



**Faculty of Medicine and Health Sciences
(Graduate)**

**Programs, Courses and University Regulations
2022-2023**

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This publication provides guidance to prospects, applicants, students, faculty and staff.

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- 2 . In the interpretation of academic regulations, the Senate is the final authority.
- 3 . Students are responsible for informing themselves of the University's procedures, policies and regulations, and the specific requirements associated with the degree, diploma, or certificate sought.
- 4 . All students registered at McGill University are considered to have agreed to act in accordance with the University procedures, policies and regulations.
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- 7 . The academic publication year begins at the start of the Fall semester and extends through to the end of the Winter semester of any given year. Students who begin study at any point within this period are governed by the regulations in the publication which came into effect at the start of the Fall semester.
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Note: Throughout this publication, "you" refers to students newly admitted, readmitted or returning to McGill.

Publication Information

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1 Dean's Welcome

Welcome to Graduate and Postdoctoral Studies (GPS) at McGill. You are joining a community of world-class researchers and more than 10,000 graduate students in over 400 programs. GPS is here to support you from admissions through to graduation and beyond. McGill's approach to graduate education emphasizes skills development; we cultivate your academic and professional growth through a variety of workshops, events and experiential learning opportunities. I invite you to consult the [GPS website](#) for information on the range of resources available to graduate students at McGill.

I would like to wish you all the best in your studies at McGill. We are here to make sure that you have the best possible experience.

Josephine Nalbantoglu, Ph.D.

Associate Provost (Graduate Education) and Dean, Graduate and Postdoctoral Studies

2 Graduate and Postdoctoral Studies

2.1 Administrative Officers

Administrative Officers

Josephine Nalbantoglu; B.Sc., Ph.D.(McG.)

Associate Provost (Graduate Education) and Dean (Graduate and Postdoctoral Studies)

Lorraine Chalifour; B.Sc., Ph.D. (Manit.)

Associate Dean (Graduate and Postdoctoral Studies)

Nathan Hall; B.A., M.A., Ph.D. (Manit.)

Associate Dean (Graduate and Postdoctoral Studies)

Russell Steele; B.S., M.S. (Carn. Mell), Ph.D. (Wash.)

Associate Dean (Graduate and Postdoctoral Studies)

2.2 Location

James Administration Building, Room 400

845 Sherbrooke Street West

Montreal QC H3A 0G4

Website: mcgill.ca/gps



Note: For inquiries regarding specific graduate programs, please contact the appropriate department.

2.3 Graduate and Postdoctoral Studies' Mission

The mission of Graduate and Postdoctoral Studies (GPS) is to promote university-wide academic excellence for graduate and postdoctoral education at McGill. GPS provides leadership and strategic direction across the university in close collaboration with the academic and administrative units, and the graduate and postdoctoral community.

3 Important Dates

For all dates relating to the academic year, consult mcgill.ca/importantdates.

4 Graduate Studies at a Glance

Please refer to [University Regulations & Resources](#) > *Graduate* > : [Graduate Studies at a Glance](#) for a list of all graduate departments and degrees currently being offered.

5 Program Requirements

Refer to [University Regulations & Resources](#) > *Graduate* > *Regulations* > : [Program Requirements](#) for graduate program requirements for the following:

- Master's Degrees
- Doctoral Degrees
- Coursework for Graduate Programs, Diplomas, and Certificates

6 Graduate Admissions and Application Procedures

Please refer to [University Regulations & Resources](#) > *Graduate* > : [Graduate Admissions and Application Procedures](#) for information on:

- Application for Admission
- Admission Requirements
- Application Procedures
- Competency in English

and other important information regarding admissions and application procedures for Graduate and Postdoctoral Studies.

7 Fellowships, Awards, and Assistantships

Please refer to [University Regulations & Resources](#) > *Graduate* > : [Fellowships, Awards, and Assistantships](#) for information and contact information regarding fellowships, awards, and assistantships in Graduate and Postdoctoral Studies.

8 Postdoctoral Research

Students must inform themselves of University rules and regulations and keep abreast of any changes that may occur. The *Postdoctoral Research* section of this publication contains important details postdoctoral scholars will require during their studies at McGill and should be periodically consulted, along with other sections and related publications.

8.1 Postdocs

Postdocs are recent graduates with a Ph.D. or equivalent (i.e., Medical Specialist Diploma) engaged by a member of the University's academic staff, including Adjunct Professors, to assist them in research.

Postdocs must be appointed by their department and registered with Enrolment Services in order to have access to University facilities (library, computer, etc.).

8.2 Guidelines and Policy for Academic Units on Postdoctoral Education

Every unit hosting postdocs should apply institutional policies and procedures for the provision of postdoctoral education and have established means for informing postdocs of policies, procedures, and privileges (available at mcgill.ca/gps/postdocs), as well as mechanisms for addressing complaints. For their part, postdocs are responsible for informing themselves of such policies, procedures, and privileges.

1. Definition and Status

- i. Postdoctoral status will be recognized by the University in accordance with Quebec provincial regulations as may be modified from time to time. The eligibility period for postdoctoral status is up to five years from the date when the Ph.D. or equivalent degree was awarded. A : *leave of absence* for parental or health reasons may extend the eligibility period. Leaves for other reasons, including vacation, do not impact the eligibility period.
- ii. Some McGill postdocs have dual status as both students and employees (unionized or non-unionized). Consult the [Graduate and Postdoctoral Studies website](#) for definitions of Postdoctoral Fellows, Postdoctoral Scholars and Postdoctoral Researchers.
- iii. Postdocs must conduct research under the supervision of a McGill professor (including Adjunct Professors), qualified in the discipline in which training is being provided and with the ability to fulfil supervisory responsibilities and act as a mentor for career development. Postdocs are expected to engage primarily in research with minimal teaching or other responsibilities.

2. Registration

- i. Postdocs must *register* annually with the University through Enrolment Services. Registration will be limited to postdocs who fulfil the definition above, and who meet the eligibility criteria as stipulated on the [Graduate and Postdoctoral Studies website](#).
- ii. Upon registration, postdocs will be eligible for a University identity card issued by Enrolment Services.
- iii. Leaves of absence must comply with the Graduate and Postdoctoral Studies Policies for Vacation, Parental/Familial, and Health Leave (see [section 8.3: Vacation Policy for Graduate Students and Postdocs](#) and [University Regulations & Resources](#) > Graduate > Regulations > Categories of Students > : *Leave of Absence Status*).

3. Appointment, Funding, Letter of Agreement

- i. Postdoctoral appointments may not exceed the registration eligibility period as defined above.
- ii. In order to be registered, the postdoc must be assured of financial support other than from personal means during their stay at McGill University. This amount must be equivalent to the minimal stipend requirement set by the University in accordance with guidelines issued by federal and provincial research granting agencies or the collective agreement, as applicable. Funding during parental leave is subject to the conditions of the funding agency or the collective agreement, as applicable.
- iii. Postdocs require a [Letter of Agreement for Postdoctoral Education](#) signed by the postdoc, the supervisor, and the department/unit head or delegate.
- iv. Postdocs with full responsibility for teaching a course should be compensated over and above their postdoctoral funding as course lecturers. This applies to all postdocs, except those for whom teaching is part of the award.
- v. The amount of research, teaching, or other tasks that postdocs engage in over and above postdoctoral activities should conform to the regulations for postdocs specified by the Canadian research council of their discipline or the collective agreement. This applies to all postdocs, including those whose funding does not come from the Canadian research councils.

4. Privileges

- i. Postdocs have the same pertinent rights as the ones granted to McGill students under mcgill.ca/students/srr, and those granted by the policies listed at mcgill.ca/secretariat/policies-and-regulations.
- ii. Postdocs have full graduate student borrowing privileges in McGill libraries through their identity card.
- iii. As a general rule, postdocs may take courses for credit as Special Students following the admissions procedures outlined at mcgill.ca/gradapplicants/apply/prepare/visiting. *Tuition and other charges* will apply.
- iv. Postdocs may be listed in the McGill directory.
- v. Access to sports facilities may be purchased on a monthly basis through McGill Athletics and Recreation.
- vi. Postdoctoral Fellows and Scholars are mandatory members of the Post-Graduate Students' Society (PGSS) and an annual association fee is automatically charged.
- vii. Postdocs are permitted membership in the Faculty Club; an annual fee will be charged for this membership.
- viii. Postdocs are encouraged to participate in Professional Development Workshops provided by Graduate and Postdoctoral Studies, and Teaching and Learning services. These sessions are usually free of charge.
- ix. Postdocs have access to the services provided by the Ombudsperson.
- x. Postdocs may enrol as part-time students in the second language written and spoken English/French courses offered by the School of Continuing Studies/French Language Centre. Postdocs will be charged tuition for these courses. International Postdocs may be required to obtain a CAQ and a Study Permit.
- xi. Access to student services is granted to non-unionized postdocs, who are charged the Student Services fee in the Fall and Winter terms, through their student fee accounts.

5. Responsibilities

- i. Postdocs are subject to the responsibilities outlined at mcgill.ca/students/srr and must abide by the policies listed at mcgill.ca/secretariat/policies-and-regulations.
- ii. Each academic unit hosting postdocs should clearly identify postdocs' needs and the means by which they will be met by the unit.
- iii. Each academic unit should assess the availability of research supervision facilities, office space, and research funding before recruiting postdocs.
- iv. Some examples of the responsibilities of the academic unit are:
 - to verify the postdoc's eligibility period for registration;
 - to provide postdocs with departmental policy and procedures that pertain to them;
 - to facilitate the registration and appointment of postdocs;
 - to assign departmental personnel the responsibility for postdoctoral affairs in the unit;
 - to oversee and sign off on the Letter of Agreement for Postdoctoral Education;
 - to ensure that each postdoc has a supervisor, lab and/or office space, access to research operating costs and necessary equipment;
 - to include postdocs in departmental career and placement opportunities;
 - to refer postdocs to the appropriate University policies and personnel for the resolution of conflict that may arise between a postdoc and a supervisor.
- v. Some examples of the responsibilities of the supervisor are:
 - to uphold and transmit to their postdocs the highest professional standards of research and/or scholarship;
 - to provide research guidance;
 - to meet regularly with their postdocs;
 - to provide feedback on research submitted by the postdocs;
 - to clarify expectations regarding intellectual property rights in accordance with the University's policy;
 - to provide mentorship for career development;
 - to prepare, sign, and adhere to a Letter of Agreement for Postdoctoral Education.
- vi. Some examples of the responsibilities of postdocs are:
 - to inform themselves of and adhere to the University's policies and/or regulations for postdocs as outlined at mcgill.ca/gps/postdocs, mcgill.ca/students/srr and the Graduate and Postdoctoral Studies [University Regulations and Resources](#);
 - to submit a complete file for registration to Enrolment Services;
 - to sign and adhere to their Letter of Agreement for Postdoctoral Education;
 - to communicate regularly with their supervisor;
 - to inform their supervisor of their absences.
- vii. Some examples of the responsibilities of the University are:
 - to register postdocs;
 - to provide an appeal mechanism in cases of conflict;
 - to provide documented policies and procedures to postdocs;
 - to provide postdocs with the necessary information on McGill University student services (Postdoctoral Fellows and Scholars) and HR policies and guidelines (Postdoctoral Researchers).

Approved by Senate, April 2000; revised May 2014; February 2020.

8.3 Vacation Policy for Graduate Students and Postdocs

Graduate students and Postdocs should normally be entitled to vacation leave equivalent to university holidays and an additional total of fifteen (15) working days in the year. Funded students and Postdocs with fellowships and research grant stipends taking additional vacation leave may have their funding reduced accordingly.

Council of FGSR April 23, 1999

8.4 Leave of Absence for Health and Parental/Familial Reasons

A leave of absence may be granted for maternity or parental reasons or for health reasons (see [University Regulations & Resources > Graduate > : Leave of Absence Status](#)).

Such a leave must be requested on a term-by-term basis and may be granted for a period of up to 52 weeks. For a maternity or parental leave, the eligibility period of a maximum of 52 consecutive weeks is determined based on when the child is born; if the leave is interrupted for one or two terms, the eligibility period cannot be extended. Students and Postdocs must make a request for such a leave in writing to their department and submit a medical certificate. The department shall forward the request to Enrolment Services. See the procedure in [University Regulations & Resources > Graduate > : Leave of Absence Status](#).

Students who have been granted such a leave will have to register for the term(s) in question and their registration will show as “leave of absence” on their record. No tuition fees will be charged for the duration of the authorized leave. Research supervisors are not obligated to remunerate students and Postdocs on leave. A summary table of various leave policies (paid or unpaid) for students and Postdocs paid from the Federal and Quebec Councils through fellowships or research grants is available at mcgill.ca/gps/funding/getting-paid under "Leave Policies and Form."

8.5 Postdoctoral Research Trainees

Eligibility

If your situation does not conform to the Government of Quebec's definition of a Postdoctoral Fellow, you may be eligible to attend McGill as a Postdoctoral Research Trainee. While at McGill, you can perform research only (you may not register for courses or engage in clinical practice). Medical specialists who will have clinical exposure and require a training card must register through Postgraduate Medical Education of the Faculty of Medicine and Health Sciences—not Graduate and Postdoctoral Studies.

The category of Postdoctoral Research Trainee is for:

Category 1: An individual who has completed requirements for the Doctoral degree or medical specialty, but whose degree/certification has not yet been awarded. An individual in this category will subsequently be eligible for registration as a Postdoctoral Fellow.

Category 2: An individual who is not eligible for Postdoctoral Registration according to the Government of Quebec's definition, but is a recipient of an external postdoctoral award from a recognized Canadian funding agency.

Category 3: An individual who holds a professional degree (or equivalent) in a regulated health profession (as defined under CIHR-eligible health profession) and is enrolled in a program of postgraduate medical education at another institution. This individual wishes to conduct the research stage or elective component of their program of study at McGill University under the supervision of a McGill professor. This individual will be engaged in full-time research with well-defined objectives, responsibilities, and methods of reporting. Applications must be accompanied by a letter of permission from the applicant's home institution (signed by the Department Chair, Dean, or equivalent) confirming registration in their program and stating the expected duration of the research stage. Individuals who are expecting to spend more than one year are encouraged to obtain formal training (master's or Ph.D.) through application to a relevant graduate program.

Category 4: An individual with a regulated health professional degree (as defined under CIHR-eligible health profession), but not a Ph.D. or equivalent or medical specialty training, but who fulfils criteria for funding on a tri-council operating grant or by a CIHR fellowship (up to maximum of five years post-degree).



Note: Individuals who are not Canadian citizens or permanent residents must inquire about eligibility for a work permit.

General Conditions

- The maximum duration is three years
- The individual must be engaged in full-time research
- The individual must provide copies of official transcripts/diplomas
- The individual must have the approval of a McGill professor to supervise the research and of the Unit
- The individual must have adequate proficiency in English, but is not required to provide official proof of English competency to Enrolment Services
- The individual must comply with regulations and procedures governing research ethics and safety and obtain the necessary training
- The individual will be provided access to McGill libraries, email, and required training in research ethics and safety. Any other University services must be purchased (e.g., access to athletic facilities)
- The individual must arrange for basic health insurance coverage prior to arrival at McGill and may be required to provide proof of coverage

9 Graduate Studies Guidelines and Policies

Refer to [University Regulations & Resources](#) > [Graduate](#) > [: Guidelines and Policies](#) for information on the following:

- Guidelines and Regulations for Academic Units on Graduate Student Advising and Supervision
- Policy on Graduate Student Research Progress Tracking
- Ph.D. Comprehensives Policy
- Graduate Studies Reread Policy
- Failure Policy
- Guideline on Hours of Work

10 Graduate Student Services and Information

Graduate students are encouraged to refer to : [Student Services and Information](#) for information on the following topics:

- Service Point
- Student Rights & Responsibilities
- Student Services – Downtown & Macdonald Campuses
- Residential Facilities
- Athletics and Recreation
- Ombudsperson for Students
- Extra-Curricular and Co-Curricular Activities
- Bookstore
- Computer Store
- Day Care

11 Information on Research Policies and Guidelines, Patents, Postdocs, Associates, Trainees

Refer to [University Regulations & Resources](#) > *Graduate* > : [Research Policy and Guidelines](#) for information on the following:

- Regulations on Research Policy
- Regulations Concerning the Investigation of Research Misconduct
- Requirements for Research Involving Human Participants
- Policy on the Study and Care of Animals
- Policy on Intellectual Property
- Regulations Governing Conflicts of Interest
- Safety in Field Work
- Office of Sponsored Research
- Postdocs
- Research Associates

12 Browse Academic Units & Programs

The programs and courses in the following sections have been approved for the 2022–2023 session as listed.

12.1 Medicine

12.1.1 Location

Faculty of Medicine and Health Sciences
680 Sherbrooke West, Suite 1701
Montreal QC H3A 2M7
Canada

Website: mcgill.ca/medhealthsci/education/our-schools-1829-present/school-medicine

12.1.2 About the School of Medicine

The School of Medicine comprises several departments and divisions including the Undergraduate Medical Education (UGME), the Postgraduate Medical Education (PGME), and the Office for Continuing Professional Development (CPD). List of departments: mcgill.ca/medhealthsci/schools-departments

12.1.3 Medical Physics

12.1.3.1 Location

Medical Physics Unit, DS1-4556
 McGill University Health Centre – Glen Site
 Cedars Cancer Centre
 1001 Décarie Boulevard
 Montreal QC H4A 3J1
 Telephone: 514-934-1934 ext. 44158
 Fax: 514-934-8229
 Email: margery.knewstubb@mcgill.ca
 Website: mcgill.ca/medphys

12.1.3.2 About Medical Physics

The Medical Physics Unit is a teaching and research unit focusing on the role that physics and its related sciences plays in medicine and cancer research, especially (but not exclusively) in radiation medicine; i.e., radiation oncology, medical imaging, and nuclear medicine. The Unit offers a graduate diploma and an M.Sc. in Medical Radiation Physics. Facilities are available for students to undertake a Ph.D. in Physics administered through the Department of Physics, or a Ph.D. in Biological and Biomedical Engineering administered through the Departments of Biomedical Engineering and Bioengineering, each with a research emphasis on medical physics. These graduate programs are supervised, funded, and hosted by Medical Physics Unit PIs (principal investigators).

The research interests of Unit members include various topics related to the application of physics methods to medicine:

- 3D and 4D imaging, the development of new imaging modalities, and applications of imaging in radiation therapy;
- radiation physics and computational & experimental dosimetry;
- AI and machine learning applications to medical imaging, radiation therapy, and health informatics;
- applications of nano-sciences to medical imaging and therapy;
- numerical modelling of fundamental interactions of radiation with living cells;
- metabolic and functional imaging using radio-nuclides and MRI;
- applications of radiation biology to therapy and radiation protection.

Graduate students are part of the *Medical Physics Research Training Network* (MPRTN) supported by the *Collaborative Research Education Training Experience* (CREATE) of the Natural Sciences & Engineering Research Council (NSERC).

The M.Sc. and Ph.D. programs in Medical Physics are accredited by the Commission on Accreditation of Medical Physics Education Programs, Inc., sponsored by the *American Association of Physicists in Medicine* (AAPM), the *American College of Radiology* (ACR), the *American Society for Radiation Oncology* (ASTRO), the *Canadian Organization of Medical Physicists* (COMP), and the *Radiological Society of North America* (RSNA).

section 12.1.3.5: Master of Science (M.Sc.) Medical Radiation Physics (Thesis) (45 credits)

This two-year program provides a comprehensive introduction to the academic, research, and practical aspects of physics applied to radiation medicine. Students may go on to careers in clinical service as medical physicists in research-oriented hospital settings after clinical residency training; may consider development careers in industry in radiation therapy, diagnostic radiology, or nuclear medicine or nuclear energy; in governmental organizations as radiation safety experts, etc.; or pursue academic careers in university, industry, or government organizations. Our graduate programs are accredited by *CAMPEP* (Commission for Accreditation of Medical Physics Education Programs). Medical physicists must go through CAMPEP training (M.Sc. or Ph.D., followed by a residency training) to be eligible to sit certification exams. Certification is becoming a mandatory requirement for eligibility to practise in a clinical environment. The McGill M.Sc. program is research oriented, which has the additional advantage that the roads toward a Ph.D., followed by academic, industry, or clinical careers, are wide open. The practical and laboratory sections of the program are conducted in various McGill teaching hospitals.

The program comprises:

1. didactic courses in radiation physics, radiation dosimetry, the physics of nuclear medicine and diagnostic radiology, medical imaging, medical electronics and computing, radiation biology, and radiation hazards and protection;
2. seminars in radiation oncology, diagnostic radiology, and miscellaneous aspects of medical physics, e.g., lasers;
3. laboratory courses in radiation dosimetry and medical imaging;
4. an individual research thesis.

section 12.1.3.6: Graduate Diploma (Gr. Dip.) Medical Radiation Physics (30 credits)

The Medical Physics Unit offers a Graduate Diploma in Medical Radiation Physics which is accredited as a Certificate in Medical Physics by the *CAMPEP* (Commission on Accreditation of Medical Physics Education Programs). It allows eligible individuals to retrain in Medical Physics. Applicants should hold a Ph.D. degree and also a B.Sc. in Honours Physics, Physics Major, or related Physics-oriented science.

12.1.3.3 Medical Physics Admission Requirements and Application Procedures**12.1.3.3.1 Admission Requirements**

Candidates applying to the Graduate Diploma must hold a Ph.D. degree and also a B.Sc. in Physics, Physics Major, or related Physics-oriented science.

12.1.3.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures. Further information regarding the application procedures is available on the [Medical Physics Unit website](#).

Only complete applications will be considered.



Note: When completing the online application, the following information should be entered in the "Application" section to ensure that the application is routed to the correct department:

Under **Program choice:**

"Application type" = Degree, certificate, or diploma

"Term" = Fall 2022

"Department" = Medical Physics Unit

"Program" = Graduate Diploma (Med Radiation Physics)

"Area of study" = Medical Radiation Physics-T

"Status" = Full Time

Under **Additional Questions:**

Please indicate source(s) of funding to cover tuition & student fees + living expenses while studying at McGill University.

Supporting Documents: All supporting documentation must be uploaded to the online application; any documents sent by mail will be considered unofficial and missing from the application. For detailed instructions on how to upload required supporting documents, please see mcgill.ca/gradapplicants/apply/ready.

Transcripts: All transcripts and degree certificates in a language other than English or French must be uploaded to the application in both the original language version and also in an officially certified English or French language version. If the applicant is accepted, original documents must be presented to the University prior to registration. The grading scale must also be viewable.

English Language Proficiency: Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit documented proof of competency in English by submitting a *TOEFL* iBT or *IELTS* test score. The original test report must be sent electronically by the testing centre to McGill University; to ensure successful transmission, the student's name given to the testing centre must be identical to the name used for the McGill online application, otherwise the electronic result will not be applied to the McGill application.



Note: McGill institution code = 0935; Medical Physics Unit = 99 (department not listed).

The test must have been taken within the two years prior to date of application review, i.e., not prior to January 1, 2020 for a graduate application to McGill for Fall 2022. Applicants from some countries are exempt from providing evidence of English language proficiency. For more information, see mcgill.ca/gradapplicants/international/proficiency.

Reference Letters: In order for referees to receive an automated email with instructions to upload their recommendation, applicants must include referees' institutional email addresses in the online application; Gmail, Yahoo, etc. email addresses will not be accepted.

12.1.3.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- GRE is not required for the Medical Physics M.Sc. program.
- Applicants must either complete the "Applicant Statement" portion of the online application, or alternatively, may submit a one-page Personal Statement.
- Applicants are requested to provide information regarding expected funding, etc., under "Additional Questions".

12.1.3.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Medical Physics Unit and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

Admissions to the M.Sc. and Graduate Diploma programs are open for the Fall term (beginning in September) only. Applications must be **completed** by January 15 to be considered for the following Fall term, i.e., online application submitted and all required documents uploaded.

Application Opening Dates		Application Deadlines		
		All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)
Fall Term:	Sept. 15	Jan. 15	Jan. 15	Jan. 15
Winter Term:	N/A	N/A	N/A	N/A
Summer Term:	N/A	N/A	N/A	N/A

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

12.1.3.4 Medical Physics Faculty

Director

J. Seuntjens (*on leave 2021-2022*); Co-Directors: S. Enger, J. Kildea, I. Levesque

Co-Directors

S. Enger, J. Kildea, I. Levesque

Emeritus Professors

S.M. Lehnert, E.B. Podgorsak

Professors

D. Louis Collins, J. Seuntjens

Associate Professors

D. Louis Collins, S. Enger, J. Seuntjens

Assistant Professors

S. Devic, M.D.C. Evans, J. Kildea, I. Levesque, W. Parker, P. Pater, H.J. Patrocinio, E. Poon, M. Popovic, G. Stroian, P.G. Watson, N. Ybarra

Faculty Lecturers

L. Archambault, K. Asiev, H. Bekerat, T. Connell, C. Furstoss, A. Gauvin, D. Guillet, G. Hegyi, L. Liang, R. Ruo, M. Serban, N. Tomic

Affiliate Members

S. Darvasi, C. Furstoss, A. Gauvin, D. Guillet, G. Hegyi, L. Liang, E. Poon, R. Richardson, R. Ruo, M. Serban, N. Tomic

Adjunct Professors

F. DeBlois, I. El Naqa, C. Janicki, B. Mofteh, G.B. Pike, J. Renaud, R. Richardson, A. Sarfehnia, E. Soisson

12.1.3.5 Master of Science (M.Sc.) Medical Radiation Physics (Thesis) (45 credits)

The M.Sc. program in Medical Radiation Physics provides candidates with the knowledge required to enter into the field of medical physics. The program relies on a strong fundamental science background and enables candidates to undergo further training through a clinical residency program or to further advanced graduate studies in medical physics through a Ph.D. degree. Graduates from the program typically find employment in clinical settings, academia, industry, or governmental research and regulatory agencies. The program is accredited by the Commission for Accreditation of Medical Physics Education Programs (CAMPEP).

Thesis Courses (18 credits)

MDPH 691D1	(9)	MSc Thesis Research 2
MDPH 691D2	(9)	MSc Thesis Research 2

Required Courses (27 credits)

MDPH 601	(3)	Radiation Physics
MDPH 602	(3)	Radiotherapy Physics
MDPH 603	(2)	Laboratory Radiotherapy Physics
MDPH 607	(3)	Medical Imaging
MDPH 608	(2)	Laboratory - Diagnostic Radiology and Nuclear Medicine
MDPH 609	(2)	Radiation Biology
MDPH 610	(2)	Instrumentation and Computation in Medical Physics 2
MDPH 613	(2)	Health Physics
MDPH 614	(3)	Physics of Diagnostic Radiology
MDPH 615	(2)	Physics of Nuclear Medicine
MDPH 618	(3)	Anatomy and Physiology for Medical Physics

12.1.3.6 Graduate Diploma (Gr. Dip.) Medical Radiation Physics (30 credits)

The Graduate Diploma in Medical Radiation Physics is intended to provide candidates holding a graduate degree in a related field with the knowledge required to enter into the field of medical physics. The program relies on a strong fundamental science background. The graduate diploma program is accredited by the Commission for Accreditation of Medical Physics Education Programs (CAMPEP) only for students holding a Ph.D. degree.

