Year in Review

2021 HIGHLIGHTS FROM THE FACULTY OF HEALTH SCIENCES

OUR PANDEMIC RESPONSE

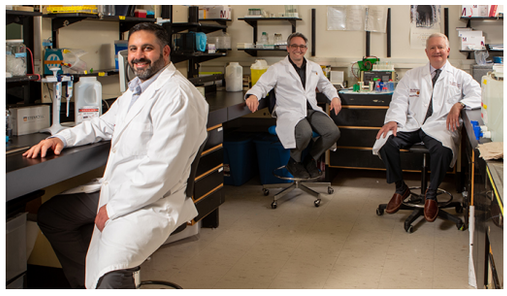
McMaster researchers have actively addressed the myriad issues relating to the COVID-19 pandemic, through impactful research studies, innovative treatments and synthesizing the best available evidence across the full breadth of Canada's COVID-19 pandemic response.

In 2021, McMaster received $1 million to support a new network called the "COVID-19 Evidence Network to support Decision-makers". The network was created to ensure decision-makers have access to the best COVID-19 science in a timely manner. It is being led by John Lavis, director of the McMaster Health Forum.

In addition, researchers have launched human trials for two next-generation COVID-19 vaccines. Designed to combat variants of concern and delivered by inhaled aerosol, not by injection, the vaccines will target the lungs and upper airways, where respiratory infections begin. These are two of the very few COVID-19 vaccines being developed in Canada. Phase 1 of the clinical trials was approved by Health Canada and the vaccines are being designed and produced in a specialized facility on campus, the McMaster Robert E. Fitzhenry Vector Laboratory. This is the first facility of its kind in Canada and one of a few with the capacity to develop and produce viral-vectored vaccines for clinical testing.

Researchers also launched one of the largest single studies focused on long-term care (LTC) homes in Canada to find out how well vaccination works in residents in LTC homes, and which features of these homes may be directly linked with outbreaks. The Government of Canada, through its COVID-19 Immunity Task Force, supported this study with almost $5 million. The study, in partnership with Schlegel Villages, St. Joseph's Health System, and Health Sciences North Research Institute, involved more than 2,000 residents, staff, and visitors of LTC homes in Ontario.

Platelet lab a national testing centre for vaccine-related clots



Left to right, Ishac Nazy, Donald Arnold, John Kelton from the McMaster Platelet Immunology Laboratory.

A grant from the Public Health Agency of Canada has cemented the McMaster Platelet Immunology Laboratory (MPIL) as Canada's centre for combatting vaccine-related blood clots.

The funds of almost $1.5 million designated the MPIL to provide confirmation and reports of vaccine-induced immune thrombotic thrombocytopenia (VITT).

A small number of Canadians have had the VIIT condition after receiving the AstraZeneca Vaxzevria vaccine for the COVID-19 virus. Both the AstraZeneca Vaxzevria and Janssen vaccines use adenovirus vectors, which can trigger clotting in rare cases.

National cancer therapy platform launched

A McMaster researcher is co-leading a new project to develop a national research platform to coordinate the development of new cancer cell therapies. Jonathan Bramson, professor of medicine, is co-lead with the Annette Hay of the Canadian Cancer Trials Group on the ExCELLirate Canada project, which received $5.19 million from the Canada Foundation for Innovation.

Juravinski Research Institute transforming the health system

Thanks to a $3-million donation from Charles and Margaret Juravinski, the Juravinski Research Institute funded five new research projects across Hamilton Health Sciences, McMaster University and St. Joseph's Healthcare Hamilton - all centred around health system transformation. Health system transformation involves using innovative approaches to create a more integrated and efficient health care system. The delivery of innovative and transformative care, including remote and virtual services, has become especially important amidst the COVID-19 pandemic. This work will honour the incredible life of Charles Juravinski, who passed away on February 16, 2022.

CLSA lead principal investigator Parminder Raina.

