pediatric program. Dr. Michael Cyr is the site director and deputy program director.

There are seven residents from both Pediatrics and Internal Medicine currently in full-time training. Our division is very active in teaching medical and pediatric residents, and clinical clerks from McMaster and elsewhere. Graduating trainees have proceeded to academic and clinical careers in Clinical Immunology and Allergy in Canada and internationally.

In July 2021, the program will be transitioning to Competence-by-Design with Dr. David Fahmy designated as the Competency Based Medical Education lead and Competence Committee (CC) chair. The CC is comprised of seven faculty members from both the pediatric and adult programs who will also serve as academic coaches.

An area in which the McMaster Immunology Research Centre (MIRC),

recently integrated with our Division is undergraduate teaching. This area is very active and very well supported by our divisional faculty. Our weekly Clinical Immunology Allergy Rounds, which include internationally renowned invited speakers, are a major success. Other seminars, journal clubs, and teaching sessions occur regularly including weekly academic half-days.

RESEARCH PROGRAMS

The Division continues to be extremely active in a variety of areas. Principal research themes are therapeutics related to the respiratory tract (Keith), food allergy and anaphylaxis (Waserman, Jordana Chu), autoimmune disease (Denburg, Haaland, Larché), hereditary angioedema (Waserman, Keith), peptide immunotherapy in allergic and autoimmune disease (Denburg, Larché, Haaland), systematic reviews (Chu), hemopoietic stem cells in allergy (Denburg), and urticaria/eczema (Lima, Waserman). Peer-reviewed, private sector and Foundation funding for studies of basic mechanisms in allergy and novel therapeutics/biologics in pre-clinical and clinical models continue to grow and yield exciting scientific discovery. The AllerGen NCE, which came to a close in 2019, has

Years of research development for AllerGen NCD, under the leadership of Dr. Judah Denburg

nurtured and supported these research developments for 15 successful years under the leadership of Dr. Judah Denburg, Scientific Director and CEO.

In January 2021, the Division experienced a significant advancement with the incorporation of five faculty members from the McMaster Immunology Research Centre (MIRC) as they migrated from the Department of Pathology and Molecular Medicine. They are all internationally recognized experts in their respective fields of mucosal immunology research. Dr. Manel Jordana MD, PhD, is an expert on the basic immune pathogenesis of food allergy and anaphylaxis; Dr. Ali Ashkar DVM, PhD is an expert on NK biology and its application to cancer immunotherapy; Dr. Charu Kaushic's research is focused on women's reproductive health and the impact of infections and she is also the Director of the CIHR Institute of Infection and Immunity based at McMaster; Dr. Amy Gilgrass PhD has expertise in HIV-tuberculosis (TB) co-infections and Dr. Zhou Xing MD, PhD is a world expert on respiratory mucosal immunity with an emphasis on tuberculosis and vaccine development against TB and Covid-19.

MAJOR ACHIEVEMENTS

HEALTH LEADERSHIP

An exciting development in 2021 will be the deployment of the Schroeder Allergy and Immunology Research Institute through a generous gift from the Walter and Maria Schroeder Foundation. Dr. Susan Waserman will be the inaugural Director, and Dr. Manel Jordana the Coordinator of the Translational branch. The Institute will be established on the principle that foundational strides in the prevention and treatment of allergic disease are best achieved when interdisciplinary discovery proceeds in close collaboration with industry partners, and when embedded in the community.

FUTURE DIRECTIONS

The maintenance of a critical mass of academically committed members within our Division remains an important priority. We expect our discipline to continue to grow, in keeping with the rising prevalence of all allergic and immunologic diseases, and the public demand for expert clinical services and discovery in these areas. The incorporation of MIRC faculty offers incredible opportunities for further collaboration in research, education and training. The Schroeder Allergy and Immunology Research Institute similarly will foster interdisciplinary cooperation and advancement in our field. ■

DIVISION REPORT

Clinical pharmacology and toxicology

Dr. Anne Holbrook
MD, PharmD, MSc, FRCPC
Division Director

EDUCATIONAL ACTIVITIES

Although our division is the smallest, it leads the Department in academic contributions overall and for education. This includes year-round supervision of medical students and residents on internal medicine, critical care and emergency department clinical services at St. Joseph's Healthcare and Hamilton Health Sciences, as well as elective rotations through our specialty inpatient and eConsult service. Faculty members are active supervisors and program leaders in the undergraduate and postgraduate Medicine program as well as postgraduate education at the Masters and PhD level in Health Research Methodology, Medical Sciences, eHealth, Global Health, and Pharmaceutical Sciences at both McMaster University and the University of Toronto. The division draws undergraduate pharmacology, health sciences, pharmacy and health technology assessment students. We play a leading role in several national and provincial training programs in drug safety and effectiveness, and in drug policy.

Clinical Pharmacology and Toxicology (CPT) participates in Clinical Pharmacology and Toxicology Residency Training Programs accredited by the Royal College of Physicians and Surgeons of Canada. We are actively recruiting

> One of the unique features of our division *is its ability to directly impact professional practice* and patient care through drug policy decision-making

trainees and graduates.We continue to advocate for other formal specialty-clinical pharmacology training.

RESEARCH PROGRAMS

Despite its small numbers, the division continues to be highly successful in attracting research funding, largely because of a very wide collaborative network within medicine, pharmacy, nursing, epidemiology, economics and the social sciences. Grants come from a variety of peer-review sources. Our research topics focus on the benefits, harms, economics and potential vs actual use of therapies, and include projects examining methods of improving prescribing, the impact of electronic medical records and computer-based decision support, the impact of changes in drug policies on health and health care utilization, patient preferences regarding therapies, the development, dissemination and implementation of evidence-based guidelines for therapies, medication management interventions, drug interactions, comparative effectiveness and safety of competing medications, and the international benchmarking of prescribing skills. As well as scholarly papers and presentations, members of the division hold multiple copyrights and patents on research products, software, reports and guidances.

MAJOR ACHIEVEMENTS

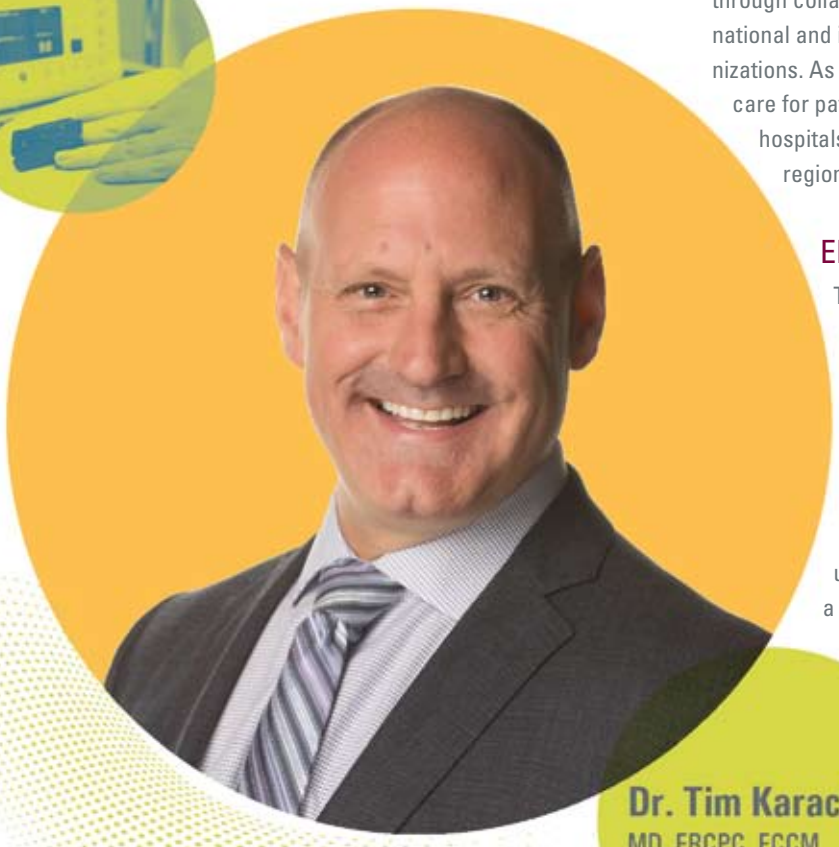
The recent department initiative to quantify and rank academic activities of all faculty has shown that clinical pharmacologists are amongst the top percentile group. One of the unique features of our division is its ability to directly impact professional practice and patient care through drug policy decision-making. Our leadership in evidence-based therapeutics and inter-professional practice leads to multiple major advisory roles with the federal and provincial governments influencing budgets in excess of $10 billion annually, as well as leadership positions in provincial and national professional societies. National Pharmacare implementation and upgrading national pharmaceutical pricing processes, are recent areas of focus this year.

FUTURE DIRECTIONS

Since therapies are a prevalent and increasingly costly sector of health care, clinical pharmacologists with training in medicine plus epidemiology or quality assurance are in high demand but critically short supply. Thus, a major immediate goal of the division is the recruitment of new members to allow us to address the significant needs for therapeutics and toxicology consultation, for education to improve prescribing practices and medication safety, and to expand our involvement in health policy and research. ■

DIVISION REPORT

Critical care



Dr. Tim Karachi
MD, FRCPC, FCCM
Division Director

Our faculty have an international reputation for excellence in research and education all the while maintaining an extremely high level of care to critically ill patients. We are dedicated to supporting a broad range of academic programs through collaboration and partnerships with national and international critical care organizations. As a diverse group of clinicians, we care for patients at the McMaster teaching hospitals in Hamilton, Niagara and Waterloo regions.

EDUCATIONAL ACTIVITIES

The McMaster Critical Care Medicine Residency Program is a Royal College accredited program that is highly sought after by trainees. National & international fellows undertake rigorous competency-based training, including simulation-based education and bedside ultrasonography. The program offers a novel scheduling model for fellows, which closely matches that of a consultant. This provides a unique educational experience while also allowing for sufficient non-clinical time to foster academic pursuits. Our faculty experts foster scholarship which includes a research mentorship program culminating in the annual

McMaster/Western Fellows' Research Day, showcasing all the fellow's research. External elective requests in our critical care units have grown in popularity in recent years with numerous trainees from across the country hoping to come to our centre.

RESEARCH ACTIVITIES

There is tremendous breadth and diversity to critical care research at McMaster. We are dedicated to designing and conducting large pragmatic clinical trials and many of our faculty have CIHR grants aimed at improving the care of our ICU patients. Our research programs focus on knowledge translation for the prevention and reduction of complications of critical illness; management of respiratory failure; resuscitation and sepsis; optimizing end-of-life care; organ donation; as well as rehabilitation and mobility in the ICU. Our faculty are also innovative leaders in guideline development, including the GUIDE group, which provides methodological support for several national and international critical care societies.

MAJOR ACHIEVEMENTS

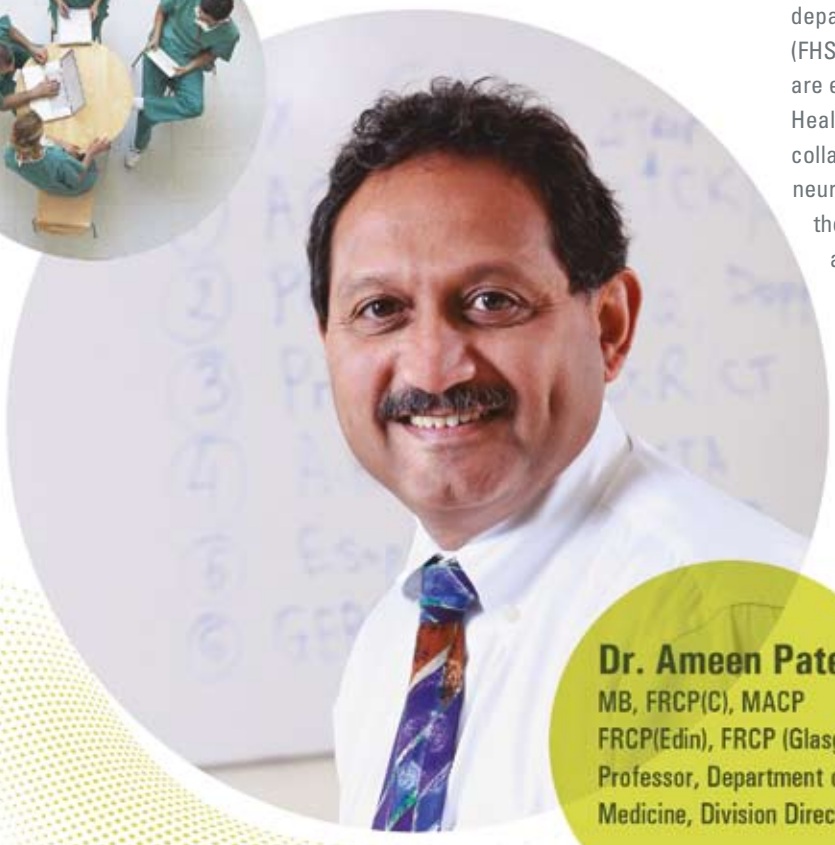
Members of our division have leading roles in the Canadian Critical Care Trials Group, Canadian Critical Care Society, Society of Critical Care Medicine, Community ICU Research Network, and the Canadian Sepsis Research Network as well as having active critical care journal editorial boards. Several faculty have joint appointments with the Department of Health Research Methods, Evidence and Impact and are involved in supervising MSc and PhD students.

> "Our faculty have an international reputation for excellence in research and education, *all the while maintaining* an extremely high level *of care to* critically ill patients."

FUTURE DIRECTIONS

The division remains committed to providing high-quality patient and family-centred care while increasing our commitment to excellence in research and supporting mentorship of the next generation of physicians and scientists in critical care. ■

Education and innovation



Dr. Ameen Patel
MB, FRCP(C), MACP
FRCP(Edin), FRCP (Glasg)
Professor, Department of
Medicine, Division Director

The Division of Education and Innovation was established in 2019 and is the newest Division in the Department of Medicine. It is made up of Clinician and Non-Clinician Educators, and has affiliated members from many divisions within the Department of Medicine, senior hospital administration and other departments within the Faculty of Health Sciences (FHS). The Division brings together members who are exploring innovative pedagogical approaches in Health Sciences education and who are exploring collaborative opportunities to generate entrepreneurship and commercialization. The Division is the inspiration of Drs. John Kelton, Paul O'Byrne, and Mark Crowther to create a home within the Department of Medicine for faculty within the FHS with a mission to enhance innovation, health leadership, entrepreneurship, and commercialization.

EDUCATION:

Sean Park, Anna Korol, Carol Bassim and Kenneth Owen all contribute substantially to education within the Integrated Biomedical Engineering (iBioMED) and Health Sciences Program. Dr. Park teaches courses on human-centered design, creative problem-solving and strategic foresight in the iBioMed Program and the Michael G. DeGroote (MGD) Health Leadership Academy (HLA). He is a McPherson Fellow

INNOVATION

"... a MISSION to *enhance* innovation, HEALTH LEADERSHIP, ENTREPRENEURSHIP, *and* COMMERCIALIZATION."

COMMERCIALIZATION

who is leading education research and capacity building activities. Dr. Korol also teaches in the iBioMed (Health Engineering Entrepreneurship stream) HLA Programs and develops new educational programs in the MGD Health Innovation, Commercialization and Entrepreneurship Program. She is a member of the iBioMed Curriculum Committee and MGD Health Innovation, Commercialization and Entrepreneurship Advisory Board. Dr. Bassim graduated from dental school in 2004 and was a member of the Department of Health Research Methods, Evidence and Impact, before joining the Division of Education and Innovation. She teaches in the iBioMed Program and is an instructor in the Health Research Methodology Program. Dr. Kenneth Owen obtained his PhD in Business Administration from McMaster. He has contributed to the iBioMed Program as a teacher, lecturer and has been active in student and community engagement activities.

HEALTH LEADERSHIP

Sarrah Lal leads several educational programs and courses in Health Innovation and Entrepreneurship in the MGD Initiative for Innovation in Healthcare, including Health Ventures, Clinical Health Innovation, Frameshift Innovations Lab, and Innovators in Scrubs.

Dr. Deborah Diliberto is an interdisciplinary researcher with interests in the design and evaluation of health services interventions in low resource settings. She contributes as a course coordinator and lecturer for an MSc Global Health course on research methods, as a tutor on the MSc Global Health courses, and has developed and taught three scholarly skills workshops for the MSc Global Health Program.

ENTREPRENEURSHIP

Dr. Gail Martin is the Executive Director of the Research Institute at St. Joseph's Hamilton. Gail facilitates education, research, coaching and mentoring of members within the SJH Research Institute. Sandra Ramelli is an important contributor to faculty leadership development. She is co-leading the Bridging Leader's Program and is a leadership coach for faculty members.

Carol Walker Bassim

Deborah DiLiberto

Anna Korol

Dr. Karim Ladak

Sarrah Lal

Kenneth Owen

Sean Park

Sandra Ramelli

Dr. Karim Ladak is an Assistant Clinical Professor in the Division. Dr. Ladak provides substantial clinical teaching and has received funding from industry and the McPherson Institute to develop an educational podcast on complex rheumatological conditions. To date, he has completed five episodes and has had multiple downloads from listeners across the globe. Dr. Ladak also Co-Chairs the International Medical Graduate Internal Medicine Residency Application Committee.

The Nuclear Medicine physicians were part of the Division of Education and Innovation and made important contributions to patient care, teaching and research. Their primary appointment has since been moved to the Department of Radiology. The Division thanks Drs. Christopher Marriott, Karen Gulenchyn, William Wong-Pac, Katherine Zukotynski, Valerie Yakemchuk and Olfat Kamel Hasan for their contributions while members of the Division.

Members of the Division have played an important role in the Department's Community of Practice in Quality Improvement and Patient Safety and Medical Education. The Department welcomes individuals with an interest in innovation, entrepreneurship, and collaboration to consider affiliate membership. ■

DIVISION REPORT

Emergency medicine

Dr. Michelle Welsford
BSc, MD, FACEP, CCPE, FRCPC
Professor & Interim Division Director

FUTURE DIRECTIONS & HIGHLIGHTS

Early 2020 brought the announcement of Dr. Michelle Welsford as the Division Director, after serving in the "interim" position for the prior two years.

As part of her interim role, Dr. Welsford reached out to the other Divisions of Emergency Medicine (EM) under the Departments of Pediatrics and Family Medicine to strengthen collaboration and envision other models that may help the faculty across the three divisions succeed.

The EM tri-division leaders worked together to invite our national organization, the Canadian Association of Emergency Physicians (CAEP), to conduct an external assessment of our Divisions. This process was exceedingly helpful to provide comparison data with similar academic programs across the country, confirm our strengths, and provide advice and recommendations that will allow us to move forward with strategic planning. Several new initiatives have started as part of this tri-division collaboration process.