Required Courses (30 credits)

MDPH 601	(3)	Radiation Physics
MDPH 602	(3)	Radiotherapy Physics
MDPH 603	(2)	Laboratory Radiotherapy Physics
MDPH 607	(3)	Medical Imaging
MDPH 608	(2)	Laboratory - Diagnostic Radiology and Nuclear Medicine
MDPH 609	(2)	Radiation Biology
MDPH 610	(2)	Instrumentation and Computation in Medical Physics 2
MDPH 613	(2)	Health Physics
MDPH 614	(3)	Physics of Diagnostic Radiology
MDPH 615	(2)	Physics of Nuclear Medicine
MDPH 618	(3)	Anatomy and Physiology for Medical Physics
PHIL 643	(3)	Seminar: Medical Ethics

12.1.4 Medicine, Experimental**12.1.4.1 Location**

Division of Experimental Medicine
Department of Medicine
1001 Decarie Boulevard
Montreal QC H4A 3J1
Canada
Telephone: 514-934-1934, ext. 34699 or 34700 or 36465
Email: experimental.medicine@mcgill.ca
Website: mcgill.ca/expmed

12.1.4.2 About Experimental Medicine

Experimental Medicine is a Division of the Department of Medicine charged with the task of providing graduate education in the Department, and enabling professors located in the research institutes of the McGill teaching hospitals and other centres to supervise graduate students. Graduate Students pursue cutting-edge medical research in a unique setting in which Ph.D. and M.D. researchers collaborate, favouring translational research into the pathogenesis and treatment of disease. The Division offers various programs, each of which has different training objectives (see below). The internationally-recognised high-quality training our graduates receive is in essence what distinguishes graduates of our programs from the graduates of comparable programs in peer institutions.

section 12.1.4.5: Master of Science (M.Sc.) Experimental Medicine (Thesis) (45 credits)

Applicants for the M.Sc. in Experimental Medicine must hold either an M.D. degree, a B.Sc. degree, or the equivalent. The graduate training offered is wide-ranging and addresses experimental aspects of medicine in such diverse areas as:

- endocrinology;
- hematology;
- cardiology;
- oncology;
- gastroenterology;
- genetics;
- infectious diseases.

This thesis program may lead to careers in industry, or serve as a stepping stone to further graduate studies.

section 12.1.4.6: Master of Science (M.Sc.) Experimental Medicine (Thesis): Bioethics (45 credits)

Applicants for the M.Sc. Bioethics Option program must hold an M.D.; a Nursing degree; a Physical and Occupational Therapy degree; and/or any other professional health training degree. Students who do not fit these criteria may be considered for admission on an individual basis. The objectives of this research-stream program are to allow students to conduct innovative research in relation to a bioethical issue pertinent to health care, and to acquire a working knowledge of bioethical issues from the current viewpoint of other relevant disciplines such as law, philosophy, and religious studies.

The curriculum is composed of required courses (6 credits) offered in the Biomedical Ethics Unit, Bioethics courses (6-credit minimum) offered by the base faculty or department, and any graduate course required or accepted by a base faculty for the granting of a master's degree, for a total of 21 credits. A minimum of 45 credits is required including the thesis. The research culminates in the preparation of a thesis.

section 12.1.4.7: Master of Science (M.Sc.) Experimental Medicine (Thesis): Digital Health Innovation (45 credits)

The M.Sc. in Experimental Medicine; Digital Health Innovation focuses on the basics of clinical epidemiology, medical artificial intelligence, clinical innovation, and applied data science, including the use and generation of digitized health and social data using specialized software. Fundamentals of current AI applications in medicine, methods to employ big data in clinical tool development, mathematical principals underpinning digital health and big data, and design thinking methodology in clinical innovation. High-volume streams of clinical and health-related data from clinical systems, wearables and social media.

section 12.1.4.8: Master of Science (M.Sc.) Experimental Medicine (Thesis): Environment (45 credits)

Applicants for the M.Sc. Environment Option must meet the requirements for the M.Sc. in Experimental Medicine as well as those set out by the Bieler School of Environment (BSE) for their graduate option. Acceptance into the option will be based on a student's academic experience and performance; availability of an BSE-accredited supervisor or co-supervisor; the proposed research; and plans for funding as articulated by the supervisor(s). The Environment Option is aimed at students who wish to use interdisciplinary approaches in their graduate research on environmental issues, and who wish to benefit from interactions that will occur as they are brought into contact with students from a wide range of disciplines through structured courses, formal seminars, and informal discussions and networking. The graduate option in Environment provides students with an appreciation for the role of science in informed decision-making in the environmental sector, and its influence on political, socio-economic, and ethical judgments.

section 12.1.4.9: Doctor of Philosophy (Ph.D.) Experimental Medicine

Applicants for the Ph.D. in Experimental Medicine must normally hold an M.Sc. degree. The one exception is the possibility of direct entry offered to candidates having demonstrated academic excellence, i.e., a CGPA of 3.5 or more out of a possible 4.0 throughout their undergraduate studies. The training is in the conduct of research in a wide range of medical specialties. The method of instruction consists of a combination of in-class and practical training, as well as exposure to international conferences and guest seminars. Success is ultimately determined by the preparation and defence of a thesis. This program may lead to research careers in industry, government, or academia.

section 12.1.4.10: Doctor of Philosophy (Ph.D.) Experimental Medicine: Environment

Applicants to the Ph.D. Environment Option must meet the same qualifications as those for the M.Sc. Environment Option, the only difference being that they must hold an M.Sc. rather than simply a B.Sc. For further details, please see the section above regarding the M.Sc. Environment Option.

section 12.1.4.11: Graduate Certificate (Gr. Cert.) Regenerative Medicine (15 credits)

The Graduate Certificate in Regenerative Medicine focuses on the biology of stem cells, their uses in diagnostic and therapeutic applications, the practicalities of generating them, and using and modifying them for clinical translation. Students explore of the combination of stem cell-based model systems for drug discovery and disease modelling as well as the ethical implications of their use.

section 12.1.4.12: Graduate Diploma (Gr. Dip.) Clinical Research (30 credits)

The objectives of this program are to give students exposure to both theoretical and practical issues relevant to the conception and conduct of a clinical research study, as well as allowing them to put these principles in practice by participating in an ongoing clinical trial. The core element of the diploma is the Practicum in Clinical Research. It is an active “clerkship” or “intern/resident-type” participation in an ongoing clinical trial and/or research program. Six 1-credit workshops will be provided by experts in the academic, industrial, and government sectors, and cover wide-ranging issues pertinent to the conduct of clinical research. The training provided qualifies students to manage and design clinical research studies in both academic and industrial settings.

12.1.4.3 Medicine, Experimental Admission Requirements and Application Procedures**12.1.4.3.1 Admission Requirements****M.Sc. or Ph.D. in Experimental Medicine**

Candidates who hold only an undergraduate degree in the medical and allied sciences (B.Sc. degree or an M.D. degree), must apply to the M.Sc. program, unless they have an undergraduate CGPA of 3.5 or more out of a possible 4.0, in which case they may apply for direct entry into the Ph.D. if they so desire. Candidates who already hold an M.Sc. apply directly to the Ph.D. program.

Admission is based on an evaluation by the Admissions Committee, which looks for evidence of high academic achievement, and on acceptance by a research director. All students must be financially supported either by their supervisor or through studentships or fellowships.

In addition to the documentation currently required by Graduate and Postdoctoral Studies, the student must submit a Research Project Proposal Form, a 1-2 page document outlining the M.Sc. or Ph.D. project.

M.Sc. (Bioethics Option)

Admission to the master's program in Bioethics, from the base discipline of Medicine, is limited to students having degrees in Medicine, Nursing, or Physical and Occupational Therapy, as well as any other professional health training degree. Students who do not fit these criteria may be considered for admission on an individual basis.

For requirements, application deadlines, and further information regarding this program, please refer to the Bioethics entry or visit the [Biomedical Ethics Unit website](#).

M.Sc. or Ph.D. (Environment Option)

Although the requirements and application deadlines remain the same as the M.Sc. and Ph.D., applicants wishing to apply to the Environment Option must submit additional documents that constitute their application to **both** the Division of Experimental Medicine and the Bieler School of Environment. Further information can be found on the mcgill.ca/environment/envroption.

Students in the M.Sc. in Experimental Medicine may choose to transfer to the Environment Option; interested students should refer to the departmental website or contact the Student Affairs Office.

Graduate Certificate in Regenerative Medicine

Applicants for the Graduate Certificate in Regenerative Medicine must hold a B.Sc. degree. Applicants must have completed with success the following courses: BIOL 200 (Molecular Biology), BIOL 202 (Basic Genetics), CHEM 212 (Introduction to Organic Chemistry), their equivalent, or permission of the coordinator.

Graduate Diploma in Clinical Research

The Diploma program is open to health care and research professionals, medical residents, pharmacists, nurses, and those with an undergraduate degree in the medical and allied sciences.

12.1.4.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures. Further information is also available on the [Experimental Medicine website](#).

12.1.4.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

M.Sc. and Ph.D. in Experimental Medicine

- Personal Statement
- Curriculum Vitae
- Acceptance by a research director (*Confirmation of Supervision* form duly completed)
- Research Project Proposal form, a 1-2 page document outlining the M.Sc. or Ph.D. research project
- Additional documents (in the cases of the M.Sc. (Bioethics Option) and the M.Sc. or Ph.D. (Environment Option))

12.1.4.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Division of Experimental Medicine and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

All Programs (except Bioethics Option)				
	Application Opening Dates		Application Deadlines	
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
Fall Term:	Sept. 15	April 15	June 15	June 15
Winter Term:	Feb. 15	Sept. 1	Nov. 1	Nov. 1
Summer Term:	N/A	N/A	N/A	N/A

M.Sc. (Bioethics Option)				
	Application Opening Dates		Application Deadlines	
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
Fall Term:	Sept. 15	April 15	April 15	April 15
Winter Term:	N/A	N/A	N/A	N/A
Summer Term:	N/A	N/A	N/A	N/A

12.1.4.4 Medicine, Experimental Faculty**Chair, Department of Medicine**

M. Rodger

Director, Division of Experimental Medicine

A.-M. Lauzon

Associate Director, Division of Experimental Medicine

E. Fixman

Professors

M. Alaoui-Jamali; S. Ali; C. Autexier; S. Bartlett; A. Bateman; G. Batist; M. Behr; S. Bernatsky; V. Blank; J. Bourbeau; A. Cybulsky; K. Dasgupta; G. Di Battista; M. Divangahi; V. Essebag; I.G. Fantus; M. Friedrich; A. Fuks; A. Gatignol; J. Genest Jr.; M. Goldberg; D. Goltzman; S.A. Grover; L.J. Hoffer; S. Hussain; B. Jean-Claude; A.C. Karaplis; R. Kremer; S. Laporte; A. M. Lauzon; J.-J. Lebrun; S. Lehoux; C. Liang; M.S. Ludwig; S. Magder; D. Malo; A. J. Marelli; J. Martin; N. Mayo; W.H. Miller; J. Morais; A. Moulard; W.J. Muller; M. Murshed; A. Nepveu; T. Nilsson; M. Olivier; L. Panasci; K. Pantopoulos; M. Park; B.J. Petrof; L. Pilote; M.N. Pollak; S. Rabbani; D. Radzioch; J. Rauch; S. Richard; J.-P. Routy; D. Sasseville; E. Schiffrin; E. Schurr; A. Schwertani; D. Sheppard; P. Siegel; A.D. Sniderman; M.M. Stevenson; T. Takano; R. Tamblyn; M. Trifiro; C. Tsoukas; B.J. Ward; J. White; S. Wing; X.-J. Yang.

Associate Professors

W. Afif; J. Afilalo; A. Alam; C. Baglolle; D. Baran; N. Bernard; M. Blostein; P. Brassard; L. Chalifour; I. Colmegna; C. Costiniuk; D. Cournoyer; D. Da Costa; S. Daskalopoulou; N. Dendukuri; C. Ells; J.C. Engert; E. Fixman; N.S. Giannetti; B. Gilfix; S.B. Gottfried; M. Hudson; T. Jagoe; N. Johnson; M. Kaminska; M. Kokoeva; A. Kristof; P. Laneuville; T.C. Lee; S. Lemay; R. Lin; M. Lipman; J.-L. Liu; E.G. McDonald; S. Morin; M. Ndao; D. Nguyen; N. Pai; S. Pamidi; A.C. Peterson; S. Qureshi; E. Rahme; C. Rocheleau; S. Rousseau; R. Sapir-Pichhadze; M. Sebag; G. Sebastiani; C. Séguin; M. Sewitch; A. Sharma; R. Sladek; B. M. Smith; G. Thanassoulis; E. Torban; B. Turcotte; E. Vinet; D.C. Vinh.

Assistant Professors

R. Aloyz; I. Azuelos; A. Baass; A. Bessissow; Y. Chen; N. Dayan; J. Ding; N. Ezer; G. Fonseca; I. Fortier M. Goldfarb; C. Jack; I. Litvinov; T. Mavrakanas; F. Mercier; E. Netchiporouk; M. Paliouras; T. Peters.

Associate Members, McGill

B. Abdulkarim; H. Abenhaim; M. Abrahamowicz; S. Ahmed; G. Altit; M. Basik; M. Ben-Shoshan; M. Bouchard; P. Brodt; K. Brown; D. Buckeridge; S. Burgos; F. Carnevale; I. Cestari; S. Chevalier; H. Clarke; T. Coderre; S. del Rincon; L. Diatchenko; T. Duchaine; D. Dufort; K. Eppert; M. Fabian; L. Ferri; R. Forghani; P. Friesen; V. Giguere; P. Goodyer; W. Gotlieb; C. Goudie; I. Gupta; A. Haidar; T. Hebert; M. Hunt; N. Jabado; A. Jahani Asl; D. Juncker; M. Kaartinen; A. Khoutorsky; J. Kimmelman; N. King; A. Koromilas; D. Labbé; L. Lands; J. Lapointe; C. Loiselle; F. Lopes; M.E. Macdonald; C. Mandato; K. Mann; M. O. Martel; P. Martineau; B. Mazer; L. McCaffrey; C. McCusker; C. Moraes; T. Muanza; M. Nagano; C. O'Flaherty; A. Orthwein; A. Philip; C. Piccirillo; C. Polychronakos; S. Prakash; D.F. Quail; J. Rak; S. Robbins; A. Rose; G. Rouleau; A. Ryan; G. Sant'Anna; D. Senger; W. Shalish; R. Slim; J. Spicer; I. Topisirovic; M. Tremblay; J. Ursini-Siegel; J. Van Raamsdonk; M. Witcher; J.-H. Wu; S. Wurzba; N. Ybarra; M. Zawati; G. Zogopoulos.

Adjunct Professors

M. Cayouette; F. Charron; E. Cohen; J.M. Di Noia; J. Drouin; J. Estall; M. Ferron; N. Francis; H. Gu; Q.A. Hamid; D. Hipfner; P. Jolicoeur; A. Kania; M. Kmita; E. Lecuyer; M. Malleshaiah; T. Moroy; M. Oeffinger; R. Rabasa-Lhoret; E. Racine; F. Robert; N. Seidah; W.-K. Suh; H. Takahashi; M. Trudel; J. Vacher; A. Veillette.

12.1.4.5 Master of Science (M.Sc.) Experimental Medicine (Thesis) (45 credits)

The overall objective of this program is to train students in the in-depth analysis of fundamental, translational and/or clinical research.

Students perform studies at diverse levels, from molecular, cellular, and tissue to whole animal, human, and population in order to elucidate mechanisms behind human diseases, leading to drug discovery. Students are trained to perform research in both academic and industrial settings.

Thesis Courses (36 credits)

EXMD 690	(3)	Master's Thesis Research 1
EXMD 692	(9)	Master's Thesis Research 3
EXMD 693	(12)	Master's Thesis Research 4
EXMD 694	(12)	Master's Thesis Research 5

Complementary Courses (9 credits)

9 credits at the 500 level or higher.

Course choices should be made in consultation with research supervisor(s). Courses may be taken outside the department at the 500 level or higher in medical and allied sciences*.

* Note that some seminar, current topics and readings, and conference courses may not count towards your degree. Thus, students must obtain prior approval from the Division's Student Affairs Coordinator for courses at the 500 level or higher from other Allied Health Sciences departments.

12.1.4.6 Master of Science (M.Sc.) Experimental Medicine (Thesis): Bioethics (45 credits)

** This program will not be offered for 2022-2023. **

Thesis Courses (24 credits)

BIOE 690	(3)	M.Sc. Thesis Literature Survey
BIOE 691	(3)	M.Sc. Thesis Research Proposal
BIOE 692	(6)	M.Sc. Thesis Research Progress Report
BIOE 693	(12)	M.Sc. Thesis

Required Courses (6 credits)

BIOE 680	(3)	Bioethical Theory
BIOE 681	(3)	Bioethics Practicum

Complementary Courses (15 credits)

3 credits, one of the following:

CMPL 642	(3)	Law and Health Care
PHIL 643	(3)	Seminar: Medical Ethics
RELG 571	(3)	Ethics, Medicine and Religion

12 credits, four 3-credit BIOE or EXMD graduate courses (500, 600, or 700 level) chosen in consultation with the Supervisor.

12.1.4.7 Master of Science (M.Sc.) Experimental Medicine (Thesis): Digital Health Innovation (45 credits)

The M.Sc. in Experimental Medicine; Digital Health Innovation focuses on the basics of clinical epidemiology, medical artificial intelligence, clinical innovation, and applied data science, including the use and generation of digitized health and social data using specialized software. Fundamentals of current AI applications in medicine, methods to employ big data in clinical tool development, mathematical principals underpinning digital health and big data, and design thinking methodology in clinical innovation. High-volume streams of clinical and health-related data from clinical systems, wearables and social media.

Thesis Courses (24 credits)

EXMD 693	(12)	Master's Thesis Research 4
EXMD 694	(12)	Master's Thesis Research 5

Required Courses (12 credits)

EXMD 601	(3)	Real World Applications of Data Science and Informatics
EXMD 634	(3)	Quantitative Research Methods
EXSU 500	(3)	Artificial Intelligence in Medicine
EXSU 620	(3)	Surgical Innovation 1

Complementary Course (3 credits)

3 credits from the following:

EPIB 600	(3)	Clinical Epidemiology
EXMD 600	(3)	Principles of Clinical Research

Elective Courses (6 credits)

6 credits of courses at the 500 level or higher approved by the Director.

12.1.4.8 Master of Science (M.Sc.) Experimental Medicine (Thesis): Environment (45 credits)

** This program will not be offered for 2022-2023. **

The M.Sc. in Experimental Medicine; Environment is a research program offered in collaboration with the Bieler School of Environment. As a complement to the unit's expertise, the program considers how various dimensions (scientific, social, legal, ethical) interact to define environment and sustainability issues.

Thesis Courses (27 credits)

EXMD 690	(3)	Master's Thesis Research 1
EXMD 693	(12)	Master's Thesis Research 4
EXMD 694	(12)	Master's Thesis Research 5

Required Course (3 credits)

ENVR 615 (3) Interdisciplinary Approach Environment and Sustainability

Complementary Courses (15 credits)

3-6 credits from:

ENVR 610 (3) Foundations of Environmental Policy
 ENVR 614 (3) Mobilizing Research for Sustainability

0-3 credits from:

ENVR 585 (3) Readings in Environment 2
 ENVR 630 (3) Civilization and Environment
 ENVR 680 (3) Topics in Environment 4

or 3 credits at the 500 level or higher recommended by the Advisory Committee and approved by the Environment Option Committee.

9 credits of courses at the 500-level or higher. Course choices should be made in consultation with research supervisor(s). Courses may be taken outside the department at the 500 level or higher in medical and allied sciences*.

* Students must get approval of GPD for courses at the 500 level or higher from other Allied Health Sciences.

12.1.4.9 Doctor of Philosophy (Ph.D.) Experimental Medicine

The overall objective of this program is to train students in the in-depth analysis of fundamental, translational and/or clinical research. Students perform studies at diverse levels, from molecular, cellular, and tissue to whole animal, human, and population in order to elucidate mechanisms behind human diseases, leading to drug discovery. Students are trained to become research leaders in both academic and industrial settings.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses

EXMD 701D1 (0) Comprehensive Oral Examination
 EXMD 701D2 (0) Comprehensive Oral Examination

Complementary Courses (12 or 18 Credits)

12 credits, at the 500 level or higher, are required for students admitted to Ph.D. 2, i.e. students entering the program with a prior Master's degree.

18 credits, at the 500 level or higher, are required for students admitted to Ph.D. 1, i.e. students entering the program with only a B.Sc. or M.D. degree. Students that fast track from the masters level should take a total of 18 credits including previous courses taken at the Masters Level in a related-field.

Course choices should be made in consultation with research supervisor(s). Courses may be taken outside the department at the 500 level or higher in medical and allied sciences*.

* Note that some seminar, current topics and readings, and conference courses may not count towards your degree. Thus, students must obtain prior approval from the Division's Student Affairs Coordinator for courses at the 500 level or higher from other Allied Health Sciences departments.

12.1.4.10 Doctor of Philosophy (Ph.D.) Experimental Medicine: Environment

** This program will not be offered for 2022-2023. **

The Ph.D. in Experimental Medicine; Environment is a research program offered in collaboration with the School of Environment. As a complement to the unit's expertise, the program considers how various dimensions (scientific, social, legal, ethical) interact to define environment and sustainability issues.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (3 credits)

ENVR 615	(3)	Interdisciplinary Approach Environment and Sustainability
EXMD 701D1	(0)	Comprehensive Oral Examination
EXMD 701D2	(0)	Comprehensive Oral Examination

Complementary Courses (18 or 24 credits)

3-6 credits from:

ENVR 610	(3)	Foundations of Environmental Policy
ENVR 614	(3)	Mobilizing Research for Sustainability

0-3 credits from:

ENVR 585	(3)	Readings in Environment 2
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

or 3 credits at the 500 level or higher recommended by the Advisory Committee and approved by the Environment Option Committee.

12 credits, at the 500 level or higher, are required for students admitted to Ph.D. 2, i.e. students entering the program with a prior Master's degree.

Or

18 credits, at the 500 level or higher, are required for students admitted to Ph.D. 1, i.e. students entering the program with only a B.Sc. or M.D. degree and who have been either admitted directly or fast-tracked to the Ph.D.

Course choices should be made in consultation with research supervisor(s). Courses may be taken outside the department at the 500 level or higher in medical and allied sciences*.

* Students must get approval from the GPD for courses at the 500 level or higher from other allied health sciences.

12.1.4.11 Graduate Certificate (Gr. Cert.) Regenerative Medicine (15 credits)

The Graduate Certificate in Regenerative Medicine focuses on biology of stem cells, their uses in diagnostic and therapeutic applications, the practicalities of generating them, and using and modifying them for clinical translation. Exploration of the combination of stem cell-based model systems for drug discovery and disease modelling as well as the ethical implications of their use.

Required Courses (9 credits)

FMED 525	(3)	Foundations of Translational Science
HGEN 675	(3)	Stem Cell Biology
PHAR 508	(3)	Drug Discovery and Development 3

Complementary Courses (6 credits)

CHEE 512	(3)	Stem Cell Bioprocess Engineering
EXMD 501	(3)	Clinical Applications of Regenerative Medicine
EXMD 505	(3)	Directed Readings in Regenerative Medicine
HGEN 660	(3)	Genetics and Bioethics

12.1.4.12 Graduate Diploma (Gr. Dip.) Clinical Research (30 credits)

The objectives of this program are to give students exposure to both theoretical and practical issues relevant to the conception and conduct of a clinical research study, and to put these principles into practice by participating in an ongoing clinical trial. The training provided qualifies students to manage and design clinical research studies in both academic and industrial settings.

Required Courses (24 credits)

EXMD 617	(1)	Workshop in Clinical Trials 1
EXMD 618	(1)	Workshop in Clinical Trials 2
EXMD 619	(1)	Workshop in Clinical Trials 3
EXMD 620	(1)	Clinical Trials and Research 1
EXMD 625	(1)	Clinical Trials and Research 2
EXMD 626	(1)	Clinical Trials and Research 3
EXMD 627	(18)	Practicum in Clinical Research

Complementary Courses (6 credits)

Six credits at the 500 level or higher chosen from: Experimental Medicine (EXMD), Pharmacology and Therapeutics (PHAR), Epidemiology and Biostatistics (EPIB). With prior approval from the Division's Student Affairs Coordinator, courses at the 500 level or higher, from other Allied Health Sciences departments may be accepted.

12.1.5 Medicine, Family**12.1.5.1 Location**

Department of Family Medicine
5858 Côte-des-Neiges Road, 3rd Floor
Montreal QC H3S 1Z1
Email: graduateprograms.fammed@mcgill.ca
Website: mcgill.ca/familymed/education/graduate-programs

12.1.5.2 About Family Medicine

The McGill Department of Family Medicine is home to an exceptional community of primary health care professionals, researchers, students, and support staff, whose mission is to contribute to the health of the population and the sustainability of the health care system in Quebec, in Canada, and internationally by:

- developing research and scholarly activity to contribute to the academic discipline;
- promoting curriculum innovation and education research;
- engaging in international and global health activities;
- developing and engaging in public policy discussions;
- training medical students, residents, and other health care professionals to become committed to primary care, contributing to accessibility, continuity, coordination, accountability, patient-centredness, and health promotion and prevention;
- promoting innovation in family medicine and primary health care delivery and practice.

We understand that research in family medicine and primary care is essential to the achievement of excellence in health care delivery, patient care, and education. Our research division is composed of Ph.D. and clinical researchers who dedicate their efforts to producing and translating knowledge that advances the discipline, practice, and teaching of family medicine and primary care while supporting the scholarly activities of clinicians and residents in the Department. We have developed unique and rigorous research programs for **M.Sc.** and **Ph.D.** students that advance academic excellence in family medicine and primary health care through patient-oriented, community-based research with innovative methodologies and participatory approaches.

section 12.1.5.5: Master of Science (M.Sc.) Family Medicine (Thesis) (45 credits)

The M.Sc. in Family Medicine is a research-oriented thesis-based graduate program in family medicine. The objective is to increase the skills of those interested in carrying out research pertinent to the practice of family medicine.

As many relevant research questions cross conventional boundaries of disciplines and research traditions, we incorporate an **interdisciplinary approach** with an emphasis on **participatory research** and **community engagement**.

This program provides training in epidemiology and statistics, as well as in qualitative, quantitative and mixed methods. Students are also oriented for knowledge synthesis, and participatory research approaches.

