MDCM & PhD Program

An outstanding training opportunity for those passionate about a career as a physician-scientist
Thanks to the emergence of big data, precision medicine and artificial intelligence, among other innovations, health care is undergoing a major transformation. There is no group better able to harness these advances than graduates from McGill’s stellar MDCM & PhD Program. These future health care leaders have the skills, knowledge and drive to rethink the status quo and redraw the health care landscape. Their ability to straddle research and clinical care will improve diagnoses, prevention, treatments and delivery of care for current and future generations.

David H. Eidelman, MDCM
Vice-Principal (Health Affairs)
Dean, McGill Faculty of Medicine

McGill’s MDCM & PhD Program doubles enrollment

In order to attract elite trainees, McGill is doubling enrollment in its MDCM & PhD Program. In addition, to ensure our trainees are able to focus on their studies and research, the University provides guaranteed annual funding of $25,000.

To study the phenomena of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all.

--William Osler, MD, Professor of Institutes of Medicine and Registrar of the Faculty, McGill University, 1874-1884
MDCM & PhD graduates have a transformative impact on human health

A career as a physician-scientist is more rewarding and meaningful than you can imagine. It is challenging and requires creativity, perseverance and passion. The McGill MDCM & PhD Program trains a talented cohort of candidates to become premier physician-scientists in basic and translational sciences as well as clinical or population research.

With their dual degrees, physician-scientists are poised to bridge the gap between research and clinical practice. Most will spend the majority of their time doing research and the remainder of their time taking care of patients. This allows them to identify novel and clinically relevant questions at the patient’s bedside that inspire and inform their research.

Despite making up only three to four per cent of all physicians, physician-scientists have made remarkable contributions to health care innovation in Canada and abroad. Graduates of the McGill MDCM & PhD Program often go on to become faculty members at medical schools, universities and research institutes.

Responding to today’s critical health problems

Successful physician-scientists have an eclectic skill set. They are intelligent, motivated, hard-working, and efficient. They also love solving problems. If this sounds like you, then I encourage you to apply to the McGill MDCM & PhD Program. The program provides exceptional clinical training and an opportunity to conduct innovative and collaborative research alongside remarkable investigators. McGill is an ideal place for young people interested in a hugely rewarding career that enables them to advance knowledge of disease and to develop treatments and preventive measures to improve human health.

Mark J. Eisenberg, MD, MPH
Professor of Medicine, McGill University and Director of the McGill MDCM and PhD Program
Senior Investigator, Centre for Clinical Epidemiology and Community Studies, Lady Davis Institute Jewish General Hospital (JGH) and Director of the Cardiovascular Health Services Research Group, JGH
Heather Whittaker  
Class of 2024 (MDCM & PhD)

**Hometown:**
Port Hardy, B.C.

**Education:**
BSc (Biopsychology), University of Winnipeg  
MSc (Clinical Neuroscience), University College, London

**Research experience:**
Research Assistant, Martin Lab, Dept. of Physics, University of Winnipeg  
Laboratory Technician, Fisher Lab, Dept. of Neurodegenerative Disease, University College London (UCL) Institute of Neurology (IoN)  
Research Assistant, Houlden Lab, Dept. of Molecular Neuroscience, UCL IoN

**Area of research:**  
To be selected

Heather’s ambition is to help people living with a neurological illness enjoy as fulfilling a life as possible. After finishing her Master’s of Science (Clinical Neuroscience), she considered going right into a PhD program, but she hesitated because she didn’t want to immerse herself in the study of disease without treating patients. “The McGill MDCM & PhD Program is the ideal platform to learn to navigate the interface between science and medicine and to develop the synergy between researching a disease and caring for those living with it,” Heather says.

Heather was drawn to the McGill program because it is an epicentre for cutting-edge neuroscience research and care. She became interested in exploring the causes of Alzheimer’s when she was a volunteer in a seniors’ home. Many residents were slowly losing their identity and ability to connect with others. Today, little can be done to stop the progression of the illness. In addition, the impact of Alzheimer’s on society is growing due to our aging population. The number of people living with Alzheimer’s worldwide is expected to triple by 2050 according to the World Health Organization.

“Alzheimer’s really interests me on a biological level. Researchers around the world are looking for the root causes of the disease and for treatments to slow and even halt its progression. It will be very rewarding to work on solving the mysteries of this complex brain disease, particularly at a time when so many are at risk,” she says.