These initiatives included launching a Hamilton Emergency Medicine Executive in the summer of 2018 comprised of the clinical and academic EM leads at the three

The Emergency Medicine Tri-Division

Hamilton sites that meets quarterly or more frequently, and several new committees, events, and joint recruitment efforts focused on tri-division collaboration. In February of 2019 we launched the inaugural Faculty Project Day (Brag & Steal) hosted by Drs. Michelle Welsford and Raj Vadera which included faculty in Hamilton and regional campuses to provide an opportunity for faculty across all 3 divisions to present on projects that are completed, in-process, or being planned. This event was a great opportunity to discuss results and plan future multi-site collaboration and teamwork. In April of 2019, we had our first Tri-Division Spring Retreat facilitated by Drs. April Kam, Liane Shipp-Dey, and Teresa Chan. The retreat focused on brainstorming and solution building activities based on the external consultation and focused on 3 areas:

1. improving hiring/recruitment/retention;
2. rethinking educational leadership; and
3. enhancing research & scholarship.

We hope to work on several of the key recommendations over the next several years to make the Divisions stronger. In September of 2019 we also hosted the first city-wide Hamilton Faculty Emergency Physician/Faculty Recruitment event.

Building on the success of these initiatives in 2019, we planned to continue all of these activities in 2020, although some modifications needed to be made due to the pandemic and restrictions of in-person events. We moved our annual @MacEmerg Faculty Awards Dinner to a virtual video format in June of 2020. Additionally, as many of our national meetings were cancelled in the Spring of 2020, and to support our learners and junior faculty that missed out on presenting their projects, we held the inaugural @MacEmerg abstract presentation event virtually in June of 2020.

Through much of 2020, our faculty along with our hospital-based and first responder colleagues have been at the coal-face on the front-lines of the COVID-19 pandemic. The work has been difficult but fulfilling and our families have been worried. The faculty are looking forward to a future where we can gather in person again and celebrate our achievements, perseverance, and innovations.

EDUCATIONAL ACTIVITIES

POSTGRADUATE (PG) PROGRAM

The McMaster EM PG residency has over 40 residents and is well supported by the leadership (Drs. Alim Pardhan and Kelly van Diepen), our strong faculty and our unmatched program management and administration (Teresa Vallera and Julia Smerilli). Now entering its' 4th year, the program has been well prepared to implement the Competency by Design (CBD) curriculum and evaluation (Dr. Alex Chorley). We will have our double cohort of residents challenging the Royal College exam this coming year. Simulation (Dr. Chris Heyd), research boot camp (Dr. Mat Mercuri), and continuous quality improvement (CQI, Dr. Shawn Mondoux) curricula continue to strengthen our core content curriculum. Large skills and simulation events, critical care and disaster simulation days, respectively, are run on a 2-year cycle. Our junior ultrasound scanning weekend will now be running on an annual basis in conjunction with our CCFP-EM colleagues. In addition to our resident-led wellness curriculum, Ice Cream Rounds allow celebration of successes and peer support for the challenges of residency. Transitions throughout residency and into staff life are supported by PGY specific Bootcamps. This coming year we will be piloting our Inclusion, Diversity, Equity and Anti-Racism (IDEA) curriculum, designed by our EM Residents. This curriculum builds on existing programming, adding a structural framework, additional lectures, a journal club and learning activities in a longitudinal format. Finally, our administration curriculum and transition to practice bootcamp will undergo a restructuring and merging this coming year. COVID has posed

an interesting challenge this year, however, has successfully pivoted the majority of our teaching to online. We look forward to being able to pivot back once restrictions are lifted.

Critical Care Day, CBME launched in 2018, first simulation OSCE in 2019

UNDERGRADUATE (UG) PROGRAM

The UG EM program leadership passed from the capable Dr. Massoud Jalayer to the eager Dr. Alim Nagji in December 2019. Dr. Massoud led a successful curriculum change and implementation that has been highly valued by the clerkship learners. The program had its own "boot camp", a one-week non-clinical case-based introduction to core topic areas, resuscitation, and procedural skills. Coordinated across the Hamilton, Niagara, and Kitchener-Waterloo sites, the program has always been highly rated by students. The EM faculty continue to foster medical student-faculty research collaboration via annual Medical Student EM Research Awards.

In the spring of 2020 as the pandemic began, clerks were withdrawn from the clinical environment. True to our chameleon nature, the EM faculty pivoted quickly to help support the longitudinal virtual clerkship learning and start designing a new virtual interactive curriculum for clerkship return in July 2020.

CONTINUING PROFESSIONAL DEVELOPMENT (CPD)

The CPD director (Dr. Alex Chorley) organized a tri-divisional "Design Thinking" CPD retreat in September 2018 and came up with 5 items to focus on:

1. Clinically-oriented small group learning
2. Clinical coaching experiences
3. Career-enhancing mentorship program
4. Simulation & procedure labs
5. On-line portal and offerings (including a podcast).

The faculty have been involved in a number of innovative programming including REACH rounds (Research, Education, Administration, Clinical, Health) and BEER Rounds (Beginner to Expert Education Rounds) #FoamED including international blogs and podcasts such as ALiEM.com, CanadiEM.org, and more. Following the retreat, the following new initiatives followed:

1. @MacEmerg Podcast Launch in February 2019;
2. Coaching & Mentorship Interactive Sessions in 2019-2020;
3. Formal @MacEmerg Mentorship Program Launch;
4. Do-it-yourself Mentorship Guidebook published 2020;
5. Faculty Simulation launch in 2019 (placed on hold due to pandemic in 2020);
6. PERC (Practice Excellence through Collaboration and Review) Rounds launched in 2019 and is held 6-10 times annually.

RESEARCH ACTIVITIES

The Division has a burgeoning clinical research program (led by Drs. Kerstin de Wit, Mathew Mercuri and many others) and research synthesis and knowledge translation group (Drs. Andrew Worster, Suneel Upadhye, and Michelle Welsford). The educational research program continues to flourish (Drs. Jonathan Sherbino and Teresa Chan), with strong connections to the McMaster Faculty of Health Sciences Program in Education Research, Innovation and Theory (MERIT) with Dr. Jonathan Sherbino as the Assistant Dean. The faculty continue to have numerous high-profile publications including those that focus on up-to-date evidence evaluations on key EM and resuscitation treatments.

MAJOR ACHIEVEMENTS

2018

Dr. Teresa Chan,	Program Director, AFC – Clinician Educator Program
Dr. Shawn Mondoux,	E.J. Moran Campbell Internal Career Research Award
Dr. Shawn Mondoux,	ALiEM Faculty Incubator (2018-2019)

2019

Dr. Ian Buchanan,	Outstanding Contributions to FRCPC Residency Program Award
Dr. Ian Buchanan,	Internal Medicine, EM Mentor Award
Dr. Teresa Chan,	Assistant Dean, Faculty Development, Faculty of Health Sciences, McMaster University

> *This coming year,* we will be *piloting* our Inclusion, Diversity, *Equity* and Anti-Racism (IDEA) curriculum, *designed by* our EM Residents.

Dr. Teresa Chan,	Excellence in Teaching Award, Emergency Medicine
Dr. Teresa Chan,	CAME Meridith Marks New Educator Award
Dr. RJ Eby,	EM Clinical Teaching Unit SJHH Award
Dr. Mike Hatcher,	Postgraduate Community Teacher of the Year Award
Dr. Brian Levy,	Undergraduate Community Teacher of the Year Award
Dr. Mathew Mercuri,	Editor-in-Chief of the Journal of Evaluation in Clinical Practice

2020

Dr. Teresa Chan,	CAEP Ian Stiell Researcher of the Year Award
Dr. Alex Chorley,	Outstanding Contributions to FRCPC Residency Program Award
Dr. Jonathan Taves,	EM Clinical Teaching Unit HHS Award
Dr. Noura Labib,	EM Clinical Teaching Unit SJHH Award

Promotions:

2018

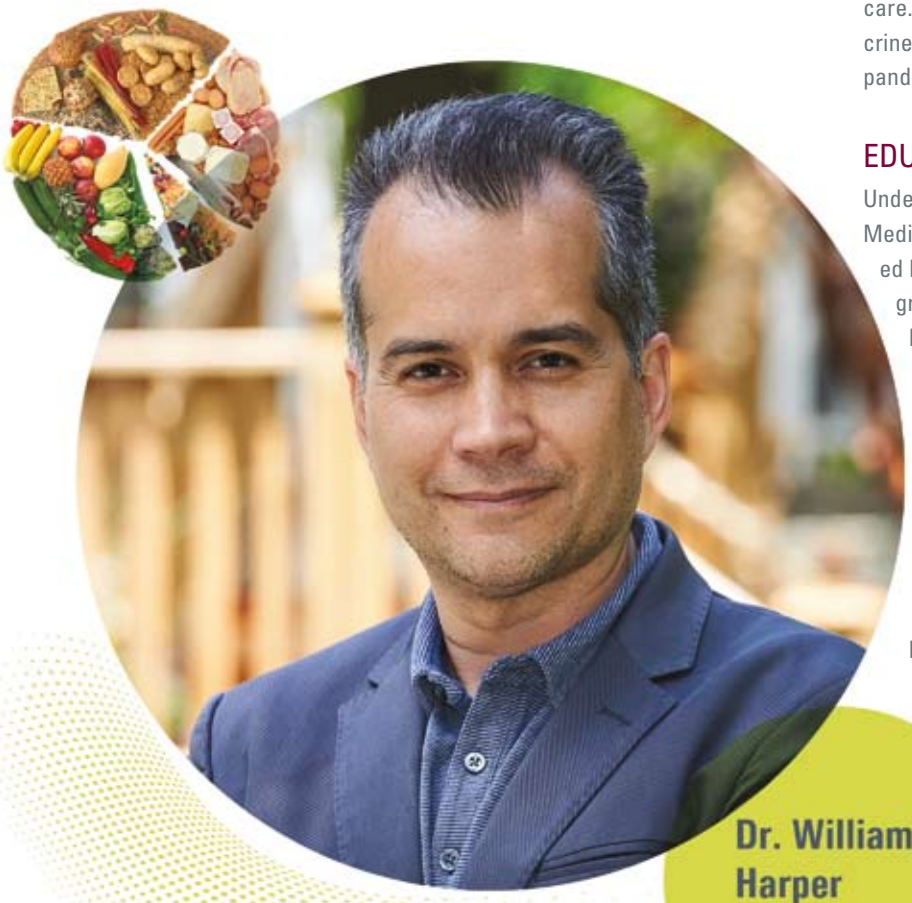
Dr. Alim Pardhan,	Associate Professor (GFT)
Dr. Bandar Bar,	Associate Professor (GFT)
Dr. Jonathan Sherbino,	Professor (GFT)

2019

Dr. Teresa Chan,	Associate Professor (GFT) ciation Young Leader Award. ■

DIVISION REPORT

Endocrinology and metabolism



Dr. William Harper
MD, FRCPC
Division Director

Endocrinology and metabolism is a highly productive Division that supports all academic endeavours including: research, medical education and clinical care. Throughout 2020 many members of the Endocrine Division have also contributed to the COVID-19 pandemic effort.

EDUCATION

Undergraduates in the Michael DeGroote School of Medicine have many educational activities supported by Endocrine Division faculty including large group lectures, horizontal electives, problem-based learning (PBL) tutorials, and clinical skills preceptorships. Endocrine Division faculty contributed to the curriculum development and subunit planning leadership through a major renewal of the Compass Curriculum that integrated reproductive endocrinology and shifted the energy homeostasis domains of nutrition, gastroenterology, and endocrinology away from their prior home in Medical Foundation 2. After this curriculum renewal an Endocrine Division member has assumed the Directorship of the new Medical Foundation 3.

Postgraduate residents interact with Endocrine Division faculty on the Clinical Teaching Units, in Academic Half-Day lectures, and during a variety of rounds and presentations. Internal Medicine residents rotate through an endocrine rotation block that includes both in-patient consultations and out-patient endocrine/diabe-

> "Divisional faculty are actively engaged in leading the development of clinical, practice guidelines *and* quality assurance initiatives."

tes clinics. Endocrine Division faculty also contribute as Internal Medicine examination board members for the Royal College of Physicians and Surgeons. Members have contributed to and helped lead the transient of postgraduate trainee evaluation towards a Competency By Design Model.

The Division has a two-year subspecialty residency program in endocrinology and metabolism which accommodates the entry of up to two new residents per annum. This program has passed every accreditation with the most recent reviews being externally by the Royal College in 2017 and internally in November 2020. With the next external review is due in 2022. The program is consistently ranked highly by candidates in the Canadian Resident Matching Service (CaRMs) Medicine Subspecialty match. The Division also runs a successful one-year fellowship in metabolic bone disease.

Divisional faculty are extensively involved in non-clinical education as PhD comprehensive and defense examiners, mentors, and graduate thesis committee members. They also teach undergraduates, master's level, and PhD students every year and currently accommodate postdoctoral fellows.

Divisional faculty are actively engaged in leading the development of clinical practice guidelines and quality assurance initiatives. They provide continuing medical education in diabetes, hypertension, parathyroid disease and general endocrinology, speak internationally on endocrine topics, educate the public about diabetes, osteoporosis, endocrine hypertension and related disorders, and provide departmental leadership in global health education and training.

Dr. Ally Prebtani

Awarded Presidential Award from OMA for longstanding humanitarian work and community service

RESEARCH PROGRAMS

All members of the Division are involved in a variety of research activities ranging from genetics, biochemistry and physiology to epidemiology and large international clinical trials. Current research topics include prevention of cardiovascular outcomes in diabetes, diabetes remission, obesity, brown adipose tissue metabolism, AMP-activated protein kinase, inflammation, fatty liver disease, dysglycemia and serious health outcomes, pediatric to adult care transitions, imaging modalities and therapies for osteonecrosis of the jaw, osteoporosis, hypoparathyroidism and metabolic bone disease, and identification of novel biomarkers pertaining to diabetes care. Endocrine Division members also contributed to launching a clinical trial investigating therapies against COVID-19 in 2020.

MAJOR ACHIEVEMENTS/RECOGNITIONS

In 2020, Dr. Ally Prebtani was awarded the Presidential Award from the Ontario Medical Association in honour of longstanding humanitarian work and community service.

FUTURE DIRECTIONS

The current focus of research in the Division is on identifying an effective and robust means of achieving type 2 diabetes remission using medical approaches, and on understanding the pathophysiology behind diabetes remission. Members are continuing to research ways of characterizing and preventing obesity in children and adults, reducing the metabolic consequences of obesity, and identifying therapies that may mitigate both obesity and diabetes. Members are also involved in research on atypical femoral fractures, metabolic bone disease, hyperparathyroidism, and hypoparathyroidism. As well, members are contributing to research and administrative reform on equity, diversity, and inclusion. ■

DIVISION REPORT

Gastroenterology

Dr. John K. Marshall
MD, MSc, FRCPC, AGAF
Division Director

EDUCATIONAL ACTIVITIES

The adult gastroenterology residency program continues to thrive with high-caliber Canadian and international trainees, under the leadership of its Program Director, Dr. Eric Greenwald. McMaster continues to host the annual Residents' Endoscopy Training Course (RETC) for first-year residents in adult gastroenterology from across Canada. This course continues to grow in popularity, under the leadership of Drs. David Armstrong, Frances Tse and Eric Greenwald. McMaster is also a lead site for Skills Enhancement in Endoscopy (SEE) programs and a related Train the Endoscopy Trainers (TET) program, aimed at improving and teaching advanced skills for practicing gastroenterologists. This program is coordinated by the Canadian Association of Gastroenterology (CAG) and run by local faculty including Drs. Greenwald, Armstrong and Tse.

We have also launched a successful annual Gastroenterology and Liver Disorders CME Day for local physicians, residents, and allied health providers, under the directorship of Drs. Armstrong, Tse, John Marshall and Khurram Khan. Many members of the Division also remain active in both undergraduate and graduate education.

This year the Division of Gastroenterology will welcome a new faculty member. Dr. Christopher Stallwood will be based at St. Joseph's Hospital with training

in advanced therapeutic endoscopy and a strong interest in postgraduate education. On a local level, we were proud to see our GI resident Lindsay Russell awarded the 2021 PARO Teaching Award.

RESEARCH PROGRAMS

The Division of Gastroenterology remains highly productive in bench-to-bedside research, with many faculty members also appointed to the Farncombe Family Digestive Health Research Institute (FFDHRI). FFDHRI is directed by Dr. Stephen Collins, with Dr. Elena Verdu appointed recently as Associate Director.

McMaster University was recently selected to host Cochrane Gut, which combines the previous upper gastrointestinal and IBD groups and is led by Drs. Paul Moayyedi, Frances Tse, and Grigoris Leontiadis. This team produces systematic reviews published in the Cochrane Library, and provides methodologic support to a number of clinical practice guidelines produced by the Canadian Association of Gastroenterology and other international societies. Many members of the Division play prominent roles in high-impact national and global clinical practice guidelines.

Dr. Moayyedi holds the Audrey Campbell Chair in Ulcerative Colitis Research and is also the Assistant Dean for Clinical Research. He continues to lead the national, multi-centre **I**nflammation, **M**icrobiome and **A**limentation: **G**astro-**i**ntestinal and **N**europsychiatric **E**ffects (IMAGINE) network, with over $35M in funding from the CIHR Strategy for Patient-Oriented Research (SPOR) and industry partners. This program is evaluating the roles of gut microbiome and diet on inflammatory bowel disease, irritable bowel syndrome and associated psychiatric disorders.

Dr. Premysl Bercik holds the Richard H. Hunt Astra-Zeneca Chair in Gastroenterology and holds NIH funding for cutting-edge research on the role of the microbiome on the gut-brain axis and functional bowel disorders. Drs. Marshall and Narula lead McMaster's participation in the Crohn's and Colitis Canada (CCC) Promoting Access and Care Through Centres of Excellence (PACE) with a focus on remote patient management.

The HHS Digestive Diseases Clinic was formally recognized as a Celiac Disease Unit by the Society for the Study of Celiac Disease, with advanced clinical care and translational research led by members of our Division including Drs. Ines Pinto Sanchez, David Armstrong and Elena Verdu.

> "... NIMBLE *in its adoption of virtual* technologies and new models OF WORK in healthcare delivery, research *and* education."

MAJOR ACHIEVEMENTS

Members of the Division of Gastroenterology are recognized nationally and internationally for their work. Dr. Elena Verdu was awarded both the 2020 CAG Research Excellence Award and the 2020 CCC/Pfizer Women in IBD Outstanding Research Award. Dr. Premsyl Bercik won the 2021 CAG Research Excellence Award. Dr. John Marshall was awarded the 2020 CAG Clinical Professorship and continues as Editor-in-Chief of the Journal of the Canadian Association of Gastroenterology. Dr. Neeraj Narula was awarded the 2020 Meeting of the Minds Junior Investigator Award. In 2021, Dr. David Armstrong became President of the OAG and Dr. Moayyedi was appointed as President-Elect of the CAG. Dr. Moayyedi was also noted to be among the top 1% of global researchers and was awarded the prestigious 2019 Jack Hirsh Award for outstanding academic achievement.