An emphasis is placed on the relevance of the thesis research to family practice and primary health care. Close links are maintained with the main family medicine clinical sites located around Montreal and Quebec.

section 12.1.5.6: Master of Science (M.Sc.) Family Medicine (Thesis): Bioethics (45 credits)

The objectives of this program are to allow students to conduct innovative research in relation to a bioethical issue pertinent to health care and to acquire a working knowledge of bioethical issues from the current viewpoint of other relevant disciplines such as law, philosophy, and religious studies. A minimum of 45 credits is required including the thesis. The research culminates in the preparation of a thesis.

section 12.1.5.7: Master of Science (M.Sc.) Family Medicine (Thesis): Medical Education (45 credits)

This program will have very close ties to the *Family Medicine Educational Research Group* (FMER), which is the corollary of the educational innovations in teaching and research conceived and established in the McGill Department of Family Medicine since 2005. The FMER group's ultimate goal is to advance knowledge to:

1. constantly inform family medicine curricula innovations and continuing professional development to better family physicians' clinical practice;
2. significantly contribute to the development of the family medicine education field of inquiry;
3. rigorously develop and inform medical education policy.

This research agenda of FMER is articulated into four interrelated streams:

1. family physician's professional identity formation;
2. information use and technology in the learning episodes of practicing physicians and organizational learning;
3. program evaluation of educational innovations;
4. knowledge synthesis.

section 12.1.5.8: Doctor of Philosophy (Ph.D.) Family Medicine & Primary Care

The Ph.D. program will build upon our M.Sc in Family Medicine. Research topics in the field of family medicine and primary health care cross conventional discipline boundaries and research traditions. Our training program focuses on patient-oriented, community-based research using innovative methodologies and participatory approaches. The program advances academic excellence in family medicine and primary health care.

12.1.5.3 Medicine, Family Admission Requirements and Application Procedures**12.1.5.3.1 Admission Requirements**

Our program encourages the following applicants:

- Practicing family physicians
- Undergraduate university students with a strong interest in family medicine research
- Family medicine residents who are completing their residency and would like to continue with their education by completing an enhanced skills program specializing in family medicine research with the possibility of obtaining an M.Sc. degree. If interested, you may learn more about the [Clinician Scholar Program here](#).

What do we look for?

High academic achievement: A cumulative grade point average (CGPA) of 3.4 is required out of a possible maximum CGPA of 4.0, or a GPA of 3.6 is required in the last two years of full-time studies.

Proof of competency in oral and written English: TOEFL: International students who have not received their instruction in English, or whose mother tongue is not English, must pass the Test of English as a Foreign Language (*TOEFL*) with a minimum score of 86 on the Internet-based test (iBT), with each component score not less than 20 (internet-based test).



Note: The TOEFL institution code for McGill University is 0935. For further information, please refer to the [TOEFL website](#).

Alternatively, students may submit International English Language Testing System (*IELTS*) scores with a minimum overall band score of 6.5. Original score reports must be submitted (photocopies will not be accepted).

For overseas graduates, an attempt is made to situate the applicant's academic grades among the standards of their universities. Grades are, however, converted to their McGill equivalent. Conversion charts, as well as required admission documentation for each country, are provided by [Graduate and Postdoctoral Studies](#) and prospective students should refer to these in order to determine if they are admissible to our program.

12.1.5.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures.

All supplemental application materials and supporting documents must be uploaded directly to the McGill admissions processing system.

- **Supervisor:** All students must be matched to a [supervisor](#) to be admitted to our graduate programs; this matching will occur during the application process (i.e., after the applicant has submitted a complete application). After the application has been received, the applicants will have an opportunity

to be chosen for an interview with one of our supervisors if the minimum admission requirements have been met. After the application has been changed to "In Review" status in Uapply, candidates may contact potential supervisors who interest them for an interview.

- **Application form and fee:** All applicants must complete the [Online Application](#). The application must be accompanied by a non-refundable application fee payable by credit card (Visa or Mastercard); fee amounts and details are listed on the [Student Accounts](#) website. Please ensure you apply for the M.Sc. in Family Medicine or the Ph.D. in Family Medicine and Primary Care.
- **Curriculum Vitae:** Please upload the latest version of your CV, which should include a listing of previous research experience and publications. All relevant research experience should be included in your CV since you are applying for a research position in the Department.
- **Letters of Reference:** Two (2) or three (3) letters of reference must accompany any application to our program. These letters must be no more than six months old, must be on letterhead paper, and are required to be uploaded to the admissions processing system. Applicants are encouraged to request references from academic or other professional employers who can evaluate their potential for graduate studies and research, and who can attest to the applicant's research skills. Referees will also be asked to rank each applicant and to provide a size of the comparison (i.e., out of 50 supervised students). **Any applicant having undertaken previous graduate studies (whether at McGill or elsewhere) should make sure that one of the letters of reference is from their graduate supervisor. Please note:** On the application form, applicants must provide the names and email addresses of referees. McGill will contact these referees via email and invite them to upload reference letters on the applicant's behalf (along with the instructions on how to upload the documents). **Neither of these reference letters should be from the proposed supervisor.**
- **Personal Statement:** Applicants must submit a personal statement in which they:
 1. describe their background and the reasons why they are applying to the desired program;
 2. describe their research interests and with whom, among the list of potential supervisors, they would like to work;
 3. describe how they hope to impact family medicine practice; and
 4. describe future plans upon graduation from the desired program.

The statement should be no more than two (2) pages long.

- **Writing Assessment**
- **Interview**
- **Official Transcripts:** Applicants must submit one (1) official copy of all transcripts for all post-secondary education undertaken (Quebec students need not submit CEGEP transcripts). Unofficial transcripts may be uploaded to uApply, the McGill admissions processing system. Official transcripts are required when an offer of admission has been extended. **Please note:** Official transcripts are not required for studies conducted at McGill University.
- **Writing Sample (for Ph.D. and Bioethics option applicants only):** Applicants to our Ph.D. program must upload a writing sample to review, preferably a thesis or a published article. For Bioethics option applicants, please upload a sample of your writing skills from your undergraduate studies; it does not need to be a thesis or a publication.

12.1.5.32.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Curriculum Vitae
- Personal Statement – no more than two (2) pages long
- Writing sample (for Ph.D. and Bioethics option applicants only)

12.1.5.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Family Medicine and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

	Application Opening Dates		Application Deadlines	
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
Fall Term:	September 15	February 1	February 1	February 1
Winter Term:	Ph.D. applicants only	September 10	November 10	November 10
Summer Term:	N/A	N/A	N/A	N/A

All supporting documents must be received by February 1 for the Fall semester. Candidates who are interested in our MSc programs are only allowed to apply for the Fall semester. Candidates who are interested in our Ph.D. in Family Medicine and Primary Care program may apply in either the Fall or Winter semesters.

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

12.1.5.4 Medicine, Family Faculty**Chair**

Marion Dove

Graduate Program Directors

Ph.D. program & Postdoctoral Fellows: Tibor Schuster

M.Sc. program: Isabelle Vedel

Professors

Neil Andersson, Gillian Bartlett, Howard Bergman, Jeannie Haggerty, Ann Macaulay, Pierre Pluye, Charo Rodriguez, Mark Yaffe.

Associate Professors

Eugene Bereza, Anne Cockcroft, Perle Feldman, Roland Grad, Ellen Rosenberg, Ian Shrier, Pierre-Paul Tellier, Isabelle Vedel, Mark Ware.

Assistant Professors

Alayne Adams, Anne Andermann, Tracie Barnett, Yves Bergevin, Richard Budgell, Alexandra De Pokomandy, Vladimire Khanassov, Bertrand Lebouche, Alex McComber, Peter Nugus, Samira Rahimi, Kathleen Rice, Tibor Schuster, Mabelle Wilchesky.

Associate Members

Sara Ahmed; Olivier Beauchet; David Buckeridge; Tamara Carver; Robin Cohen; Carolyn Ells; Jennifer Fishman; Matthias Friedrich; Terry Hebert; Richard Hovey; Matthew Hunt; Patricia Li; Francesca Luconi; Antonia Maioni; Melissa Park; Erin Strumpf; Daniel Weinstock; Meredith Young.

Adjunct Professors

Antoine Boivin; Julie Bruneau; Yves Couturier; Catherine Hudon; Amalia Issa; Janusz Kaczorowski; Edeltraut Kroger; Susan Law; Marie-Thérèse Lussier; Emily Marshall; Vivian Ramsden; Christian Rochefort; Jon Salsberg; Marie Claude Tremblay.

12.1.5.5 Master of Science (M.Sc.) Family Medicine (Thesis) (45 credits)**Thesis Courses (24 credits)**

FMED 697	(12)	Master's Thesis Research 1
FMED 698	(12)	Master's Thesis Research 2

Required Courses (13 credits)

FMED 505	(3)	Epidemiology and Data Analysis in Primary Care 1
FMED 509	(3)	Epidemiology and Data Analysis in Primary Care 2
FMED 603	(1)	Foundations of Participatory Research
FMED 614	(2)	Foundations of Mixed Methods Research
FMED 616	(1)	Applied Literature Reviews
FMED 625	(3)	Qualitative Health Research

Elective Courses (8 credits)

8 credits at the 500 level or higher chosen by the student and the Department in consultation with the student's thesis supervisor(s) of which 3 credits may be chosen from another department at McGill.

FMED 504D1	(.5)	Family Medicine Research Seminars
FMED 504D2	(.5)	Family Medicine Research Seminars
FMED 511	(1)	Introduction to Art in Healthcare: Making Art Accessible
FMED 525	(3)	Foundations of Translational Science
FMED 601	(3)	Advanced Topics in Family Medicine

FMED 604	(3)	Advanced Participatory Research in Health
FMED 605	(1)	AI and Analytical Decision-Making in Healthcare
FMED 606	(1)	Operational Issues in Survey Methods in Primary Care
FMED 607	(1)	Intro to Discourse Analysis & Interpretive Health Research
FMED 608	(1)	Advanced Mixed Methods Seminar in Health Research
FMED 610	(1)	Foundations of Family Medicine
FMED 611	(3)	Healthcare Systems, Policy and Performance
FMED 612	(1)	Evaluation Research and Implementation Science
FMED 615	(1)	Applied Knowledge Translation and Exchange in Health
FMED 618	(1)	Topics in Pharmacoeconomics, Drug Safety and Policy
FMED 619	(3)	Program Management in Global Health and Primary Health Care
FMED 621	(1)	Participatory Health Systems for Safe Birth
FMED 690	(3)	Advanced Ethnography: Context, Complexity and Coordination

12.1.5.6 Master of Science (M.Sc.) Family Medicine (Thesis): Bioethics (45 credits)

The M.Sc. in Family Medicine; Bioethics is a thesis graduate program option designed to provide graduate training to those interested in studying empirical research methods and bioethics specialization.

Required Courses (31 credits)

BIOE 680	(3)	Bioethical Theory
BIOE 681	(3)	Bioethics Practicum
BIOE 690	(3)	M.Sc. Thesis Literature Survey
BIOE 691	(3)	M.Sc. Thesis Research Proposal
BIOE 692	(6)	M.Sc. Thesis Research Progress Report
BIOE 693	(12)	M.Sc. Thesis
FMED 603	(1)	Foundations of Participatory Research

Complementary Course (3 credits)

3 credits from the following:

FMED 505	(3)	Epidemiology and Data Analysis in Primary Care 1
FMED 625	(3)	Qualitative Health Research

Elective Courses (11 credits)

11 credits, at the 500 level or higher, of coursework may be chosen from inside or outside the Department in consultation with the student's academic adviser or supervisor.

12.1.5.7 Master of Science (M.Sc.) Family Medicine (Thesis): Medical Education (45 credits)

The MSc in Family Medicine; Medical Education option is a thesis option graduate program designed to provide research training to family physicians, and exceptionally other health professionals and other students interested in family medicine education research. This MSc Option has very close ties to the Family Medicine Educational Research Group (FMER), which integrates family medicine researchers deeply committed to the development of the family medicine education field of inquiry. The FMER's ultimate goal is to advance knowledge to: (1) constantly inform family medicine curricula innovations and continuing professional development to better family physicians' clinical practice, (2) significantly contribute to the development of the family medicine education field of inquiry, and (3) rigorously develop and inform medical education policy. This research agenda of FMER is articulated into four interrelated streams: (1) family physicians' professional identity formation; (2) information use and technology in the learning episodes of practicing physicians and organizational learning; (3) mentoring in family medicine education, and (4) knowledge synthesis.

Thesis Courses (24 credits)

Thesis subject should be related to medical education.

FMED 697	(12)	Master's Thesis Research 1
FMED 698	(12)	Master's Thesis Research 2

Required Courses (13 credits)

FMED 505	(3)	Epidemiology and Data Analysis in Primary Care 1
FMED 509	(3)	Epidemiology and Data Analysis in Primary Care 2
FMED 603	(1)	Foundations of Participatory Research
FMED 614	(2)	Foundations of Mixed Methods Research
FMED 616	(1)	Applied Literature Reviews
FMED 625	(3)	Qualitative Health Research

Elective Courses (8 credits)

8 credits at the 600 level or higher, chosen in consultation with the student's academic supervisor, of which 6 credits must involve educational issues and relate to the student's thesis topic within the medical education field – most of these courses are offered by the Faculty of Education. The additional 2 credits may be completed in any department at McGill.

12.1.5.8 Doctor of Philosophy (Ph.D.) Family Medicine & Primary Care

The PhD program will build upon our MSc in Family Medicine.

Research topics in the field of family medicine and primary health care cross conventional discipline boundaries and research traditions. Our training program focuses on patient-oriented, community-based research using innovative methodologies and participatory approaches. The program advances academic excellence in family medicine and primary health care.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

PhD Comprehensive Exam

PhD students are expected to demonstrate proficiency in the following topics: basic statistics, epidemiology, qualitative and mixed methods, literature synthesis, knowledge translation and participatory research approaches. If a PhD candidate does not have prior training in any of these areas and believes that he or she cannot answer questions on these topics during the comprehensive exam, additional courses will be required for the PhD student.

FMED 701	(0)	PhD Comprehensive Examination
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Required Courses (9 credits)

FMED 601	(3)	Advanced Topics in Family Medicine
FMED 604	(3)	Advanced Participatory Research in Health
FMED 702*	(1)	Advanced Doctoral Primary Care Research Seminars

* Note: this slot course must be taken three times (3 cr.)

Elective Course (3 credits)

3 credits in advanced research methods, at the 600 level or higher. May be chosen from outside the Department, in consultation with the student's academic adviser or supervisor.

12.1.6 Oncology**12.1.6.1 Location**

Gerald Bronfman Department of Oncology
5100 de Maisonneuve Blvd West, Suite 720

Montreal QC H4A 3T2
 Website: mcgill.ca/oncology/

12.1.6.2 Grad. Dip. in Oncology

The Graduate Diploma in Oncology provides students the opportunity to gain exposure to the principles and practice of oncology as well as its research domains, while exploring in more detail one of four areas of focus:

- Population and Global Cancer Control
- Psychosocial Oncology/Palliative Care
- Clinical Cancer Research
- Cancer Care Services and Quality

12.1.6.3 Oncology Faculty

Chair

E. Franco

Professors

B. Abdulkarim, M. Alaoui-Jamali, A. Aprikian, M. Basik, G. Batist, N. Beauchemin, C. Borchers, P. Brodt, L. Ferri, W. Foulkes, E. Franco, C. Freeman, A. Fuks, V. Giguère, L. Gilbert, W. Gotlieb, C. Greenwood, T. Hutchinson, A. Koromilas, C. Loiselle, R. Margolese, S. Meterissian, W. Miller, A. Nepveu, L. Panasci, M. Park, J. Pelletier, M. Pollak, S. Richard, S. Robbins, N. Sadeghi, J.P. Seuntjens, C. Shustik, L. Souhami, A. Spatz, M. Thirlwell, M. Tremblay, T. Vuong

Associate Professors

S. Abbasinejad Enger, J. Agulnik, T. Alcindor, J. Alfieri, J. Asselah, L. Azoulay, S. Caplan, P. Chaudhury, D. Cournoyer, S. Devic, M. Fabian, S.L. Faria, M. Henry, M. Hier, T. Hijal, A. Jahani-Asl, N. Johnson, P. Kavan, P. Laneuville, A. Langleben, B. Lapointe, S. Lau, A.S. Liberman, A. Loutfi, M. Martin, L. McCaffrey, A. Meguerditchian, E.J. Mitmaker, T. Muanza, M. T. Niazi, A. Peterson, J. Prchal, R. Rajan, Z. Rosberger, D. Senger, G. Shenouda, I. Topisirovic, A. Towers, J. Ursini-Siegel, A. Vigano, M. Witcher, J.H. Wu, G. Zogopoulos

Assistant Professors

S. Abish, R. Aloyz, D. Anderson, S. Aubin, M. Azoulay, B. Bahoric, S. Bouchard, N. Bouganim, J. Burnier, V. Cohen, F. Cury, R. Dalfen, M. David, S. del Rincon, M. Duclos, K. Esfahani, M. Evans, C. Ferrario, J. Friedmann, J. Kildea, N. Kopek, C. Lambert, H. Laryea, M. Lecavalier, C. Legler, I. Levesque, V. Mandilaras, D. Melnychuk, N. Meti, C. Mihalcioiu, A. Orthwein, S. Owen, V. Panet-Raymond, W. Parker, F. Patenaude, P. Pater, H. Patrocinio, C. Pepe, E. Poon, M. Popovic, I. Prakash, A. Rose, R. Saleh, S. Sirhan, S. Skamene, B. Stein, G. Stroian, K. Sultanem, F. Tremblay, J.M.G. Tsui, T. Vanounou, C.A. Vasilevsky, P. Watson, S. Wong, A. Wong Wong Keet, N. Ybarra

Lecturers

R. Archambault, K. Asiev, H. Bekerat, S. Bendellali, N. Buhlaiga, A. Carbonneau, P. Charghi, T. Connell, S. Ferland, R. Fisher, D. Frechette, J. Goudreault, D. Guillet, G. Hegyi, G. Huni, A. Khadoury, L.H. Liang, P-Y. McLaughlin, E. Neamt, P. Ramia, R-M Rouleau, R. Ruo, A. Saidi, S. Sud, S. Tisseverasinghe, N. Tomic

Associate Members

J. Arseneau, S. Assouline, G. Bartlett-Esquillant, H. Bergman, J-F. Boileau, M. Burnier, S. Chevalier, L. Collins, T. Duchaine, C. Elbaz, J-P. Farmer, J. Feine, D. Fleiszer, R. Forghani, P. Galiatsatos, Z-H. Gao, M. Goldberg, C. Goudie, P. Gros, L.A. Habib, J. Hall, N. Jabado, T. Jagoe, S. Jordan, C. Kleinman, A.C. Korner, S. Lambert, K. Lawlor, A. Leung, S. Li, M.E. Macdonald, C. Maheu, K. Mann, R. Michel, A. Mlynarek, L. Musgrave, B. Nicolau, P. Nugus, L. Ofiara, M. Paliouras, R. Payne, S. Rabbani, J. Rak, C. Reinhold, L. Roudaia, M. Sebag, B. Shieh, P. Siegel, E. Strumpf, R. Tabah, S. Tanguay, P. Tonin, G. Tradounsky, A. Tsimicalis, R. Turcotte, D. Wan-Chow-Wah, B. Wang

Adjunct Professors

R-K. Agnihotram, A.E. Al Moustafa, N. Blais, A. Burchell, M. Chasen, F. Coutlee, F. DeBlois, I. El Naqa, B. Gagnon, M-H. Mayrand, B. Mofteh, G.B. Pike, J. Renaud, B. Rivera, D. Roberge, A. Sarfehnia, G. Simos, E. Soisson, T. Sullivan, H. Trottier

12.1.6.4 Graduate Diploma (Grad. Dip.) Oncology (30 credits)

The Graduate Diploma in Oncology provides exposure to the entire spectrum of principles and practice in all fields of oncology as well as its research domains while allowing exploration in more detail of a specific area of focus through courses and a practicum. The areas of focus are: population and global cancer control, psychosocial oncology/palliative care, clinical cancer research, or cancer care services and quality.

Required Courses (12 Credits)

ONCO 610D1	(3)	Fundamentals of Oncology and Cancer Research
ONCO 610D2	(3)	Fundamentals of Oncology and Cancer Research
ONCO 620	(3)	Best Practices in Biomedical Research
ONCO 630	(3)	Oncology Practicum

Complementary Courses (12 Credits)

6 credits from:

EPIB 671	(3)	Cancer Epidemiology and Prevention
PPHS 612D1	(1.5)	Principles of Public Health Practice
PPHS 612D2	(1.5)	Principles of Public Health Practice

OR

NUR2 783	(3)	Psychosocial Oncology Research
ONCO 635	(3)	Qualitative and Psychosocial Health Research

OR

EXMD 617	(1)	Workshop in Clinical Trials 1
EXMD 618	(1)	Workshop in Clinical Trials 2
EXMD 619	(1)	Workshop in Clinical Trials 3
ONCO 615	(3)	Principles and Practice of Clinical Trials

OR

ONCO 625	(3)	Quality Improvement Principles and Methods
PPHS 528	(3)	Economic Evaluation of Health Programs

If a course in the course grouping is not available in a given year, a suitable replacement will be chosen by the Graduate Program Director in consultation with the Program Committee.

3 credits from:

DENT 505	(3)	Epidemiology and Data Analysis in Primary Care 1
EPIB 507	(3)	Biostats for Health Sciences
EPIB 521	(3)	Regression Analysis for Health Sciences
EXMD 634	(3)	Quantitative Research Methods
FMED 505	(3)	Epidemiology and Data Analysis in Primary Care 1

OR

3 credits of a research design or statistics course at the 500 level or higher chosen in consultation with the student's mentor and approved by the Program Committee and the Graduate Program Director. Students who already have a very strong background in statistics may be exempt from taking a statistics course and would choose another 3-credit course. This must be approved by the Program Committee and the Graduate Program Director.

3 credits from:

EPIB 671	(3)	Cancer Epidemiology and Prevention
EXMD 614	(3)	Environmental Carcinogenesis
EXMD 620	(1)	Clinical Trials and Research 1

EXMD 625	(1)	Clinical Trials and Research 2
EXMD 626	(1)	Clinical Trials and Research 3
EXMD 640	(3)	Experimental Medicine Topic 1
EXSU 505	(3)	Trends in Precision Oncology
FMED 619	(3)	Program Management in Global Health and Primary Health Care
HGEN 690	(3)	Inherited Cancer Syndromes
NUR2 705	(3)	Palliative Care
ONCO 615	(3)	Principles and Practice of Clinical Trials
ONCO 625	(3)	Quality Improvement Principles and Methods
ONCO 635	(3)	Qualitative and Psychosocial Health Research
POTH 637	(3)	Cancer Rehabilitation
PPHS 528	(3)	Economic Evaluation of Health Programs
PSYC 507	(3)	Emotions, Stress, and Illness
SWRK 668	(3)	Living with Illness, Loss and Bereavement

The course will be chosen in consultation with the student's mentor and must be approved by the Program Committee and the Graduate Program Director.

Elective Courses (6 credits)

6 credits at the 500 level or higher can be chosen from the course list above or from other courses. The courses do not necessarily have to include cancer-related content, but must have relevance to the field. The courses will be chosen in consultation with the student's mentor and must be approved by the Program Committee and the Graduate Program Director.

12.1.7 Otolaryngology – Head and Neck Surgery

12.1.7.1 Location

Department of Otolaryngology – Head and Neck Surgery
 MUHC (Royal Victoria Hospital)
 1001 boul. Decarie, D05.5709
 Montreal QC H4A 3J1
 Canada
 Telephone: 514-934-1934, ext. 36386
 Website: mcgill.ca/ent

12.1.7.2 About Otolaryngology – Head and Neck Surgery

The Master of Science degree offered by the Department of Otolaryngology – Head and Neck Surgery provides inter-disciplinary training for clinical or basic science research in Otolaryngology. Master's programs can include research on normal function and disease of head and neck structures: otology, neuro-otology, laryngology, rhinology, oncology, surgery, auditory-vestibular sciences, middle-ear modelling, oto-toxicity, genomics, infection, thyroid disease, or genetics.

section 12.1.7.5: Master of Science (M.Sc.) Otolaryngology (Thesis) (45 credits)

The master's program is intended for those having with a strong interest in otolaryngology research (e.g., Otolaryngologists, physicians, PhDs. dentists, veterinarians, medical professionals, engineering or science undergraduates etc.). The program addresses research questions using an interdisciplinary approach, combining methodologies of both the clinical sciences and the basic sciences. The master's program is unique in Canada and rare elsewhere. Graduates of the program can better treat ear-nose-throat diseases; they are better positioned to do, and to evaluate, research in Otolaryngology. They typically obtain the most highly sought positions in their fields.

12.1.7.3 Otolaryngology Admission Requirements and Application Procedures

12.1.7.3.1 Admission Requirements

Admission to the M.Sc. program requires acceptance by a research supervisor, and the proposed program must be approved by the Department.

Applicants should be otolaryngologists, or they should be currently enrolled in a residency program leading to certification in Otolaryngology, or they should be physicians. Under exceptional circumstances, others (Ph.D.s, dentists, veterinarians, medical professionals, etc.) with a strong interest in Otolaryngology Research will be considered.

The results of the Test of English as a Foreign Language (TOEFL) (minimum of 86 on the Internet-based test [iBT] with each component score not less than 20 is required for applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone).

12.1.7.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures.

Prospective students should contact research supervisors individually.

12.1.7.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Curriculum Vitae
- Personal Statement
- Acceptance by a research supervisor

12.1.7.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Otolaryngology and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

	Application Opening Dates		Application Deadlines	
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
Fall Term:	Sept. 15	March 15	July 15	July 15
Winter Term:	Feb. 15	Sept. 10	Nov. 15	Nov. 15
Summer Term:	May 15	Jan. 15	April 1	April 1

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

12.1.7.4 Otolaryngology – Head and Neck Surgery Faculty

Chair

N. Sadeghi

Graduate Program Director and Director of Research

B. Segal

Director of Residency Training Program

K. Richardson

Director of Head and Neck Oncology Program

N. Sadeghi

Director of Undergraduate Medical Education

J. Young

Director of Fellowship Training

J. Rappaport

Emeritus Professor

A. Katsarkas

Professors

M. Desrosiers, N. Fanous, W.R.J. Funnell, M. Hier, J. Manoukian, L. HP. Nguyen, W.H. Novick, R. Payne, J. Rappaport, M. Samaha, B. Segal, M. Tewfik, A.G. Zeitouni

Associate Professors

M. Desrosiers, N. Fanous, W.R.J. Funnell, M. Hier, J. Manoukian, L. HP. Nguyen, W.H. Novick, R. Payne, J. Rappaport, M. Samaha, B. Segal, M. Tewfik, A.G. Zeitouni

Assistant Professors

F. Chagnon, M. Duval, V.I. Forest, J. Gurberg, Y. Lacroix, R. Lafleur, A. Lehmann, C. Marchica, T. Mijovic, A. Mlynarek, K. Richardson, J. Schwartz, G. Sejean, L. Tarantino, S.D. Wurzba, J. Yeung, J. Young

Associate Members

H.L. Galiana, M. Henry, N.Y.K. Li, L. Mongeau, M. Paliouras, M. Sewitch

Lecturers

C. Boucher, S. Bouhabel, R. Caouette, M. Campagna-Vaillancourt, R. Dionne, Yalon Dolev, A. Finesilver, L. Himdi, O. Houle, V. Iordanescu, M. Lalonde, L. Monette, S. Nguyen, L. Picard, J. Rothstein, R. Varshney, T.V.T. Vu, R. Ywakim

12.1.7.5 Master of Science (M.Sc.) Otolaryngology (Thesis) (45 credits)

Thesis Courses (30 credits)

OTOL 690	(3)	M.Sc. Thesis 1
OTOL 691	(3)	M.Sc. Thesis 2
OTOL 692	(6)	M.Sc. Thesis 3
OTOL 693	(6)	M.Sc. Thesis 4
OTOL 694	(12)	M.Sc. Thesis 5

Required Courses (12 credits)

When appropriate, courses OTOL 602, OTOL 612, OTOL 603, or OTOL 613 may be replaced by other Basic Science or Clinical (500, 600, or 700 level) courses of relevance to Otolaryngology, as recommended or approved by the Department.