Investments support the science of healthy aging

The Canadian Longitudinal Study on Aging (CLSA) hosted at McMaster University received major funding injections during 2021. Launched in 2010, the CLSA is Canada's largest study of aging following more than 50,000 individuals who were between the ages of 45 and 85 at recruitment, for 20 years.

The Weston Family Foundation awarded a $12-million research grant to the CLSA for a new initiative that will shed light on the many factors that influence brain health as we age, including lifestyle and the human microbiome. The Healthy Brains, Healthy Aging Initiative features a cohort of 6,000 research participants who are enrolled in the CLSA. It marks the first time a national study of aging in Canada has introduced both brain imaging and microbiome analyses to investigate cognitive aging in the population over time.

The CLSA also received $61.5 million from the Minister of Labour, to ensure researchers have ongoing and timely access to a world-class data platform focused on health and aging; $9.6-million from the Government of Canada to renew infrastructure; and an additional $1 million from the Public Health Agency of Canada to explore innovative ways to close data gaps on dementia progression and impacts, socio-demographic and risk factors, and caregivers.

Gift supports most vulnerable seniors

Suzanne Labarge, a McMaster University chancellor emerita and alumna, invested $5 million in research to help improve the lives of marginalized and at-risk seniors, a group that is not often seen or heard. Her gift supports the creation of the MIRA | Dixon Hall Centre, a unique partnership between the university's McMaster Institute for Research on Aging and Dixon Hall, an established multi-service agency located in the heart of downtown Toronto.

Research centre zeros in on treatment-resistant cancers

A new Centre for Discovery in Cancer Research draws together clinicians and scientists from across Hamilton, focusing their research on treatment-resistant cancers with high death rates, such as glioblastoma, triple-negative breast cancer and pancreatic cancer, among others.

In 2021, the Centre received a $100,000 grant from Brain Cancer Canada to allow McMaster scientist Sheila Singh to devise new treatments for recurrent glioblastomas. Singh and her team are focusing their research on stem-like cells driving GBMs to reoccur, using CRISPR technology to map a series of genes in cancer cells as potential points of attack. Once identified, specific antibodies or immunotherapy can be used to disable the function of those genes, and potentially offer a new method to treat recurring GBMs.

Ashirbani Saha

Endowed chair is a BRIGHT idea

Community members who volunteered, ran and donated funds for the annual Hamilton BRIGHT Run for breast cancer research have helped establish a new research chair at McMaster University. BRIGHT Run organizers donated $2 million to permanently fund a new endowed research chair that will focus on advanced analytics in breast cancer and oncology. McMaster added $2 million to the endowment.

The first holder is Ashirbani Saha, an engineer who joined the Department of Oncology of McMaster's Michael G. DeGroote School of Medicine as an assistant professor and research educator on July 1, 2021. As the BRIGHT Run chair, she is focusing on developing a collaborative interdisciplinary research program, using advanced data analytic techniques including artificial intelligence to improve the care of breast cancer patients. She will draw on the large amount of local data through McMaster University and Hamilton Health Sciences.

McMaster doctor receives prestigious teaching award

Jonathan Sherbino, a professor of medicine and assistant dean at the McMaster Education Research, Innovation and Theory (MERIT) program, won a 3M National Teaching Fellowship award for his ground-breaking work as a medical educator. The Fellowship is Canada's most prestigious recognition of excellence in educational leadership and teaching at the post-secondary level, and Sherbino is one of 10 national fellowships for 2021.