FUTURE DIRECTIONS

The Division of Gastroenterology and FFDHRI continue to enjoy strong collaboration and productivity across the spectrum of luminal gastroenterology with strong clinical and translational interests in nutrition, inflammation and the role of the microbiome in health and disease. Our prominence and focus on nutrition will grow, in alignment with global interests in both food security and obesity, and an enhanced awareness of the role of the intestinal ecosystem in human health and disease. The coronavirus pandemic has placed immense pressure on the healthcare system delivery, our academic mandate, and our collective mental health. The Division of Gastroenterology has been nimble in its adoption of virtual technologies and new models of work, and will continue to pursue innovation in healthcare delivery, research and education. ■

DIVISION REPORT

General internal medicine

Dr. John Neary
MD, FRCP(C),
Division Director

EDUCATIONAL ACTIVITIES

The Division of General Internal Medicine (GIM) continues to play an essential role in the education of trainees in health professional programs, including Undergraduate Medical Education, the Physician Assistant Education Program, the IM and GIM Residency Programs, various fellowship programs, and the many residency programs whose trainees learn essential competencies in the IM inpatient Clinical Teaching Units (CTU) and the Ambulatory CTU at McMaster. Our faculty also contribute to education of graduate and undergraduate students in non-clinical university departments.

RESEARCH PROGRAMS

Our Division continues its record of exceptional research contributions. The accomplishments of our senior researchers, including Drs. James Douketis, Gordon Guyatt, and Holger Schünemann, need no introduction. We are very fortunate to have recruited Dr. Flavia Kessler Borges to our Division as a new Research Educator; in her first year at McMaster, she was the first author of a paper describing the results of a landmark 3000-patient trial in timing of hip fracture surgery. Major areas of active research in the Division include health research methodology, perioperative medicine, thrombosis, and medical education.

Dr. Akbar Panju

> *Thank you*
> **Dr. Akbar Panju**
> *for* 22 years *of*
> *dedicated leadership as*
> **General Internal Medicine Division Director.**
> Through your contributions to **education, research and clinical care,** you have enhanced the lives of many, and have made **a profound impact** *on our community and beyond.*
>
> — Dr. Mark Crowther

MAJOR ACHIEVEMENTS

Many leadership roles in the Division have gone through a period of transition. Dr. Zahira Khalid took over as Director of the GIM Residency Program from Dr. Raj Hanmiah, the founding director of that program. Dr. Leslie Martin was appointed as a Deputy Program Director in the IM Residency Program, Dr. Maura Marcucci was named Research Director of the Division of GIM, and Dr. Serena Gundy became Head of Service for Obstetrical Medicine at Hamilton Health Sciences. Most notably, Dr. Akbar Panju stepped down as Division Director after 22 years of leadership. We are grateful to Dr. Panju for his leadership of the Division through a long period of growth and through a number of existential challenges.

Perhaps the greatest test faced by our Division (and the entire Department) in recent years has been the human resources challenge of sustaining three inpatient CTUs while maintaining excellence in education and patient care. Other academic health sciences centres in Ontario of comparable size maintain two CTUs. We have collaborated with our partners in the IM Residency Program, the academic hospitals, and the Chair's office to implement new models of weekend, evening, and overnight coverage that are less structurally reliant on residents. This collaboration paid unexpected dividends during the early stages of the Covid-19 pandemic, when the Department and its teaching hospitals were able to quickly reinforce our CTUs with 9 new physician assistants, whose presence has helped to sustain clinical and academic excellence during a time of unprecedented challenge. Many members of the Division played important leadership roles in the clinical and academic response to the Covid-19 pandemic.

FUTURE DIRECTIONS

We have been very pleased to welcome five new full-time faculty to our Division: Drs. Flavia Kessler Borges, Kristen Burrows, Andrew Cheung, Conor Cox, and Haroon Yousuf. Dr. Burrows, the first full-time Physician Assistant member of our Division, is the Assistant Dean of the Physician Assistant Education Program. Conversely, we greatly miss our former faculty members who have retired (Dr. James Gibson) or moved their practice (Drs. Arthur Wong and John You.) We have every confidence that our early-career faculty will continue to have success in their educational and research endeavours.

Our Division has a number of members with specialized practices in such diverse fields such as addictions medicine, autonomic disorders, bariatric medicine, hypertension, obstetric medicine, perioperative medicine, and thrombosis. We hope to expand our education and research impact in these areas of excellence.

We will continue to identify opportunities for innovation and improvement in our inpatient CTU model. ■

DIVISION REPORT

Geriatric medicine

> "COVID-19 showed *us the* exigency TO HAVE BETTER HEALTHCARE *for* OURSENIORS."

120

Learners in clinical rotation each year from 10 different programs

2020 marks the last year of Dr. Sharon Marr's tenure as the academic division director. We are deeply grateful for her support and outstanding leadership over the past decade and we will endeavor to build on the excellence she has helped us to achieve.

Dr. Joye St. Onge
BSc, MD, FRCP(C), MEd,
Division Director

EDUCATIONAL ACTIVITIES

Geriatric medicine is a strong contributor to education at all levels. Each year, we provide clinical rotations in geriatrics for over 120 learners, with backgrounds ranging from clinical clerk to PGY5, from 10 different educational programs. We've added rotations at our regional campuses, including an innovative interdisciplinary geriatric pharmacology and psychiatry elective. Under the program directorship of Dr. Woo and a highly committed planning committee, the subspecialty residency program has thrived, attracting excellent trainees. We have had a successful and smooth transition to Competency-Based Medical Education (CBME) thanks to leadership of Drs. Wang and McLeod, and our inaugural coaches Drs. Keen & Cowan. Dr. McLeod also supports Undergraduate Medical Education (UGME) as the clerkship director for concept integration and review.

DR. SHARON MARR

Awarded from the Canadian Geriatrics Society (2020)

DR. CHRISTOPHER PATTERSON

(2019)

DR. JOHN GONG

(2019)

DR. ARMEEN JAFRI

Canadian Geriatrics Society Annual Scientific Meeting (2019)

The Annual Update in Geriatrics held every November remains a very popular CME event. Division members contribute to the Regional Geriatric Program's Geriatric Certificate Program for regulated and non-regulated healthcare workers. This program has grown substantially in demand, geographic reach and enrolment, with more than 115 graduates in 2019. Many caregivers and patients living with dementia access online educational offerings through iGeriCare©. The clinical and educational services of GeriMedRisk© expanded geographically and are now provincial in scope. With established delivery through technological platforms, these programs were a natural fit with the pandemic world and have proven extremely valuable.

RESEARCH PROGRAMS

Division members are actively involved in research related to the "5 Ms" of geriatric medicine: mind, mobility, medications, multi-complexity, and "what matters most" for older adults. Specific areas include delirium, therapeutic value of dance (GERAS-Dance), fracture risk assessment and prevention in LTC, frailty prevention, older high-cost healthcare users, and perioperative medicine. The GERAS centre for aging research, under the leadership of Dr. Papaioannou, celebrated its 5-year anniversary. With a distinctive vision for practical, intervention-based research that tangibly makes lives better for older adults, it continues to build on the momentum of its success.

MAJOR ACHIEVEMENTS

Dr. Sharon Marr was awarded the Peter McCracken Physician Innovator in Education Award from the Canadian Geriatrics Society (2020). Dr. Christopher Patterson was awarded the lifelong achievement award at the Annual Update in Geriatrics (2019). Dr. John Gong, PGY5 won the Dr. Mark Crowther Resident Teaching Award (2019). Dr. Armeen Jafri, PGY5, won the Dr. Jack MacDonell Prize for her oral presentation at the Canadian Geriatrics Society Annual Scientific Meeting (2019).

Outpatient access to geriatric care underwent major transformation with the launch and roll out of the BSO/SGS Central Clinical Intake program. There is now a streamlined, single point of access to community-based Specialized Geriatrics Services and Behavioural Supports Ontario.

FUTURE DIRECTIONS

COVID-19 showed us the exigency to have better healthcare systems for our seniors. The division of geriatric medicine will continue to drive academic and clinical work that responds to this imperative. Over the next year, we will ensure that our strength as educators is preserved as we adapt to tremendous change and impacts of the global pandemic. In addition, we anticipate a focus on academic research and development in the following areas:

- Research that leads the way in the Geriatric 5Ms
- Academic growth at regional campuses
- Cross-disciplinary collaboration ■

DIVISION REPORT

Hematology and thromboembolism

Dr. Shannon Bates
MDCM, MSc, FRCP(C)
Division Director

The Division of Hematology and Thromboembolism is internationally recognized for its excellence in research, education and patient care. Our members are derived from the Departments of Pathology and Molecular Medicine, Oncology, as well as Medicine. Several division members also hold cross-appointments in Biochemistry & Biomedical Sciences and Health Research Methods, Evidence and Impact (HEI). Division members provide clinical care for patients with hematologic disorders at the four acute care sites in Hamilton and with our part-time members, at regional hospitals. Members of the Division are also involved in leadership roles in the Hamilton Regional Laboratory Medicine Program.

EDUCATIONAL ACTIVITIES

Division members continued to make important educational contributions at all levels, including clinical mentorship of medical students, internal medicine residents, residents from other specialty programs, and clinical fellows; as well as supervision at the Masters and PhD level in HEI; Biochemistry & Biomedical Sciences and Medical Education. The Adult Hematology Residency Program, Adult Thrombosis Medicine Area of Focused Competence (AFC) Program and Transfusion Medicine AFC Program (which is housed

in the Department of Pathology & Molecular Medicine) underwent successful Internal Reviews. The Adult Thrombosis Medicine AFC Program graduated its first diplomates. The 15th McMaster Update in Thromboembolism and Hemostasis and the 4th Irwin Walker Day were great successes.

RESEARCH PROGRAM

The division has achieved world-wide recognition for its research in thrombosis and hemostasis, platelet physiology and function, blood transfusion therapy, the molecular biology of red cell disorders and clinical trials in malignant hematologic diseases. We house two research organizations, the Thrombosis and Atherosclerosis Research Institute (TaARI), directed by Dr. Jeffrey Weitz, and the McMaster Centre for Transfusion Research, directed by Dr. Donald Arnold. Funding for our research comes from a variety of sources. Division members were successful in receiving grants from CIHR, Canadian Blood Services, and Hamilton Health Sciences. Drs. Donald Arnold, Ishac Nazy, John Eikelboom, and Paul Kim received special funding for COVID-19 research in 2020. Division members were responsible for over 100 manuscripts per year, including in leading journals like *New England Journal of Medicine*, *BMJ*, *Lancet*, *JAMA*, *Annals of Internal Medicine*, *British Journal of Hematology*, *Journal of the American College of Cardiology*, and *Blood*.

MAJOR ACHIEVEMENTS

Faculty receiving academic recognition included Dr. Weitz (American Society of Hematology Ernest Beutler Lecture and Prize), Dr. James Douketis (American College of Physicians Laureate Award), Dr. Graham Turpie (inaugural TaARI Distinguished Career Award) and Dr. Deborah Siegal (2019 Postgraduate Medical Education Award – Faculty Mentor). Drs. John Eikelboom, Jeffrey Weitz and Mark Crowther were included in the 2018 and 2019 Highly Cited Researchers Lists. Dr. Menaka Pai was appointed the inaugural Head of Benign Hematology at Hamilton Health Sciences (HHS). Hematology Teaching Awards were presented to Dr. Mohammed Aljama (clinical teaching) and Dr. Michael Trus (laboratory teaching). The Adult Hematology Program residents presented a special award for Outstanding Leadership during the Pandemic to Dr. Graeme Fraser. Drs. Madeleine Verhovsek, Donald Arnold and Mickey Zeller received 2019 Hematology & Thromboembolism AFP-Funded Student Research Awards. This competition was postponed in 2020 due the COVID-19 pandemic and will be resumed in 2021.

100+

Division members were responsible for over 100 manuscripts per year, including in leading journals like *New England Journal of Medicine*, *BMJ*, *Lancet*, *JAMA*, *Annals of Internal Medicine*, *British Journal of Hematology*, *Journal of the American College of Cardiology*, and *Blood*.

TRANSITIONS

Dr. Clive Kearon

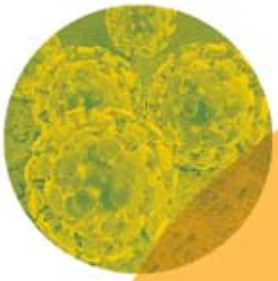
On June 3, 2020, Dr. Clive Kearon passed away after a long illness. His death was an immeasurable loss to many. He is remembered for his kindness, wit, and impact on thrombosis research and the McMaster Clinical Investigator Program. Work is ongoing to establish a thrombosis fellowship and professorship in his name.

FUTURE DIRECTIONS

We continue to recruit for both research-educators and clinician-educators and are especially interested in increasing the number of faculty in our division with formal training in education. The Adult Hematology Residency Program is closing in on transition to Competence by Design. Plans are underway for the initial Annual Update in Benign Hematology. Work is ongoing within the clinical and laboratory hematology services and in collaboration with other physician groups to enhance patient care. Participation in a large collaboration leading to an extracorporeal membrane oxygenation (ECMO) program at HHS (a service that would prove to be of particular value during the COVID-19 pandemic) is a prime example of the latter. To some extent, our immediate future directions are predicated by COVID-19. Our division members will work together to minimize the pandemic's impact on clinical care, education, and research and to explore any opportunities the pandemic might bring. ■

DIVISION REPORT

Infectious diseases



Dr. Dominik Mertz
MD, MSc, FMH(CH)
Division Director

EDUCATIONAL ACTIVITIES

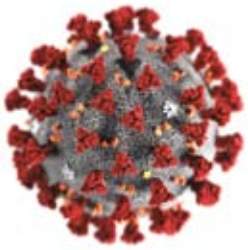
Under the new leadership of residency program director Dr. Eva Piessens, the Infectious Diseases Residency program continues to provide outstanding support and guidance to trainees in the program, in close collaboration with the medical microbiology training program which is under the leadership of division member Dr. Daniela Leto. In addition to these training programs, we have two well established subspeciality fellowship programs, one for HIV led by Dr. Shariq Haider, and one for infection prevention and control and antimicrobial stewardship, co-led by Dr. Dominik Mertz and Dr. Sarah Khan. Dr. Haider is also serving as a RCPSC surveyor for Canadian and International Residency Programs.

RESEARCH PROGRAMS

Drs. Loeb (PI), Mertz, and Chagla are conducting a CIHR and WHO-funded trial comparing medical masks versus N95 respirators to prevent COVID-19 infections among healthcare workers. Dr. Loeb is also leading a CIHR-funded trial on determinants of COVID-19 community transmission among Hutterites. Furthermore, many division members have been involved in other investigator-initiated and a few industry-initiated studies related to the COVID-19 pandemic,

COVID RESEARCH

- Trial comparing medical masks versus N95 respirators to prevent COVID-19 infections
- Determinants of COVID-19 community transmission among Hutterites
- Treatment or prophylaxis trials
- Testing for SARS-CoV-2
- Protecting vulnerable populations



DR. ZAIN CHAGLA

DR. MAREK SMIEJA

DR. SHARIQ HAIDER

DR. CHERYL MAIN

being it on treatment or prophylaxis trials (Drs. Chagla, Mertz, Haider, and Loeb), various studies around testing for SARS-CoV-2 (Dr. Smieja), vaccines (Dr. Smaill), or protecting vulnerable populations (Drs. O'Shea and Dr. Smieja).

In terms of non-COVID-19 research, Dr. Mertz (PI), Dr. Smieja and Dr. Loeb continue to work on preventing Clostridium Difficile infections by identifying carriers. Dr. Mertz (PI) and Dr. Loeb also received an industry grant from a company to continue to conduct a cluster-randomized factorial crossover trial of antibiotic prophylaxis and negative pressure wound dressing to prevent surgical site infections. Dr. Haider developed and is leading CANMUS, the Canadian Mucormycosis Network.

MAJOR ACHIEVEMENTS

Under the lead of Dr. Piessens, the Infectious Disease Handbook was launched online, a project with involvement of many division members (link: https://idhandbook.hamiltonhealthsciences.ca/). Drs. Loeb and Mertz continue to work on updating the list of antibiotics for the WHO Essential Medicine List. Dr. O'Shea was successful in obtaining an Ontario HIV Treatment Network (OHTN) grant for work in HIV treatment and prevention clinics. Drs. Mertz, Chagla, Loeb and Smieja have been serving on several local, regional, provincial (Ontario Health and Public Health Ontario, respectively), and national task forces, committees, and panels helping address the COVID-19 pandemic. Dr. Loeb also serves on the Infectious Diseases Society of America Guidelines panel on the diagnosis of COVID-19.

Dr. Haider was awarded the MSA President's Aware for Distinguished Service in 2019, serves as President Elect for the Canadian Foundation for Infectious Diseases (CFID), and sits on the Board of Directors of the Canadian Association of HIV Research (CAHR). Dr. Loeb was awarded the title of Fellow of the Royal Society of Canada and Fellow of the Canadian Academy of Health Sciences. Finally, Dr. Main received the Dr. Clive Davis award from the MSA. Finally, Dr. Yamamura is currently President Select for AMMI Canada and an IQMH Advisory Council Member.

FUTURE DIRECTIONS

We are planning to recruit 2-3 new division members over the next two academic years. This will allow us to address the ever-increasing demand for clinical Infectious Disease expertise, and also to further broaden the clinical as well as research expertise within the division. Collaboration within and across divisions and departments as well as quality improvement work will continue to be a goal for the division.

Many division members shifted their administrative, clinical and research focus to COVID-19 in 2020. Our research direction continues to be randomized trials and observational studies, systematic reviews, diagnostic and immunologic studies, research in hospital epidemiology, and we continue to work closely with colleagues doing bench and pandemic research. ■

DIVISION REPORT

Nephrology

Dr. Scott Brimble
MD, MSc, FRCPC
Division Director

EDUCATIONAL ACTIVITIES

The Division of Nephrology is very influential in shaping undergraduate and postgraduate medical education in the Department of Medicine. Nephrology continues to be a popular rotation/selective amongst the medical students and internal medicine residents. Training is provided in in-patient nephrology, transplantation and out-patient clinics. Initiatives in simulated procedures and evaluation exercises, such as the Renal OSCE, continue to be educational foundations of the rotation.

Due to the strength and popularity of this program, there are over 20 residents, fellows, and clinical scholars in the program. There are 5 fellowship programs offered and the program is one of only two centres in the country to receive RCPSC/AFC accreditation for Solid Organ Transplantation.

RESEARCH PROGRAMS

The study of kidney disease at both basic science and patient levels continues to be a major academic focus of the division. Closely affiliated with the Division of Nephrology, the Hamilton Centre for Kidney Research (HCKR) brings clinical and biomedical researchers together with the goal to improve the lives of people with chronic kidney disease (CKD) through leading-edge research. Divisional members

200+

Divisional members have published more than 200 peer-reviewed original research publications over the past five years.

have published more than 200 peer-reviewed original research publications over the past five years, with substantial funding from CIHR and other prestigious granting agencies.