OTOL 602	(3)	Physiology, Histopathology and Clinical Otolaryngology 1
OTOL 603	(3)	Advanced Scientific Principles - Otolaryngology 1
OTOL 612	(3)	Physiology, Histopathology and Clinical Otolaryngology 2
OTOL 613	(3)	Advanced Scientific Principles - Otolaryngology 2

Complementary Course

(3-4 credits)

EPIB 507	(3)	Biostats for Health Sciences
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or equivalent.

Students aiming to acquire an interdisciplinary background will be expected to take additional elective courses, at the undergraduate level if necessary.

12.1.8 Pathology

12.1.8.1 Location

Department of Pathology
Duff Medical Building

3775 University Street, Room B4
 Montreal QC H3A 2B4
 Canada
 Telephone: 514-398-3045
 Email: gradstudies.pathology@mcgill.ca
 Website: mcgill.ca/pathology

12.1.8.2 About Pathology

Pathology is the specialized area of biomedical science that emphasizes the study of disease, and it is therefore one of the most multidisciplinary fields of research. Investigators in a pathology department may be utilizing information and experimental techniques originally developed in almost any area of modern biology and, in return, may contribute new knowledge of benefit to many other disciplines. Research on disease may target any of the organ systems, in normal and abnormal conditions, and studies may be conducted from a structural, functional, or molecular perspective at any level, from the intact organism down to specific components of the individual cell. Research in pathology often provides a unique link to human data, with an opportunity to translate experimental research into improved methods of diagnosis and therapy.

The Graduate Studies Program in the Department of Pathology has been designed to achieve three major goals:

1. To train students in the design, performance, interpretation and documentation of laboratory research by guiding them as they carry out a thesis project in one of the many sub-disciplines of pathology
2. To ensure that students have a comprehensive knowledge of biomedical science, with an advanced and up-to-date understanding of pathology. In addition to the scientific component, Ph.D. candidates should also become familiar with the general principles of diagnostic pathology. (Foreign medical graduates should be aware that this level of conceptual knowledge regarding diagnostic procedures is **not** adequate preparation for clinical employment and those wishing to practise Pathology as a medical specialty should apply for residency training rather than graduate studies.)
3. To provide initial training in effective techniques of scientific communication: organizing and delivering lectures and research seminars; preparing and evaluating manuscripts and grant applications.

The Pathology Department offers research training in a wide variety of areas such as:

- Cancer research, including the fundamental biology of breast cancer, ovarian cancer, brain tumors, soft tissue tumors, and the mechanisms of metastasis;
- Immunology and transplantation;
- Autoimmune disorders;
- Ophthalmic pathology;
- Stem cell biology;
- Pulmonary disease;
- Neurodegenerative disorders;
- Smooth muscle pathophysiology; and
- Genomic biology of cancer.

Modern techniques and equipment include light, fluorescence, and electron microscopy (both transmission and scanning), laser capture, flow cytometry, DNA, RNA, protein analysis, cell culture, advanced immunological, pharmacological, biochemical, and physiological techniques, as well as morphometry and computer-aided analysis.

section 12.1.8.5: Master of Science (M.Sc.) Pathology (Thesis) (45 credits)

Graduates can directly enter rewarding careers in research, or opt to continue with their studies and obtain a Ph.D. Some combine their research training with subsequent training in medicine, law, or business administration.

section 12.1.8.6: Doctor of Philosophy (Ph.D.) Pathology

Our graduates enter successful careers in industry, academia, government/international agencies, or clinical medicine, sometimes combining two of these options. They leave McGill with experience in leadership and communication skills in addition to being highly trained in biomedical research, and their career choices include a wide range of administrative and research positions around the world.

12.1.8.3 Pathology Admission Requirements and Application Procedures

12.1.8.3.1 Admission Requirements

Applicants must have a B.Sc. or an equivalent degree with an extensive background in the physiological and biological sciences. An academic record equivalent to or better than a cumulative grade point average (CGPA) of 3.2 out of 4.0 at McGill is required for at least the two final full-time years of undergraduate training, with a minimum CGPA of 3.0 overall. It is an advantage if candidates have very favourable supporting letters or have demonstrated an exceptional aptitude for research. All candidates are expected to apply for scholarships and fellowships, which usually require a higher CGPA or other evidence of excellence.

Applicants to graduate studies whose native language is not English and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit documented proof of competency in oral and written English. Before acceptance, appropriate exam results must be submitted directly from the TOEFL (Test of English as a Foreign Language) or IELTS (International English Language Testing Systems) Office. These applicants are usually required to take the [GRE](#) in order to properly evaluate their suitability.

Students are normally accepted into the M.Sc. program, and those candidates showing exceptional ability may be permitted to transfer into the Ph.D. program after one year of training.

Applicants who already possess an additional degree (M.Sc., M.D.) with appropriate research experience may be allowed to register in the Ph.D. program directly.

For further information, applicants may contact the Teaching Office, Department of Pathology: gradstudies.pathology@mcgill.ca.

12.1.8.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources > Graduate > Graduate Admissions and Application Procedures > : Application Procedures](#) for detailed application procedures.

All applications will be evaluated by the Graduate Students Committee. Candidates found suitable must then be accepted by a research director, and adequate funding must be obtained for both personal support and research expenses.

12.1.8.3.2.1 Additional Requirements

- Personal Statement
- Curriculum Vitae
- Research Proposal (when appropriate)
- GRE may be required for applicants who have not completed an undergraduate or graduate degree from a recognized foreign institution

12.1.8.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Pathology Department and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

Application Opening Dates		Application Deadlines		
		All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)
Fall Term:	Sept. 15	May 1	June 21	June 21
Winter Term:	Feb. 15	Sept. 10	Nov. 10	Nov. 10
Summer Term:	May 15	Jan. 15	April 1	April 1

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

12.1.8.4 Pathology Faculty

Chair

Marie-Christine Guiot (*Interim*)

Director of Graduate Program

E. Zorychta

Professors

M. Auger, M.N. Burnier Jr., A. Ferenczy, R. Fraser, D. Haegert, I. Hüttner, R.P. Michel, A. Spatz, C.M. Telleria

Associate Professors

L. Alpert, J. Arseneau, C. Bernard, F. Brimo, M. Blumenkrantz, S. Camilleri-Broët, B. Case, M.F. Chen, M.-C. Guiot, T. Haliotis, J. Karamchandani, V.A. Marcus, V.-H. Nguyen, R. Onerheim, M. Pelmus, M. Pusztaszeri, L. Rochon, J. Sonnen, I. Roy, A.K. Watters, E. Zorychta

Assistant Professors

O.E. Ajise, M. Alameldin, S. Albrecht, O. Aleynikova, R. Amre, K. Bakdounes, M. Blumenkrantz, G.D. Brandao, J. Burnier, D. Caglar, J. Chepovetsky, P. Fiset, A. Florea, L. Florianova, L. Fu, A. Gregorieff, S.-M. Jung, Y. Kanber, J. Lavoie, H.R. Lopez-Valle, A.T. Marcus, T. S. Nagaria; T. Nu; A. Omeroglu, G. Omeroglu-Altinel, F. Razaghi, M. Redpath, S. Sandhu, H. Srolovitz, J. St. Cyr, T.N. Ton Nu, H. Wang

Associate Members

B. S. Abdulkarim, C.J. Baglole, N. Braverman, S. Cellot, P.J. Chauvin, M. Divangahi, N. Jabado, J.-L. Liu, S.N.A. Hussain, G.O.R. Arena, W. Kassouf, P. Metrakos, V.Papadopoulos, M. Park, J. Przybyl, A. Schwertani

12.1.8.5 Master of Science (M.Sc.) Pathology (Thesis) (45 credits)

All students must take PATH 300 plus a course in statistics if they have not completed these requirements before admission.

Candidates with insufficient background in one of the biomedical sciences will be required to take specific courses to remedy the deficiency. These and additional courses that are relevant to the student's area of research will be chosen in consultation with the research director and Graduate Students Committee.

Thesis Courses (30 credits)

PATH 690	(9)	M.Sc. Thesis Research Project 1
PATH 691	(9)	M.Sc. Thesis Research Project 2
PATH 692	(12)	M.Sc. Thesis Research Project 3

Required Courses (6 credits)

PATH 620	(3)	Research Seminar 1
PATH 622	(3)	Research Seminar 2

Complementary Courses (9 credits)

3 credits, one of the following courses:

PATH 613	(3)	Research Topics in Pathology 1
PATH 614	(3)	Research Topics in Pathology 2

6 credits, two 500-, 600-, or 700-level courses offered by the Department; subject to approval of the research director and Graduate Students Committee, up to 3 credits of 500-, 600-, or 700-level credits may be taken in another department.

12.1.8.6 Doctor of Philosophy (Ph.D.) Pathology**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (12 credits)

PATH 613	(3)	Research Topics in Pathology 1
PATH 614	(3)	Research Topics in Pathology 2
PATH 620	(3)	Research Seminar 1
PATH 622	(3)	Research Seminar 2
PATH 701	(0)	Comprehensive Examination - Ph.D. Candidates

Complementary Courses (9 credits)

Three 500-, 600-, or 700-level courses offered by the Department; subject to the approval of the research director and Graduate Students Committee, up to one 500-, 600-, or 700-level course may be taken in another department.

12.1.9 Psychiatry

12.1.9.1 Location

Department of Psychiatry
1033 Pine Avenue West
Montreal QC H3A 1A1
Canada
Telephone: 514-398-4176
Fax: 514-398-4370
Email: graduate.psychiatry@mcgill.ca
Website: mcgill.ca/psychiatry

12.1.9.2 About Psychiatry

McGill University's Department of Psychiatry is one of the most prestigious in the world. In the 1950s and 60s, Heinz Lehmann conducted the first North American clinical trials for antipsychotic and antidepressant medications. Theodore Sourkes identified the core neurobiological features of Parkinson's disease, and Eric Wittkower and Jack Fried brought together scholars from Anthropology and Psychiatry to create Transcultural Psychiatric Studies. Since then, faculty members and graduate students continue outstanding research in addictions; Alzheimer's and childhood disorders; eating, personality, and mood disorders; stress; trauma; and psychosis. The work is conducted in people and animal models, and also benefits from expertise ranging from neuroimaging and epigenetics to mental health services and public policy. Our work remains at the cutting edge of research on health, disease, and recovery.

section 12.1.9.5: Master of Science (M.Sc.) Mental Health (Thesis) (45 credits)

The graduate program in Mental Health is designed to provide advanced research training in the basic, applied, and social sciences relevant to issues in psychiatry. Applicants are admitted from a wide range of backgrounds, including undergraduate degrees in relevant areas (e.g., psychology, neuroscience, sociology, medical anthropology, nursing, and medicine), and those who are pursuing their psychiatry residency at McGill. Most, though not all students, continue to a Ph.D. program. The graduate program does not provide clinical training.

section 12.1.9.6: Doctor of Philosophy (Ph.D.) Mental Health

The Ph.D. in Mental Health is designed to provide advanced research training in the basic, applied, and social sciences relevant to issues in psychiatry. Applicants are admitted from a wide range of backgrounds, including M.Sc. or M.A. degrees in relevant areas (e.g., psychology, neuroscience, sociology, medical anthropology, nursing, and medicine). The Ph.D. program does not provide clinical training.

12.1.9.3 Psychiatry Admission Requirements and Application Procedures

12.1.9.3.1 Admission Requirements

- A strong background in science and/or social science, as demonstrated by academic achievement equivalent to a GPA of 3.3 (on a 4-point scale) or 3.5 in the last two years
- An outline of the proposed thesis research, to be written by the prospective student in collaboration with an appropriate research supervisor
- Two letters of reference
- *TOEFL* or *IELTS* certificate of proficiency in English for non-Canadian applicants whose mother tongue and language of education is not English, with a minimum score of 86 on the TOEFL Internet-based test (iBT), with each component score not less than 20, or 6.5 on the IELTS test

and

Master of Science: Psychiatry (thesis)

- A B.Sc., B.A., B.N., or M.D. degree
- Demonstration of financial support through a scholarship/award and/or by the student's supervisor

Doctor of Philosophy: Mental Health

- A M.Sc., or M.A. degree
- The student's statement of purpose for seeking a Ph.D.
- Confirmation of supervision, including confirmation of funding from the supervisor or from an external scholarship

12.1.9.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures.

12.1.9.3.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Personal Statement – describing the specific reasons for seeking a Master of Science degree in Psychiatry
- Letters of Reference – with Applicant Evaluation checklist forms (see Department [website](#))
- Written Confirmation of Supervision form (see Department [website](#)) from the proposed research supervisor

12.1.9.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Psychiatry and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

Application Opening Dates		Application Deadlines		
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
Fall Term:	Sept. 15	March 15	March 15	March 15
Winter Term:	Feb. 15	Sept. 10	Sept. 10	Sept. 10
Summer Term:	N/A	N/A	N/A	N/A

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

12.1.9.4 Psychiatry Faculty

Chair

G. Turecki

Director of Graduate Program

N. Mechawar

Emeritus Professors

F. Abbott, L. Annable, M.K. Birmingham, F. Engelsmann, N. Frasure-Smith, A. M. Ghadirian, C. Gianoulakis, J.C. Negrete, J. Paris, G. Pinard, S. Young

Professors (Post-Retirement)

D.P. Dastoor, J.P. Ellman

Professors

V. Bohbot, D. Boivin, P. Boksa, M. Bond, J. Bretnier, A. Brunet, N. Cermakian, S. El Mestikawy, F. Elgar, M.-J. Fleury, C. Flores, S. Gauthier, B. Giros, G. Gobbi, I. Gold, A. Gratton, D. Groleau, J. Guzder, L.T. Hechtman, R. Jooper, S. King, L.J. Kirmayer, E. Latimer, M. Lepage, M. Leyton, G. Lusheshi, A. Malla, M.J. Meaney, N. Mechawar, R. Mizrahi, V.N.P. Nair, R. Palmour, J.C. Perry, R.O. Pihl, J. Poirier, R. Quirion, M. N. Rajah, P. Rosa, C. Rousseau, N. Schmitz, L.K. Srivastava, H. Steiger, B. Thombs, G. Turecki, C.-D. Walker, S. Williams

Associate Professors

J. Armony, S. Beaulieu, M. Berlim, R. Biskin, M.J. Brouillette, N. Casacalenda, E. Chachamovich, M. Chakravarty, D. Charney, J.B. Debrulle, D. Dunkley, C.P. Ernst, C. Fichten, D. Frank, R. Fraser, A. Gagnon, G. Galbaud Du Fort, M. Gignac, K. Gill, A. Granich, B. Greenfield, N. Grizenko, R. Gruber, K. Igartua, M. Israëli, S.N. Iyer, E. Jarvis, T. Kolivakis, K. Looper, H.C. Margolese, R. Montoro, G. Myhr, L. Nadeau, J. Palacios-Boix, J. Pecknold, M. Perreault, A. Propst, R.A. Ramsay, A. Raz, J. Renaud, S. Renaud, B.M. Robertson, J. Rochford, Z. Rosberger, M. Ruiz Casares Yebenes, R. Russell, S. Singh, D. Sookman, W. Steiner, F.K. Storch, B. Suranyi-Cadotte, A. Wazana, G. Wiviott, T.P. Wong, P. Zelkowitz

Assistant Professors

D. Awad, S.M. Bailes, P. Bajsarowicz, E. Banon, M. Barbarosie, L. Beauclair, C. Beneirakis, P. Bleau, D. Bloom, J. Bond, F. Bourque, I. Bradley, M. Brandon, T.G. Brown, A. Bucatel, J. Canfield, P. Cervantes, M. Chammas, R.M.E. Chenard-Soucy, S. Choudhury, J. Cohen, L. Creti, L. Dabby, M.E. Davis, N. Deleva, P. Des Rosiers, R. Desautels, J. Desmarais, M. Di Tomasso, J. Dornik, S. Ducharme, M. Elie, J. Errunza, K. Faridi, N. Faridi, K. Fathalli, M. Ferrari, A. Fielding, J. Friedland, K. Geagea, J. Glass, K. Goddard, M. Grignon, P. Habib, B. Hayton, L. Hoffman, F. Ianni, H. Iskandar, J. Joly, S. Karama, M. Koch, T. Kolivakis, R. Kronick, R. Kuyumjian, P. Lageix, S. Lamarre, M. Laporta, L. Laporte, M. Lashley, J.D. Leccia, E. Levy, E. Libman,

Assistant Professors

N.C.P. Low, W. Ma, R. Martins, N. Masrouha, T. Measham, X. Meng, M. Messier, G. Meterissian, T.M. Milroy, M. Miresco, C. Nagy, A. Nakhost, J.P. Near, M-C. Noel, T. V. Nguyen, M. Piat, L. Pinard, Z. Prelevic, A. Propst, R. Rabin, M. Rabinovitch, S. Rej, S.B. Rosenbloom, C. Roy, P. Rusjan, T. Said, H. Schwartz, M. Segal, J. Seguin, T. Semeniuk, J. Shah, P.P. Silveira, I. Spector, K.A. Steger, A. St-Hilaire, M. St-Laurent, N. Szkrumelak, K. Tabbane, M. Temple, L. Thaler, Z. Thomas, L. Tourian, A. Traicu, J. Tremblay, M. R. Tuineag, F. Van Den Eynde, S. Veissière, S. Vida, S. Villeneuve, J. Vogel, R. Whitley, M.A. Wolf, Y. Wolf, G. Zahirney, T.Y. Zhang, V. Zicherman, D. Zigman, E. Zikos

Lecturers

F. Amdiss, F. Bensaada, I. Blais, M. Boisvert, O. Boureau, V. Brazzini-Poisson, C.M.J. Brebion, Mioara Bunea Cotfas, A. Cadivy, E. Casimir, E. Cauchois, R. Chaala, P. Chan, D. Charest, C. Chen, M. Coward, T.-V. Dao, C. Desmarais, M.H.N. Dinh, S. S. Douyon, H.C. Dube, J.A. Farquhar, H. Goldhaar, J. Guimezap Tsopmo, P. Harden, J. Harvey, M. Heyman, H.G. Jean-Francois, D. Kunin, L. LaChance, S. Mauger, D.F.S. Monti, A. Morissette, K. Myron, C. Paquin-Hodge, R. Payeur, L. Peters, M. Pickles, K. Richter, D.T. Rochon, M. Rodier, O. Sidhom, V. Tagalakis, F.C. Toma, O. Triffault, E. Veljanova, S. Wisebord

Associate Members

R.C. Bagot, C. Blake, S. Bond, M. Drapeau, A. Evans, J. Foley, P. Friesen, M-C Geoffroy, M. MacKenzie, S. Margolese, L. McVey, T. Montreuil, G. O'Driscoll, J. Russell, A. Schiavetto, R.N. Spreng, J.I. Trakadis, Z. Vang, D. Wendt

Adjunct Professors

M. Alda, E. Amirali, P. Blier, L. Booij, B. Chaumette, A. Crocker, A. Daigneault, S. Deschenes, D. Fikretoglu, J.-M. Guile, F. Jollant, B. Kieffer, V. Kovess, R. Labonte, A. Lesage, S.J. Lloyd, A. Maccordick, O. Linnaranta, K. O'Donnell, J. Pruessner, M. Pruessner, S. Richard-Devantoy, A. Ryder, C. Tranulis

12.1.9.5 Master of Science (M.Sc.) Mental Health (Thesis) (45 credits)

The M.Sc. in Mental Health provides training in research methodology related to psychiatry and mental health topics and entails the completion of a thesis research project.

Thesis Courses (36 credits)

PSYT 691	(12)	Thesis Research 1
PSYT 692	(12)	Thesis Research 2
PSYT 693	(12)	Thesis Research 3

Complementary Courses (9 credits)

9 credits of graduate-level courses approved by the student's Supervisory Committee.

Courses are selected on the basis of the area of research interest and the background of the student, and must include a course in statistical analysis if not presented upon admission.

12.1.9.6 Doctor of Philosophy (Ph.D.) Mental Health

The Ph.D. in Mental Health, which is rooted in a strong tradition of multidisciplinary research approaches, focuses on the development of mental health services and policy, social and cultural psychiatry, and clinical and transnational psychiatry. Students are exposed to a rich body of knowledge in psychiatry and mental health research methods by participating in regular academic activities organized by different units of the Department of Psychiatry, such as weekly research seminars, global mental health rounds, Indigenous mental health workshops, the Summer Program in Cultural Psychiatry, and the conferences and workshops organized by the Advanced Study Institute in Cultural Psychiatry.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (6 credits)

PSYT 605	(3)	History and Philosophy of Psychiatry
PSYT 606	(3)	Mental Illness: Symptoms Diagnostics and Determinants
PSYT 701	(0)	Comprehensive Exam Mental Health

Complementary Courses (3 credits)

3 credits from the following or 3 credits of 500 level or higher from another unit chosen in consultation with the student's academic advisor or supervisor:

PSYT 500	(3)	Advances: Neurobiology of Mental Disorders
PSYT 515	(3)	Advanced Studies in Addiction
PSYT 620	(3)	Trends in Clinical Psychiatry
PSYT 625	(3)	Qualitative Research in Health Care
PSYT 630	(3)	Statistics for Neurosciences
PSYT 633	(3)	Social and Cultural Research Methods
PSYT 682	(3)	Psychosocial Issues of Disease
PSYT 696	(3)	Special Topics in Psychiatry
PSYT 711	(3)	Cultural Psychiatry
PSYT 713	(3)	Psychiatric Epidemiology

12.1.10 Surgery, Experimental**12.1.10.1 Location**

Surgery, Experimental
 Montreal General Hospital, Room C9-169
 1650 Cedar Avenue
 Montreal QC H3G 1A4
 Canada
 Graduate Program Coordinator: Sharon Turner
 Telephone: 514-934-1934, ext. 42837
 Email: gradstudies.surgery@mcgill.ca
 Website: mcgill.ca/experimentalsurgery

12.1.10.2 About Experimental Surgery

Experimental Surgery offers graduate-level training leading to an **M.Sc.** or a **Ph.D.** degree. At the master's level, in addition to the core program, those who are interested have a new opportunity to choose a concentration in Surgical Innovation, Surgical Education, or Global Surgery. The Experimental Surgery Department is responsible for the administration of the graduate programs and allows excellent opportunities for training under the supervision of professors located in the Research Institute of the McGill University Health Centre or other McGill teaching hospitals. The scope of the research and close connections with other Montreal research centres and McGill departments provide ample opportunities for collaboration. Research in the Department covers a wide spectrum, including injury, repair, recovery, tissue engineering, transplantation, fibrosis, cancer and stem cell biology, biomechanics, organ failure, surgical stimulation, surgical innovation, education, and evaluative/outcomes research.

A list of research directors and their research topics is available on our [website](#).

section 12.1.10.5: Master of Science (M.Sc.) Experimental Surgery (Thesis) (45 credits)

The M.Sc. core program is intended for students wishing to pursue careers in academia, the medical field, or industry. Thesis projects available in the various laboratories of the Department are multidisciplinary and ensure that students are exposed to a broad spectrum of research projects and experimental approaches. Students who have achieved superior progress in their research have the option to transfer to the Ph.D. program, waiving the M.Sc. thesis submission.

section 12.1.10.6: Master of Science (M.Sc.) Experimental Surgery (Thesis): Digital Health Innovation (45 credits)

The M.Sc. in Experimental Surgery; Digital Health Innovation focuses on the basics of clinical epidemiology, medical artificial intelligence, clinical innovation, and applied data science, including the use and generation of digitized health and social data using specialized software. Fundamentals of current AI applications in medicine, methods to employ big data in clinical tool development, mathematical principals underpinning digital health and big data, and design thinking methodology in clinical innovation. High-volume streams of clinical and health-related data from clinical systems, wearables and social media.

section 12.1.10.7: Master of Science (M.Sc.) Experimental Surgery (Thesis): Global Surgery (45 credits)

This concentration emphasizes healthcare needs specifically within the surgical field in resource-limited settings. It comprises three main pillars: research, education, and mentorship. Through extensive research work, students will participate in the design and implementation of innovative approaches in surgical care and injury surveillance, advancing the surgical capacities in low- and middle-income countries. Students will also participate in global surgical endeavors allowing professionals from partner countries and Canada to engage in a learning and knowledge transfer experience through training and courses. Students choosing this option will have the opportunity to engage in international projects and orient their work depending on their research interest (i.e., health economics, injury epidemiology, etc.) aligned with the Centre for Global Surgery's (CGS) mission.

section 12.1.10.8: Master of Science (M.Sc.) Experimental Surgery (Thesis): Surgical Education (45 credits)

This concentration provides a foundation in surgical education practice and research. The program highlights the unique teaching and learning environment of surgery coupled with a basis in educational theory, curricular design, and implementation. A major emphasis of this program is surgical educational research with the elaboration, designs, implementation, and analysis of a research project founded in best practices of educational research. The research project may encompass, but is not limited to, surgical stimulation, technical skills acquisition, surgical technology, and assessment.

section 12.1.10.9: Master of Science (M.Sc.) Experimental Surgery (Thesis): Surgical Innovation (45 credits)

This concentration is intended for residents interested in developing new devices and software solutions for surgical needs, as well as non-clinician trainees with a passion for healthcare technology. The program allows for a hands-on learning experience for students to develop skills necessary to work within multidisciplinary teams in the creation of novel, needs-driven and marketable prototypes used in development of novel surgical and medical devices. As such, participants work in these teams to identify clinical needs and to innovate solutions to them.

section 12.1.10.10: Master of Science (M.Sc.) Experimental Surgery (Thesis): Surgical Outcomes Research (45 credits)

This concentration offers a graduate-level training program focused on the science of measuring and improving the outcomes of surgical patients. Students in this concentration will complete coursework addressing research methods, biostatistics, and strategies to measure and improve postoperative outcomes. This concentration aims to provide students with the knowledge and skills required to start a successful career as a surgical outcomes researcher.

section 12.1.10.11: Master of Science (M.Sc.) Experimental Surgery (Non-Thesis) (45 credits)

This is a graduate level training program in fundamentals of modern surgical research. The program is based primarily on academic course work and short projects. It is designed to be flexible and provide students the opportunity to gain knowledge in various surgical core disciplines while allowing training opportunities in more specific areas such as global surgery, innovation, education or as the interest of the students dictates.

section 12.1.10.12: Doctor of Philosophy (Ph.D.) Experimental Surgery

The doctoral program is intended for students with excellent academic standing who wish to pursue research-focused careers in academia, the medical field, or industry. Thesis projects, available in the various laboratories of the Department, ensure that students receive in-depth training and exposure to varied conceptual frameworks and a wide array of experimental strategies.

section 12.1.10.13: Graduate Certificate (Gr. Cert.) Surgical Innovation (15 credits)

The centre of this graduate program is two innovation courses (EXSU 620 and EXSU 621) delivered by the McGill Department of Surgery. The first semester of the program focuses on team building and, supported by lectures, the students embark on a needs-finding process by observing all aspects of clinical activity in their focus themes. The trainees learn basic prototyping skills, start-up organization, and project management. This is supplemented by a basic statistics course and an introduction to the current status of biomedical research innovation. This certificate then gives a solid non-thesis-based foundation in the innovation process.

section 12.1.10.14: Graduate Diploma (Gr. Dip.) Surgical Innovation (30 credits)

The cores of this program are two-fold. Firstly, two innovation courses are offered by the McGill Department of Surgery, Experimental Surgery (EXSU 620 Surgical Innovation 1 and EXSU 621 Surgical Innovation 2) and supporting courses are delivered by the McGill Department of Surgery with some sessions in those courses provided by external partners, Local Industry (Regulatory & IP), the John Molson School of Business (JMSB) (lean start-up), Concordia University (software design), and *L'École de technologie supérieure* (ETS) (prototyping). Secondly, fundamental business and management courses are taken concurrently provided by Continuing Studies (McGill) and JMSB and reinforce the innovation project team experience.