During her spare time, Heather stays active with dance, yoga, and cycling. She is also exploring Montreal and enjoying its plethora of festivals and events.

Montreal ranks among world’s best cities for students

Montreal beat out Paris, New York and Tokyo in a global ranking of 125 cities. Montreal’s affordability and students’ positive perception of their time studying in Montreal placed it among the top four student cities for 2018, according to a survey by global higher education analyst Quacquarelli Symonds (QS).
Preparing candidates to excel

Founded in 1829, the McGill Faculty of Medicine was the first faculty at the University and the first medical faculty in Canada. McGill has graduated generations of physicians and researchers dedicated to improving the lives of individuals and society at large.

Today, McGill enjoys an international reputation for excellence in teaching, clinical training, research and scholarship. Our graduates are well prepared, highly skilled health care professionals and scientists able to adapt to the rapidly changing health care landscape. McGill graduates provide innovative, compassionate patient care and advance medical knowledge through novel research in the fields of basic and translational sciences.

Training the next generation of physician-scientists

By pursuing MDCM & PhD training at McGill candidates obtain exclusive degrees from Canada’s top medical-doctoral university, as per Maclean’s Magazine’s 2018 university rankings.

Trainees can choose to do their PhDs in any department or institute within McGill Graduate and Postdoctoral Studies (mcgill.ca/gps). Graduates are well positioned to contribute to the discovery of new diagnostic approaches, drugs and technologies that will improve and save lives. They also train the next generation of students who, in turn, will push the boundaries of our knowledge.

A close-knit community

While rigorous, the program is designed to help trainees flourish. Trainees receive support and guidance as they chart their unique professional future. We encourage them to tap into the knowledge and experience of colleagues as well as advisors and physician-scientist mentors. The program provides focused research training and a unique bi-weekly seminar series that gives trainees an opportunity to meet established physician-scientists and to learn the requisite skills for a successful research career. Additionally, the program fosters team spirit by organizing social activities and other networking opportunities.
There is plenty of evidence that social factors, including education, employment status, income level, gender and ethnicity influence the health of individuals. In all countries, Canada included, there are differences in the health and well-being of different social groups. Generally, marginalized groups are at higher risk of poor health. Lashanda’s research is looking at the systemic and social factors that impact patient care among vulnerable populations. Her ultimate goal is to identify the root causes of health inequities in order to influence health care practices and policies to improve patient outcomes.

Currently, Lashanda’s doctoral work applies mixed methods to study the sexual and reproductive health care needs of women living with HIV. She is using data from the Canadian HIV Women’s Sexual and Reproductive Health Cohort Study (CHIWOS) to look at the health care needs of this patient population and the services and support available to them. The goal is to determine how the health care system can better address the particular needs of these women.

“My studies didn’t follow a linear path. I had a sense I wanted to study medicine and social science, but really didn’t know how I’d get to that point,” she says. It was while doing a research internship on cancer therapies at Boston Children’s Hospital that Lashanda decided to pursue an MD-PhD. She was inspired by the physician-scientists she was working with and was able to see firsthand how their translational research was positively impacting patient care and outcomes.

She chose to study at McGill because the University provides a learning environment that values clinical research and provides medical students with ample research opportunities throughout their training. She was also drawn to Montreal because of its cultural diversity.

Lashanda is completing her doctoral thesis under the supervision of Alexandra de Pokomandy, MDCM, MSc, Assistant Professor at McGill and a family physician specializing in HIV patient care.

One of Lashanda’s hobbies is playing the piano and she recently started to play the djembe, an African drum. She also loves cooking; each time she tries out a new recipe she writes about it in her food blog (messyapron.space).
Physician-scientists make major contributions to health care innovation

An article in the Journal of Biomedical Education (Volume 2016) found the majority of graduates from the McGill MDCM & PhD Program are on staff at institutions that protect their time for research. McGill graduates have had remarkable success at obtaining peer-reviewed grants and publications in high-impact journals.

Physician-scientists have made remarkable contributions to Canadian health care innovation despite making up only a fraction of physicians and researchers. McGill alumni are scattered across a spectrum of medical specialties.