Clinical research continues to grow in the division. The division is home to one of the largest randomized controlled trials in nephrology ever to be undertaken (ACHIEVE). This study is evaluating the role of aldosterone antagonism in reducing cardiovascular events in people on dialysis. The division also has expertise in utilizing large datasets to better understand the risk of thrombotic and cardiovascular complications in people with CKD.

A number of divisional members conduct cutting-edge biomedical research in their laboratories. One line of investigation focuses on the underlying mechanisms of atherogenesis and vascular calcification in CKD. Other areas of intense interest include studying the pathogenesis and potential therapies of diabetic and hypertensive kidney disease, progressive renal fibrosis, and monogenetic and polygenetic contributors to kidney disease.

MAJOR ACHIEVEMENTS

Growth in our renal transplant program has been unparalleled, necessitating the recent recruitment of an additional transplant nephrologist. This has been a success story for our patients. Participation in the National Living Donor Paired Exchange registry has provided the opportunity for many patients, including those at high immunological risk, to receive a kidney transplant.

The division continues to make substantial contributions towards narrowing the long-standing evidence gap in the clinical care of people with kidney disease, and to better understand the pathophysiology and genetics of progressive kidney disease and vascular calcification.

FUTURE DIRECTIONS

The division will continue to lead the way in educational innovation at an undergraduate and postgraduate level. We will continue to expand our offerings of additional fellowship training, including genetics in nephrology and geriatric nephrology. Simulation and "Competence by Design" are two areas in particular where we expect to lead the way.

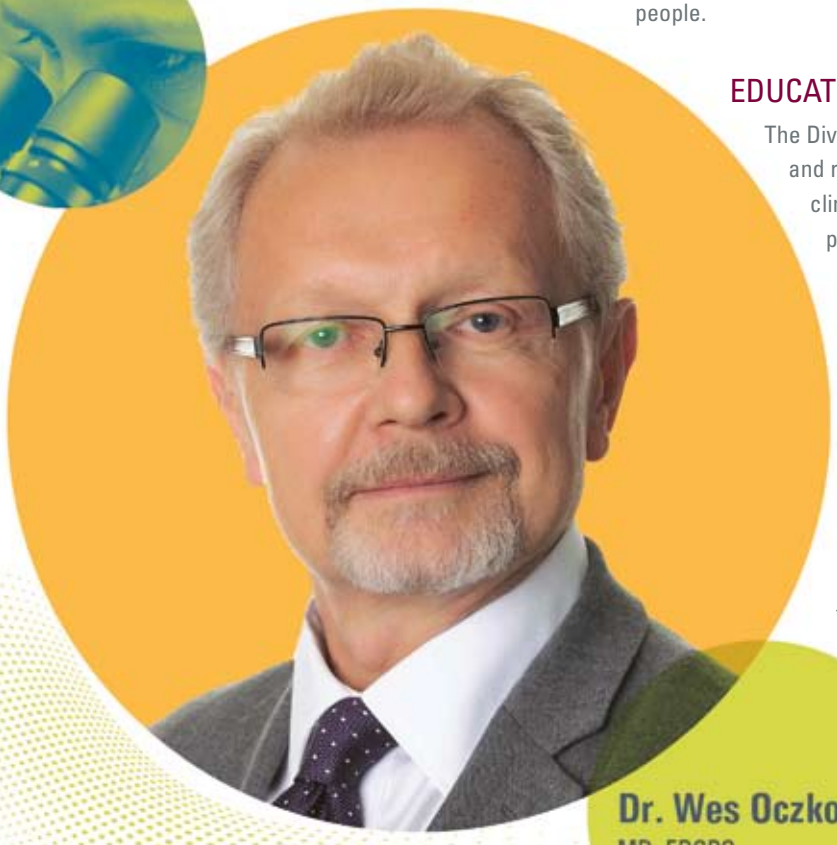
> "Our program is one of **only two centres** in the country to receive **RCPSC/AFC** *accreditation for* **SOLID ORGAN TRANSPLANTATION.**"

Our goal is to be the preeminent nephrology program in Canada for clinical research, attracting national and international future clinical trialists who seek additional training. Furthermore, increasing research collaborations between divisional members has begun to yield exciting findings in translational research that may lead to novel therapies in the management of CKD and its complications.

The division continues to pride itself in the delivery of high-quality, patient-partnered care; its academic pursuits will always focus on the ultimate goal of improving the lives of people with kidney disease. Growing divisional expertise in quality improvement will further strengthen our strong relationships with hospitals and provincial agencies as we work together towards this common goal. ■

DIVISION REPORT

Neurology



Dr. Wes Oczkowski
MD, FRCPC
Division Director

INTRODUCTION

The Division of Neurology is one of the largest divisions in the Department of Medicine with 31 academic faculty. We provide tertiary neurological consultation for the largest regional service area in Ontario of over 2.3 million people.

EDUCATIONAL ACTIVITIES

The Division of Neurology helps coordinate and run the neuroscience curriculum and clinical skills in the MD undergraduate program. Many of the faculty are tutors and most faculty supervise undergraduate students on the neurology teaching units and in their outpatient clinics.

The five-year neurology residency training program has grown to 20 residents. All our graduates have been successful in passing their Royal College examinations. Some have started in general neurological practice while others have continued their training in neurological subspecialties. The training program has a robust teaching

20

Number of residents in the five-year neurology residency training program.

curriculum which includes a weekly problem-based academic half-day, daily teaching rounds, including subspecialty rounds in EEG, EMG, movement disorders, multiple sclerosis, stroke, and neuroradiology. Weekly Neuroscience Grand Rounds and Stroke Program Grand Rounds supplement our other teaching sessions. We host a successful annual Residents' Research Day and Neuroscience Half-Day.

The division offers fellowship programs in stroke, epilepsy, multiple sclerosis, and neuromuscular disorders. The stroke fellowship program is a fully funded program supported by the Marta and Owen Boris Foundation.

Continuing health education is provided at our annual Neuromuscular Day, Half-Day in Epilepsy, Stroke Update and Half-Day in Clinical Neurology.

RESEARCH ACTIVITIES

COVID-19 has had a significant impact on clinical research, with much of it initially paused. However, it has also changed how we engage research patients, with telephone visits and video consent.

The Stroke Program continues to be very active in clinical trials research along with the Population Health Research Institute and Hamilton Health Sciences. We have been successful in continuing to run many of our clinical trials despite pandemic restrictions. Trials include testing acute stroke risk reduction and neuroprotective agents, endovascular interventional trials, prevention of stroke in patients with atrial fibrillation after intracerebral hemorrhage, and reducing the risk of stroke in patients with intracranial disease. The Epilepsy Program is investigating the prognosis of generalized epileptiform discharges, new agents in status epilepticus, trials on sudden unexpected death in epilepsy, and automated methods of EEG analysis. The Neuro-Oncology program is actively recruiting and running trials in treatments for patients with brain tumors. The Multiple Sclerosis program is participating in trials testing new agents to enhance remyelination and repair. Basic science research continues in ALS, neuromuscular disorders, and the neural mechanisms of consciousness. The neurocritical care and stroke groups are involved in national guideline development.

MAJOR ACHIEVEMENTS

The division has grown substantially in the last 2 years, especially in the context of subspecialty program growth and moving towards gender equity. We now have 2 or more subspecialty trained full-time academic neurologists in each of stroke, epilepsy, movement disorders, multiple sclerosis, neuro-oncology, neuromuscular disorders, and ALS.

The neurology training program is a mature and coveted program that graduates excellent neurologists and is predicated on an exceptional teaching curriculum. Our faculty have received undergraduate and postgraduate teaching awards.

Many of the neurology subspecialty programs have a fellowship program and are actively involved in clinical research, either leading or participating in clinical trials.

FUTURE DIRECTIONS

Neurology has recruited our first cognitive neurologist and plans to grow this high priority program. We have started the recruitment process for an epileptologist with expertise in surgery for epilepsy and a movement disorders neurologist with expertise in deep brain stimulation. Other priority clinical areas of headache, pain, and general neurology look to be filled by some of our exceptional senior graduates.

The division of neurology will continue to focus on clinical trials and education as priorities for its academic mission. ■

"We now have 2 or more... full-time neurologists *in each of* stroke, epilepsy, movement disorders, MULTIPLE SCLEROSIS, neuro-oncology, neuromuscular disorders, and ALS."

DIVISION REPORT

Physical medicine and rehabilitation

Dr. Nora Cullen
MD MSc FRCPC
Division Director

It has been my honour to serve as the Division Director and Chief of Physical Medicine and Rehabilitation (PM&R) since March 2020. The journey continues to inspire as we move towards a highly productive academic and clinical enterprise. We remain committed to optimizing the health and function of our patients with disabilities while providing educational and research opportunities for medical students, residents and fellows.

CLINICAL SERVICES

Rehabilitation care in Hamilton is one of the largest clinical programs in North America. We provide services to a wide variety of patients including individuals recovering from stroke, spinal cord injury, brain injury, amputation, cancer, as well as bone and joint injuries. The in-patient program has a compliment of over 100 beds. The majority of clinical services are delivered at the Regional Rehabilitation Center located on the Hamilton General Hospital campus. Additional services are provided at the Juravinski Hospital, St. Joseph's Healthcare Hamilton (SJHH), St Peter's Hospital and McMaster University Medical Centre. We conduct approximately 30,000 out-patient visits yearly.

UNDERGRADUATE AND RESIDENCY TRAINING PROGRAM

The PM&R faculty supports the second largest residency program in Canada with approximately 20 post-graduate trainees, many medical students, as well as clinical fellows from other universities. The Residency Program Committee oversees the quality of teaching over the course of five years of training. Competency by Design will be introduced in July 2020, providing a new platform for evaluation and feedback for residents during their training. As well, the PM&R program will be undergoing an Internal Review in November 2020 to provide clarity on priorities. We are excited to embark on these important activities as they will enhance our program.

Number of out-patient visits to Physical Medicine and Rehabilitation

> "Rehabilitation care in Hamilton is one of the largest clinical programs in North America."

RESEARCH

Our faculty and residents have presented abstracts and posters in recent years at national research meetings, including the American Congress of Rehabilitation Medicine, American Academy of Physiatry, and the American Academy of Neuropathology. We are currently facilitating research projects within the division to ensure that studies move towards advancing knowledge about optimal care of patients with disabilities.

STRATEGIC PLANNING

We will be embarking on a multifaceted strategic planning process in September 2020, seeking a unified vision from members and residents of a roadmap for the next five years. We will hear from researchers and biotech scientists across McMaster who will inform us of collaborative opportunities in related fields. We will do a deep dive into the results of an Internal Review for the residency program and seek consensus on identified priorities in improving our teaching, research and other priorities.

FUTURE DIRECTIONS

The division of PM&R is a collaborative and academically productive group of committed individuals who are equipped to optimize our strengths in spite of the constraints of the pandemic. We are actively recruiting new faculty to support in-patient and out-patient programs. With an aging population and technological advances, we expect to be busy meeting the needs of the population that we serve.

I am very much looking forward to the future of PM&R at McMaster. ■

DIVISION REPORT

Respirology

Dr. Martin Kolb
MD, PhD
Division Director,
Research Director,
Associate Professor

The Division of Respirology is the primary provider for tertiary care service for Southern Ontario. We offer many specialty clinics that attract patients from our region and beyond. Amongst the "flagships" are our severe airway disease and interstitial lung disease clinics, and more recently, the Pulmonary Hypertension and a Respirology/Infectious Disease Clinic (all at St. Joseph's Hospital), and at the HGH site, a clinic for adult Cystic Fibrosis.

FACULTY

Dr. Jane Turner has joined the Division after completing some additional training in the field of pulmonary complications post bone marrow transplant in Seattle. She is providing expert care in this area at the Juravinski Hospital. Dr. Terence Ho is another new recruit and he is particularly interested in complex airways disorders and chronic obstructive pulmonary disease. Both Drs. Turner and Ho have already been successful in obtaining funding for clinical research projects. Dr. Madhu Chari has been recruited to our group of sleep physicians after the retirement of Dr. Peter Powles in 2020.

EDUCATIONAL ACTIVITIES

Under the leadership of our program director, Dr. Rebecca Amer, the Respirology Residency Training Program continues to attract top

trainees from Canada and the Middle East. For the first time we had a fellow join our program from the University of Tel Aviv in Israel. Our capacity to provide a respirology training experience for rotating residents from other postgraduate programs such as Internal Medicine, Anesthesia, Radiation Oncology, and Head and Neck Surgery has been considerably enhanced by offering electives at the Hamilton General and Juravinski Hospitals.

RESEARCH PROGRAMS

The research within the Division of Respirology continues to be very diverse. Dr. Malcolm Sears has retired as the director of the Canadian Healthy Infant Longitudinal Development study (CHILD) which has enrolled an impressive number of infants, almost 3,000, from across Canada. Dr. Padmaja Subbarao, who holds a primary appointment at the University of Toronto and an adjunct appointment with the Division of Respirology at McMaster has taken over as director of the CHILD study. The study continues to produce 10-15 publications per year. One of the many questions that will be addressed in this study are the identification and better understanding of early determinants of factors that lead to asthma in children, adolescents, and young adults. Our sputum lab at the Firestone Institute for Respiratory Health, under the leadership of Dr. Param Nair as medical director and Dr. Helen Neighbour as deputy director, is world-renowned and attracts many clinical trials that are aimed at personalized medicine to treat severe asthma and COPD. Peptide immunotherapy for allergic diseases and asthma is another major research area, led by Dr. Mark Larché. In addition, our faculty members continue to investigate the basic mechanisms of airway and vascular smooth muscle cells in airway disease. The labs of Drs. Ask, Hirota and Kolb explore the cellular and molecular biology of pulmonary fibrosis with substantial translational research. Dr. Janssen, an expert in smooth muscle cell biology, retired in 2020 after more than 25 years of service. The numbers of pre-clinical and early clinical trials that are conducted in this field are increasing every year. Several of our researchers are also conducting projects to study the impact of COVID-19 on respiratory health. Funding for these research programs is provided by CIHR, CFI, the OLA, and other public agencies.

> "Several of our researchers are also conducting projects to study the impact of COVID-19 on respiratory health."

DR. PADMAJA SUBBARAO

DR. PARAM NAIR

DR. HELEN NEIGHBOUR

DR. MARK LARCHE

DR. ASK

DR. HIROTA

FUTURE DIRECTIONS

The development of collaborative clinical programs across the City of Hamilton and within the larger region remains the major goal for our division. The plan is on track and will result in better integration between the sites and their respective strengths. Focused recruitment of new faculty with an interest in clinical research will assure the continuity of our profile as a strong academic division. ■

DIVISION REPORT

Rheumatology

Dr. Alfred Cividino
BASc, MD, FRCPC, FACR
Division Director

EDUCATIONAL ACTIVITIES

The Postgraduate training program has flourished under Dr. Nader Khalidi's strong leadership and continues to do so under Dr. Kim Legault who recently took the reins on July 1, 2019. The program remains to be nationally recognized for its excellent teaching. The applicant pool for trainees continues to be of the highest caliber. The Division has embraced Competency by Design and has had a successful Internal Review of its newly redesigned evaluation system that Dr. Khalidi and Program Coordinator Rennée Tremblay worked tirelessly to implement (and currently Dr. Kim Legault alongside Rennée Tremblay).

The program offers sub-specialty clinics in lupus, scleroderma, vasculitis, metabolic bone disease as well as multi-disciplinary clinics with respirology, nephrology and neurology. The Division also provides educational support for neurology, physiatry, internal medicine, dermatology, family medicine and ophthalmology. Dr. Matsos will be co-chair of the recently established Internal Medicine Competency by Design Committee.

The faculty has strong representation across the undergraduate program in tutoring, professional skills, musculoskeletal boot camp, clerkship selective and supervising Medical Foundation 5 under Dr. Carmona's direction.

Outreach and community learning experiences are provided by the many associated clinical faculty in Hamilton, Burlington, Milton, St. Catherine's, Cambridge and Kitchener-Waterloo.

Dr. June Lee, our first faculty at the St. Catherine's campus has completed her Master's in Education while providing leadership in the undergraduate program.

Our highly rated 'Clinical Day in Rheumatology: The Pearls you Need to Know' was held again this year.

RESEARCH

Research activity and funding support has been broadly based in the areas of metabolic bone disease, lupus, scleroderma, inflammatory arthritis, and vasculitis.

Multiple grants have been supported by CIHR, HAHSO Innovation Fund, NIH, The Arthritis Society, The Canadian Rheumatology Association as well as industry partners.

Collaboration with radiology, respirology, nephrology, geriatrics, engineering and rehabilitation sciences have continued.

Dr. Rick Adachi's work continues to be recognized internationally as one of the most published faculty at St. Joseph's Health Care. He has several peer-reviewed grants.

Dr. Khalidi continues to be very productive in expanding work in new treatments for vasculitis with NIH and industry funding.

Dr. Larché continues her work in scleroderma and imaging in inflammatory arthritis.

MAJOR ACHIEVEMENTS

- Dr. Maggie Larché has been awarded a $1.1 million grant to study biomarkers in patients with Rheumatoid Arthritis and Interstitial Lung Disease in collaboration with respirologists, (Drs. Cox, Kolb, Hambly, Scallan, Ho, Nair) rheumatologists, (Drs. Khalidi and Garner) and scientists (Drs. Ask, Mukjerjee and Larché).
- Dr. Nader Khalidi remains the Vice-President of CanVasc (Canadian Vasculitis Research Network). He is involved in numerous international research projects in Vasculitis (VCRC/PEXIVAS/DCVAS).
- Dr. Kim Legault continues to work on several research projects including guidelines in SLE and CAPS, and the cohort study rivaroxaban in antiphospholipid syndrome. This has led to publication of new guidelines for CAPS and Lupus
- Dr. Mark Matsos is an investigator in the LuCIN (Lupus clinical investigator network) and co-author of new Lupus guidelines
- Our fifth annual Clinical Day in Rheumatology was extremely successful in a virtual format
- New Fellowships in Vasculitis and Scleroderma have been established
- New faculty recruitment; Dr. Stephanie Garner having completed a Vasculitis and Rare Disease fellowship and Dr. Kostas Tselios having extensive experience in Lupus Clinical research
- Clinical Scholars Dr. Faiza Khokhar and Dr. Mary-Clair Yelovich were supported by the division in completing their Master's in Education and Quality Improvement respectively

FUTURE DIRECTIONS

Our vision is to be recognized for leadership and innovation in education, research and inter-disciplinary patient-centered care.