12.1.10.3 Experimental Surgery Admission Requirements and Application Procedures**12.1.10.3.1 Admission Requirements****M.Sc. Core Program**

Usually a B.Sc., M.D., or D.V.M. degree is required, with a minimum CGPA of 3.2/4.0. Applications will be accepted from candidates sponsored by a research supervisor willing to provide laboratory space, funding, and direction for their research work.

M.Sc. Concentrations

Generally a B.Sc. in biological, biomedical and life science; physical science; computer science; an M.D. degree; or a B.Eng. is required. Exceptionally, on a case-by-case basis, an applicant holding a B.Com.; B.C.L./LL.B.; or B.A. or B.Sc. in humanities and social sciences will be considered. An applicant must have a minimum CGPA of 3.2/4.0.

Ph.D. Program

Admission is usually through one of the M.Sc. programs, either upon completion of the M.Sc. degree, or by transfer from the first year of M.Sc. to the second year of Ph.D. studies, within the Department. Request for such transfer is to be made in writing by the thesis supervisor during the candidate's first year of M.Sc. studies. A candidate for transfer must submit an application to the doctoral program according to normal procedures and deadlines. **Transfer is granted on the basis of an examination administered by the student's Research Advisory Committee.** Exceptional students with a minimum 3.5/4.0 CGPA may apply directly to the Ph.D. program.

Students with an M.Sc. degree from other departments or from other recognized universities whose M.Sc. topic is closely related to the subject of their Ph.D. research may be admitted directly into the Ph.D. program, at the level of Ph.D. 2, at the discretion of the Department. Exceptional students with a master's degree unrelated to their proposed research may be admitted to Ph.D. 1.

Graduate Certificate and Graduate Diploma

Generally a B.Sc. in biological, biomedical and life science; physical science; computer science; an M.D. degree; or a B.Eng. is required. Exceptionally, on a case-by-case basis, an applicant holding a B.Com.; B.C.L./LL.B.; or B.A. or B.Sc. in humanities and social sciences will be considered. An applicant must have a minimum CGPA of 3.2/4.0.

12.1.10.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources > Graduate > Graduate Admissions and Application Procedures > : Application Procedures](#) for detailed application procedures.

12.1.10.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Curriculum Vitae
- Research Project Proposal
- Confirmation of Supervisor
- Letter of Understanding
- Tuition Assistance

Additional Requirements for the Concentrations in Surgical Education and Surgical Innovation

- Letter of Intent – A letter of intent from the students describing their reasons for pursuing the concentration of their choice, what their qualifications are, and why they should be accepted.
- Interview session – Students applying to the concentration in Surgical Education or in Surgical Innovation may be requested to attend an interview session either in person, by phone, or via Skype.

12.1.10.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by Experimental Surgery and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

	Application Opening Dates		Application Deadlines	
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
Fall Term:	Sept. 15	April 30	June 15	June 15
Winter Term*:	Feb. 15	Sept. 1	Nov. 1	Nov. 1
Summer Term:	N/A	N/A	N/A	N/A

*Application to the Graduate Certificate in Surgical Innovation is only available for the Fall term.

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

12.1.10.4 Surgery, Experimental Faculty**Director**

F. Mwale

Professors

J. Antoniou, A. Aprikian, A. Barkun, J. Barkun, J. Barralet Beng, P. Brodt, F. Carli, S. Chevalier, P. Chan, S. Daniel, M.M. Elhilali, S. Emil, L. Feldman, L. Ferri, G.M. Fried, P. Gordon, L. Haglund, R. Hamdy, E. Harvey, T.E. Hebert, W. Kassouf, J.M. Laberge, F. Mwale, S. Meterissian, P. Metrakos, D.S. Mulder, J.A. Ouellet, A. Philip, D. Poenaru, C. Reinhold, L. Rosenberg, D. Shum-Tim, R. St. Arnaud, T. Taketo-Hosotani, S. Tanguay, M. Tanzer, C.I. Tchervenkov, J.I. Tchervenkov, R. Turcotte, A. Zini

Associate Professors

S. Antonian, G. Baldini, M. Basik, S. Bergman, G. Berry, O. Blaschuk, M. Boutros, R. Cecere, R. Chaytor, D. Deckelbaum, D. Fleiszer, S. Fraser, M. Gilardino, T. Hemmerling, K. Khwaja, K.J. Lachapelle, J. Lapointe, L. Lessard, P.A. Martineau, A. Meguerditchian, C. O'Flaherty, S. Paraskevas, P. Puligandla, T. Razek, R. Reindl, J. Sampalis, J. Spicer, T. Steffen, O. Steinmetz, A. Thomson, M. Vassiliou, D. Zukor

Assistant Professors

A. Aoude, S. Bergeron, M. Burman, L. Campeau, M. Corriveau, O. Court, A. Dragomir, N. Eliopoulos, J. Faria, J. Fiore, H. Flageole, R. Gawri, E. Girsowicz, J. Harley, O. Huk, P. Jarzem, D. Labbe, E. Lee, L. Lee, I. Litvinov, S.K. Loganathan, K. Mackenzie, J. Marcoux, E. Mitmaker, C. Mueller, M. Petropavlovskaja, D. Rosenzweig, N. Saran, K. Shaw, J. Vorstenbosch

Adjunct Professor

Louis-Nicolas Veilleux

Associate Members

J. Alfieri, A. Arnaert, M.N. Burnier, M. Cantarovich, J.P. Capolicchio, J.C. Chen, F. Cury, M. Falcao, C.E. Ferland-Legault, P. Goldberg, A. Gursahaney, S. Hussein, R. Koenekoop, S. Komarova, M. Larouche, J.J. Lebrun, P. Lefrancois, N.M. Makhoul, S. Mayrand, M. Murshed, P.H-N. Nguyen, S. Prakash, I. Prakash, J. Przybyl, L.A. Stein, M. Tabrizian, B.M. Willie

Professors of Practice

S. Arless, S. Kozlick

12.1.10.5 Master of Science (M.Sc.) Experimental Surgery (Thesis) (45 credits)

The M.Sc. in Experimental Surgery offers a graduate-level training program in experimental surgery, leading to a Master's degree. This program allows for a hands-on learning experience for students to develop skills necessary to work within multidisciplinary teams in the creation of novel, needs driven, and marketable prototypes used in development of novel surgical and medical devices. As such participants work in multidisciplinary teams. The program offers both specialized and broad-based training through the use of the most recent techniques in molecular biology, biochemistry, pharmacology, physiology, pathology, bio-informatics, and genomics.

Thesis Courses (30 credits)

EXSU 690	(4)	M.Sc. Research 1
EXSU 691	(4)	M.Sc. Research 2
EXSU 692	(4)	M.Sc. Research 3
EXSU 693	(18)	M.Sc. Thesis

Required Courses (6 credits)

EXSU 602	(3)	Knowledge Management 2
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And:

3 credits from the following:

EDPE 575	(3)	Statistics for Practitioners
EPIB 507	(3)	Biostats for Health Sciences

EXSU 606 (3) Statistics for Surgical Research

Complementary Courses (9 credits)

9 credits, taken from 500, 600, or 700 level courses in consultation with the Research Advisory Committee.

Depending on their individual background, students may be asked by their Research Advisory Committee to take additional courses.

12.1.10.6 Master of Science (M.Sc.) Experimental Surgery (Thesis): Digital Health Innovation (45 credits)

The M.Sc. in Experimental Surgery; Digital Health Innovation focuses on the basics of clinical epidemiology, medical artificial intelligence, clinical innovation, and applied data science, including the use and generation of digitized health and social data using specialized software. Fundamentals of current AI applications in medicine, methods to employ big data in clinical tool development, mathematical principals underpinning digital health and big data, and design thinking methodology in clinical innovation. High-volume streams of clinical and health-related data from clinical systems, wearables and social media.

Thesis Courses (30 credits)

EXSU 690	(4)	M.Sc. Research 1
EXSU 691	(4)	M.Sc. Research 2
EXSU 692	(4)	M.Sc. Research 3
EXSU 693	(18)	M.Sc. Thesis

Required Courses (15 credits)

EXMD 600	(3)	Principles of Clinical Research
EXMD 601	(3)	Real World Applications of Data Science and Informatics
EXMD 634	(3)	Quantitative Research Methods
EXSU 500	(3)	Artificial Intelligence in Medicine
EXSU 620	(3)	Surgical Innovation 1

12.1.10.7 Master of Science (M.Sc.) Experimental Surgery (Thesis): Global Surgery (45 credits)

The M.Sc. in Experimental Surgery, Concentration in Global Surgery, emphasizes health care needs specifically within the surgical field in resource-limited settings. It comprises three main pillars: research, education, and mentorship. Through extensive research work, students will participate in the design and implementation of innovative approaches in surgical care and injury surveillance, advancing the surgical capacities in low and middle income countries. Students will also participate in global surgical endeavors allowing professionals from partner countries and Canada to engage in a learning and knowledge transfer experience through training and courses. Students choosing this option will have the opportunity to engage in international research projects including injury epidemiology surveillance and assessment of surgical access through the study of databases. The thesis must be relevant to global surgery.

Thesis Courses (30 credits)

EXSU 690	(4)	M.Sc. Research 1
EXSU 691	(4)	M.Sc. Research 2
EXSU 692	(4)	M.Sc. Research 3
EXSU 693	(18)	M.Sc. Thesis

Required Courses (9 credits)

EPIB 507	(3)	Biostats for Health Sciences
EPIB 521	(3)	Regression Analysis for Health Sciences
EXSU 602	(3)	Knowledge Management 2

Complementary Courses (6 credits)

6 credits, taken from 500-, 600-, or 700-level courses in consultation with the Research Advisory Committee.

Depending on their individual background, students may be asked by their Research Advisory Committee to take additional courses.

12.1.10.8 Master of Science (M.Sc.) Experimental Surgery (Thesis): Surgical Education (45 credits)

The M.Sc. in Experimental Surgery, Concentration in Surgical Education, provides a foundation in surgical education practice and research. The program highlights the unique teaching and learning environment of surgery coupled with a basis in educational theory, curricular design, and implementation. A major emphasis of this program is surgical educational research with the elaboration, designs, implementation, and analysis of a research project founded in best practices of educational research. The research project may encompass, but is not limited to, surgical stimulation, technical skills acquisition, surgical technology, and assessment.

Thesis Courses (30 credits)

EXSU 690	(4)	M.Sc. Research 1
EXSU 691	(4)	M.Sc. Research 2
EXSU 692	(4)	M.Sc. Research 3
EXSU 693	(18)	M.Sc. Thesis

Required Courses (6 credits)

EDPH 689	(3)	Teaching and Learning in Higher Education
EXSU 603	(3)	Surgical Education Foundations

Complementary Courses (9 credits)

3 credits from the following:

EDPE 575	(3)	Statistics for Practitioners
EDPE 637	(3)	Issues in Health Professions Education
EXSU 606	(3)	Statistics for Surgical Research

And:

6 credits, taken from 500-, 600-, or 700-level courses in consultation with the Research Advisory Committee.

Depending on their individual backgrounds, students may be asked by their Research Advisory Committee to take additional courses.

12.1.10.9 Master of Science (M.Sc.) Experimental Surgery (Thesis): Surgical Innovation (45 credits)

The M.Sc. in Experimental Surgery, Concentration in Surgical Innovation, offers graduate-level training program in experimental surgery, leading to a Master's degree. This concentration allows for a hands-on learning experience for students to develop skills necessary to work within multidisciplinary teams in the creation of novel, needs driven, and marketable prototypes used in development of novel surgical and medical devices. As such participants work in multidisciplinary teams to identify clinical needs and to innovate solutions to them.

Thesis Courses (30 credits)

EXSU 690	(4)	M.Sc. Research 1
EXSU 691	(4)	M.Sc. Research 2
EXSU 692	(4)	M.Sc. Research 3
EXSU 693	(18)	M.Sc. Thesis

Required Courses (12 credits)

EXSU 619	(3)	The Hospital Environment
EXSU 620	(3)	Surgical Innovation 1
EXSU 621	(3)	Surgical Innovation 2

And:

3 credits from the following:

EDPE 575	(3)	Statistics for Practitioners
EPIB 507	(3)	Biostats for Health Sciences
EXSU 606	(3)	Statistics for Surgical Research

Complementary Courses (3 credits)

3 credits taken from 500-, 600-, or 700- level courses in consultation with the Research Advisory Committee.

Depending on their individual background, students may be asked by their Research Supervisory Committee to take additional courses.

12.1.10.10 Master of Science (M.Sc.) Experimental Surgery (Thesis): Surgical Outcomes Research (45 credits)

The M.Sc. in Experimental Surgery; Surgical Outcomes Research program focuses on the science of measuring and improving the outcomes of surgical patients. Coursework addresses research methods, biostatistics, and strategies to measure and improve postoperative outcomes. The thesis component of the program must focus on a topic in the field of surgical outcomes research.

Required Courses (33 credits)

EXSU 610	(3)	Surgical Outcomes Research Foundations
EXSU 690	(4)	M.Sc. Research 1
EXSU 691	(4)	M.Sc. Research 2
EXSU 692	(4)	M.Sc. Research 3
EXSU 693	(18)	M.Sc. Thesis

Complementary Courses (12 credits)

3 credits from the following:

EPIB 600	(3)	Clinical Epidemiology
EXMD 600	(3)	Principles of Clinical Research

3 credits from the following:

EPIB 507	(3)	Biostats for Health Sciences
EXMD 634	(3)	Quantitative Research Methods

6 credits from the following:

EPIB 521	(3)	Regression Analysis for Health Sciences
EPIB 629	(3)	Knowledge Synthesis
EXSU 500	(3)	Artificial Intelligence in Medicine
FMED 625	(3)	Qualitative Health Research
PPHS 527	(3)	Economics for Health Services Research and Policy

Or other relevant 500-, 600-, or 700-level courses upon approval of the student's Research Advisory Committee.

12.1.10.11 Master of Science (M.Sc.) Experimental Surgery (Non-Thesis) (45 credits)

This M.Sc. in Experimental Surgery (Non Thesis) offers a graduate level training program in core fundamentals of modern surgical research. The program is based primarily on academic course work and short projects. It is designed to be flexible and provide students the opportunity to gain core disciplines whilst allowing training opportunities in more specific areas such as global surgery, innovation, education, or as the interest of the students dictates. The individual research interests of the faculty cover a wide spectrum, from injury, repair, recovery, tissue engineering, transplantation, fibrosis, cancer and stem

cell biology, biomechanics, and organ failure, to surgical simulation, surgical innovation, education, and evaluative/outcomes research. Importantly, the project(s) is performed in a collaborative spirit with basic and clinician scientists working together using interdisciplinary approaches to solve the most challenging problems in the field of surgery. Upon graduation, students will have acquired core skills on statistics, knowledge management, biomedical research, epidemiology as well as education, global surgery, and innovation.

Required Courses (21 credits)

EXSU 500	(3)	Artificial Intelligence in Medicine
EXSU 602	(3)	Knowledge Management 2
EXSU 622D1	(6)	Surgery Research Project 1
EXSU 622D2	(6)	Surgery Research Project 1

And:

3 credits from:

EDPE 575	(3)	Statistics for Practitioners
EPIB 507	(3)	Biostats for Health Sciences
EXSU 606	(3)	Statistics for Surgical Research

Complementary Courses (21 credits)

3 credits selected from:

EXSU 603	(3)	Surgical Education Foundations
FMED 525	(3)	Foundations of Translational Science

6 credits selected from:

EDPE 637	(3)	Issues in Health Professions Education
EDPH 689	(3)	Teaching and Learning in Higher Education
EPIB 521	(3)	Regression Analysis for Health Sciences
EXSU 505	(3)	Trends in Precision Oncology
EXSU 620	(3)	Surgical Innovation 1
EXSU 621	(3)	Surgical Innovation 2
PPHS 528	(3)	Economic Evaluation of Health Programs

Note: Students either take EDPE 637 and EDPH 689; or EPIB 521 and PPHS 528; or EXSU 620 and EXSU 621.

12 credits selected from:

ANAT 690D1	(3)	Cell and Developmental Biology
ANAT 690D2	(3)	Cell and Developmental Biology
BMDE 653	(3)	Patents in Biomedical Engineering
BMDE 654	(3)	Biomedical Regulatory Affairs - Medical Devices
BMDE 655	(3)	Biomedical Clinical Trials - Medical Devices
DENT 669	(3)	Extracellular Matrix Biology
DENT 673	(3)	Biotechnology and Entrepreneurship
EDPE 637	(3)	Issues in Health Professions Education
EDPE 687	(3)	Qualitative Methods in Educational Psychology
EDPH 689	(3)	Teaching and Learning in Higher Education

EPIB 641	(1)	Substantive Epidemiology 1
EPIB 643	(1)	Substantive Epidemiology 3
EPIB 681	(3)	Global Health: Epidemiological Research
EXMD 609	(3)	Cellular Methods in Medical Research
EXMD 610	(3)	Molecular Methods in Medical Research
EXSU 601	(3)	Knowledge Management 1
EXSU 605	(3)	Biomedical Research Innovation
EXSU 620	(3)	Surgical Innovation 1
EXSU 621	(3)	Surgical Innovation 2
EXSU 623	(6)	Surgery Research Project 2
EXSU 684	(3)	Signal Transduction
FMED 619	(3)	Program Management in Global Health and Primary Health Care
PHGY 518	(3)	Artificial Cells
PHGY 550	(3)	Molecular Physiology of Bone
PPHS 511	(3)	Fundamentals of Global Health
PPHS 529	(3)	Global Environmental Health and Burden of Disease

Electives (3 credits)

3 credits taken from 500-, 600-, or 700-level courses at the University will be taken with the approval of the director of the program/adviser.

12.1.10.12 Doctor of Philosophy (Ph.D.) Experimental Surgery**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (3 credits)

EXSU 700	(0)	Comprehensive Examination
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And:

3 credits from the following:

EDPE 575	(3)	Statistics for Practitioners
EPIB 507	(3)	Biostats for Health Sciences
EXSU 606	(3)	Statistics for Surgical Research

Complementary Courses (12 credits)

6 credits from the following:

EDPH 689	(3)	Teaching and Learning in Higher Education
EXMD 634	(3)	Quantitative Research Methods
EXSU 500	(3)	Artificial Intelligence in Medicine
EXSU 601	(3)	Knowledge Management 1
EXSU 602	(3)	Knowledge Management 2
EXSU 603	(3)	Surgical Education Foundations

EXSU 619	(3)	The Hospital Environment
EXSU 620	(3)	Surgical Innovation 1
EXSU 621	(3)	Surgical Innovation 2

And 6 credits at the 500 level or higher in the student's specialty, selected in consultation with the Research Supervisory Committee.

12.1.10.13 Graduate Certificate (Gr. Cert.) Surgical Innovation (15 credits)

The core of this 15-credit graduate program consists of two innovation courses (EXSU 620 and EXSU 621) delivered by McGill Department of Surgery, with some sessions offered by external partners: John Molson School of Business (lean start-up), Concordia (software design), Local Industry (Regulatory & IP), and ETS (prototyping). The first semester of the program core focuses on team building and, supported by lectures, the students embark on a needs-finding process by observing all aspect of clinical activity in their focus themes. Trainees learn basic prototyping skills, start up organization and project management, supplemented by a basic statistics course and an introduction to the current status of biomedical research innovation. This certificate provides a solid foundation in the innovation process.

Required Courses (12 credits)

9 credits in:

EXSU 619	(3)	The Hospital Environment
EXSU 620	(3)	Surgical Innovation 1
EXSU 621	(3)	Surgical Innovation 2

And:

3 credits from the following:

EDPE 575	(3)	Statistics for Practitioners
EPIB 507	(3)	Biostats for Health Sciences
EXSU 606	(3)	Statistics for Surgical Research

Some courses may be substituted with equivalents if timetabling requires it.

Elective Course (3 credits)

3 credits at the 500 level or higher, taken in consultation with the program director/adviser.

12.1.10.14 Graduate Diploma (Gr. Dip.) Surgical Innovation (30 credits)

The cores of this 30-credit program are two-fold. Firstly, two innovation courses are offered by the McGill Department of Experimental Surgery (EXSU 620-Surgical Innovation & 621-Surgical Innovation 2) and supporting courses are delivered by the McGill Department of Surgery with some sessions in those courses provided by external partners: Local Industry (Regulatory & IP), the John Molson School of Business (JMSB) (lean start-up), Concordia University (software design), and L'École de technologie supérieure (ETS) (prototyping). Secondly, fundamental business and management courses provided by the School of Continuing Studies (McGill) and JMSB are taken concurrently and reinforce the innovation project team experience. Students embark on a hospital-based needs finding process by observing all aspects of clinical activity in their focus themes. The trainees learn basic prototyping skills, start-up organization, and project management. This is supplemented by a basic statistics course and an introduction to the current status of biomedical research innovation. This graduate diploma then gives a business-oriented training in the surgical innovation process.

Required Courses (15 credits)

12 credits in:

CORG 556	(3)	Managing and Engaging Teamwork
EXSU 619	(3)	The Hospital Environment
EXSU 620	(3)	Surgical Innovation 1
EXSU 621	(3)	Surgical Innovation 2

And:

3 credits from the following:

EDPE 575	(3)	Statistics for Practitioners
EPIB 507	(3)	Biostats for Health Sciences
EXSU 606	(3)	Statistics for Surgical Research

Complementary Courses (9 credits)

9 credits from the following:

CACC 520	(3)	Accounting for Management
CMR2 542	(3)	Marketing Principles and Applications
CPL2 510	(3)	Communication and Networking Skills

Or:

9 credits of graduate-level courses taken at Concordia University, chosen in consultation with the program director/adviser.

Elective Courses (6 credits)

6 credits at the 500 lever or higher, taken in consultation with the program director/adviser.

Some courses may be substituted with equivalents at the 500 level or higher if timetabling or background of the student requires it, e.g., prior qualification in accounting.

12.2 Biomedical Sciences**12.2.1 Location**

School of Biomedical Sciences
3605 de la Montagne
Montreal QC H3G 2M1
Website: mcgill.ca/medhealthsci/education/our-schools-1829-present/school-biomedical-sciences

12.2.2 Anatomy and Cell Biology**12.2.2.1 Location**

Department of Anatomy and Cell Biology
Strathcona Anatomy and Dentistry Building
3640 University Street, Rooms M21-M31
Montreal QC H3A 0C7
Canada
Telephone: 514-398-6350
Fax: 514-398-5047
Website: mcgill.ca/anatomy

12.2.2.2 About Anatomy and Cell Biology

The Department offers graduate programs leading to **M.Sc.** and **Ph.D.** degrees. Research in the Department investigates the dynamics and organization of molecules, organelles, cells, and tissues in several major systems of the body. The work makes fundamental contributions to a number of established and emerging multidisciplinary fields such as:

- cell and molecular biology;
- cellular immunology and hematology;
- reproductive biology;
- calcified tissue biology;
- tumour cell biology;
- developmental biology;

- neurobiology;
- aging.

The Department offers contemporary facilities for the wide range of techniques currently employed in research. Modern methods of cell and molecular biology, immunology, and biochemistry are used in conjunction with specialized microscopy in a variety of experimental systems.

The Department has one of the largest and best-equipped electron microscope facilities in the world. Currently in use are four modern electron microscopes which include a Tecnai F20 and a Titan Krios. Combined with some of these microscopes are computer-aided analytical equipment capable of elemental microanalysis, histomorphometry, reconstruction, and quantitation. The high-voltage microscope is particularly useful for certain analytical electron optical procedures such as electron diffraction, lattice imaging, and three-dimensional electron microscopy.

Funding

The minimum yearly stipend for Canadian Citizens and Permanent Residents is \$20,000 for MSc students, and \$22,000 for PhD students. MSc and PhD International students will receive a minimum yearly stipend of \$24,000 to compensate for tuition fees higher than Canadian Citizens, Permanent Residents, and Quebec-resident students. The minimum stipend for International students is guaranteed for the duration of the residency period in which students pay their highest fees.

All students are financially supported either by their supervisor or through fellowships or scholarships. Prospective students are urged to make every effort to secure their own funding. Applications may be made for a variety of fellowships administered by the University or by various federal, provincial, or private agencies. For more information on fellowships and awards, see the [Graduate and Postdoctoral Studies website](#).

Departmental Seminars

Nationally and internationally recognized scientists present their research findings to the Department at a regular [seminar series](#) throughout the academic year. On a regular basis, graduate students also present their own research progress and results to other students, postdoctoral fellows, and researchers in the Department through the Research in Progress Seminar Series.

section 12.2.2.5: Master of Science (M.Sc.) Cell Biology (Thesis) (45 credits)

Graduate research activities leading to the presentation of the M.Sc. Thesis involve original experimental work in one of the areas being actively investigated by the Department's research supervisors. Our graduate program offers training in a personal, unique, and multidisciplinary environment in a top Canadian university with worldwide recognition. The thesis-based Master's training is intended for students with a B.Sc. or B.A. degree in life sciences from a university of recognized reputation. Candidates with an M.D., D.D.S., or D.V.M. degree are also welcome. Students are trained in how to address biological problems with an integrative understanding of cell biology by conducting hypothesis-driven projects. The training provides all the tools required for successful careers in academic settings as well as in industry or other fields.

section 12.2.2.6: Doctor of Philosophy (Ph.D.) Cell Biology

Graduate research activities leading to the presentation of the Ph.D. thesis involve original experimental work in one of the areas being actively investigated by the Department's research supervisors. Our graduate program offers training in a personal, unique, and multidisciplinary environment in a top Canadian university with worldwide recognition. The thesis-based Ph.D. training is intended for students with a B.Sc., B.A., or M.Sc. degree in life sciences from a university of recognized reputation. Candidates with an M.D., D.D.S., or D.V.M. degree are also welcome. Students are trained in how to address biological problems with an integrative understanding of cell biology by conducting hypothesis-driven projects. The training provides all the tools required for successful careers in academic settings as well as in industry or other fields.