Chair bolsters patient-centred research

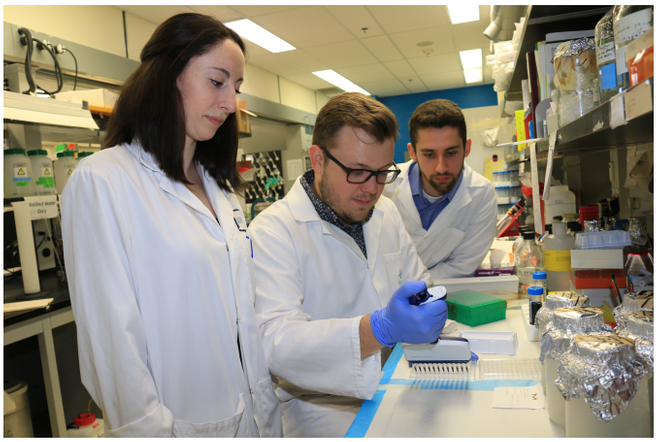
Throughout his career as a doctor and researcher, David Armstrong has seen first-hand the difference nutrition therapy can make in a patient's life. The McMaster University professor of medicine and practising gastroenterologist will have a unique opportunity to make an even greater impact as the inaugural holder of the Douglas Family Chair in Nutrition Research. This position was established thanks to a generous $2-million gift from McMaster graduates, Paul Douglas, BCom '76, MBA '78 and Susan Douglas, BScN '76.

Professors join Canadian Academy of Health Sciences

Five professors of the Faculty of Health Sciences joined the Canadian Academy of Health Sciences (CAHS) as fellows. This election is considered the highest recognition of excellence in Canadian academic health sciences. The five new McMaster CAHS fellows are Lori Burrows, Maureen Dobbins, Alfonso Iorio, Mitchell Levine and Maureen Markle-Reid.

Two new Royal Society of Canada Fellows

Two professors of the Department of Psychiatry and Behavioural Neurosciences were honoured for their work by the Royal Society of Canada. Professor Harriet MacMillan was elected as a fellow, and associate professor Ryan Van Lieshout was selected to join the society's College of New Scholars, Artists and Scientists.



Researchers in the Waserman-Jordana lab.

Researchers pioneer new peanut allergy therapy

McMaster University researchers have discovered a potentially game-changing new treatment that could bring relief to millions of people worldwide living with peanut allergy.

The current understanding is that in certain individuals, the immune system mistakenly identifies a specific food protein as harmful and triggers the production of an antibody called Immunoglobulin E (IgE) to eliminate it.

"The situation with peanut allergy is that it is a life-long disease for most people. Unlike other allergies, there are no mitigating treatments like inhalers. The only available treatment is epinephrine which is given only after an allergic reaction has occurred," said Susan Waserman, Schroeder Allergy and Immunology Research Institute Director and Schroeder Chair in Allergy and Immunology Research. She shares a lab with senior author of the paper Manel Jordana, professor of medicine. Their previous research found that a certain subset of allergen-specific memory cells is virtually lifelong.

Simple surgery prevents strokes in heart patients

A simple surgery saves patients with heart arrhythmia from often-lethal strokes, says a large international study led by McMaster University. Researchers found that removing the left atrial appendage - an unused, finger-like tissue that can trap blood in the heart chamber and increase the risk of clots - cuts the risk of strokes by more than one-third in patients with atrial fibrillation.

Even better, the reduced clotting risk comes on top of any other benefits conferred by blood-thinner medications that patients with this condition are usually prescribed.

"If you have atrial fibrillation and are undergoing heart surgery, the surgeon should be removing your left atrial appendage, because it is a set-up for forming clots. Our trial has shown this to be both safe and effective for stroke prevention," said Richard Whitlock, first author of the study. "This is going to have a positive impact on tens of thousands of patients globally."

McMaster's wide pandemic outreach

Throughout the pandemic, McMaster's faculty, staff and students contributed to many community outreach initiatives. For example, two undergraduate students in the Faculty of Health Sciences launched Period Pop-Ups, an accessible, donation-based pantry filled with free menstrual products that is available to the public 24/7. The students came up with the idea at the start of the COVID-19 pandemic after being inspired by the idea of community fridges.

Faculty, staff and students of the Michael G. DeGroote School of Medicine, the School of Nursing and other schools and departments across campus, assisted with onsite vaccination clinics. For example, members of the McMaster Family Health Team took part in a provincial pilot project that saw adults 60 to 64 given the COVID-19 vaccine. The pilot was the first step in understanding the role primary care will play in offering vaccine to patients at their family doctor's office. Nursing students also stepped up to assist with vaccine administration, working and learning at the City of Hamilton's mass vaccination clinics.