As division director, I am excited about the developments in the division and interest in new clinical scholars who will bring a new set of skills to expand our potential. ■

Photo taken pre-COVID

30th Annual Resident Research Day in Medicine

The Department of Medicine celebrated the 30th Annual Resident Research Day on May 22, 2019 at the Liuna Station. Sixty-three abstracts were submitted and reviewed by Dr. Christine Ribic, Research Director, and Drs. Kim Legault, Mark Matsos and Siraj Mithoowani. Judging was conducted by Drs. Kim Legault, Wendy Lim and Martin Loeb (Scientific); Drs. Raj Hanmiah, Arthur Lau, and Nishma Singhal (Clinical); and Drs. Erick Duan, Azim Gangji and Deborah Siegal (Subspecialty)

2019 RESIDENT RESEARCH GRANT RECIPIENTS

Dr. Paul O'Byrne Resident Research Grant:

RECIPIENT: **Dr. Tammy Ryan, PGY1.**

Title: A Genetic Risk Score for Hypertrophic Cardiomyopathy

Supervisor: Dr. Guillaume Paré

Dr. Paul O'Byrne Resident Research Grant

RECIPIENT: **Dr. Omar Ibrahim, PGY1.**

Title: Single Oral Dose Anti-Arrhythmics for Conversion of Atrial Fibrillation Episodes (SODA-CAFÉ)

Supervisor: Dr. Emilie Belley-Côté

Hamilton Health Sciences Resident Research Grant in Patient Safety

RECIPIENT: **Dr. Derek Little, PGY3.**

Title: Management of Antithrombotic Therapy After Gastrointestinal Bleeding: A Mixed Methods Study

Supervisor: Dr. Deborah Siegal

Thank you to the Grant Review Committee: Drs. Hertzel Gerstein, Kim Legault, Azim Gangji, Sharon Marr, Amna Ahmed, Carly Barron, Kevin Singh

BRIGHTER WORLD

ORAL PRESENTATIONS

Gold medal: Derek Chu, PGY5 Immunology.
Oral Immunotherapy for Peanut Allergy: A Systematic Review and Meta-Analysis
Supervisor: H J Schunemann

Silver medal: Derek Little, PGY3 Internal Medicine.
Resumption of Anticoagulant Therapy after Anticoagulant-Related Bleeding: A Population-Based Cohort Study
Supervisor: D Siegal

Bronze medal: Clara Lu, PGY2 Internal Medicine.
Somatostatin and Analogues for Acute Non-Variceal Upper GI Bleeding: A Systematic Review and Meta-Analysis
Supervisor: W Alhazzani

SCIENTIFIC POSTER MEDAL

First: Derek Little, PGY3.
Management of Antithrombotic Therapy after GI Bleeding: A Qualitative Study of Healthcare Providers
Supervisor: D Siegal

Second: Olivia Geen PGY2, Derek Chu PGY5 Immunology.
Cytoreduction for the Treatment of Essential Thrombocythemia: A Systematic Review
Supervisor: C Hillis

Subspecialty: Michael Wang, PGY4 GIM.
Are Learner Assessments Happening at the Bedside? A Survey of Direct Observation and Feedback Practices on the Internal Medicine Ward
Supervisor: D Brandt Vegas

CLINICAL POSTER MEDAL

First: Laura Goodliffe, PGY2.
Massive Hemoptysis and Pulmonary Embolism: When to Reconsider your Diagnosis
Supervisor: S Mithoowani

Second: Matthew Jessome, PGY1.
Is Miliary Pattern Always TB? Revisiting the Age-Old Adage: A Unique Case of Primary Colon Cancer Presenting as a Miliary Pattern on CT Chest
Supervisor: R Amer

Subspecialty: Ola Tarabzuni, PGY4 Nephrology.
Chronic Inflammatory Demyelinating Polyneuropathy and Concurrent Membranous Nephropathy Associated with Anti-Contactin-1 Autoantibodies.
Supervisor: P Margetts

Dr. Laura Goodliffe, PGY2, presents the Rotation Award on behalf of the residents to Dr. Azim Gangji Program Director and Wendy Clark, Program Coordinator, Nephrology

Photo taken pre-COVID

Dr. Akbar Panju presents the Panju PGY1 Professionalism Award to co-recipients Dr. Rand AlOhaly and Dr. Anthony Sandre.

Photo taken pre-COVID

RESIDENCY PROGRAM AWARDS

Jeff Ginsberg Subspecialty Resident Award.

Demonstrating excellence in professionalism, leadership and education. This award has been made possible by a donation from a patient of Dr. Jeff Ginsberg. Candidates are recognized for consistently displaying outstanding performance in clinical rotations, excellence in teaching, research and professionalism and commitment to academic achievement.

Recipients: Andrew Kelly, Derek Chu

CMR Award for Excellence in Clinical Competence and Teaching. Nominees display a strong presence on the CTU and demonstrate excellence in education, administration and professional responsibility, serving as a role model for junior trainees.

Nominees: Hugh Traquair, Kevin Singh, Nikita Malhotra and Rachel Gow

Recipients: Elliot Hepworth, Sandeep Dhillon, Jessica Kapralik and **Malik Farooqi**

Dr. Hui Lee Award for Excellence in Clinical Care and Teaching (PGY2).

Nominees consistently exhibit excellence in clinical performance, strong education involvement with the undergraduate program and exemplary professionalism.

Nominees: Laiya Carayannopoulos, Heather Bannerman, Ankur Goswami, Clara Lu and Tyler James

Recipients: Hernan Franco Lopez and **Laura Goodliffe**

Akbar Panju Professionalism Award.

The Panju Professionalism Award in Residency Training is awarded to a PGY1 who encompasses all those humanistic attitudes and behaviors that respect the core values of the medical profession. The successful candidate consistently exhibits appropriate personal and interpersonal professional behaviors in an ethically responsible manner; and delivers a high quality of patient-centered care with integrity, honesty and compassion.

Recipients: Rand Al Ohaly PGY1 and **Anthony Sandre PGY1.**

RESIDENT AWARDS TO FACULTY

Faculty Internist and Faculty Subspecialty Award for Excellence in Clinical Teaching, selected by residents.

General Internal Medicine: **Naufal Mohammed** HGH**, Ahraaz Wyne** JH, **Andrew Cheung** SJH

Subspecialty: **Bram Rochwerg**

Community Preceptor: **Michael Wang,** Waterloo

ED Mentor Award: I**an Buchanan**

Subspecialty Rotation Award presented annually to the rotation that consistently delivers exemplary educational experience to the residents.

Recipient: **Nephrology SJH**

RESIDENT PROGRAM CONTRIBUTION

Education Committee: **Christina Reppas**, **Courtney Coschi**, **Abdulrahman Aldeeri**, **Laura Goodliffe**, **Zahra Merali**, **Liam Finlay**, **Matthew Jessome** & **Katherine Steckham**

Academic Half Day committee co-chairs: **Hernan Franco Lopez** & **Annie Khan**

Journal Club: **Liam Finlay**, **Cindy Law**, **Deborah Koh**, **Oksana Motalo** & **Nischal Ranganath**

PoCUS Leadership: **Mats Junek** & **Ryan Quinn**

M&M Rounds: **Tyler James** & **Alec Campbell**

Winter Gala Co-Chairs: **Shoshana Grossman** & **Jessica Kapralik**

Research Committee: **Cindy Law, Carly Barron**, **Emily Baxter**, **Victor Lo**, **Nischal Ranganath**, **Tammy Ryan** & **Teresa Semalulu**

R3 Exam Impact Committee: **Nikita Malhotra**

CBD Executive Committee: **Rachel Gow**, **Malik Farooqi**, **Elliot Hepworth**, **Sheryl Hodgson**, **Ankur Goswami**, **Kristen Sullivan**, **Nick Timmerman** & **Gabriel Jeyasingham**

Wellness Committee Leadership: **Olivia Geen**, **Laiya Carayannopoulos**, **Emily Baxter** & **Zahra Merali**

EBM Curriculum Committee Leadership: **Cindy Law**

PGY1 Boot Camp Leadership: **Laura Goodliffe** and **Zahra Merali**

Survival Guide Update Leadership: **Zachary Gowanlock** and **Hernan Franco Lopez**

Residency education continues to thrive because of strong faculty support in the Department. Residents benefit greatly from faculty mentorship, research supervision, clinical teaching and academic curriculum contributions throughout their training. It's our privilege each year to recognize and celebrate these contributions.

Jan Taylor
Administrator, Internal Medicine Residency Program ■

Dr. Christine Ribic, Resident Research Director, presents Clinical Poster awards to Dr. Laura Goodliffe, PGY2, First Place and Dr. Matthew Jessome, PGY1, Second Place
Photo taken pre-COVID

31st Annual Resident Research Day in Medicine

The Department of Medicine celebrated the 31st Annual Resident Research Day virtually on May 25 and 27, 2020. Sixty-nine abstracts were submitted and reviewed by Dr. Christine Ribic, Research Director, and Drs. Kim Legault, Mark Matsos, Siraj Mithoowani and Deborah Siegal. Judging was conducted by Drs. Catherine Clase, Hertzel Gerstein, Maggie Larché and Jeff Weitz (Scientific); Drs. Zara Khalid, Mohamed Panju and Marianne Talman (Clinical); and Drs. Mark Inman, Bram Rochwerg and Madeleine Verhovsek (Subspecialty).

2020 RESIDENT RESEARCH GRANT RECIPIENTS

Dr. Parveen Wasi Resident Research Grant in Medical Education:

RECIPIENT: **Drs. Wendy Ye, Jaymee Shell, Aram Karkar and MacKenzie Turpin PGY1.**

Title: *Implementation of visual aids to enhance understanding, awareness, and successful completion of entrustable professional activities in internal medicine residency: A medical education project applying quality improvement methodology.*

Supervisor: Dr. Leslie Martin

Dr. Paul O'Byrne Resident Research Grant:

RECIPIENT: **Dr. David Putman, PGY2.**

Title: *Immune Phenotyping of Asymptomatic SARS-CoV-2 Infection in Pregnant Women Admitted for Delivery in Hamilton Ontario*

Supervisor: Dr. Judah Denburg

Dr. Paul O'Byrne Resident Research Grant

RECIPIENT: **Drs. Wendy Ye and Jinbaek Kim, PGY1.**

Title: *Opinions and Attitudes of Patients on Hemodialysis on Withdrawal of Renal Replacement Therapy*

Supervisor: Drs. Anne Woods, Azim Gangji and Anne Boyle

Hamilton Health Sciences Resident Research Grant in Patient Safety

RECIPIENT: **Dr. Sanjay Sonney, PGY1.**

Title: *The effect of EHR and Electronic Discharge Summaries on General Internal Medicine Discharge Summaries Quality*

Supervisor: Dr. Steven Wong

Dr. Christopher Patterson Resident Research Grant

RECIPIENT: **Dr. Victoria Chuen PGY1.**

Title: *The use of telemedicine from the perspective of specialist physicians in geriatrics.*

Supervisor: Dr. Joanne Ho

Thank you to the Grant Review Committee: Drs. J-D Schwalm, Amna Ahmed, Sharon Marr, Kim Legault and Derek Little.

BRIGHTER WORLD

ORAL PRESENTATIONS

Gold medal: Anasuiya Surendran, PGY5 Endocrinology.

Appropriateness of Clinical Indications for Ordering Thyroid Stimulating Hormone in Non-Critically Ill Adult Inpatients – A Delphi Study

Supervisor: Dr. Zubin Punthakee

Silver medal: Omar Ibrahim, PGY2**, Kevin Um** PGY1**, Shreyash Dalmia** PGY2 Internal Medicine.

Single Oral Dose Antiarrhythmic Drugs for Cardioversion of Acute Atrial Fibrillation Episodes – a Systematic Review and Network Meta-Analysis

Supervisor: Dr. Emilie Belley-Côté

Bronze medal: Jason An, PGY5 Rheumatology.

Elevation of CXCL4 in Systemic Sclerosis

Supervisor: Dr. Maggie Larché

SCIENTIFIC POSTER MEDAL

First: Carly Barron, PGY3.

Association of Inflammation, Thrombogenicity and Myocardial Injury in Patients Undergoing Surgery for Cancer: A Nested Case Control Study

Supervisor: Dr. Darryl Leong

Second: Teresa Semalulu, PGY2.

Transition from Pediatric to Adult Rheumatology: The Clinician as a Fundamental Ally?

Supervisor: Drs. Mark Matsos and Karen Beattie

Subspecialty: Megan Guay, PGY3 Neurology.

Utility of Echocardiogram in the Workup of Ischemic Stroke Patients (UTMOST)

Supervisor: Dr. Kanchana Perera

CLINICAL POSTER MEDAL

First: Tauben Averbuch, PGY1.

Marburg's Variant Multiple Sclerosis: A Case Report

Supervisor: Dr. Amit Chakroborty

Second: Waseem Hijazi, PGY2.

When Less is More; Refractory Hypertension in an Elderly Woman and an Elegant Resolution

Supervisor: Dr. Naufal Mohammed

Subspecialty: Xena Li, PGY4 Infectious Disease.

Salmonella Typhimurium Carotid Artery Mycotic Aneurysm

Supervisor: Dr. Nishma Singhal

Jeff Ginsberg Subspecialty Resident Award.

Demonstrating excellence in professionalism, leadership and education. This award has been made possible by a donation from a patient of Dr. Jeff Ginsberg. Candidates are recognized for consistently displaying outstanding performance in clinical rotations, excellence in teaching, research and professionalism and commitment to academic achievement.

Recipients: **Andrea Cervi, Richard Onizuka**

RESIDENCY PROGRAM AWARDS

CMR Award for Excellence in Clinical Competence and Teaching.

Nominees display a strong presence on the CTU and demonstrate excellence in education, administration and professional responsibility, serving as a role model for junior trainees.

Nominees: Hernan Franco Lopez, Olivia Geen, Tyler James, Annie Khan, Zahra Merali and Ali Someili

Recipients: **Laura Goodliffe**, **Ankur Goswami** and **Torrance Oravec**

Dr. Hui Lee Award for Excellence in Clinical Care and Teaching (PGY2).

Nominees consistently exhibit excellence in clinical performance, strong education involvement with the undergraduate program and exemplary professionalism.

Nominees: Candice Griffin, Shaan Gupta

Recipients: **Olivia Cook, Waseem Hijazi**, **Nischal Ranganath** and **Michael Rheaume**

Akbar Panju Professionalism Award.

The Panju Professionalism Award in Residency Training is awarded to a PGY1 who encompasses all those humanistic

attitudes and behaviors that respect the core values of the medical profession. The successful candidate consistently exhibits appropriate personal and interpersonal professional behaviors in an ethically responsible manner; and delivers a high quality of patient-centered care with integrity, honesty and compassion.

Recipients: **Tamoor Afzaal**

RESIDENT AWARDS TO FACULTY

Faculty Internist and Faculty Subspecialty Award for Excellence in Clinical Teaching, selected by residents.

General Internal Medicine: **Drs. Haroon Yousuf** HGH**, Leslie Martin** JH**, Zahira Khalid** SJH

Subspecialty: **Dr. Zain Chagla**

Community Preceptor: **Dr. Matthew Chamberlain,** Waterloo

Subspecialty Rotation Award presented annually to the rotation that consistently delivers exemplary educational experience to the residents.

Recipient: **Critical Care, Grand River Hospital**

RESIDENT PROGRAM CONTRIBUTION

Education Committee: **Laura Goodliffe, Zahra Merali, Liam Finlay, Matthew Jessome, Katherine Steckham, Aoife Cox, Tamoor Afzaal** and **MacKenzie Turpin**

Academic Half Day committee co-chairs: **Kristeen Eshak, Will Lee, Deborah Koh, Jasmine Liu, Brandon Budhram, Alexandra Kobza, Wendy Ye, Tauben Averbuch and Victoria Chuen**

Journal Club: **Deborah Koh** and **Oksana Motalo**

PoCUS Leadership: **Zahra Merali, Coralea Kappel** (Co-chairs), **Mats Junek, Kristeen Eshak, Ilia Ostrovski, Omar Ibrahim, Kevin Um, Nischal Ranganath, Matthew Chan, Shreyash Dalmia, Mary Sedarous, Mohammed Alruwayeh** and **Jeff Curran**

Resident Rounds: Patient Safety: **Rand Al Ohaly** and **Matthew Chan** (Co-chairs). **Tyler James, Alec Campbell, Anna Whalen-Browne** and **Yazeed Abalkhail**

Winter Gala Co-Chairs: **Teresa Semalulu, Deborah Koh** (Co-chairs), **Brandon Budhram, Brittany Dennis, Rehman Jinah, Alexandra Kobza, Kiyoka Sasaki, Curtis Sobchak, Matthew Chan, Waseem Hijazi, Oksana Motalo** and **Julie Tan**

Research Committee: **Cindy Law, Carly Barron, Emily Baxter, Victor Lo, Nischal Ranganath, Tammy Ryan** and **Teresa Semalulu, Nawaf Alotaibi, Wendy Ye and Nasser Almajarafi**

R3 Exam Impact Committee: **Clara Lu, Hosay Said, Mohammad Alruwayeh, Brandon Budhram** and **Alexandra Kobza**

CBD Executive Committee: **Ankur Goswami** (Co-chair), **Kristen Sullivan, Zachary Gowanlock, Gabriel Jeyasingham, Maryan Graiss, Wendy Ye, Aram Karkar, Jaymee Shell, MacKenzie Turpin, Graydon Lucas, Olivia Cook** and **Oksana Motalo**

Wellness Committee Leadership: **Kristeen Eshak, Cara Pray, Olivia Geen, Laiya Carayannopoulos, Emily Jackson, Zahra Merali, Aram Karkar, Yasmin Jajarmi, Rehman Jinah** and **Jaymee Shell**

EBM Curriculum Committee Leadership: **Julie Tan, Yasmin Jajarmi, Milica Tanic** and **Alexander Grindal**

Simulations Leadership: **Kristen Sullivan** (Co-chair), **Albert Chiang, Arden Azim** and **Mary Sedarous**

PGY1 Boot Camp Leadership: **Anna Whalen-Browne, Teresa Semalulu** and **Michael Rheaume**

Gulf Orientation Leadership: **Waleed Aljohani**

COVID Clinical Task Force Leadership: **Tammy Ryan, Hosay Said, Graydon Lucas, Arden Azim, Mashrur Rahman, Brittany Dennis, Waseem Hijazi, Alisa Lagrotteria, Olivia Cook, Oksana Motalo, Rand Al Ohaly, Jasmine Liu, Shreyash Dalmia, Yasmin Jajarmi, Teresa Semalulu, Aram Karkar, Aoife Cox** and **Kiyoka Sasaki**

The program recognizes the many contributions of faculty, both new and seasoned, to resident development across clinical and scholarly endeavours. The generous support of faculty for learners is a key reason why training in Medicine at McMaster remains highly competitive among training programs across Canada.