Canada’s Top Medical-Doctoral University 2018: McGill University

“McGill is lauded for its superior PhD programs and medical school. Some of its alumni’s more notable accomplishments include mapping the brain’s motor cortex, inventing Plexiglas and discovering that atoms are divisible. Today’s researchers continue that ground-breaking tradition with innovations in green chemistry, food science and computer science. This is the 13th consecutive year the university has held this title.”

-- Maclean’s Magazine, October 11, 2017
Paul Savage
Class of 2019 (MDCM & PhD)

**Hometown:**
Montreal West, QC

**Education:**
BSc, (Life Sciences), Queen’s University

**Award:**
CIHR Vanier Award Winner

**Research experience:**
Research Assistant, Park Lab, Rosalind and Morris Goodman Cancer Research Centre, McGill University
Research Assistant, Yang Lab, Dept. of Pathology and Molecular Medicine, Queen’s University
Research Assistant, Ko Lab, Dept. of Biology, Queen’s University

**Current research:**
Breast Cancer, Park Lab, Rosalind and Morris Goodman Cancer Research Centre, McGill University

Paul’s interest in medicine was sparked by great mentors, including his high school science teacher, a physician-scientist who often highlighted the link between science and medicine.

When applying to McGill, he vacillated between research and medicine. “I was interested in the intellectual challenge of research and the possibility of helping society at large. But, I was also interested in becoming a doctor because of the patients I’d treat. The McGill MDCM & PhD Program opened the door to both — medicine to help patients today; research to help them tomorrow,” he says.

Under the supervision of Dr. Morag Park, Director of the Rosalind and Morris Goodman Cancer Research Centre at McGill, Paul is studying an aggressive form of breast cancer. The goal is to determine if subsets of people living with breast cancer might benefit from drugs already approved and commonly used to treat other cancers. “It is an exciting time to be a cancer researcher. Thanks to the genomic era, the field is changing at an incredibly rapid pace. How we treat and diagnose people living with the disease is being revolutionized,” he says.

Paul is in a long-term relationship, which he credits with helping him find that sometimes elusive work-life balance. He has always loved sports and has recently taken up golf, although he won’t reveal his handicap.

Memory was not a fashionable topic when I started working on it. I only started working on it because the patients complained of poor memory. And if a patient complains of memory, you don’t say, ‘No, no, I’m interested in perception,’ and then forget about memory. You study memory or you take a different job.

--Brenda Milner, CC, GOQ, DSc, PhD, Dorothy J. Killam Professor at the Montreal Neurological Institute and Hospital, and Professor in the Department of Neurology and Neurosurgery, McGill University
Plethora of research opportunities in modern training, patient care and research facilities

McGill MDCM & PhD trainees can choose from a wide range of research opportunities. McGill is one of the highest-ranked research-intensive universities in North America, with a long tradition of excellence. McGill offers candidates an opportunity to train in cutting-edge care and research facilities equipped with the latest technologies.

Some of McGill’s research centres:
- Alan Edwards Centre for Research on Pain
- Centre for Applied Mathematics in Bioscience and Medicine
- Centre for Research on Brain, Language and Music
- Centre for Research in Reproduction and Development
- Institute for Human Development and Well-Being
- J.D. MacLean Centre for Tropical Diseases
- McGill AIDS Centre
- McGill Centre for Bioinformatics
- McGill Centre for Convergence of Health and Economics
- McGill University Research Centre for Studies in Aging
- McGill Centre for Translational Research in Cancer
- McGill Cystic Fibrosis Translational Research Centre
- McGill International Tuberculosis Centre
- McGill University Research Centre on Complex Traits
- McGill University Research Centre for Physical Activity and Health
- Microbiome and Disease Tolerance Center
- Montreal Neurological Institute and Hospital
- Rosalind and Morris Goodman Cancer Research Centre

McGill-affiliated research centres:
- Douglas Mental Health University Institute
- Lady Davis Institute for Medical Research, Jewish General Hospital
- Montreal Chest Institute
- Research Institute of the McGill University Health Centre
- St. Mary’s Research Centre

Without physician-scientists, both medicine and biomedical science are diminished. And like any other species, physician-scientists beget physician-scientists. It’s our responsibility to ensure that this species survives.