12.2.2.3 Anatomy and Cell Biology Admission Requirements and Application Procedures

12.2.2.3.1 Admission Requirements

Admission is based on the candidate's academic record and letters of recommendation. A minimum cumulative grade point average (CGPA) of 3.0 out of 4.0 is required. Once a student has submitted all the required documents, the applicant's file will be reviewed by the Graduate Admission Committee. Files that do not meet the minimum requirement will not be considered. Applicants must also be accepted by a research supervisor who is a faculty member or an associate member of the Department of Anatomy and Cell Biology (Adjunct members may serve only as co-supervisors while the primary supervisor must be a full or associate member of the Department). Recommendation for admission will be made once the applicant has secured a supervisor and adequate financial support. Financial support should be in the form of a stipend from the supervisor's research grant or a fellowship held by the student.

Master's Program (Cell Biology)

1. A B.Sc. degree in life sciences or any of M.D., D.D.S., or D.V.M. degrees from a university of recognized reputation
2. Evidence of a high academic achievement with a minimum cumulative grade point average (CGPA) of 3.0 out of 4.0 as indicated in the general guidelines set up by GPS

Ph.D. Program (Cell Biology)

1. An M.Sc. degree in life sciences or any of M.D., D.D.S., or D.V.M. degrees from a university of recognized reputation
2. Evidence of a high academic achievement with a minimum cumulative grade point average (CGPA) of 3.0 out of 4.0 as indicated in the general guidelines set up by GPS

International Applicants

Graduate studies applicants whose mother tongue is not English and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction, or from a recognized Canadian institution (anglophone or francophone), must submit the following:

TOEFL: Minimum score of 86 on the Internet-based test (iBT) with each component score 20 or higher.

or

IELTS: Minimum overall band score of 6.5.

12.2.2.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources > Graduate > Graduate Admissions and Application Procedures > : Application Procedures](#) for detailed application procedures. Further details from the department can be found under the "Applying" tab at mcgill.ca/anatomy/graduate.

All applicants are advised to contact potential research supervisors before the application process since supervisor acceptance is required. Information about the research interests of faculty members can be found in our [Departmental Directory](#).

Program guidelines are listed under the "Master's" and "Doctorate" tabs at mcgill.ca/anatomy/graduate.

1222.32.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Agreement of a faculty member to act as Thesis Supervisor and to provide adequate financial support

12.2.2.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Anatomy and Cell Biology and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

	Application Opening Dates		Application Deadlines	
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
Fall Term:	Sept. 15	April 21	June 21	June 21
Winter Term:	Feb. 15	Sept. 1	Nov. 10	Nov. 10
Summer Term:	N/A	N/A	N/A	N/A

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

12.2.2.4 Anatomy and Cell Biology Faculty

Chair

Craig Mandato

Emeritus Professors

Gary C. Bennett, John J.M. Bergeron, James R. Brawer, Louis Hermo, Sandra C. Miller, Dennis G. Osmond, Hershey Warshawsky

Professors

Chantal Autexier, Samuel David, Elaine Davis, Timothy Kennedy, Nathalie Lamarche-Vane, Marc D. McKee, Peter McPherson, Carlos R. Morales, Joaquin Ortega, Barry I. Posner, Dieter Reinhardt, Alfredo Ribeiro-da-Silva, Wayne Sossin, Stefano Stifani, Hojatollah Vali, Dominique Walker

Associate Professors

Orest W. Blaschuk, Khanh Huy Bui, Craig Mandato, John F. Presley

Assistant Professors

Susanne Bechstedt, Sean McWatt, Michael Strauss, Mikaela Stiver, Gabriel Venne, Nicole Ventura, Mina Zeroual, Natalie Zeytuni

Associate Members

Biochemistry: Donna Senger, Peter Siegel

Bioengineering: Allen Ehrlicher

Associate Members*Biomedical Engineering:* Maryam Tabrizian*Dentistry:* Mari T. Kaartinen, Svetlana Komarova*Endocrinology & Metabolism:* Christian Rocheleau*Human Genetics:* Loydie A. Jerome-Majewska*Ingram School of Nursing:* Rosetta Antonacci*Medicine:* Giovanni Di Battista, Janet Henderson, Stephane Laporte, Stéphanie Lehoux, Donna Senger, Peter Siegel*Neurology and Neurosurgery:* Colin Chalk, Jean-François Cloutier, Alyson Fournier, Andréa Leblanc, Heidi McBride, Edward S. Ruthazer, Charles E. Smith, Thomas Stroh*Obstetrics and Gynecology:* Makato Nagano*Oncology:* Stephen Robbins, Donna Senger*Pediatrics:* Loydie A. Jerome-Majewska*Pharmacology and Therapeutics:* Daniel Bernard, Claudio Cuello, Jason Tanny*Physiology:* Claire Brown*Surgery:* Lisbet Haglund, David Labbé, Peter Metrakos*Urology:* David Labbé**Adjunct Professors**

Gregor Andelfinger, Philippe Campeau, Michel Cayouette, Frédéric Charron, Jean-François Côté, Daniel Cyr, Jacques Drouin, Jennifer Estall, Patrick Freud, Michael Greenwood, David Hipfner, Artur Kania, Justin Kollman, Stéphane Lefrançois, Alexei Pshezhetsky, Isabelle Rouiller, Michael Sacher, Elitza Tocheva, Javier Vargas

12.2.2.5 Master of Science (M.Sc.) Cell Biology (Thesis) (45 credits)**Thesis Course (24 credits)**

ANAT 698	(24)	M.Sc. Thesis Research 1
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Required Course (12 credits)

ANAT 601	(3)	MSc Seminar Examination
ANAT 695	(3)	Seminars in Cell Biology 1
ANAT 696	(3)	Seminars in Cell Biology 2
ANAT 697	(3)	Seminars in Cell Biology 3

Complementary Courses (9 credits)

6 credits from one of two streams: Cell Developmental Biology Stream or Human Systems Biology Stream

Cell Developmental Biology Stream

ANAT 690D1	(3)	Cell and Developmental Biology
ANAT 690D2	(3)	Cell and Developmental Biology

Human Systems Biology Stream

** This stream is currently under review. **

6 credits required:

ANAT 690D1	(3)	Cell and Developmental Biology
ANAT 690D2	(3)	Cell and Developmental Biology

3 credits selected from:

BMDE 502	(3)	BME Modelling and Identification
BMDE 519	(3)	Biomedical Signals and Systems
BTEC 501	(3)	Bioinformatics
COMP 564	(3)	Advanced Computational Biology Methods and Research
COMP 680	(4)	Mining Biological Sequences
EXMD 602	(3)	Techniques in Molecular Genetics
MIMM 613	(3)	Current Topics 1
MIMM 614	(3)	Current Topics 2
MIMM 615	(3)	Current Topics 3
NEUR 502	(3)	Basic and Clinical Aspects of Neuroimmunology

Upon consultation with the supervisor, students may select a 3-credit course outside of this list from Biomedical Science courses at the 500-600 level.

12.2.2.6 Doctor of Philosophy (Ph.D.) Cell Biology

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses

ANAT 690D1	(3)	Cell and Developmental Biology
ANAT 690D2	(3)	Cell and Developmental Biology
ANAT 695	(3)	Seminars in Cell Biology 1
ANAT 696	(3)	Seminars in Cell Biology 2
ANAT 697	(3)	Seminars in Cell Biology 3
ANAT 701	(0)	Ph.D. Comprehensive Examination

12.2.3 Biochemistry

12.2.3.1 Location

Department of Biochemistry
 McIntyre Medical Sciences Building
 3655 Promenade Sir-William-Osler
 Montreal QC H3G 1Y6
 Canada
 Christine Laberge: Student Affairs Officer/Graduate Program Coordinator
 Telephone: 514-398-2423
 Email: christine.laberge@mcgill.ca
 Website: mcgill.ca/biochemistry

12.2.3.2 About Biochemistry

The Department of Biochemistry offers M.Sc. and Ph.D. programs, which emphasize laboratory research. Our research interests include:

- molecular and cell biology;
- the regulation of gene and protein expression;
- signal transduction;

- protein structure and function;
- membrane biology;
- cell death and differentiation;
- embryonic development;
- neurobiology;
- bioinformatics;
- cancer.

Specialized graduate training programs in Chemical Biology, Human Systems Biology (Bioinformatics), *Cancer Research/Oncology*, and *Structural Biology* are available. Laboratories are located in the new Bellini Life Sciences Building and Rosalind and Morris Goodman Cancer Research Institute, and the renovated McIntyre Medical Sciences Building, together comprising one of the best-equipped research facilities in Canada. The outstanding quality of our research has been recognized by recent awards including a Gairdner Award, two Killam Prizes, and eight Canada Research Chairs.

Funding

Master's students receive a minimum stipend of \$20,000 annually; doctoral students receive \$22,000. The Department is committed to helping graduate students secure adequate funding for their research. All students are financially supported either by their supervisor or through fellowships or scholarships. Prospective students are urged to make every effort to secure their own funding. Applications may be made for a variety of fellowships administered by the University or by various federal, provincial, or private agencies. For more information on fellowships and awards, see the [Graduate and Postdoctoral Studies website](#).

Departmental Seminars

Visiting scientists and senior doctoral students present their research findings to the Department at a regular seminar series throughout the academic year. All graduate students are required to attend the regular seminars and additional special lectures, and are encouraged to attend scientific conferences and symposia.

section 12.2.3.5: Master of Science (M.Sc.) Biochemistry (Thesis) (45 credits)

The M.Sc. in Biochemistry introduces students to laboratory-based research at an advanced level. The M.Sc. program offers core courses in advanced biochemistry topics, but focuses on laboratory research. The program provides sophisticated training in the technical as well as theoretical aspects of biochemistry, at one of the leading Biochemistry departments in Canada. The M.Sc. program is an excellent preparation for skilled positions in the biomedical sciences, in industry or the public sector, or for superior research in a Ph.D. program.

section 12.2.3.6: Master of Science (M.Sc.) Biochemistry (Thesis): Bioinformatics (45 credits)

Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. The intention of the Bioinformatics option is to train students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyse datasets, the application of modelling techniques, the creation of tools for manipulating bioinformatics data, the integration of biological databases, and the use of algorithms and statistics.

Students successfully completing the Bioinformatics option at the M.Sc. level will be fluent in the concepts, language, approaches, and limitations of the field.

The option consists of a number of interdisciplinary courses and a seminar designed to bring students from many backgrounds together and to provide a thorough overview of research in this field.

section 12.2.3.7: Master of Science (M.Sc.) Biochemistry (Thesis): Chemical Biology (47 credits)

The Chemical Biology Thematic Group is engaged in a diverse range of research topics, which span structural biology, enzymology, nucleic acid research, signalling pathways, single molecule biophysics, and biophysical chemistry of living tissues. Among the themes that unite the research being performed in this group is the attempt to learn new chemistry and physics from biological systems. We have projects relating to pharmaceutically relevant enzymes such as those involved in drug metabolism and antibiotic resistance; development of therapeutic agents in the control of inflammation, cancer, and viral infections; the chemical biology of NO; quantification of bioenergetic markers of metabolism; self-assembly mechanisms of the HIV-1 virion capsid; liposome microarray systems to address membrane protein dynamics and recognition; studies on reactive oxygen species translocation across the aqueous/lipid membrane interface; RNAi/antisense technologies; dynamic combinatorial chemistry; protein dynamics and function; mechanistic aspects involved in cellular adhesion and transport in membrane and zeolite channels; and cutting-edge microscopes used to examine transport, motility, and reactivity in cells.

The Chemical Biology graduate option is centred on the pursuit of an original research project under the direction of one or more mentors. The program is supported by McGill University and by the Canadian Institutes of Health Research (CIHR) through its Strategic Training Initiatives program.

The program of training incorporates several important features, including a diverse curriculum and programs of seminars, workshops, and discussion groups designed to provide students with a well-rounded exposure to both the chemical and biological aspects of the discipline. The M.Sc. option provides a foundation in the concepts and approaches of Chemical Biology.

section 12.2.3.8: Doctor of Philosophy (Ph.D.) Biochemistry

The Ph.D. in Biochemistry trains students in laboratory-based research at the highest level. The Ph.D. program is streamlined to emphasize independent research, and the many areas of biochemistry studied in our Department offer a wide choice of specialties. Students gain in-depth expertise in biochemistry

section 12.2.3.8: Doctor of Philosophy (Ph.D.) Biochemistry

and the biomedical sciences, with the opportunity to carry out research projects at a world-class level and build collaborations with other leading research groups.

Graduates of the Ph.D. program are outstandingly prepared for leadership careers in the basic health sciences in industry, the public sector, or academia.

section 12.2.3.9: Doctor of Philosophy (Ph.D.) Biochemistry: Bioinformatics

Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. The intention of the Bioinformatics option is to train students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyse datasets, the application of modelling techniques, the creation of tools for manipulating Bioinformatics data, the integration of biological databases, and the use of algorithms and statistics.

Students successfully completing the Bioinformatics option at the Ph.D. level will be fluent in the concepts, language, approaches, and limitations of the field, and have the capability of developing an independent Bioinformatics research program.

The option consists of a number of interdisciplinary courses and a seminar designed to bring students from many backgrounds together and to provide a thorough overview of research in this field.

section 12.2.3.10: Doctor of Philosophy (Ph.D.) Biochemistry: Chemical Biology

The Chemical Biology Thematic Group is engaged in a diverse range of research topics which span structural biology, enzymology, nucleic acid research, signalling pathways, single molecule biophysics, and biophysical chemistry of living tissues. Among the themes which unite the research being performed in this group is trying to learn new chemistry and physics from biological systems. We have projects relating to pharmaceutically relevant enzymes such as those involved in drug metabolism and antibiotic resistance; development of therapeutic agents in the control of inflammation, cancer and viral infections; the chemical biology of NO; quantification of bioenergetic markers of metabolism; self-assembly mechanisms of the HIV-1 virion capsid; liposome microarray systems to address membrane protein dynamics and recognition; studies on reactive oxygen species translocation across the aqueous/lipid membrane interface; RNAi/antisense technologies; dynamic combinatorial chemistry; protein dynamics and function; mechanistic aspects involved in cellular adhesion and transport in membrane and zeolite channels; and cutting-edge microscopes used to examine transport, motility, and reactivity in cells.

The Chemical Biology graduate option is centred on the pursuit of an original research project under the direction of one or more mentors. The program is supported by McGill University and by the Canadian Institutes of Health Research (CIHR) through its Strategic Training Initiatives program.

The program of training incorporates several important features, including a diverse curriculum and programs of seminars, workshops, and discussion groups designed to provide students with a well-rounded exposure to both the chemical and biological aspects of the discipline. The Ph.D. option provides advanced training in Chemical Biology based on independent research.

Financial support for students in the program is available from a variety of sources, including competitively awarded CIHR-funded Chemical Biology Scholarship awards.

12.2.3.3 Biochemistry Admission Requirements and Application Procedures**12.2.3.3.1 Admission Requirements**

Admission is based on the candidate's academic record, letters of recommendation, curriculum vitae, and personal statement. A minimum grade point average of 3.2/4.0 (B+) is required. Once a student has submitted all the required documents, the applicant's file will be reviewed by the Graduate Admission Committee. Files that do not meet the minimum requirement will not be considered. Applicants must also be accepted by a research supervisor who is a faculty member or associate member of the Department of Biochemistry. Recommendation for admission will be made once the applicant has secured a supervisor and adequate financial support. Financial support should be in the form of a stipend from the supervisor's research grant or a fellowship held by the student.

Master's Program

Candidates for the M.Sc. degree must hold a B.Sc. degree or its equivalent in Biochemistry or in related disciplines (e.g., biology, chemistry, physiology, microbiology).

Doctoral Program

Candidates who have completed their M.Sc. degree may be admitted directly to the Ph.D. program. Candidates who are admitted to the M.Sc. program and who are interested in the Ph.D. may transfer into the Ph.D. program after successfully completing the transfer seminar (BIOC 701) and all course requirements. The M.Sc. thesis requirement is then waived.

International Applicants

Applicants to graduate studies whose mother tongue is not English and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit the following:

- **TOEFL** (Test of English as a Foreign Language): N.B. an institutional version of the TOEFL is not acceptable. Minimum acceptable scores are: IBT (Internet-Based Test): 86 overall, no less than 20 in each of the four component scores.

or

IELTS: (International English Language Testing System): a band score of 6.5 or greater (Academic module)

- International students who have received their degree outside North America should submit *GRE* scores: The GRE is not required but is recommended for international students. The Biochemistry subject test is now part of the Biology test. The most important sub-score is "Cellular and Molecular Biology", followed by "Evolution"; "Organismal Biology and Ecology" is less important.

For additional information, please consult the department's [website](#).

Admission Requirements – Bioinformatics or Chemical Biology Option (options are not offered at this time- in review)

As for the regular graduate programs of the Biochemistry Department, acceptance into the Bioinformatics or Chemical Biology option consists of two steps:

1. Preliminary approval by the Department's Graduate Admission Committee based on the student's transcript, references, and other documents submitted with the application. The criteria for assessment at this level are the same as for the regular graduate programs of the Department.
2. Acceptance by a Bioinformatics or Chemical Biology research director. The director must propose a research project for the student that provides training in the methods and philosophy of Chemical Biology. Project proposals are assessed by the Bioinformatics or Chemical Biology Program Committee.

12.2.3.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures. Information for prospective students is also available on the Department of Biochemistry's [website](#).

All applicants are advised to contact potential research supervisors during or before the application process since supervisor acceptance is required. Information about the research interests of faculty members can be found at mcgill.ca/biochemistry/research and mcgill.ca/biochemistry/about-us/department/faculty-members.

12.2.3.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Curriculum Vitae
- Personal Statement
- Agreement of a faculty member to act as Thesis Supervisor and to provide adequate financial support
- Acceptance by a Bioinformatics or Chemical Biology research director

12.2.3.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Biochemistry and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

Application Opening Dates		Application Deadlines		
		All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)
Fall Term:	Sept. 15	April 20	June 15	June 15
Winter Term:	Feb. 15	Sept. 1	Nov. 1	Nov. 1
Summer Term:	N/A	N/A	N/A	N/A

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

12.2.3.4 Biochemistry Faculty

Chair

Albert Berghuis

Emeritus Professors

Rhoda Blostein, Philip E. Branton, Peter E. Braun, Robert E. MacKenzie, Walter E. Mushynski, Joseph Shuster, John R. Silvius, Clifford P. Stanners, Maria Zannis-Hadjopoulos, Imed Gallouzi

Professors

Nicole Beauchemin, Albert Berghuis, Maxime Bouchard, Josée Dostie, Thomas Duchaine, Kalle Gehring, Vincent Giguère, Philippe Gros, Alba Guarné, Roderick R. McInnes, William Muller, Bhushan Nagar, Alain Nepveu, Morag Park, Arnim Pause, Jerry Pelletier, Martin Schmeing, Nahum Sonenberg, Jose G. Teodoro, David Y. Thomas, Michel L. Tremblay.

Associate Professors

Sidong Huang, Selena M. Sagan, Ian Watson, Jason C. Young.

Assistant Professors

Natasha C. Chang, Maxime Denis, Lawrence Kazak, William Pastor, Maria Vera Ugalde.

Associate Members

Gary Brouhard, Marc Fabian, Robert S. Kiss, Gergely Lukacs, Luke McCaffrey, Joaquin Ortega, Janusz Rak, Stéphane Richard, Reza Salavati, Erwin Schurr, Peter Siegel, Ivan Topisirovic, Youla S. Tsantrizos, Bernard Turcotte, Josie Ursini-Siegel, Simon Wing, Xiang-Jiao Yang, Natalie Zeytun.

Adjunct Professors

Jacques Drouin, Enrico Purisima, Julie St-Pierre.

12.2.3.5 Master of Science (M.Sc.) Biochemistry (Thesis) (45 credits)**Thesis Courses (36 credits)**

BIOC 697	(9)	Thesis Research 1
BIOC 698	(12)	Thesis Research 2
BIOC 699	(15)	Thesis Research 3

Required Course (3 credits)

BIOC 696	(3)	Seminars in Biochemistry
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Complementary Courses* (6 credits)

At least 3 credits must be chosen from the following:

BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Protein Biology and Proteomics
BIOC 670	(3)	Biochemistry of Lipoproteins
EXMD 615	(3)	Essentials of Glycobiology
EXMD 635D1	(3)	Experimental/Clinical Oncology
EXMD 635D2	(3)	Experimental/Clinical Oncology

Plus additional credits, to a minimum of 6 total complementary course credits, of 500- or higher-level courses in biomedical and allied sciences.

* Complementary courses are chosen in consultation with the Research Director.

The Graduate Advisory Committee may stipulate additional coursework depending on the background of the candidate. BIOC 450 (Protein Structure and Function) and BIOC 454 (Nucleic Acids) are additional requirements for those who have not previously completed equivalent courses in their prior training.

12.2.3.6 Master of Science (M.Sc.) Biochemistry (Thesis): Bioinformatics (45 credits)**Thesis Courses (30 credits)**

BIOC 694	(3)	Thesis Research 4
BIOC 698	(12)	Thesis Research 2
BIOC 699	(15)	Thesis Research 3

Required Courses (6 credits)

BIOC 696	(3)	Seminars in Biochemistry
COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar

Complementary Courses* (9 credits)

3 credits to be chosen from the following courses:

BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Protein Biology and Proteomics
BIOC 670	(3)	Biochemistry of Lipoproteins
EXMD 615	(3)	Essentials of Glycobiology
EXMD 635D1	(3)	Experimental/Clinical Oncology
EXMD 635D2	(3)	Experimental/Clinical Oncology

Plus 6 credits from the following courses:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics
PHGY 603	(3)	Systems Biology and Biophysics

* Complementary courses are chosen in consultation with the Research Director.

The Graduate Advisory Committee may stipulate additional coursework depending on the background of the candidate. BIOC 450 (Protein Structure and Function) and BIOC 454 (Nucleic Acids) are additional requirements for those who have not previously completed equivalent courses in their prior training.

12.2.3.7 Master of Science (M.Sc.) Biochemistry (Thesis): Chemical Biology (47 credits)**Thesis Courses (33 credits)**

BIOC 695	(6)	Thesis Research 1 (Chemical - Biology)
BIOC 698	(12)	Thesis Research 2
BIOC 699	(15)	Thesis Research 3

Required Course (3 credits)

BIOC 696	(3)	Seminars in Biochemistry
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Complementary Courses* (11 credits)

Two of the following courses:

BIOC 610	(1)	Seminars in Chemical Biology 1
BIOC 611	(1)	Seminars in Chemical Biology 3
BIOC 689	(1)	Seminars in Chemical Biology 2

BIOC 690 (1) Seminars in Chemical Biology 4

At least 3 credits from the following:

CHEM 502 (3) Advanced Bio-Organic Chemistry
 CHEM 503 (3) Drug Discovery
 PHAR 503 (3) Drug Discovery and Development 1

and at least 3 credits from the following:

BIOC 600 (3) Advanced Strategies in Genetics and Genomics
 BIOC 603 (3) Genomics and Gene Expression
 BIOC 604 (3) Macromolecular Structure
 BIOC 605 (3) Protein Biology and Proteomics
 BIOC 670 (3) Biochemistry of Lipoproteins
 EXMD 615 (3) Essentials of Glycobiology
 EXMD 635D1 (3) Experimental/Clinical Oncology
 EXMD 635D2 (3) Experimental/Clinical Oncology

Plus additional credits, to a total of at least 11 complementary course credits from the following list:

CHEM 522 (3) Stereochemistry
 CHEM 582 (3) Supramolecular Chemistry
 CHEM 591 (3) Bioinorganic Chemistry
 CHEM 621 (5) Reaction Mechanisms in Organic Chemistry
 CHEM 629 (5) Organic Synthesis
 EXMD 510 (3) Bioanalytical Separation Methods
 EXMD 602 (3) Techniques in Molecular Genetics
 PHAR 504 (3) Drug Discovery and Development 2
 PHAR 562 (3) Neuropharmacology
 PHAR 563 (3) Endocrine Pharmacology
 PHAR 707 (3) Topics in Pharmacology 6

* Complementary courses are chosen in consultation with the Research Director.

The Graduate Advisory Committee may stipulate additional coursework depending on the background of the candidate. BIOC 450 (Protein Structure and Function) and BIOC 454 (Nucleic Acids) are additional requirements for those who have not previously completed equivalent courses in their prior training.

12.2.3.8 Doctor of Philosophy (Ph.D.) Biochemistry

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (3 credits)

BIOC 696* (3) Seminars in Biochemistry

BIOC 701**	(0)	Research Seminar 1
BIOC 702**	(0)	Ph.D. Thesis Proposal
BIOC 703**	(0)	Ph.D. Seminar

*Students promoted directly from the M.Sc. to the Ph.D. program, and who registered for and passed BIOC 696 at the M.Sc. level, do not register for BIOC 696 at the Ph.D. level.

** NOTE: Students DO NOT register for these courses until notified by the Student Affairs Officer.

Students must complete BIOC 701 in the third term after admission to the program, BIOC 702 in the fifth or sixth term, and BIOC 703 approximately six months prior to submission of the Ph.D. thesis.

Complementary Courses*** (6 credits)

At least 3 credits selected from:

BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Protein Biology and Proteomics
BIOC 670	(3)	Biochemistry of Lipoproteins
EXMD 615	(3)	Essentials of Glycobiology
EXMD 635D1	(3)	Experimental/Clinical Oncology
EXMD 635D2	(3)	Experimental/Clinical Oncology

Plus additional credits to a minimum of 6 total complementary course credits of 500- or higher-level courses in the biomedical and allied sciences.

*** Complementary courses are chosen in consultation with the Research Director.

The Graduate Advisory Committee may stipulate additional course work depending on the background of the candidate. BIOC 450 (Protein Structure and Function) and BIOC 454 (Nucleic Acids) are additional requirements for those who have not previously completed equivalent courses in their prior training.

12.2.3.9 Doctor of Philosophy (Ph.D.) Biochemistry: Bioinformatics

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (6 credits)

BIOC 696*	(3)	Seminars in Biochemistry
BIOC 701**	(0)	Research Seminar 1
BIOC 702**	(0)	Ph.D. Thesis Proposal
BIOC 703**	(0)	Ph.D. Seminar
COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar

* Students promoted directly from the M.Sc. to the Ph.D. program, and who registered for and passed BIOC 696 at the M.Sc. level, do not register for BIOC 696 at the Ph.D. level.

** NOTE: Students DO NOT register for these courses until notified by the Student Affairs Officer.

Students must complete BIOC 701 in the third term after admission to the program, BIOC 702 in the fifth or sixth term, and BIOC 703 approximately six months prior to submission of the Ph.D. thesis.