Jan Taylor

Administrator, Internal Medicine Residency Program ■

Our faculty 2018-2020

Professor and Chair

Crowther, Mark A.	Hematology and Thromboembolism

Professor Emeritus

Banerjee, Sikhar	Physical Medicine and Rehabilitation
Bayne, Ronald	Geriatrics
Brain, Michael	Hematology and Thromboembolism
Churchill, David	Nephrology
Clark, David	Clinical Immunology and Allergy
Connolly, Stuart	Cardiology
Daniel, Edwin	Neurology
Fallen, Ernest	Cardiology
Fuller, Hugh	General Internal Medicine
Ginsberg, Jeffrey	Hematology and Thromboembolism
Grover, Ashok	Gastroenterology
Hart, Robert	Neurology
Heddle, Nancy	Hematology and Thromboembolism
Heigenhauser, George	Respirology
Hirsh, Jack	Hematology and Thromboembolism
Holder, Doug	Cardiology
Hunt, Richard	Gastroenterology
Jones, Norman	Respirology
Kamath, Mark	Education and Innovation/Neurology
Killian, Kieran	Respirology
Kwan, David	Cardiology
Ludwin, David	Nephrology
Mandell, Lionel	Infectious Diseases
McComas, Alan	Neurology
McKelvie, Robert	Cardiology
Molloy, William (Willie)	Geriatrics
Montgomery, Erwin	Neurology
Morse, John	Respirology
Muir, David	Respirology
Neufeld, Victor	General Internal Medicine
Patterson, Christopher	Geriatrics
Powles, Peter	Critical Care/Respirology
Rangachari, P.K.	Gastroenterology
Rodger, Ian	Respirology
Rosenthal, Donald	Dermatology
Sears, Malcolm	Respirology
Smith, Kinsey	Nephrology
Sweeney, George	Gastroenterology/Clinical Pharmacology
Tanser, Paul	Cardiology
Turpie, Alexander	Hematology and Thromboembolism/ General Internal Medicine
Turpie, Irene	Geriatrics
Upton, Adrian	Neurology
Werstiuk, Eva	Hematology and Thromboembolism

Endowed Chairs and Professorships

Cividino, Alfred	AbbVie Chair in Education in Rheumatology
Adachi, Rick	Actavis Chair in Rheumatology for Better Bone Health
Austin, Richard	Amgen Canada Chair in Nephrology
Turnbull, John	Andrew Bruce Douglas Chair in Neurology
Sears, Malcolm	AstraZeneca Chair in Respiratory Epidemiology
Moayyedi, Paul	Audrey Campbell Chair in Ulcerative Colitis Research
Iorio, Alfonso	Bayer Chair for Clinical Epidemiology Research in Bleeding Disorders
Panju.Akbar	Boris Family Chair in Education and Internal Medicine
Ginsberg, Jeffrey	David Braley and Nancy Gordon Chair in Thromboembolic Disease
Papaioannou, Alexandra	Eli Lilly Canada Chair in Osteoporosis
Bates, Shannon	Eli Lilly Canada/May Cohen Chair in Women's Health
Collins, Stephen	Farncombe Family Chair in Digestive Health Resesarch
Stearns, Jennifer	Farncombe Family Chair in Microbial Ecology and Bioinformatics
Hynes, Alexander	Farncombe Family Chair in Phage Biology
Nair, Param	Frederick Hargreave / Teva Innovation Chair in Airway Diseases
Collins, Stephen	GlaxoSmithKline Chair in Gastroenterology
Baker, Steven	Hamilton Hospitals Assessment Centre Endowed Professorship in Neuromuscular Disease
Weitz, Jeffrey	Heart and Stroke Foundation / J. Fraser Mustard Chair in Cardiovascular Research
Yusuf, Salim	Heart and Stroke Foundation / Marion W. Burke Chair in Cardiovascular Disease
Anand, Sonia	Heart and Stroke Foundation / Michael G. DeGroote Chair in Population Health Research
Steinberg, Greg	J. Bruce Duncan Chair in Metabolic Diseases
Eikelboom, John	Jack Hirsh / PHRI Chair in Thrombosis and Atherosclerosis Research
Kearon, Clive	Jack Hirsh Professorship in Thrombosis
Arnold, Donald	John G. Kelton Chair in Translational Research
Walker, Irwin	Joseph E. DesRoches Chair in Bone Marrow Transplantation
Crowther, Mark	Leo Pharma Chair in Thromboembolism Research
Shoamanesh, Ashkan	Marta and Owen Boris Chair in Stroke Research and Care

FACULTY

There were a further 41 new geographic full-time faculty members appointed to the Department and 86 part-time faculty over these two academic years.

283 geographic full-time faculty

404 part-time faculty

43 professor emeriti

4 clinical scholars

31 joint and associate members

41 New geographic full-time faculty members appointed to the Department

Larché, Mark	McMaster University / GlaxoSmith Kline Chair in Lung Immunology at St. Joseph's Healthcare
Loeb, Mark	Michael G. DeGroote Chair in Infectious Diseases
Sharma, Mukul	Michael G. DeGroote Chair in Stroke Prevention
Sahlas, Demetrios	Michael G. DeGroote Professorship in Stroke Management
Kolb, Martin	Moran Campbell Chair in Respiratory Medicine
Healey, Jeffrey	PHRI Chair in Cardiology Research
Gerstein, Hertzel	Population Health Institute Chair in Diabetes Research and Care
Bercik, Premysl	Richard Hunt / AstraZeneca Chair in Gastroenterology
Devereaux, Philip	Salim Yusuf Chair in Cardiology
Marr, Sharon	St. Peter's / McMaster Chair in Aging
Patel, Ameen	William J. Walsh Chair in Medical Education
Denburg, Judah	William J. Walsh Chair in Medicine
Caminero Fernandez, Alberto Caminero	Douglas Family Chair in Gastroenterology Research

Geographic Full-time

Professor

Adachi, Rick	Rheumatology/Hematology and Thromboembolism
Anand, Sonia	Cardiology
Armstrong, David	Gastroenterology
Austin, Richard	Nephrology
Azzam, Khalid	General Internal Medicine
Bates, Shannon	Hematology and Thromboembolism
Bercik, Premysl	Gastroenterology
Cividino, Alfred	Rheumatology
Collins, Stephen	Gastroenterology
Cook, Deborah	Critical Care/General Internal Medicine
Cox, Gerard	Respirology
Crowther, Mark	Hematology and Thromboembolism
Cullen, Nora	Physical Medicine and Rehabilitation
Denburg, Judah	Clinical Immunology and Allergy
Douketis, James	General Internal Medicine/ Hematology and Thromboembolism
Fox-Robichaud, Alison	Critical Care

Freitag, Andreas	Critical Care/Respirology
Gagnon, Michelle	Geriatrics
Gangji, Azim	Nephrology
Gauvreau, Gail	Respirology
Gerstein, Hertzel	Endocrinology
Guyatt, Gordon	General Internal Medicine/Respirology
Haider, Shariq	Infectious Diseases/General Internal Medicine
Hart, Lawrence	Rheumatology
Hart, Robert	Neurology
Healey, Jeffrey	Cardiology
Holbrook, Anne	Clinical Pharmacology/General Internal Medicine
Huizinga, Jan	Gastroenterology
Ingram, Alistair	Nephrology
Inman, Mark	Respirology
Jaeschke, Roman	Critical Care/Neurology
Janssen, Luke	Respirology
Jolly, Sanjit	Cardiology
Kearon, Clive	Hematology and Thromboembolism/ Respirology
Kelton, John	Hematology and Thromboembolism
Khalidi, Nader	Rheumatology
Kolb, Martin	Respirology
Krepinsky, Joan	Nephrology
Larche, Mark	Clinical Immunology and Allergy/ Respirology
Leber, Brian	Hematology and Thromboembolism
Liaw, Patricia	Hematology and Thromboembolism
Lim, Wendy	Hematology and Thromboembolism
Lonn, Eva	Cardiology
Lumb, Barry	Gastroenterology
Margetts, Peter	Nephrology
Marshall, John	Gastroenterology
Mazurek, Michael	Neurology
McIvor, Andrew Robert	Respirology
Meade, Maureen	Critical Care
Mehta, Shamir	Cardiology
Moayyedi, Paul	Gastroenterology
Morillo, Luis	Neurology
Nair, Param	Respirology
Natarajan, Madhu	Cardiology
Nesathurai, Shanker	Physical Medicine and Rehabilitation
O'Byrne, Paul	Respirology
Oczkowski, Wieslaw	Neurology
Panju, Akbar	General Internal Medicine
Papaioannou, Alexandra	Geriatrics/Rheumatology
Patel, Ameen	General Internal Medicine
Prebtani, Ally	Endocrinology/General Internal Medicine
Rathbone, Michel	Neurology
Schulman, Sam	Hematology and Thromboembolism
Sehmi, Roma	Respirology
Sherbino, Jonathan	Emergency Medicine
Spencer, Frederick	Hematology and Thromboembolism/ Cardiology
Steinberg, Greg	Endocrinology
Stewart, Tom	Critical Care
Surette, Michael	Gastroenterology
Teo, Koon	Cardiology
Turnbull, John	Neurology
Verdu, Elena	Gastroenterology
Walker, Irwin	Hematology and Thromboembolism
Waserman, Susan	Clinical Immunology and Allergy
Wasi, Parveen	Hematology and Thromboembolism
Weitz, Jeffrey	Hematology and Thromboembolism
Welsford, Michelle	Emergency Medicine
Werstuck, Geoff	Hematology and Thromboembolism
Whitehead, Lori	Respirology
Worster, Andrew	Emergency Medicine
Yusuf, Salim	Cardiology

Associate Professor

Ainsworth, Craig	Cardiology
Alhazzani, Waleed	Critical Care/General Internal Medicine
Amer, Rebecca	Respirology/General Internal Medicine
Amit, Guy	Cardiology
Arnold, Donald	Hematology and Thromboembolism
Ask, Kjetil	Respirology
Baker, Steven	Physical Medicine and Rehabilitation
Baw, Bandar	Emergency Medicine/Clinical Pharmacology
Beattie, Karen	Rheumatology
Bobba, Raja	Rheumatology
Braga, Manoela	Endocrinology
Brimble, Scott	Nephrology
Carlisle, Euan	Nephrology
Carmona, Rajendra	Rheumatology
Chagla, Zain	Infectious Diseases
Chakroborty, Amitabha	General Internal Medicine/Infectious Diseases
Chan, Teresa	Emergency Medicine
Clase, Catherine	Nephrology
Conen, David	Cardiology
Connolly, Barbara	Neurology
Cowan, David	Geriatrics
Demers, Catherine	Cardiology
Dickhout, Jeffrey	Nephrology
Divakaramenon, Syamkumar	Cardiology
Dorasamy, Punginathn	General Internal Medicine/Respirology
Duong, Mylinh	General Internal Medicine/Respirology
Eikelboom, John	Hematology and Thromboembolism
El-Helou, Phillipe	Infectious Diseases
Forsythe, Paul	Respirology
Fulford, Martha	Infectious Diseases
Ganame, Javier	Cardiology
Ganguli, Subhas	Gastroenterology

Gilani, Ammar	Neurology
Greenwald, Eric	Gastroenterology
Gross, Peter	Hematology and Thromboembolism
Guzman, Juan	General Internal Medicine
Halder, Smita	Gastroenterology
Hanmiah, Raj	General Internal Medicine
Harper, William	Endocrinology/General Internal Medicine
Hunt, Dereck	General Internal Medicine/ Endocrinology
Jones, Graham	Critical Care
Joseph, Philip	Cardiology
Karachi, Tim	Critical Care/General Internal Medicine
Keith, Paul	Clinical Immunology and Allergy
Khalid, Zahira	General Internal Medicine
Khan, Khurram	Gastroenterology
Kraeker, Christian	General Internal Medicine
Kraus, Peter	Critical Care
Lanzini, Rosilene	Dermatology
Larche, Margaret	Rheumatology
Leontiadis, Grigorios	Gastroenterology
Lepic, Kylie	Hematology and Thromboembolism
Leto, Daniela	Infectious Diseases/General Internal Medicine
Li, Juliana	Respirology
Lima, Hermenio	Dermatology/Clinical Immunology and Allergy
Linkins, Lori-Ann	Hematology and Thromboembolism
Luthra, Meera	Endocrinology/General Internal Medicine
Magloire, Patrick	Cardiology
Mallin, A. Rebecca	Emergency Medicine
Marr, Sharon	Geriatrics/General Internal Medicine
Mathew, Anna	Nephrology
Matsos, Mark	Rheumatology
Mazzadi, Sergio	General Internal Medicine/ Gastroenterology
McInnes(nee Yakubovich), Natalia	Endocrinology
McLeod, Heather	Geriatrics
McMullin, Joe	General Internal Medicine
Mertz, Dominik	Infectious Diseases
Miller, Matthew	Nephrology
Misiaszek, Brian	Geriatrics
Mohammed, Naufal	General Internal Medicine/Infectious Diseases
Montgomery, Alison	Cardiology
Morgan, David	Gastroenterology
Muniz, Flor	Physical Medicine and Rehabilitation
Nazi, Ishac	Hematology and Thromboembolism
Neary, John	General Internal Medicine
Neighbour, Helen	Respirology/Clinical Immunology and Allergy
Ng, Kuan Huei (Kelvin)	Neurology
O'Shea, Tim	Infectious Diseases
Pai, Menaka	Hematology and Thromboembolism
Panju, Mohamed	General Internal Medicine
Pardhan, Alim	Emergency Medicine
Perri, Dan	Clinical Pharmacology
Perumpillichira, Joseph	Neurology
Piessens, Eva	Infectious Diseases
Puglia, Marco	Gastroenterology
Punthakee, Zubin	Endocrinology
Rabbat, Christian	Nephrology
Raghavan, Natya	Respirology/General Internal Medicine
Ribas, C. Sebastian	Cardiology
Ribic, Christine	Nephrology
Rudkowski, Jill	General Internal Medicine/Critical Care
Sahlas, Demetrios	Neurology
Salehian, Omid	Cardiology
Salena, Bruno	Gastroenterology
Schwalm, Jon-David	Cardiology
Shapiro, Michelle	Neurology
Sharma, Mukul	Neurology
Sheth, Tej	Cardiology
Sibbald, Matthew	Cardiology
Singhal, Nishma	Infectious Diseases
Soth, Mark	Critical Care
Spaziani, Robert	Gastroenterology
St. Onge, Joye	Geriatrics
Talman, Marianne	General Internal Medicine
Tandon, Vikas	Cardiology
Tang, Damu	Nephrology
Tiboni, Maria	General Internal Medicine
To, Karen	Nephrology
Treleaven, Darin	Nephrology
Tse, Frances	Gastroenterology
Tsoi, Keith	Gastroenterology
Tunks, Marcel	Respirology
Valettas, Nicholas	Cardiology
Van Adel, Brian	Neurology
Velianou, James	Cardiology
Verhovsek, Madeleine	Hematology and Thromboembolism
Walsh, Michael	Nephrology
Whittingham, Heather	Critical Care
Woo, Tricia	Geriatrics
Woodward, Kevin	Infectious Diseases
Xenodemetropoulos, Theodore	Gastroenterology
Yang, Robert	Nephrology
Yegappan, Chidambaram	Neurology
Zukotynski, Katherine	Education and Innovation

Assistant Professor

Abu-Hilal, Mohannad	Dermatology
Acosta Velez, Juan-Gabriel	Cardiology
Aghel, Nazanin	Cardiology
Ahmed, Amna	General Internal Medicine
Alak, Aiman	Cardiology
Albashir, Siwar Mazen	Gastroenterology
Amin, Faizan	Cardiology/Critical Care
Attar, Ahmed	Neurology
Bassim, Carol	Education and Innovation
Belley-Cote, Emilie	Cardiology
Bhagirath, Vinai	Hematology and Thromboembolism
Brandt-Vegas, Daniel	General Internal Medicine
Caminero Fernandez, Alberto Caminero	Gastroenterology
Caners, Kyla	Emergency Medicine
Catanese, Luciana	Neurology
Chan, Noel	Hematology and Thromboembolism
Chari, Madhu	Respirology
Chen, Jihong	Gastroenterology
Cheung, Jason	General Internal Medicine
Chui, Betty	General Internal Medicine
Chum, Marvin	Neurology
Connolly, Colleen	Neurology
Connolly, Katherine	Cardiology
Corriveau, Sophie	Respirology
de Wit, Kerstin	Emergency Medicine
Deng, Zhihui (Joy)	Physical Medicine and Rehabilitation
DiLiberto, Deborah	Education and Innovation
Duan, Erick	Critical Care
Gundy, Serena	General Internal Medicine/ Obstetric Medicine
Hall, Devin	Neurology
Hambly, Nathan	Respirology
Hirota, Jeremy	Respirology
Ho, Joanne	Geriatrics/Clinical Pharmacology
Ho, Terence	Respirology
Hynes, Alexander	Gastroenterology
Ikesaka, Rick	Hematology and Thromboembolism
Kamel Hasan, Olfat	Education and Innovation
Karbassi, Arsha	Cardiology
Kessler-Borges, Flavia	General Internal Medicine
Kim, Paul	Hematology and Thromboembolism
Korol, Anna	Education and Innovation
Kretz, Collin	Hematology and Thromboembolism
Kurmi, Om Prakash	Respirology
Lai-Yee Tsang, Jennifer	Critical Care
Lal, Sarrah	Education and Innovation
Lanktree, Matthew	Nephrology
Lau, Arthur	Rheumatology
Legault, Kimberly	Rheumatology
Leong, Darryl	Cardiology
Matino, Davide	Hematology and Thromboembolism
Martin, Leslie	General Internal Medicine
Menon, Suresh	Neurology
Molnar, Amber	Nephrology
Mondoux, Shawn	Emergency Medicine
Narula, Neeraj	Gastroenterology
Nayar, Sumiti	Neurology
Ning, Shuoyan	Hematology and Thromboembolism
Oczkowski, Simon	Critical Care
Park, Sean	Education and Innovation
Perera, Kanjana	Neurology
Pigeyre, Marie	Endocrinology
Pinilla Echeverri, Natalia	Cardiology
Pinto Sanchez, Maria	Gastroenterology
Raza, Samir	General Internal Medicine
Rochwerg, Bram	Critical Care
Saffie, Muntasir	Respirology
Samoraj, Krystyna	Emergency Medicine
Satia, Imran	Respirology
Shah, Reema	Endocrinology
Shoamanesh, Ashkan	Neurology
Shroff, Anjali	Infectious Diseases/Clinical Pharmacology
Sidhu, Mona	Geriatrics
Siegal, Deborah	Hematology and Thromboembolism
Simms, Taryn	Respirology
Sovran, Steven	Endocrinology
Srivaratharajah, Kajenny	General Internal Medicine
Stearns, Jennifer	Gastroenterology
Sztramko, Richard	Geriatrics
Tsang, Michael	Cardiology
Turner, Jane	Respirology
Van Spall, Harriette	Cardiology
Wald, Joshua	Respirology
Wang, Mimi	Geriatrics
Wong, Jorge	Cardiology
Wong, Steven	General Internal Medicine
Wright, Douglas	Cardiology
Wyne, Ahraaz	General Internal Medicine/ Obstetric Medicine
Yaghoobi, Mohammad	Gastroenterology
Yohanna, Seychelle	Nephrology
Zeller, Michelle	Hematology and Thromboembolism