--Phil Gold CC, OQ, MD, PhD, FRSC, DSc (Hon) MACP, FRCP(C)
Douglas G. Cameron Professor of Medicine and Professor of Physiology and Oncology at McGill University and Executive Director, Clinical Research Centre (MGH), McGill University Health Centre
Dr. Kevin Petrecca opens heads and cuts into brains for a living. He is a neurosurgeon specializing in brain cancer. When not in the operating room, you’ll find him in his lab perfecting a neuro-oncology surgical tool or maybe doing fundamental research to determine why brain cancer stem cells are treatment resistant. Then again, you might find him hanging out with his wife and three children.

To say he is busy is an understatement. “I have the luxury of doing what I am interested in. I never actually have to go to work or work late because it isn’t work. I love the balance. I love treating patients and love doing my research. You need to work in a place that values physician-scientists and with colleagues who understand your dual role. After that it is fun,” he says.

Dr. Petrecca did things in reverse when he started McGill’s MDCM & PhD Program. He focused on research and put off his medical studies. “I deferred medicine as long as I could because I wasn’t really sure I wanted to be a doctor, however, I soon discovered I really liked taking care of people and making a difference in their lives.”

There is no doubt Dr. Petrecca makes a difference. He, along with Frédéric Leblond of Polytechnique Montréal and the Research Centre of the Université de Montréal, received the 2017 Québec Science Discovery of the Year Award. They developed a fiber-optic probe, no bigger than a pencil, that differentiates between cancer cells and healthy brain cells in a matter of seconds.

“Often it is impossible to visually distinguish cancer from normal brain, so invasive brain cancer cells frequently remain after surgery, leading to cancer recurrence and a worse prognosis. The probe improves patient outcomes,” Dr. Petrecca says.

Dr. Petrecca acknowledges physician-scientists bring a unique perspective to biomedical research that is inspired by their experience caring for patients. “All fields require people to move them forward. The contribution physician-scientists make to both research and patient care is critical if we are going to answer the most pressing health care issues facing society.”
### MDCM & PhD curriculum

McGill’s seven- or eight-year program is divided into three segments:

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### McGill researchers contribute to three of its 10 nominees for Discovery of the Year 2017, selected by Québec Science for 2017

Québec Science magazine selected its 10 Discoveries of the Year for 2017, including three involving McGill researchers. The annual list has highlighted top scientific research from across Quebec for the past 25 years, and McGill has been cited more than any other institution during that quarter-century.

Here are the selected discoveries involving McGill scientists for the past year:

- **Biofilms—the eradication has begun** – Don Sheppard, Brendan Snarr
- **An infallible hand-held probe to aid cancer surgery** – Kevin Petrecca, Frédéric Leblond (Polytechnique Montréal)*
- **McGill scientists also contributed to a study led by researchers by researchers at l’Université du Québec à Montréal: “Quantification of brain cholinergic denervation in Alzheimer’s disease using PET imaging with $[^{18}F]$-FEOBV” (Molecular Psychiatry) Meghmik Aghourian, Camille Legault-Denis, Jean-Paul Soucy, Pedro Rosa-Neto, Serge Gauthier, Alexey Kostikov, Paul Gravel, Marc-André Bedard.

### Some of the awards held by our students

- Brain Tumour Foundation of Canada Research Studentship
- Canadian Medical Hall of Fame Award
- Cedars Cancer Institute Fellowship
- Division of Experimental Medicine Graduate Entrance Fellowship
- Dr. Clarke K. McLeod Memorial Scholarship
- Fonds de recherche en ophtalmologie de l’Université de Montréal
- Fonds Suzanne Véronneau-Troutman
- FRQS Doctoral Training for Medical Students Award
- Graduate Excellence Award in Neurology and Neurosurgery
- Harry Shankman Scholarship
- Richard H. Tomlinson Doctoral Fellowship
- Scarlet Key Award (inducted to Scarlet Key Society)
- Sir Edward W. Beatty Memorial Scholarship
- Vanier Canada Graduate Scholarship

*named the 2017 Québec Science Discovery of the Year
To understand what we are treating is the best gift, as is the hope for improved care we can give our patients.

-- Nada Jabado
MD, PhD
Professor, Department of Human Genetics, Division of Hematology and Oncology, Faculty of Medicine, McGill University
Senior Scientist, RI-MUHC, Glen site
Child Health and Human Development Program
Pediatric Hematologist and Neuro-Oncologist, Montreal Children's Hospital, McGill University Health Centre