Complementary Courses*** (9 credits)

3 credits from the following:

BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Protein Biology and Proteomics
BIOC 670	(3)	Biochemistry of Lipoproteins
EXMD 615	(3)	Essentials of Glycobiology
EXMD 635D1	(3)	Experimental/Clinical Oncology
EXMD 635D2	(3)	Experimental/Clinical Oncology

Plus 6 credits from the following:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics
PHGY 603	(3)	Systems Biology and Biophysics

*** Complementary courses are chosen in consultation with the Research Director.

The Graduate Advisory Committee may stipulate additional coursework depending on the background of the candidate. BIOC 450 (Protein Structure and Function) and BIOC 454 (Nucleic Acids) are additional requirements for those who have not previously completed equivalent courses in their prior training.

12.2.3.10 Doctor of Philosophy (Ph.D.) Biochemistry: Chemical Biology

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (7 credits)

BIOC 610	(1)	Seminars in Chemical Biology 1
BIOC 611	(1)	Seminars in Chemical Biology 3
BIOC 689	(1)	Seminars in Chemical Biology 2
BIOC 690	(1)	Seminars in Chemical Biology 4
BIOC 696*	(3)	Seminars in Biochemistry
BIOC 701**	(0)	Research Seminar 1
BIOC 702**	(0)	Ph.D. Thesis Proposal
BIOC 703**	(0)	Ph.D. Seminar

* Students promoted directly from the M.Sc. to the Ph.D. program, and who registered for and passed BIOC 696 at the M.Sc. level, do not register for BIOC 696 at the Ph.D. level.

** NOTE: Students DO NOT register for these courses until notified by the Student Affairs Officer.

Students must complete BIOC 701 in the third term after admission to the program, BIOC 702 in the fifth or sixth term, and BIOC 703 approximately six months prior to submission of the Ph.D. thesis.

Complementary Courses* (9 credits)**

At least 3 credits from the following:

CHEM 502	(3)	Advanced Bio-Organic Chemistry
CHEM 503	(3)	Drug Discovery
PHAR 503	(3)	Drug Discovery and Development 1

At least 3 credits from the following:

BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Protein Biology and Proteomics
BIOC 670	(3)	Biochemistry of Lipoproteins
EXMD 615	(3)	Essentials of Glycobiology
EXMD 635D1	(3)	Experimental/Clinical Oncology
EXMD 635D2	(3)	Experimental/Clinical Oncology

Plus additional credits to a total of at least 9 complementary course credits from the following list:

CHEM 522	(3)	Stereochemistry
CHEM 582	(3)	Supramolecular Chemistry
CHEM 591	(3)	Bioinorganic Chemistry
CHEM 621	(5)	Reaction Mechanisms in Organic Chemistry
CHEM 629	(5)	Organic Synthesis
EXMD 510	(3)	Bioanalytical Separation Methods
EXMD 602	(3)	Techniques in Molecular Genetics
PHAR 504	(3)	Drug Discovery and Development 2
PHAR 562	(3)	Neuropharmacology
PHAR 563	(3)	Endocrine Pharmacology
PHAR 707	(3)	Topics in Pharmacology 6

*** Complementary courses are chosen in consultation with the Research Director.

The Graduate Advisory Committee may stipulate additional coursework depending on the background of the candidate. BIOC 450 (Protein Structure and Function) and BIOC 454 (Nucleic Acids) are additional requirements for those who have not previously completed equivalent courses in their prior training.

12.2.4 Biomedical Engineering**12.2.4.1 Location**

Department of Biomedical Engineering
Duff Medical Building
3775 University Street, Room 316
Montreal QC H3A 2B4
Canada

Telephone: 514-398-6736

Fax: 514-398-7461

Website: mcgill.ca/bme

12.2.4.2 About Biomedical Engineering

Excellent laboratory facilities for basic and applied research are available in the Department and in the laboratories of associated staff located elsewhere on campus. The Department operates a network of high-performance workstations and well-equipped mechanical and electronics workshops.

Basic research in the Department concentrates on the application of quantitative engineering analysis methods to basic biomedical research problems. Currently active areas of research include:

- neuromuscular and postural control;
- muscle mechanics;
- the vestibular system;
- oculomotor control;
- the auditory system;
- joint prosthetics;
- biomaterials;
- artificial cells and organs;
- cell and tissue engineering;
- drug delivery;
- microencapsulation;
- microbiome and probiotics;
- functional food and nutraceuticals;
- medical imaging;
- microfluidics;
- nanomedicine and nanotechnology;
- bioinformatics in genomics and proteomics.

Staff members are also active in more applied research related to the development of quantitative analysis tools and instruments for biomedical research. Areas of activity here include: signal analysis, system identification, modelling, simulation and parameter estimation, image processing, pattern recognition, ultrasound, and biorobotics.

section 12.2.4.5: Graduate Certificate (Gr. Cert.) Translational Biomedical Engineering (15 credits)

This program will enable students to translate advances in biomedical engineering research to clinical and commercial solutions. Students will learn the complementary skills needed to take early-stage research results from the bench to the bedside and bridge the gap between invention and product innovation.

The graduate certificate responds to the demand from students for such training and addresses the needs of the biomedical industry for such highly qualified personnel.

For additional information, see the [Biomedical Engineering website](#).

12.2.4.3 Biomedical Engineering Admission Requirements and Application Procedures

12.2.4.3.1 Admission Requirements

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Admission Requirements \(Minimum Requirements to be Considered for Admission\)](#). In addition, please see the Department's website: mcgill.ca/bme/programs/certificate.

12.2.4.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures.

Please address enquiries directly to the Department.

12.2.4.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Biomedical Engineering and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

	Application Opening Dates		Application Deadlines	
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
Fall Term:	Sept. 15	May 1	June 21	June 21
Winter Term:	Feb. 15	Sept. 10	Nov. 10	Nov. 10
Summer Term:	N/A	N/A	N/A	N/A

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.



Note: Applications for Summer term admission will not be considered.

12.2.4.4 Biomedical Engineering Faculty

Chair

D. Juncker

Emeritus Professors

T.M.S. Chang; H.L. Galiana.

Professors

D.L. Collins; D. Juncker; R.E. Kearney; S. Prakash; M. Tabrizian.

Associate Professors

W.R.J. Funnell; D. Bzdok.

Assistant Professors

G. Chen; A. Haidar; D.A. Rudko; C.L. Tardif.

Associate Members

M. Amabili; S. Baillet; C. Baker; S. Blain-Moraes; M. Chacron; X. Chai; M. Chakravarty; J. Ding; M. Driscoll; A. Ehrlicher; S. Enger; A. Evans; J. Gotman; D. Guitton; A. Hendricks; C. Hoesli; R. Hoge; Y. Iturria-Medina; A. Kamen; A. Katsarkas; J. Kildea; J. Kinsella; S. Komarova; A.-M. Lauzon; R. Leask; I. Levesque; J. Li; N. Li-Jessen; S. Lomber; G. Mitsis; L. Mongeau; R. Mongrain; C. Moraes; D. Nicolau; C. Pack; D. Pasini; W. Reisner; A. Shmuel; C. Wagner; B. Willie; Y.B. Xia.

Adjunct & Affiliate Members

P.G. Charette; K. Cullen; I. El Naqa; C. Grova; D. Kroo; L. Malic; H. Motallebzadeh; J.-M. Lina; M. Mekhail; J.L. Nadeau; P. Nguyen; G.B. Pike; A. Reader; T. Veres; P. Warrick.

12.2.4.5 Graduate Certificate (Gr. Cert.) Translational Biomedical Engineering (15 credits)

This program comprises mandatory courses dealing with topics that are unique to the translational process in the biomedical engineering environment. Topics covered will include: managing intellectual property; patents and the patenting process; regulatory affairs; medical standards; quality management systems; and clinical trials. Complementary courses will provide students with advanced training in a specialized area of biomedical engineering selected from the areas where Departmental staff have significant expertise.

In cases where students have taken one or more of the core courses as part of another program, these core courses will be replaced with the equivalent number of credits, at the 500 level or higher, by other appropriate courses selected in consultation with the program director.

Required Courses (9 credits)

Three courses dealing with issues related specifically to the translation of biomedical engineering advances to clinical and commercial environments:

BMDE 653	(3)	Patents in Biomedical Engineering
BMDE 654	(3)	Biomedical Regulatory Affairs - Medical Devices

BMDE 655 (3) Biomedical Clinical Trials - Medical Devices

Complementary Courses (6 credits)

Students must complete 6 credits of biomedical engineering course work selected from one or more of the following domains or other appropriate courses at the 500 level or higher approved by the Program Director:

General Biomedical Engineering

BMDE 501 (3) Selected Topics in Biomedical Engineering

Biomedical Signals and Systems

BMDE 502 (3) BME Modelling and Identification
 BMDE 503 (3) Biomedical Instrumentation
 BMDE 512 (3) Finite-Element Modelling in Biomedical Engineering
 BMDE 519 (3) Biomedical Signals and Systems

Medical Imaging

BIEN 530 (3) Imaging and Bioanalytical Instrumentation
 BMDE 610 (3) Functional Neuroimaging Fusion
 BMDE 650 (3) Advanced Medical Imaging
 MDPH 607 (3) Medical Imaging

Biomaterials and Tissue Engineering

BIEN 510 (3) Engineered Nanomaterials for Biomedical Applications
 BMDE 504 (3) Biomaterials and Bioperformance
 BMDE 505 (3) Cell and Tissue Engineering

Biosensors and Devices

BIEN 550 (3) Biomolecular Devices
 BIEN 560 (3) Design of Biosensors
 BMDE 503 (3) Biomedical Instrumentation
 BMDE 508 (3) Introduction to Micro and Nano-Bioengineering

Translational Biomedical Engineering

BMDE 656 (3) Medical Device Reimbursement

12.2.5 Human Genetics

12.2.5.1 Location

Department of Human Genetics
 Strathcona Anatomy & Dentistry Building
 3640 University Street, Room 2/38F

Montreal QC H3A 0C7
 Canada
 Telephone: 514-398-4198
 Fax: 514-398-2430
 Email: dept.humangenetics@mcgill.ca
 Website: mcgill.ca/humangenetics

Administration

Ross MacKay – *Student Affairs Advisor*

Email: ross.mackay@mcgill.ca

Rimi Joshi – *Student Affairs Coordinator*

Email: grad.hg@mcgill.ca

12.2.5.2 About Human Genetics

M.Sc. and Ph.D. Degrees in the Department of Human Genetics

The Department of Human Genetics offers a clinical master's program, M.Sc. in Genetic Counselling, as well as research training at both the M.Sc. and Ph.D. levels in Human Genetics. Both the M.Sc. and Ph.D. in Human Genetics research programs require the completion of a thesis, which is the major focus of the student's effort. A minimal amount of coursework is required, but specific course choices are flexible and vary according to the student's previous training and current research interest.

Most of the faculty members of the Human Genetics Department are located in McGill teaching hospitals, reflecting the medically learned knowledge at the core of human genetic studies.

Faculty members have a wide variety of research interests, which embrace:

- cancer genetics;
- cytogenetics;
- reproductive biology;
- neurogenetics;
- genomic and genetic basis of human diseases.

Detailed information regarding faculty research interests can be found on the [Department website](#).

The Graduate Training Committee requires that students who have been accepted into the M.Sc. or Ph.D. in Human Genetics research graduate program have a guaranteed minimum stipend of \$15,000, plus the full amount of tuition and fees. Detailed information regarding financial matters can be found on the [Student Funding webpage](#).

Tuition Assistance Packages

A certain number of tuition assistance packages will be offered to incoming out-of-province/international students for the M.Sc. or Ph.D. in Human Genetics thesis program who have demonstrated outstanding academic achievement. Students who have a **CGPA of 3.5 out of 4.0 or above** (as converted by the McGill GPS guidelines) and who submit online application and documents by **March 31 (Fall), or Sept. 10 (Winter)** will automatically be considered eligible for assistance. Once applications have been received by the deadline, the Graduate Training Committee will review all eligible applications and award tuition assistance to certain top eligible candidates at the time of admission into the program.

section 12.2.5.5: Master of Science (M.Sc.) Human Genetics (Thesis) (45 credits)

The Department of Human Genetics provides a unified curriculum of study in genetics. Areas of specialization include:

- biochemical genetics
- genetics of development
- animal models of human diseases
- cancer genetics
- molecular pathology
- gene therapy
- genetic dissection of complex traits
- genetics of infectious and inflammatory diseases
- non-mendelian genetics
- bioinformatics
- behavioural genetics

section 12.2.5.5: Master of Science (M.Sc.) Human Genetics (Thesis) (45 credits)

- neurogenetics
- bioethics
- genomics

Many of our faculty hold cross-appointments in various departments (including: biochemistry, biology, cardiology, medicine, microbiology, immunology, neurology, pathology, pediatrics, pharmacology, psychiatry, etc.) within the Faculties of Science and Medicine. This enables numerous opportunities for interdisciplinary research and collaboration. The Department conducts research on all sites of the McGill University Health Centre (MUHC), the Montreal Neurological Institute and Hospital, the McGill Life Sciences Complex, the *McGill University & Genome Quebec Innovation Centre*, the Biomedical Ethics Unit, and the *Centre for Genomics and Policy*.

section 12.2.5.7: Master of Science (M.Sc.) Human Genetics (Thesis): Bioethics (45 credits)

McGill University offers specialized education in bioethics to graduate students in the Faculties of Medicine and Law, the School of Religious Studies, and the Department of Philosophy. The Master's degree Specialization in Bioethics is an interdisciplinary academic program that emphasizes both the conceptual and the practical aspects of bioethics.

section 12.2.5.6: Master of Science (M.Sc.) Human Genetics (Thesis): Bioinformatics (45 credits)

Students successfully completing the Bioinformatics option at the M.Sc. level will be fluent in the concepts, language, approaches, and limitations of the field. Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. The intention of the Bioinformatics Option is to train students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating bioinformatics data, the integration of biological databases and the use of algorithms and statistics.

Enrolment in the Bioinformatics option can only be approved after a student has been admitted into the Department. There is an agreement for the option that must be signed by the student, supervisor, and Department, and enrolment in the option is subject to space availability and other constraints that the Department cannot assess at the time of admission. For more information, please contact the Graduate Program Coordinator.

section 12.2.5.8: Master of Science (M.Sc.) Genetic Counselling (Non-Thesis) (48 credits)

The M.Sc. in Genetic Counselling program provides the academic foundation and clinical training required for the contemporary practice of genetic counselling. Genetic counsellors are health professionals who provide information and support to families who have members with birth defects or genetic disorders and to families who may be at risk for a variety of inherited conditions. Genetic counsellors investigate the problem present in the family, analyze inheritance patterns and risks of recurrence, and review available options with the family. Some counsellors also work in administrative and academic capacities, and many engage in research activities.

The curriculum includes a variety of required courses in human genetics and other departments, and 40 weeks of supervised clinical training spread over four semesters. Graduates will be eligible to sit for both the Canadian Association of Genetic Counsellors and the American Board of Genetic Counselling certification examinations. Upon completion of the M.Sc. in Genetic Counselling program, students will demonstrate competence in, or satisfactory knowledge of: principles of human genetics, including cytogenetics, biochemical, molecular, and population genetics; methods of interviewing and counselling, and the dynamics of human behaviour in relation to genetic disease; and social, legal, and ethical issues in genetics. Enrolment will be limited to four students.

section 12.2.5.9: Doctor of Philosophy (Ph.D.) Human Genetics

The Department of Human Genetics provides a unified curriculum of study in genetics. Areas of specialization include: biochemical genetics, genetics of development, animal models of human diseases, cancer genetics, molecular pathology, gene therapy, genetic dissection of complex traits, genetics of infectious and inflammatory diseases, non-mendelian genetics, bioinformatics, behavioural genetics, neurogenetics, bioethics, and genomics. Many of our faculty hold cross-appointments in various departments (including: biochemistry, biology, cardiology, medicine, microbiology, immunology, neurology, pathology, pediatrics, pharmacology, psychiatry) within the Faculties of Science and Medicine. This enables numerous opportunities for interdisciplinary research and collaboration. The Department conducts research on all sites of the McGill University Health Centre (MUHC), the Montreal Neurological Institute and Hospital, the McGill Life Sciences Complex, the *McGill University & Genome Quebec Innovation Centre*, the Biomedical Ethics Unit, and the *Centre for Genomics and Policy*.

section 12.2.5.10: Doctor of Philosophy (Ph.D.) Human Genetics: Bioinformatics

Students successfully completing the Bioinformatics option at the Ph.D. level will be fluent in the concepts, language, approaches, and limitations of the field and have the capability of developing an independent Bioinformatics research program. Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. The intention of the Bioinformatics option is to train students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating bioinformatics data, the integration of biological databases, and the use of algorithms and statistics.

Enrolment in the Bioinformatics option can only be approved after a student has been admitted into the Department. There is an agreement for the option that must be signed by the student, supervisor, and Department, and enrolment in the option is subject to space availability and other constraints that the Department cannot assess at the time of admission. For more information, please contact the Graduate Program Coordinator.

12.2.5.3 Human Genetics Admission Requirements and Application Procedures**12.2.5.3.1 Admission Requirements****M.Sc. in Genetic Counselling****Prerequisites:**

- Bachelor's or medical degree – minimum cumulative grade point average (CGPA) of 3.2 out of 4.0, or 3.4 out of 4.0 in the last two full-time academic years;
- Recent (within the past five years) university-level courses in molecular/cell biology, biochemistry, advanced genetics (preferably human), statistics, and a minimum of two courses in psychology;
- Some experience (either paid or volunteer) working with adults in a counselling or advisory capacity, ideally in a crisis setting.

For detailed information, visit the [Genetic Counselling Program website](#).

M.Sc. and Ph.D. in Human Genetics**Prerequisites:**

- B.Sc. – minimum CGPA of 3.2 out of 4.0;
- A minimum of 6 credits in cellular and molecular biology or biochemistry, 3 credits in mathematics or statistics, and 3 credits in genetics.

Admission is based on acceptance by a [research supervisor](#), confirmed [funding](#) for the duration of the academic program, and an online application form evaluated by the Graduate Training Committee.

Prospective graduate students should complete the online application form and indicate the name of the secured research supervisor.

For detailed information, visit the [Human Genetics program website](#).

Language Requirements

Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit a [TOEFL](#) or [IELTS](#) test score to McGill University. For TOEFL, a minimum score of 100 on the Internet-based test (iBT) is required, with each component scoring 20 or higher. On the IELTS the minimum standard for consideration is 7.



Note: TOEFL scores must be sent electronically by the testing agency to McGill University using our institution code of 0935. Scanned copies of results or hard copies sent in the mail will not be entered as received in your application. IELTS scores also must be submitted electronically by the test centre to McGill University.

12.2.5.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures.

12.2.5.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Human Genetics and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

M.Sc. Genetic Counselling program* (Non-Thesis)				
Application Opening Dates		Application Deadlines		
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
Fall Term:	Sept. 15	Jan. 01	Jan. 01	Jan. 01
Winter Term:	N/A	N/A	N/A	N/A
Summer Term:	N/A	N/A	N/A	N/A

M.Sc. (Thesis) and Ph.D. Human Genetics programs

	Application Opening Dates		Application Deadlines	
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
Fall Term:	Sept. 15	March 31	March 31	March 31
Winter Term:	Feb. 15	Jul. 15	Sept. 1	Sept. 1
Summer Term:	May 15	Jan. 10	Apr. 1	Apr. 1

Applications for thesis programs submitted after these deadlines may be considered, if a suitable supervisor can be secured. However, these applications will not be considered for departmental funding or entrance awards.

* The **M.Sc. Genetic Counselling program** accepts applications for the Fall term only. **No late applications or applications for Summer or Winter terms for the Genetic Counselling program will be considered under any circumstances.**

12.2.5.4 Human Genetics Faculty**Chair**

E.A. Shoubridge

Program Directors

J. Fitzpatrick, A. Naumova

Emeritus Professors

F. Kaplan, K. Morgan, L. Pinsky, C. Scriver

Professors

E. Andermann, B. Brais, W. Foulkes, B. Knoppers, M. Lathrop, D. Malo, R. McInnes, R. Palmour, D. Radzioch, D.S. Rosenblatt, R. Rozen, E. Schurr, E.A. Shoubridge, R. St-Arnaud, P. Tonin, J. Trasler, S. Vidal

Associate Professors

A. Ao, G. Bourque, N. Braverman, K. Dewar, R. Hernandez, Y. Joly, J. Majewski, P. Moffatt, R. Nadon, I. Ragoussis, L. Russell, A. Ryan, R. Sladek, R. Slim, Y. Yamanaka

Assistant Professors

D. Buhas, L. Cartier, G. Chong, C. Crist, M-D. D'Agostino, I. De Bie, J. Fitzpatrick, S. Gravel, C. Kleinman, D. Langlais, B. Mucha-Le Ny, H. Najafabadi, L-C. Palma, I. Ragoussis, Y. Riaz Alhosseini, J.-B. Rivière, A. Ruchon, V. Soleimani, D. Torgerson, Y. Trakadis, L. Walsh

Lecturers

N. Anoja, L. Baret, C. Bascunana, K-E. Canales, S. Drury, S. Fox, M. Lalous, L. Macrae, M. Richard, G. Sillon, E. Weber, L. Whelton, N. Wong

Adjunct Professors

C-M. Chisholm, T. Chiu, M. Cloutier, E. Creede, L. Gallagher, D. Gauquier, C. Goldsmith, B. Gottlieb, E-L. Grundberg, V.A. Hastings, C. Honeywell, T-M. Pastinen, J. Rutberg

Adjunct Member

D. Vinh

Associate Members

P. Gros, D. Thomas, J. Kimmelman, J. Genest, J. Lavoie, L. Diatchenko, C. Polychonakos, B. Richards, C. Polychonakos, B. Richards, C. Greenwood, S. Ali, S. Richard, S-A. Rabbani, R. Gold, D. Cournoyer, J. Engert, L. Garzia, B. Gilfix, C. Gilpin, G.Hendy, R. Koenekoop, A. Peterson, F. Rauch, M. Trifiro, I. Gupta, G. Rouleau, Z. Gan-Or, M. Srour, A. Naumova, C. Goudie, N. Jabado, L. Majewska, J. Mitchell, J. Rak, R. Jooper, G. Turecki, C. Ernst

12.2.5.5 Master of Science (M.Sc.) Human Genetics (Thesis) (45 credits)**Thesis Courses (33 credits)**

HGEN 680	(9)	M.Sc. Thesis Research 1
HGEN 681	(12)	M.Sc. Thesis Research 2
HGEN 682	(12)	M.Sc. Thesis Research 3

Required Courses (6 credits)

HGEN 662	(3)	Laboratory Research Techniques
HGEN 692	(3)	Human Genetics

Complementary Courses (6 credits)

6 credits chosen from the departmental offerings below or from 500-, 600-, or 700-level courses offered in the Faculties of Medicine or Science:

HGEN 660	(3)	Genetics and Bioethics
HGEN 661	(3)	Population Genetics
HGEN 663	(3)	Beyond the Human Genome
HGEN 670	(3)	Advances in Human Genetics 1
HGEN 690	(3)	Inherited Cancer Syndromes
HGEN 693	(3)	Using Bioinformatics Resources
HGEN 695	(3)	Psychiatric Genetics
HGEN 696	(3)	Advanced Readings in Genetics 1
HGEN 697	(3)	Advanced Readings in Genetics 2
HGEN 698	(3)	Advanced Readings in Genetics 3
HGEN 699	(3)	Advanced Readings in Genetics 4

Note: The Graduate Advisory Committee may stipulate additional coursework at the 500, 600, or 700 level depending on the background of the candidate.

12.2.5.6 Master of Science (M.Sc.) Human Genetics (Thesis): Bioinformatics (45 credits)

** This program is currently not offered. **

Thesis Courses (33 credits)

HGEN 680	(9)	M.Sc. Thesis Research 1
HGEN 681	(12)	M.Sc. Thesis Research 2
HGEN 682	(12)	M.Sc. Thesis Research 3

Required Courses (6 credits)

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar
HGEN 692	(3)	Human Genetics

Complementary Courses (6 credits)

6 credits from the following courses:

BINF 621	(3)	Bioinformatics: Molecular Biology
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BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics
PHGY 603	(3)	Systems Biology and Biophysics

Note: The Graduate Advisory Committee may stipulate additional coursework at the 500, 600, or 700 level depending on the background of the candidate.

12.2.5.7 Master of Science (M.Sc.) Human Genetics (Thesis): Bioethics (45 credits)

Thesis Courses (30 credits)

30 credits selected as follows:

HGEN 681	(12)	M.Sc. Thesis Research 2
HGEN 682	(12)	M.Sc. Thesis Research 3
HGEN 683	(6)	M.Sc. Thesis Research 4

Required Courses (12 credits)

12 credits from:

BIOE 680	(3)	Bioethical Theory
BIOE 681	(3)	Bioethics Practicum
HGEN 662	(3)	Laboratory Research Techniques
HGEN 692	(3)	Human Genetics

Complementary Courses (3 credits)

3 credits from the following:

CMPL 642	(3)	Law and Health Care
PHIL 643	(3)	Seminar: Medical Ethics
RELG 571	(3)	Ethics, Medicine and Religion

12.2.5.8 Master of Science (M.Sc.) Genetic Counselling (Non-Thesis) (48 credits)

Required Courses (48 credits)

HGEN 600D1	(3)	Genetic Counselling Practicum
HGEN 600D2	(3)	Genetic Counselling Practicum
HGEN 601	(3)	Genetic Counselling Principles
HGEN 610D1	(3)	Genetic Counselling: Independent Studies
HGEN 610D2	(3)	Genetic Counselling: Independent Studies
HGEN 617	(3)	Principles of Medical Genetics
HGEN 620	(3)	Introductory Field Work Rotations 1
HGEN 621	(6)	Introductory Field Work Rotations 2
HGEN 630D1	(6)	Advanced Field Work Rotations
HGEN 630D2	(6)	Advanced Field Work Rotations
HGEN 640	(3)	Second Year Practicum 1
HGEN 641	(3)	Second Year Practicum 2
IPEA 503	(0)	Managing Interprofessional Conflict

PATH 653 (3) Reading and Conference

12.2.5.9 Doctor of Philosophy (Ph.D.) Human Genetics

Candidates entering Ph.D. 1 must complete at least three years of full-time resident study (six terms). The normal and expected duration of the Ph.D. program is four to five years. A student who has obtained a master's degree at McGill in a related field, or at an approved institution elsewhere, and is proceeding in the same subject toward a Ph.D. degree may, upon the recommendation of the Graduate Training Committee, enter at the Ph.D. 2 level.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (3 credits)

HGEN 692 (3) Human Genetics
HGEN 701 (0) Ph.D. Comprehensive Examination

Complementary Courses (15 credits)

(15 credits or 6 credits depending on admission status as described above.)

Courses are to be chosen from the list below and/or from among 500-, 600-, or 700-level courses offered in the Faculties of Medicine and Science.

HGEN 660 (3) Genetics and Bioethics
HGEN 661 (3) Population Genetics
HGEN 663 (3) Beyond the Human Genome
HGEN 690 (3) Inherited Cancer Syndromes
HGEN 693 (3) Using Bioinformatics Resources
HGEN 695 (3) Psychiatric Genetics
HGEN 696 (3) Advanced Readings in Genetics 1
HGEN 697 (3) Advanced Readings in Genetics 2
HGEN 698 (3) Advanced Readings in Genetics 3
HGEN 699 (3) Advanced Readings in Genetics 4

Students are restricted to taking the following course.