Joint/Associate Members

Allaby, Cheryl	Geriatrics
Barr, Ronald	Hematology and Thromboembolism
Batthish, Michelle	Rheumatology
Beauchamp, Marla	Respirology
Bienenstock, John	Clinical Immunology and Allergy
Brozek, Jan	Clinical Immunology and Allergy
Costa, Andrew	General Internal Medicine
Devereaux, Philip	Cardiology
Don-Wauchope, Andrew	Endocrinology
Emerson, Claudia	Education and Innovation

Fraser, Graeme	
Hayward, Catherine	Hematology and Thromboembolism
Iorio, Alfonso	Hematology and Thromboembolism
Levine, Mitchell	Clinical Pharmacology
Loeb, Mark	Infectious Diseases
Main, Cheryl	Infectious Diseases
Marcucci, Maura	General Internal Medicine
Paré, Guillaume	Endocrinology
Rodriguez, Amadeo	Neurology
Sagar, Stephen	General Internal Medicine
Schunemann, Holger	General Internal Medicine
Shargall, Yaron	Respirology
Smaill, Fiona	Infectious Diseases
Stampfli, Martin	Respirology
Tarnopolsky, Mark	Neurology

Part-time

Clinical Professor

Brown, William (Bill)	Neurology
Chiba, Naoki	Gastroenterology
Ducharme, James	Emergency Medicine
Higgins, David	Respirology
Kagoma, Peter	Hematology and Thromboembolism
Kean, Walter	Rheumatology
Khan, Aliya	Endocrinology/Geriatrics
Newhouse, Michael	Respirology

Professor (Part Time)

Dolovich, Myrna	Respirology
Smith, Kevin	Education and Innovation

Associate Clinical Professor

Achong, Michael	General Internal Medicine
Allen, Christopher	Respirology
Bentley, Todd	Physical Medicine and Rehabilitation
Braun, Anne E.	Geriatrics
Chari, Vinjamuri	Physical Medicine and Rehabilitation
Chmiel, Agnes	Physical Medicine and Rehabilitation
Curnew, Greg	Cardiology
Cyr, Michael	Clinical Immunology and Allergy
Davis, Clive	Respirology
Didyk, Nicole	Geriatrics
Farrauto, Leonardo	Physical Medicine and Rehabilitation
Ghouse, Ali T.	Physical Medicine and Rehabilitation
Giammarco, Rose	Neurology
Gibson, James	General Internal Medicine
Grad, Sharon	Physical Medicine and Rehabilitation
Gupta, Milan	Cardiology
Haaland, Derek	Clinical Immunology and Allergy/ Rheumatology
Hamielec, Cindy	Critical Care/Respirology
Harvey, David	Physical Medicine and Rehabilitation
Hayes, Christopher	Critical Care
Healey, Andrew	Emergency Medicine
Jichici, Draga	Critical Care
Mathoo, Julian	Physical Medicine and Rehabilitation/ Rheumatology
Miller, Paul	Emergency Medicine
Morris, Catherine	General Internal Medicine
Mulji, Amin	Cardiology
O'Donnell, Martin	General Internal Medicine/ Hematology and Thromboembolism
Paulseth, John	Neurology
Perez, Gavino	General Internal Medicine
Prasad, Sadhana	Geriatrics
Puksa, Serge	Respirology
Rabin, Eli	General Internal Medicine/Nephrology
Salama, Suzette	Education and Innovation
Scocchia, Tulio	Rheumatology
Sebaldt, Rolf	Clinical Pharmacology/Rheumatology
Smith, Ruth	Physical Medicine and Rehabilitation
Stanton, Eric	Cardiology
Syed, Jaffer	Cardiology
Tomlinson, Charles	Cardiology
Tougas, Manon	Critical Care/General Internal Medicine
Upadhye, Suneel	Emergency Medicine/Physical Medicine and Rehabilitation
Varey, Peter	Physical Medicine and Rehabilitation
Vender, Ron	Dermatology
Visram, Farzin	Critical Care/General Internal Medicine
Wismer, Judy	Dermatology
You, John	General Internal Medicine

Associate Professor (Part-time)

Ackerman, Margaret	Emergency Medicine
Dore, Kelly	Education and Innovation
Gulenchyn, Karen	Education and Innovation
Ioannidis, George	Rheumatology/Geriatrics
Pugsley, Stewart	Respirology
Repa, Rebecca	Education and Innovation

Assistant Clinical Professor

Abid, Simona	Geriatrics
Abonowara, Abdulgani	Cardiology
Abouanaser, Salaheddin	Infectious Diseases
Atrie, Damon	Emergency Medicine
Bader, Mazen	Infectious Diseases/General Internal Medicine
Bansal, Pankaj	Physical Medicine and Rehabilitation
Basi, Simran	Physical Medicine and Rehabilitation
Berlingieri, Joseph	General Internal Medicine
Bhavsar, Sankalp	Rheumatology
Biman, Birubi	Respirology

Booth, John	Endocrinology/General Internal Medicine
Boulos, Pauline	Rheumatology
Buchanan, Ian	Emergency Medicine
Channan, Peter	Emergency Medicine
Chorley, Alexander	Emergency Medicine
Ciprietti, Lucas	General Internal Medicine
Cooray, Mohan	Education and Innovation
Cowan, Hamish	Emergency Medicine
Crossley, John	Emergency Medicine
Darvish-Kazem, Saeed	Cardiology
Delrue, Andrea	General Internal Medicine
Dessouki, Shariff	Physical Medicine and Rehabilitation
Dixit, Sanjay	Rheumatology
Djuric, Vladimir	Physical Medicine and Rehabilitation
D'Sa, Ryan	Critical Care
Eby, Robbie-Jane	Emergency Medicine
Edstrom, Karen	Dermatology
El Rouby, Doaa	General Internal Medicine
Fahmy, David	Clinical Immunology and Allergy
Famorca, Leilani	Rheumatology
Feloiu, Florin	Physical Medicine and Rehabilitation
Fergani, Houssein	Gastroenterology
Gelberg, Jacob	Respirology
Ghayur, Ayesha	Nephrology
Giilck, Stephan	General Internal Medicine
Gottschalk, Raymond	Respirology
Greenbaum, Joseph	Clinical Immunology and Allergy
Greenwald, Ari Joseph	Emergency Medicine
Gupta, Gaurav	Emergency Medicine
Gwardjan, Andrew	Physical Medicine and Rehabilitation
Ha, Michael	Emergency Medicine
Hameed, Adnan	Cardiology
Hamilton, David	Emergency Medicine
Hart, Alexander	Emergency Medicine
Hastings, Deborah	Cardiology
Hatcher, Michael	Emergency Medicine
Hawley, Kristopher	Emergency Medicine
Hayward, Melissa	Emergency Medicine
Heckman, George	Geriatrics
Hersi, Ali	Emergency Medicine
Heyd, Christopher	Emergency Medicine
Hosseini, Seyed	Physical Medicine and Rehabilitation
Husein, Nadira	Endocrinology
Ibrahim, Khaled	Gastroenterology
Jalali, Subash	Gastroenterology
Jalayer, Massoud	Emergency Medicine
Jensen, Lorraine	General Internal Medicine
Keen, Sabina	Geriatrics
Kim, Harold	Clinical Immunology and Allergy
Kitching, Allan	Cardiology
Kronby, Michael	Neurology
Kruisselbrink, Rebecca	General Internal Medicine/Critical Care
Labib, Noura	Emergency Medicine
Labuda, Anna	Physical Medicine and Rehabilitation
Langmann, Caillin	Emergency Medicine
Lee, June	Rheumatology
Liebregts, Michelle	Emergency Medicine
Lin, Celina	Physical Medicine and Rehabilitation
Liu, Theresa	Infectious Diseases
Marshall, Thomas	Emergency Medicine
Masood, Syed	General Internal Medicine
Massarella, Carys	Emergency Medicine
McMillan, Richard	Physical Medicine and Rehabilitation
Messieh, Mary	Clinical Immunology and Allergy
Metrie, Mary	Neurology
Muhn, Channy	Dermatology
O'Malley, Lauren	Physical Medicine and Rehabilitation
O'Malley, Maureen	Dermatology
Owen, Julian	Emergency Medicine/Critical Care
Pallie, Sven	Cardiology
Pavlova, Viktoria	Rheumatology
Perera, Gihan	Physical Medicine and Rehabilitation
Preyra, Ian	Emergency Medicine
Price, Ira	Emergency Medicine
Quinlan, David	Emergency Medicine
Quirt, Jaclyn	Clinical Immunology and Allergy
Raco, Dominic	Cardiology
Raut-Deshpande, Pooja	General Internal Medicine
Richards, Douglas	Emergency Medicine
Safranyos, Richard	Geriatrics
Sandhanwalia, Simerpreet	Emergency Medicine
Saveriano, Nellina	Dermatology
Schiff, Karen	Emergency Medicine
Schwarz, Dan	Cardiology
Sellens, Catherine	Emergency Medicine
Sennik, Serena	Emergency Medicine
Sharma, Sangita	Emergency Medicine
Siddiqui, Sameerah	General Internal Medicine
Silva, Jaime	Neurology
Stacey, Paul	Physical Medicine and Rehabilitation
Stallwood, George	Cardiology
Subbarao, Padmaja	Respirology
Sullivan, Brian	Cardiology
Sullivan, Hugh	Cardiology
Szczeklik, Wojciech	General Internal Medicine
Tang, Jennifer	Emergency Medicine
Taves, Jonathan	Emergency Medicine
Thompson, Jennifer	Emergency Medicine
Trotter, Brendon	Emergency Medicine
Van Diepen, Kelly	Emergency Medicine
Vignjevic, Peter	Dermatology
Vlahaki, Dean	Emergency Medicine
Wassef, Anthony	Cardiology
Williams, Ryan	Physical Medicine and Rehabilitation
Witt-Sullivan, Helga	Gastroenterology
Yakemchuk, Valerie	Nuclear Medicine

Zaki, Amna	Emergency Medicine
Zandi Riahi, Shervin	General Internal Medicine
Zdravkovic, Tatjana	Physical Medicine and Rehabilitation

Assistant Professor (Part-time)

Al-Nedawi, Khalid	Nephrology
Gajewski, Piotr	General Internal Medicine
Johnston, Neil	Respirology/Ontario Physician Human Resources Data Centre (OPHRDC)
Kennedy, Courtney	Geriatrics
Martin, Gail	
Mercuri, Mathew	Emergency Medicine
Moffat, Karen	Hematology and Thromboembolism
Moore, Jane	Hematology and Thromboembolism
Sivji, Yasmin	General Internal Medicine
Smith, Jim	Hematology and Thromboembolism
Tonti, Elena	Clinical Immunology and Allergy

Assistant Clinical Professor (Adjunct)

Abdelshaheed, Rami	Respirology
Aboo, Ismail Y.	Hematology and Thromboembolism
Adams, Jeremy	Cardiology
Ahmed, Fahim	General Internal Medicine
Ahmed, Hanan	Clinical Immunology and Allergy
Ahsan, Shoeb	General Internal Medicine
Ajayi, Abayomi	General Internal Medicine
Alaamri, Shalan	General Internal Medicine/Cardiology
Alexander, Michael	General Internal Medicine/Clinical Immunology and Allergy
Alghamdi, Khalid	General Internal Medicine
Ali, Karim	Infectious Diseases
Ali, Rashad	Respirology
Al-Khateeb, Ziyaad	Geriatrics
Amdemichael, Eisahas	Dermatology
Arya, Naveen	Gastroenterology
Babapulle, Mohan	Cardiology
Bahrgard Nikoo, Mohammad Javad	Critical Care
Bair, F. Douglas	Gastroenterology
Bajaj, Girish	Gastroenterology
Ballard, Tonya	Physical Medicine and Rehabilitation
Batool, Tahira	Clinical Immunology and Allergy/ General Internal Medicine
Benaroia, Mark	Nephrology
Bertley, John	Respirology
Bissonnette, Lyle	Gastroenterology
Borgia, Sergio	Infectious Diseases
Brooks, Annie	Infectious Diseases
Brydges, Ryan	General Internal Medicine
Burke, Andrew	Nephrology
Butt, Ghias Ud Din	General Internal Medicine
Camacho Maldonado, Pedro	General Internal Medicine
Cameron, Kathryn Maureen	General Internal Medicine
Cao, Yang	General Internal Medicine
Cape, David	Critical Care
Chamberlain, Matthew	Cardiology
Chan, Chris	Critical Care
Chan, Terence	General Internal Medicine
Chan, Winnie	Cardiology
Chau, Laurence Kwok-Leong	Respirology/Critical Care
Chernish, Robert	General Internal Medicine
Cheung, Jessica	Emergency Medicine
Chick, Genevieve	General Internal Medicine
Chung, Han-Oh	Critical Care
Comondore, Vikram	Respirology
Connolly, Michael	Dermatology
Coyne, Jade	Respirology
Ddungu, Henry	Hematology and Thromboembolism
Desai, Dushyant	Cardiology
Edwards, Michelle	General Internal Medicine
Elsharif, Adell	General Internal Medicine
El-Sherbini, Hamdi	Physical Medicine and Rehabilitation
Ergaiey, Houda	Gastroenterology
Farghaly, Ghada	General Internal Medicine
Ferreira, Ivone	Respirology
Foster, Matthew	Physical Medicine and Rehabilitation
Friedman, Oded	Nephrology
Gallab, Nagy	General Internal Medicine
Galvin, Patti	Physical Medicine and Rehabilitation
Ganapathy, Anusoumya	Critical Care/General Internal Medicine
Gazala, Khalid	Neurology
George, Scaria	General Internal Medicine
Ghadaki, Bahareh	Infectious Diseases
Ghosh, Ananda	Infectious Diseases
Grenier, Catherine	Emergency Medicine
Gunton, Lara	Dermatology
Gupta, Shlok	General Internal Medicine
Haffner, Thomas	General Internal Medicine
Hall, Susan	Dermatology
Haynen, Bennett	Cardiology
Heffernan, Michael	Cardiology
Hentschel, Eric	Respirology
Hernandez, Jeremy	Emergency Medicine
Hindieh, Waseem	Cardiology
Ho, Victoria	Respirology
Hong, Paul	Cardiology
Hosek, Paul	Critical Care
Hunter, Christian	General Internal Medicine
Hussain, Fatima	Geriatrics
Huynh, Jennifer	Endocrinology/General Internal Medicine
Hystad, Perry	General Internal Medicine/Respirology
Irfan, Neal	Infectious Diseases
Jackson, Mary	Respirology/General Internal Medicine
Jafri, Armeen	Geriatrics

Jain, Vipul	Clinical Immunology and Allergy
Jolly, Shivinder	Nephrology
Juma, Salina	General Internal Medicine
Kaleel, Abdel	Neurology
Kalenga, Jean-Claude	General Internal Medicine
Kalina, Dale	Infectious Diseases
Kalyesubula, Robert	General Internal Medicine
Kang, Matthew	Hematology and Thromboembolism
Kara, Ali	General Internal Medicine
Kathrada, Yacoob	General Internal Medicine
Kerigan, Anthony	Respirology/Geriatrics
Khalifa, Abubaker	Critical Care/General Internal Medicine
Khan, Mohammed Abdul-Wahab	Physical Medicine and Rehabilitation
Khan, Omar	Physical Medicine and Rehabilitation
Khandelwal, Mukesh	Nephrology
Khera, Vikas	Critical Care/General Internal Medicine
Khosla, Shiv	Geriatrics
Kim, Han Hoe	Cardiology
Kim, Simon	General Internal Medicine
Klein, Cheryl	Hematology and Thromboembolism
Kohli, Sandeep Singh	General Internal Medicine
Kotrec, Marian	Cardiology
Kottachchi, Dan	Gastroenterology
Koubaesh, Yousery	General Internal Medicine
Kozij, Natalie	Respirology
Krause, Joel	Emergency Medicine
Kuk, Joda	Hematology and Thromboembolism
Lagrotteria, Danny	Nephrology
Lam, Joyce Nga Hei	Critical Care
Lang, Michael	Physical Medicine and Rehabilitation
Langridge, Jonathon	Respirology
Levy, Brian	Emergency Medicine
Li, Qin	Cardiology
Liutkus, Joanne	General Internal Medicine
Lodhi, Amina	Rheumatology
Maddison, Andre	General Internal Medicine
Mahabir, Vishwanath	General Internal Medicine/Nephrology
Maharaj, Neil	Respirology/General Internal Medicine
Maharaj, Shyam	Respirology
Maida, Eugene	Physical Medicine and Rehabilitation
Malcolm, W. Neil	Critical Care
Malhotra, Neel	Gastroenterology
Malik, Kartika	Geriatrics
Mandalfino, Patricia	Neurology
Marhong, Jonathan	Critical Care
Matiasz, Richard	Cardiology
Mazzetti, Adam	General Internal Medicine
Mazzetti, Gillian	Endocrinology
Mazzettii, Gavin	General Internal Medicine
McConachie, David	Cardiology/General Internal Medicine
McMillan, Ron	Emergency Medicine
Mehdiratta, Manu	Neurology
Merali, Abbas	Gastroenterology
Miller-Monthrope, Yvette	Dermatology
Mokhtari, Arastoo	Cardiology
Molckovsky, Andrea	General Internal Medicine
Morgan, Ingrid	Critical Care
Mussani, Farheen	Dermatology
Naden, Ray	General Internal Medicine/Obstetrical Medicine
Naeem, Omer	Neurology
Nagpal, Anil	Respirology
Naser, Mohamed	Nephrology
Needham-Nethercott, Natalie	Critical Care
Nejad, Mahsa	General Internal Medicine
Noor, Amra	Geriatrics
Noor, Amra	Geriatrics
Oykhman, Paul	Clinical Immunology and Allergy
Pandeya, Sanjay	Nephrology
Paolone, Stephanie	General Internal Medicine
Parlea, Luciana	Endocrinology
Pasricha, Ajai	General Internal Medicine
Patcai, John	Physical Medicine and Rehabilitation
Pearce, Murray	Cardiology
Persi, Adriano	Physical Medicine and Rehabilitation
Piersanti, Monique	Endocrinology
Piran, Sanaz	Cardiology
Plaxton, William	General Internal Medicine
Plaza, Katarzyna	General Internal Medicine
Poddar, Megha	Endocrinology
Pratt, Rebecca	Clinical Immunology and Allergy
Profiti, Raffaela	Gastroenterology
Puvendran, Samuel	Geriatrics
Qureshi, Shahab	General Internal Medicine
Racz, Heather	Respirology
Raso, Dean	General Internal Medicine
Raut, Amit	General Internal Medicine
Refaei, Mohammad	General Internal Medicine
Rosenbloom, David	Neurology
Rosenstein, Gerald	Nephrology
Russell, David	Nephrology
Saha, Sudip	Geriatrics
Sajic, Dusan	Dermatology
Sapir, Daniel	Nephrology
Sarkaria, Gagandeep	Geriatrics
Saxena, Shiv	General Internal Medicine
Segal, Dan	Gastroenterology
Shaikh, Sameerah	Critical Care/Emergency Medicine
Shaikholeslami, Roya	General Internal Medicine
Sharieff, Saleem	General Internal Medicine
Shih, Elizabeth	Emergency Medicine
Shukla, Rahul	Dermatology
Skanthan, Sithamparanathan	Geriatrics
Skogstad-Stubbs, David	General Internal Medicine
St. Bernard, Rosanne	General Internal Medicine/ Hematology and Thromboembolism

Stewart, Dwight	Neurology
Strauss, Matt	General Internal Medicine
Strban, Martin	Respirology
Sung, Melani	Infectious Diseases
Tan, Micheal	General Internal Medicine
Terpstra, Collin	General Internal Medicine
Teschke, Susan	Endocrinology
Valani, Rahim	Emergency Medicine
Van Alstine, Rebecca	General Internal Medicine
VanWalraven, Adrianus	General Internal Medicine
Varpio, Lara	
Vasan, Hariharan	Critical Care
Vitou, Louise	Nephrology
Voglis, Stefanos	Gastroenterology
Waiswa, Musa	Hematology and Thromboembolism
Wang, Michael	Nephrology
Warren, Heather	Cardiology
Warren, Indra	Cardiology
Warren, Thomas	Infectious Diseases/Medical Microbiology
Wu, Harry	Gastroenterology
Yee, Colin	Hematology and Thromboembolism
Yeung, Yan	Rheumatology
Young, James	Geriatrics
Zawadowski, Andrew	Cardiology
Zimakas, George	General Internal Medicine

Lecturer (Adjunct)

Doxey, Andrew	Respirology
Elahie, Allahna	Hematology and Thromboembolism
Ingalls, Brian	Respirology
McConkey, Brendan	Respirology
Oliveria, John Paul	Respirology
Tavares, Walter	Emergency Medicine

Scholars and Fellows

Clinical Scholars

Ahmed, Zeeshan	Cardiology
Akl, Elie	Cardiology
Chan, Brian	Gastroenterology
Chaudhry, Sultan	Nephrology
Cheung, Andrew	General Internal Medicine
Chu, Derek	Clinical Immunology and Allergy
Collister, David	Nephrology
Cox, Conor	General Internal Medicine
Dionne, Joanna	Critical Care
Garner, Stephanie	Rheumatology
Iqbal, Ali	Nephrology
Khokhar, Faaiza	Rheumatology
Lee, Justin	Geriatrics/Clinical Pharmacology
Medina, Mohamed	Endocrinology
Mithoowani, Siraj	Hematology and Thromboembolism
Nicholson, Matthew	Hematology and Thromboembolism
Piran, Sara	General Internal Medicine
Pyne, Lonnie	Nephrology
Rigg, Kaitlynn	Emergency Medicine
Sharif, Sameer	Emergency Medicine
Wallner, Clare	Emergency Medicine
Yang, Ruobing	Respirology
Yelovich, Mary-Clair	Rheumatology
Yousuf, Haroon	General Internal Medicine

Clinical Fellows

Abbasy, Mohamed Elsayed Mohamed	Emergency Medicine
Ahmadbeigi, Niloufar	Cardiology
Ahmed, Zeeshan	Cardiology
Aibar Gallizo, Jesus Angel	Hematology
Akbari, Vahid	Cardiology
Akl, Elie	Cardiology
Al Duhailib, Zainab Jamal Hassan	Critical Care Medicine
Al Subhi, Mahmood Salim Abdullah	Infectious Diseases
Alalawi, Yousef Mohammed Awad	Endocrinology and Metabolism
Alalkim Alzaabi, Fatema Hasan Hamdan	Gastroenterology
Alamoudi, Alaa Khaled A.	Nephrology
AlAmri, Nawaf Othman S.	Critical Care Medicine
Alasgah, Eman Amer Abdullah	Dermatology
Al-Dosary, Oweida Fahad Abdullah	Infectious Diseases
Alenazy, Ahmad Hamdan F.	Critical Care Medicine
Alexandre Dutra, Gustavo	Cardiology
Alfilfil, Wadiah Alawi M.	Critical Care Medicine
Algarni, Saleh Ahmad Saleh	Neurology
Alghamdi, Abdullah Hussien O	Nephrology
Alhanaee, Manar Yousuf Ebraheim Hamdan	Gastroenterology
Alharbi, Ahmad Obaid F.	Infectious Diseases
Alharbi, Naif Faisal N.	Neurology
Alibrahim, Bashaar Khaled I.	Gastroenterology
Alkhunizan, Muath Abdurahman A.	Geriatric Medicine
Almomen, Mohammad J. S. M. A.	Nephrology
Almusally, Rayyan Mohammedreda I.	Respirology
Alobaid, Fahad Moayad K.	Respiratory Medicine
Alosaimi, Majed Mihmas E.	Nephrology
Alotaibi, Mutlaq Eidah Q	Nephrology
Alqahtani, Shaya Yaanallah M.	Critical Care Medicine
Al-Qarni, Mustafa Ahmed	Neurology
Al-Rehaily, Ala'a Soud H.	General Internal Medicine
Alsaedi, Mona Abdullah A.	Gastroenterology
Alsalem, Mohammad A. H. A.	Infectious Diseases
Alsalem, Mohammad A. H. A.	Infectious Diseases

Alshahrani, Abdulaziz Saad S.	Gastroenterology
Alshahrani, Mona Mohammed S.	Nephrology
Alshanbari, Ahmed Mohammed H.	Neurology
Alshatti, Ahmad F.M.M.A.	Cardiology
Alshehri, Ahmed Mohammed A.	Cardiology
Alsilmi, Rahmah Abdulhadi H.	Respiratory Medicine
Alsolaihim, Alanood Abdulrahman	Physical Medicine And Rehab
Altabban, Abdullah	Cardiology
Al-Thnaibat, Mohammad Hassan Ahmad	Nephrology
Althobaiti, Youssef Awwadh A.	Neurology
Alwadai, Mohammed Mesfer H.	Neurology
Alwazan, Batoul	Geriatric Medicine
Alzayer, Hussain Jamal A.	Cardiology
Alzubaidi, Ibrahim Hashem A.	Emergency Medicine
Araujo de Jesus, Tais	Cardiology
Arsenault, Marie-Pier	Hematology
Asiri, Nawal Ali M.	Neurology
Barran, Haimchand	Nephrology
Bassuony, Mohammed Madgy Fouad Elsayed	General Internal Medicine
Bemaul-Sukhu, Kamela	Hematology
Bhutto, Burhan Sultan G.	Nephrology
Bourque, Danielle	Neurology
Chandran, Sujay Subash	Cardiology
Chen, Jihong	Gastroenterology
Chong, Sy Giin	Respiratory Medicine
Climans, Troy Harris	Hematology
Collister, David Thomas Barker	Nephrology
Connolly, Katherine Leah	Cardiology
Cusack, Ruth Patricia	Respiratory Medicine
de Sa Boasquevisque, Danielle	Neurology
Deif, Bishoy,	Cardiology
Deshmukh, Aviraj Satish	Neurology
Dinary, Fazel	Gastroenterology
Gabe, Caroline	Hematology
Garner, Stephanie	Rheumatology
Gaymes, Amanda Esther Eleanor	Internal Medicine
Gordon, Dina	Critical Care Medicine
Hawkes, Christine	Neurology
Ho, Terence Nathan Yum-Chuk	Respirology
Homenauth, Ravi	Gastroenterology
Ibrahim, Mohamed Moustafa	Cardiology
Jaffer, Iqbal Haider	Cardiology
Kacheri Pathayappura, Smitha	Dermatology
Kansiime, Grace	Nephrology
Katsanos, Aristeidis	Neurology
Kazi, Sajida	Hematology
Kessler Borges, Flavia	Cardiology
Khetan, Aditya Kumar	Cardiology
Khouj, Saleh Mohammed S.	Cardiology
King-Robinson, Kriste-Kaye Latoya	Gastroenterology
Lee, Justin Yusen	Clinician Investigator Program
Lefebvre, Marco	Cardiology
Machado de Souza, Camila	Anesthesiology
Mahmoud, Ebrahim Sabri I.	Infectious Diseases
Mai, Lauren	Neurology
Mandurah, Rouaa Faiz H.	Physical Medicine And Rehab
Mattia, Alicia Marie	Neurology
McIntyre, William Finlay	Cardiology
Mithoowani, Siraj	Hematology
Mokhtari, Arastoo	Cardiology
Moschovitis, Georgios	Cardiology
Moya, Beatriz	Respirology
Mtwesi, Viwe	Cardiology
Mubaraki, Adnan Ali A.	Neurology
Mukisa, Robert	Neurology
Mungoma, Michael	Cardiology
Musinguzi, Patrick Rwahwire	Dermatology
Mustafa Al Hussein, Muhammad	Cardiology
Nalyazi, Joanita Nalikka	Critical Care Medicine
Nicholson, Matthew	Hematology
Nimmo, Graeme	Neurology
Ofori, Sandra Nnedinma	Cardiology
Pigeyre, Marie Eva	Medical Biochemistry
Piran, Sara	Internal Medicine
Piran, Siavash	Hematology
Priel, Eldar	Respiratory Medicine
Qushmaq, Nahid Abdulhamid Q.	Hematology
Raco, Michael	Cardiology
Rahman, Muhammad Israfil Othman	Gastroenterology
Sadiq, Ibrahim Adil I.	Cardiology
Sahami, Nazanin	Cardiology
Sakkat, Abdullah Mohammadsaud I.	Respirology
Saroey, Praveen Kumar	Infectious Diseases
Satia, Imran Fackeerbhai	Respirology
Scallan, Ciaran Joseph	Respiratory Medicine
Sebzali, Fatemah A H A	Nephrology
Shawawrah, Mays Adel Krayyem	Neurology
Somaili, Mohammed Ibraheem J.	Nephrology
Syed, Talha	Cardiology
Sze, Cheung Wai Eric	Respiratory Medicine
Taher, Nouran Yasin M.	Neurology
Tairan, Hussain Mansour Mohammed	Neurology
Thom-Fernandes, Cedel Andrea	Respirology
Venegas Garrido, Carmen Paz	Respiratory Medicine
Vlachdimitropoulou, Evangelia	Hematology
Wallner, Clare Francisco	Emergency Medicine
Wheeler, Matthew Brian Lovell	Hematology
White, Grace Felicity	General Internal Medicine
Winter Del Rio, Jose Luis	Cardiology
Wongkarnjana, Amornpun	Respiratory Medicine
Worodria, William Ofuti	Respiratory Medicine
Yelovich, Mary-Clair	Rheumatology

Zapata Canivilo, Juan Marcelo	Critical Care Medicine
Zhao, Nan	Respiratory Medicine
Zheng, Luyu	Internal Medicine

Research Fellows

Balart, Marie Therese	Gastroenterology
Benz, Alexander Philipp	Cardiology
Hao, Qiukui	Internal Medicine
Kanno, Takeshi	Gastroenterology
Pittayanon, Rapat	Gastroenterology
Rueda, Gaston Horacio	Gastroenterology
Tan, Wei	Gastroenterology

New Faculty Appointments

Full time

Adams, Jeremy	Cardiology
Aghel, Nazanin	Cardio-Oncology
Ahmed, Amna	General Internal Medicine
Alak, Aiman	Cardiology
Amin, Faizan	Cardiology/Critical Care
Bassim, Carol	Education and Innovation
Belley-Cote, Emilie	Cardiology/Critical Care
Caminero Fernandez, Alberto	Gastroenterology
Caners, Kyla	Emergency Medicine
Chari, Madhu	Respirology
Chen, Jihong	Gastroenterology
Chung, Han-Oh	Critical Care
Connolly, Katherine	Cardiology
Corriveau, Sophie	Respirology
Cullen, Nora	Physical Medicine and Rehabilitation
DiLiberto, Deborah	Education and Innovation
Eliza de Freitas, Maria	Neurology
Gabriel Acosta, Juan	Cardiology
Hall, Dr. Devin	Neurology
Ho, Terence	Respirology
Ikesaka, Dr. Rick	Hematology
Kamel Hasan, Olfat	Education and Innovation
Kessler Borges, Dr. Flavia	General Internal Medicine
Korol, Anna	Education and Innovation
Lal, Sarrah	Education and Innovation
Lanktree, Dr. Matthew	Nephrology
Martin, Leslie	General Internal Medicine
Matino, Davide	Hematology and Thromboembolism
Ning, Shuoyan	Hematology
Owens, Kenneth	Education and Innovation
Park, Sean	IBEHS Program / Education & Innovation
Pigeyre, Marie	Endocrinology
Samoraj, Krystyna	Emergency Medicine
Satia, Imran	Respirology
Shah, Reema	Endocrinology
Sidhu, Amanjot (Mona)	Geriatrics
Srivaratharajah, Kajenny	General Internal Medicine
Turner, Jane	Respirology
Wong, Arthur	General Internal Medicine
Wong, Steven	General Internal Medicine
Wong, Jorge	Cardiology

Part time

Al-Dabbagh, Raed	Gastrenterology
Ahmed, Hanan	Allergy and Immunology
Ahmed, Fahim	General Internal Medicine
Ahsan, Shoeb	General Internal Medicine
Al-Dabbagh, Raed	Gastrenterology
Ali, Rashad	Respirology
Bahrgard Nikoo, Mohammad	Critical Care
Bajaj, Girish	Gastroenterology
Bennet-Heyd, Christopher	Emergency Medicine
Burrows, Kristen	General Internal Medicine
Camacho Maldonaldo, Pedro	General Internal Medicine
Cao, Yang	General Internal Medicine
Cape, David	Critical Care
Chan, Winnie	Cardiology
Cheung, Jessica	Emergency Medicine
Chick, Genevieve	General Internal Medicine
Cooray, Mohan	Education and Innovation
Darvish-Kazem, Saeed	Cardiology
Dhillon, Rajwinder	Rheumatology
Dicu, Armela	Hematology/General Internal Medicine
Doxey, Andrew	Respirology
El Rouby, Doaa	General Internal Medicine - Niagara Regional Campus
Farghaly, Ghada	General Internal Medicine
Foster, Matthew	Physical Medicine & Rehabilitation
George, Scaria	General Internal Medicine
Gregor, Laura	General Internal Medicine/Neprology
Gregory, Kathleen	General Internal Medicine
Hamilton, David	Emergency Medicine
Hart, Alexander	Emergency Medicine
Hasany, Aasim	Respirology/General Internal Medicine
Hernandez, Jeremy	Emergency Medicine
Hindieh, Waseem	Cardiology
Ingalls, Brian	Respirology
Irfan, Neal	Infectious Diseases
Juma, Salina	General Internal Medicine
Kehar, Rohan	Hematology and Thromboembolism
Khalifa, Abubaker	Critical Care/General Internal Medicine
Khera, Vikas	Critical Care / General Internal Medicine
Labib, Noura	Emergency Medicine
Ladak, Karim	Education and Innovation

Langridge, Jonathon	Respirology
Lee, June	Rheumatology/Niagara Health
Lin, Celina	Physical Medicine and Rehabilitation
Maddison, Andre	General Internal Medicine
Maida, Eugene	Physical Medicine & Rehabilitation
Marhong, Jonathan	Critical Care
Martin, Gail	Education and Innovation
Matiasz, Richard	Cardiology/General Internal Medicine
Mattia, Alicia	Neurology
Mazzetti, Adam	General Internal Medicine
Mazzetti, Gavin	General Internal Medicine
McConkey, Brendan	Respirology
Morgan, Ingrid	Critical Care
Mussani, Farheen	Dermatology
Naeem, Omer	Neurology
Naser, Mohamed	Nephrology
Nga Hei Lam, Joyce	Critical Care
Noor, Amra	Geriatric Medicine
O'Malley, Lauren	Physical Medicine and Rehabilitation
Oykhman, Paul	Clinical Allergy and Immunology
Paolone, Stephanie	General Internal Medicine
Plaza, Katarzyna	General Internal Medicine
Poddar, Megha	Endocrinology and Metabolism
Quinn, Kathleen	Nephrology
Raut, Amit	General Internal Medicine
Refaei, Mohammad	General Internal Medicine
Rehsia, Sachdeep	Critical Care
Repa, Rebecca	Education and Innovation
Russell, David	Nephrology
Sajic, Dusan	Dermatology
Shaikh, Sameer	Critical Care
Shaikholeslami, Roya	General Internal Medicine
Shukla, Rahul	Dermatology
Skitch, Steven	Emergency Medicine
Skogstad-Stubbs, David	General Internal Medicine
Spanglet, Offir	General Internal Medicine
Tam, Ben	Critical Care
Tan, Michael	General Internal Medicine
Taves, Jonathan	Emergency Medicine
Trussler, Alex	General Internal Medicine
Ud Din Butt, Ghias	General Internal Medicine
Varpio, Lara	Education and Innovation
Warren, Heather	Cardiology
Wassef, Anthony	Cardiology/Waterloo
Yeung, Yan	Rheumatology
Yip, Amelia	Cardilogy

Management Staff

Annette Rosati	Director of Administration
Campbell, Gail	Assistant to the Chair
Sara Sellers	Academic Coordinator, Tenure and Promotion
Charmaine Fraser	Administrative Coordinator
Melissa Robinson	Assistant to Director of Administration and to the Chair
Lisa Greer	Finance Manager
Andrew Folino	Finance Coordinator
Andrew Woodhall	Accounting Assistant
Graeme Matheson	Budget Manager
Gabriela Ciofliceanu	Finance Coordinator
Lorrie Reurink	Human Resources Manager/Faculty Recruitment
Mallory Freed	Interim Operations Site Coordinator, SJH
Leslie Steinberg	Business Manager, MUMC & HGH
Tanja Petrovic	Operations Coordinator
Gail LaForme	Operations Site Coordinator, JHCC
Jan Taylor	Administrator, Internal Medicine Residency Training Program

McMaster University

David Farrar
President & Vice-Chancellor
McMaster University

Paul O'Byrne
Dean & Vice-President
Faculty of Health Sciences

Mark Crowther
Chair
Department of Medicine

Contributors

Program Coordinators
Heads of Research Institutes
Endowed Chairs
Research Chairholders
Division Directors

Special Stories Writer

Emma Reilly McKay

Editor

Sandra Ramelli
Project Lead
Department of Medicine

Designers

Michelle Edmonds
Bob Edmonds
Electra Communications

Photographers

Jon Evans
Jon Evans Photography

St, Joseph's Healthcare Hamilton
Audio Visual Services

renowned results { research care learning

Department of Medicine
Faculty of Health Sciences
1280 Main Street West
Health Sciences Centre 4V33
Hamilton, Ontario, Canada L8N 3Z5
Phone 905.521.2100, ext. 76395
Fax 905.521.4972
https://healthsci.mcmaster.ca/medicine

McMaster University | BRIGHTER WORLD