HGEN 670 (3) Advances in Human Genetics 1

Note: The Graduate Advisory Committee may stipulate additional coursework depending on the background of the candidate.

12.2.5.10 Doctor of Philosophy (Ph.D.) Human Genetics: Bioinformatics

** This program is currently not offered. **

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (6 credits)

COMP 616D1 (1.5) Bioinformatics Seminar

COMP 616D2	(1.5)	Bioinformatics Seminar
HGEN 692	(3)	Human Genetics
HGEN 701	(0)	Ph.D. Comprehensive Examination

Complementary Courses (6 credits)

* Two courses from the following:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics
PHGY 603	(3)	Systems Biology and Biophysics

* Note: Students who enter in Ph.D. 1 will need to take an additional 6 credits of complementary courses chosen from the departmental offerings listed for the Ph.D. in Human Genetics and/or from among 500-, 600-, or 700-level courses in the Faculties of Medicine or Science.

12.2.6 Microbiology and Immunology

12.2.6.1 Location

Department of Microbiology and Immunology
 Duff Medical Building, Room 511
 3775 University Street
 Montreal QC H3A 2B4
 Canada
 Telephone: 514-398-3061
 Fax: 514-398-7052
 Email: grad.microimm@mcgill.ca
 Website: mcgill.ca/microimm

12.2.6.2 About Microbiology and Immunology

The Department offers graduate programs leading to the degrees of **M.Sc.** and **Ph.D.**. Each program is tailored to fit the needs and backgrounds of individual students. The graduate program is designed to offer students state-of-the-art training, concentrating on four key areas of research:

- cellular and molecular immunology;
- microbial physiology and genetics;
- molecular biology of viruses;
- medical microbiology.

Basic research discoveries in microbiology may lead to improved drug design and vaccine development to treat and prevent diseases. The Department has many notable facilities and resources, including a cell sorter, ultra centrifuges, confocal microscope, real-time PCR facilities, cryostat for immunocytochemistry, and facilities for radio-isotope studies and infectious diseases. We foster close ties with McGill's teaching hospitals and research centres to promote multidisciplinary research.

section 12.2.6.5: Master of Science (M.Sc.) Microbiology and Immunology (Thesis) (45 credits)

The primary goal of this program is to provide students with unique opportunities to learn experimental designs and fundamental research techniques, and objectively synthesize information from scientific literature. These tools enable the students to focus on major research topics offered by the Department: molecular microbiology, mycology, microbial physiology, virology, genetics, immunology, drug design, and aspects of host-parasite relationships. Each M.Sc. student chooses their preferred major research area and research supervisor. Following an interview, the student is presented with a research topic and offered a studentship (amounts vary). Each student must register for our graduate courses (two seminars, two reading and conference courses). If pertinent to the student's research program, the research adviser may advise the student to take additional courses.

Most of our students, after one year, are proficient researchers, and some first authors of a research publication. M.Sc. students may fast-track to the Ph.D. program after three terms of residency. The remaining students advance their microbiology background by opting to enter into medicine, epidemiology, biotechnology, or pharmaceutical disciplines.

section 12.2.6.6: Doctor of Philosophy (Ph.D.) Microbiology and Immunology

The primary goal of the Ph.D. program is to create a self-propelled researcher, proficient in experimental designs and advanced methodologies applicable to the varied and rapidly changing disciplines in microbiology and immunology. Close research supervision and bi-weekly laboratory sessions impart the requisite research discipline and objective assessment of acquired or published research data.

A Ph.D. student, if promoted from our M.Sc. program, without submitting the thesis, is required to register for one additional graduate seminar and one additional reading and conference course, but the bulk of their time is devoted to research. Other requirements include a yearly presentation of the accumulated research data to the Ph.D. supervisory committee, successfully clearing the Ph.D. comprehensive examination, two years after registration into the Ph.D. program, and finally submission of a thesis. The research theme must be original, and the acquired data and hypothesis must be defended orally by the student. Each student receives a stipend for the entire duration and a minimum six-semester residency is required for the completion of the program.

12.2.6.3 Microbiology and Immunology Admission Requirements and Application Procedures**12.2.6.3.1 Admission Requirements****Master's**

Candidates are required to hold a B.Sc. degree in microbiology and immunology, biology, biochemistry, or another related discipline; those with the M.D., D.D.S., or D.V.M. degrees are also eligible to apply. The minimum cumulative grade point average (CGPA) for acceptance into the program is 3.2 out of 4.0.

Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit documented proof of competency in oral and written English. Before acceptance, appropriate exam results must be submitted directly from the *TOEFL* (Test of English as a Foreign Language) or *IELTS* (International English Language Testing Systems) Office. An institutional version of the TOEFL is not acceptable. Applications will not be considered if a TOEFL or IELTS test result is not available.

- TOEFL Internet-Based Test (iBT): a minimum overall score of 86 (no less than 20 in each of the four components)
- IELTS: a minimum overall band score of 6.5

The TOEFL Institution Code for McGill University is 0935.

Ph.D.

Students who have satisfactorily completed an M.Sc. degree in microbiology and immunology, a biological science, or biochemistry, or highly qualified students enrolled in the departmental M.Sc. program, may be accepted into the Ph.D. program provided they meet its standards.

12.2.6.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures.

All applicants must approach academic staff members directly during or before the application process since no applicants are accepted without a supervisor.

12.2.6.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- [Supervisor Confirmation Form](#)
- Personal Statement
- CV

12.2.6.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Microbiology and Immunology and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

Application Opening Dates		Application Deadlines		
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
Fall Term:	Sept. 15	April 22	June 13	June 13
Winter Term:	Feb. 15	Sept. 1	Nov. 1	Nov. 1
Summer Term:	May 15	Jan. 6	March 25	March 25

Online applications and all required documents must be submitted prior to the application deadline.

12.2.6.4 Microbiology and Immunology Faculty

Chair

Samantha Gruenheid (*Interim*)

Emeritus Professors

N. Acheson, M. Baines, J.W. Coulton

Professors

J. Archambault, A. Berghuis, S. Gruenheid, G.J. Matlashewski, M. Olivier, C. Piccirillo, D. Sheppard, M. Stevenson

Associate Professors

D.J. Briedis, B. Cousineau, S. Fournier, J. Fritz, G.T. Marczynski, S. Sagan, A. Shapiro

Assistant Professors

J Chahal, I. King, C. Maurice

Associate Members

Epidemiology and Infectious Diseases: M. Behr, A. Dascal

Genetics: K. Dewar, E. Schurr

Immunology, Autoimmunity, Host Defense: J. Antel, M. Burnier, I. Colmegna, P. Gros, A. Kristof, J. Mandl, A. Orthwein, J. Rauch, J. Spicer, C. Tsoukas, S. Vidal

Immunology and Parasitology: B. Brenner, C.T. Costiniuk, M. Ndao, P. Rohrbach, B. Ward, J. Zhang

Microbiology: D. Cuong Vinh, M. Divangahi, C. Liang, D. Nguyen, M. Reed

Molecular Biology: N. Cermakian, A. Jardim, D. Langlais, A. Mouland, K. Pantopoulos, M. Tremblay, B. Turcotte, J. Xia

Virology: A. Gatignol, A.E. Koromilas, R. Lin, J. Teodoro

Adjunct Professors

E. Cohen, A. Descoteaux, J.M. Di Noia, A. Finzi, C. Krawczyk, G. Kukolj, P. Lau, S. Lesage, A. Petronela, K. Pike, W-K. Suh

Adjunct Member

F. Veyrier

12.2.6.5 Master of Science (M.Sc.) Microbiology and Immunology (Thesis) (45 credits)

Thesis Courses (33 credits)

MIMM 697	(11)	Master's Research 1
MIMM 698	(11)	Master's Research 2
MIMM 699	(11)	Master's Research 3

Required Courses (6 credits)

MIMM 611	(3)	Graduate Seminars 1
MIMM 612	(3)	Graduate Seminars 2

Complementary Courses (6 credits)

Minimum 6 credits from:

MIMM 607	(3)	Biochemical Pathology
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MIMM 616	(3)	Reading and Conference 1
MIMM 617*	(3)	Reading and Conference 2
MIMM 618*	(3)	Reading and Conference 3
MIMM 619*	(3)	Reading and Conference 4
NEUR 502	(3)	Basic and Clinical Aspects of Neuroimmunology

Any life sciences-related 500-level or above course (3 credits). Department approval required.

* Not offered in every academic year.

12.2.6.6 Doctor of Philosophy (Ph.D.) Microbiology and Immunology

The primary goal of the Ph.D. program is to create a self-propelled researcher, proficient in experimental designs and advanced methodologies applicable to the varied and rapidly changing disciplines in microbiology and immunology. Close research supervision and bi-weekly laboratory sessions impart the requisite research discipline and objective assessment of acquired or published research data.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (9 credits)

MIMM 611	(3)	Graduate Seminars 1
MIMM 612	(3)	Graduate Seminars 2
MIMM 701	(0)	Comprehensive Examination-Ph.D. Candidate
MIMM 713	(3)	Graduate Seminars 3

Complementary Courses (9 credits)

9 credits from the following:

MIMM 616	(3)	Reading and Conference 1
MIMM 617	(3)	Reading and Conference 2
MIMM 618	(3)	Reading and Conference 3
MIMM 619	(3)	Reading and Conference 4

OR

Any life sciences-related courses at the 500 level or higher. Departmental approval is required.

12.2.7 Pharmacology and Therapeutics

12.2.7.1 Location

Department of Pharmacology and Therapeutics
McIntyre Medical Sciences Building
3655 Promenade Sir-William-Osler, Room 1325
Montreal QC H3G 1Y6
Canada
Telephone: 514-398-3623
Fax: 514-398-2045
Email: gradstudies.pharmacology@mcgill.ca
Website: mcgill.ca/pharma

12.2.7.2 About Pharmacology and Therapeutics

The Department of Pharmacology and Therapeutics offers training leading to **M.Sc. (Thesis)** and **Ph.D.** degrees.

Pharmacology is a multidisciplinary science that deals with all aspects of drugs and their interactions with living organisms. Thus, pharmacologists study the physical and chemical properties of drugs, their biochemical and physiological effects, mechanisms of action, pharmacokinetics, and therapeutic and other uses. The Department offers broad exposure and training in both basic and clinical research in a range of areas of specialty, including:

- neuropharmacology;
- reproductive pharmacology;
- endocrine pharmacology;
- receptor pharmacology;
- cardiovascular pharmacology;
- cancer;
- developmental pharmacology;
- autonomic pharmacology;
- clinical pharmacology;
- biochemical pharmacology;
- molecular biology;
- toxicology.

The present 51 full and affiliate members of the Department have research laboratories located in the McIntyre Medical Sciences Building and in a variety of hospitals, institutes, and industry including the Douglas Hospital Research Centre, Allan Memorial Institute, Montreal Children's Hospital, Montreal General Hospital, Montreal Heart Institute, Lady Davis Research Institute, Pfizer Canada, and MUHC Research Institute. The participation of researchers from both industry and government ensures the relevance of the Department's applications-oriented training programs.

section 12.2.7.5: Master of Science (M.Sc.) Pharmacology (Thesis) (45 credits)

The objective of the M.Sc. (Thesis) and Ph.D. degree training programs is to provide in-depth independent research experience in a specific area of pharmacology. The program leading to a master's degree is designed to provide students the opportunity to acquire knowledge in pharmacology, to conduct a research project, to analyze data, and to write a thesis. Students will also receive essential training in research professionalism and scientific communication.

section 12.2.7.6: Master of Science (M.Sc.) Pharmacology (Thesis): Environmental Health Sciences (45 credits)

The M.Sc. in Pharmacology; Environmental Health Sciences focuses on the interplay between the environment and health. Environmental health research is highly interdisciplinary; students will be given the opportunity to acquire a broad environmental perspective on exposure sciences, hazard screening methodologies, epidemiological approaches, health implications of environmental quality, and policy approaches.

section 12.2.7.7: Doctor of Philosophy (Ph.D.) Pharmacology

The objective of the M.Sc. (Thesis) and Ph.D. degree training programs is to provide in-depth independent research experience in a specific area of pharmacology. The program leading to a doctoral degree is designed to provide students the opportunity to acquire knowledge in pharmacology, to conduct an original research project, to analyze data, and to write a thesis. Students will also receive essential training in research professionalism and scientific communication.

section 12.2.7.8: Doctor of Philosophy (Ph.D.) Pharmacology: Environmental Health Sciences

The Ph.D. in Pharmacology; Environmental Health Sciences program is designed to train professionals for advanced research, teaching, and leadership positions in environmental health sciences. The Option will add a distinct focus on the interplay between the environment and health research. Students will acquire a broad environmental perspective, including exposure sciences, hazard screening methodologies, epidemiological approaches, health implications of environmental quality, and policy approaches.

12.2.7.3 Pharmacology and Therapeutics Admission Requirements and Application Procedures

12.2.7.3.1 Admission Requirements

Candidates are required to hold a B.Sc. degree in a discipline relevant to the proposed field of study; those with the M.D., D.D.S., or D.V.M. degrees are also eligible to apply. A background in the health sciences is recommended, but programs in biology, chemistry, mathematics, and physical sciences may be acceptable.

Admission is based on a student's academic record, letters of assessment, and, whenever possible, interviews with staff members. Students are required to take the Graduate Record Examination Aptitude Test (*GRE*) and the Test of English as a Foreign Language (*TOEFL*) or the equivalent, except as follows: in accordance with McGill policy, only those whose mother tongue is English, who graduated from a recognized Canadian institution (anglophone or

francophone), or who completed an undergraduate or graduate degree at a recognized foreign institution where English is the language of instruction are exempt from providing proof of competency in English.

Inquiries relating to all aspects of graduate study should be directed to the [Graduate Coordinator](#), Department of Pharmacology and Therapeutics, as early as possible in each academic year.

12.2.7.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures.

12.2.7.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Curriculum Vitae
- Personal Statement
- GRE – required for degrees from outside North America

12.2.7.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Pharmacology and Therapeutics and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

	Application Opening Dates		Application Deadlines	
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
Fall Term:	Sept. 15	March 15	May 15	May 15
Winter Term:	Feb. 15	Aug. 15	Oct. 15	Oct. 15
Summer Term:	N/A	N/A	N/A	N/A

Please refer to our [website](#) for complete deadlines.

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

12.2.7.4 Pharmacology and Therapeutics Faculty

Chair

G. Multhaup

Graduate Program Director

T. Hébert

Emeritus Professors

R. Capek, B. Collier, P. McLeod, H.H. Zingg,

Professors

D. Bernard, D. Bowie, P.B.S. Clarke, A.C. Cuello, B.F. Hales, T. Hébert, D. Maysinger, A. McKinney, G. Multhaup, A. Ribeiro-da-Silva, B. Robaire, H. Saragovi, M. Szyf, J. Trasler

Associate Professors

B. Castagner, L. Münter, J. Tanny, J.F. Trempe

Assistant Professors

M. McKeague, A. Thanabalasuriar

Associate Members

C. Baglolle, S. Gauthier, S. Laporte, N. Luedtke, K. Mann, S. Nattel, C. O'Flaherty, S. Rousseau, E. Zorychta

Adjunct Professors

B. Allen, S. Chemtob, Y. De Koninck, G. FitzHarris, J. S. Joyal, F. Le Boeuf, T. Sanderson, L. Stone

Affiliate Members

M. Boucher, L. Breton, L. Garolalo, J. Gillard, J. Mancini, K. Meerovitch, C. Wright

12.2.7.5 Master of Science (M.Sc.) Pharmacology (Thesis) (45 credits)

The M.Sc. in Pharmacology focuses on research methodology, conducting a research project, analyzing data, and writing a thesis. It involves training in research professionalism, scientific communication, and statistics, critically analyzing scientific literature, and developing and conducting an original research project for scientific publication.

Thesis Courses (30 credits)

PHAR 696	(3)	Thesis Preparation
PHAR 697	(6)	Thesis Preparation 1
PHAR 698	(9)	Thesis Preparation 2
PHAR 699	(12)	Thesis Preparation 3

Required Courses (15 credits)

PHAR 601	(6)	Research Seminar
PHAR 602	(3)	Principles of Pharmacology
PHAR 609	(1)	Research Professionalism for Pharmacologists
PHAR 610	(2)	Scientific Communication for Pharmacologists
PHAR 712	(3)	Statistics for Pharmacologists

12.2.7.6 Master of Science (M.Sc.) Pharmacology (Thesis): Environmental Health Sciences (45 credits)

The M.Sc. in Pharmacology; Environmental Health Sciences program is designed to train professionals for advanced basic research, teaching, and leadership positions in environmental health sciences. The Option will add a distinct focus on the interplay between the environment and health research, including a broad environmental perspective, exposure sciences, hazard screening methodologies, epidemiological approaches, health implications of environmental quality, and policy approaches.

Thesis Courses (24 credits)

PHAR 696	(3)	Thesis Preparation
PHAR 698	(9)	Thesis Preparation 2
PHAR 699	(12)	Thesis Preparation 3

Required Courses (21 credits)

PHAR 601	(6)	Research Seminar
PHAR 602	(3)	Principles of Pharmacology
PHAR 609	(1)	Research Professionalism for Pharmacologists
PHAR 610	(2)	Scientific Communication for Pharmacologists
PHAR 670	(3)	Principles of Environmental Health Sciences 1
PHAR 671	(3)	Principles of Environmental Health Sciences 2
PHAR 712	(3)	Statistics for Pharmacologists

12.2.7.7 Doctor of Philosophy (Ph.D.) Pharmacology

The Ph.D. in Pharmacology focuses on research methodology, conducting a research project, analyzing data, and writing a thesis. It involves training in research professionalism, scientific communication, and statistics, critically analyzing scientific literature, and developing and conducting an original research project for scientific publication.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (9 credits)

PHAR 602	(3)	Principles of Pharmacology
PHAR 609	(1)	Research Professionalism for Pharmacologists
PHAR 610	(2)	Scientific Communication for Pharmacologists
PHAR 701	(0)	Ph.D. Comprehensive Exam
PHAR 712	(3)	Statistics for Pharmacologists

Complementary Courses (3 credits)

3 credits from the following:

PHAR 702	(3)	Topics in Pharmacology 1
PHAR 703	(3)	Topics in Pharmacology 2
PHAR 704	(3)	Topics in Pharmacology 3
PHAR 705	(3)	Topics in Pharmacology 4
PHAR 706	(3)	Topics in Pharmacology 5
PHAR 707	(3)	Topics in Pharmacology 6

or the equivalent, upon approval by the Graduate Training Committee (GTC.)

12.2.7.8 Doctor of Philosophy (Ph.D.) Pharmacology: Environmental Health Sciences

The Ph.D. in Pharmacology; Environmental Health Sciences program is designed to train professionals for advanced basic research, teaching, and leadership positions in environmental health sciences. The Option will add a distinct focus on the interplay between the environment and health research, including a broad environmental perspective, exposure sciences, hazard screening methodologies, epidemiological approaches, health implications of environmental quality, and policy approaches.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (15 credits)

PHAR 602	(3)	Principles of Pharmacology
PHAR 609	(1)	Research Professionalism for Pharmacologists
PHAR 610	(2)	Scientific Communication for Pharmacologists
PHAR 670	(3)	Principles of Environmental Health Sciences 1
PHAR 671	(3)	Principles of Environmental Health Sciences 2
PHAR 701	(0)	Ph.D. Comprehensive Exam
PHAR 712	(3)	Statistics for Pharmacologists

Complementary Courses (3 credits)

3 credits from the following:

PHAR 702	(3)	Topics in Pharmacology 1
PHAR 703	(3)	Topics in Pharmacology 2
PHAR 704	(3)	Topics in Pharmacology 3
PHAR 705	(3)	Topics in Pharmacology 4
PHAR 706	(3)	Topics in Pharmacology 5
PHAR 707	(3)	Topics in Pharmacology 6

or the equivalent, upon approval by the Graduate Training Committee (GTC.)

12.2.8 Physiology**12.2.8.1 Location**

Department of Physiology
 McIntyre Medical Sciences Building
 3655 Promenade Sir-William-Osler
 Montreal QC H3G 1Y6 Canada
 Telephone: 514-398-4343
 Website: mcgill.ca/physiology

12.2.8.2 About Physiology

The Physiology Department offers training leading to **M.Sc.** and **Ph.D.** degrees. The scope of the ongoing research, and close connections with the McGill teaching hospitals, offer excellent opportunities for collaborations with hospital-based scientists. Research in the Department covers a broad range of topics from systems neuroscience to molecular and cellular biology. Interests include studies of nuclear and membrane receptors, transporters, channels, and signal transduction pathways, to the broader integration of physiological systems (cardiovascular, respiratory, renal, endocrine, immune, and central nervous systems) using an array of molecular and cellular approaches as well as quantitative techniques in data collection, analysis, and mathematical modelling by computational means.

All graduate students in Physiology receive financial support. Any faculty or associate member who agrees to supervise a graduate student who does not hold a fellowship is financially responsible for that student. Students are encouraged to apply for a fellowship; further information is available at mcgill.ca/physiology/graduate-studies/financial-other-assistance.

section 12.2.8.5: Master of Science (M.Sc.) Physiology (Thesis) (45 credits)

The M.Sc. program is intended for students from an academic background wishing to pursue careers in academia, industry, or medicine. The multidisciplinary nature of the Department exposes students to a vast array of research interests and experimental approaches. Thesis work is available in a broad range of disciplines from molecular and cellular to systems physiology covering multiple organ systems. Students wishing to continue to the doctoral program have the option of transferring to the Ph.D., and waiving the M.Sc. thesis submission.

section 12.2.8.6: Master of Science (M.Sc.) Physiology (Thesis): Bioinformatics (45 credits)

The intention of the Bioinformatics option is to train M.Sc. students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating of bioinformatics data, the integration of biological databases, and the use of algorithms and statistics. Students successfully completing the Bioinformatics option will be fluent in the concepts, language, approaches, and limitations of the field. The option consists of a number of interdisciplinary courses and a seminar designed to bring students from many backgrounds together and to provide a thorough overview of research in this field.

section 12.2.8.7: Master of Science (M.Sc.) Physiology (Thesis): Chemical Biology (45 credits)

The Chemical Biology option is designed to expose students to aspects of drug design and development, as well as their application to the study of physiological and pathophysiological processes. In addition to thesis work with appropriate mentors, students will participate in lectures, seminar courses, and thematic workshops, all of which are designed to familiarize students with the current state of the field. This interdisciplinary approach will develop researchers interested in academic careers or in the pharmaceutical and biotechnology industries.

section 12.2.8.8: Doctor of Philosophy (Ph.D.) Physiology

The doctoral program is intended for students from a strong academic background wishing to pursue research-intensive careers in academia, industry, or medicine. The multidisciplinary nature of the Department exposes students to a vast array of research interests and experimental approaches. Thesis work provides in-depth training in a broad range of disciplines from molecular and cellular to systems physiology covering multiple organ systems.

section 12.2.8.9: Doctor of Philosophy (Ph.D.) Physiology: Bioinformatics

The intention of the Bioinformatics option is to train Ph.D. students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating of bioinformatics data, the integration of biological databases, and the use of algorithms and statistics. Students successfully completing the Bioinformatics option will be fluent in concepts, language, approaches, and limitations of the field. The option consists of a number of interdisciplinary courses and a seminar designed to bring students from many backgrounds together and to provide a thorough overview of research in this field.

section 12.2.8.10: Doctor of Philosophy (Ph.D.) Physiology: Chemical Biology

The Chemical Biology option is designed to expose students to aspects of drug design and development, as well as their application to the study of physiological and pathophysiological processes. In addition to thesis work with appropriate mentors, students will participate in lectures, seminar courses, and thematic workshops—all of which are designed to familiarize students with the current state of the field. This interdisciplinary approach will develop researchers interested in academic careers or in the pharmaceutical and biotechnology industries.

12.2.8.3 Physiology Admission Requirements and Application Procedures**12.2.8.3.1 Admission Requirements**

Admission to the graduate program is based on an evaluation by the Graduate Student Admissions and Advisory Committee (GSAAC), and on being accepted by a research supervisor. Final acceptance is contingent upon approval of the recommendation of the applicant by Enrolment Services, from whom official notification will be received.

Candidates for the M.Sc. degree must hold a B.Sc. degree or its equivalent. Candidates who have completed an M.Sc. may be admitted directly to the Ph.D. program. M.Sc. students interested in a Ph.D. may fast track to the Ph.D. program after 12–18 months. The M.Sc. thesis requirement is then waived. Candidates with exceptional academic records may be considered to proceed directly to the Ph.D. degree from the B.Sc. degree.

A minimum CGPA of 3.2 out of 4.0 or a GPA of 3.4 in the last two years is required for an application to be considered.

The *GRE* General Test is no longer required.

Language Requirements

Test of English as a Foreign Language (*TOEFL*): minimum score of 86 on the Internet-based test with each component score not less than 20 OR IELTS (International English Language Testing System) with an overall band of 6.5 or greater. Only those whose mother tongue is English, who graduated from a North American institution (anglophone or francophone) or who completed an undergraduate or graduate degree at a foreign institution where English is the language of instruction are exempt from providing proof of competency in English.

12.2.8.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures.

Applications should be submitted as early as possible in order to facilitate processing. However, no applications will be considered after the application deadlines.

12.2.8.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Curriculum Vitae
- Two letters of reference
- Personal Statement
- TOEFL (if applicable)
- List of supervisor preferences

12.2.8.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Physiology Department and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

	Application Opening Dates		Application Deadlines	
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
Fall Term:	Sept. 15	March 1	May 15	May 15
Winter Term:	Feb. 15	Aug. 15	Oct. 1	Oct. 1
Summer Term:	N/A	N/A	N/A	N/A

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

Interested candidates should refer to the Department's [website](#) for details regarding application procedures, as well as other important information.

12.2.8.4 Physiology Faculty

Chair

John White

Graduate Program Director

Alvin Shrier

Emeritus Professors

Thomas M.S. Chang, Leon Glass, Kresimir Krnjevic, Wayne S. Lapp, Mortimer Levy, Michael Mackey, George Mandl, Geoffrey Melvill Jones, Joseph Milic-Emili, Canio Polosa, Douglas G.D. Watt

Associate Professor (Post-Retirement)

Ann Wechsler

Professors

Maurice Chacron, Monroe W. Cohen, Ellis J. Cooper, Phil Gold, John Hanrahan, David Goltzman, Steve Lomber, Gergely Lukacs, Sheldon Magder, John Orłowski, Alvin Shrier, John White

Associate Professors

Claire Brown, Gil Bub, Erik Cook, Mladen Glavinovic, Michael Guevara, Suresh Krishna, Anmar Khadra, Reza Sharif-Naeini, Ursula Stochaj

Associate Professor (Part-time)

Nicole Bernard

Assistant Professors

Pouya Bashivan, Arjun Krishnaswamy, Judith Mandl, Anastasia Nijnik, Masha Prager-Khoutorsky, Daniela Quail, Melissa Vollrath

Associate Members

Anaesthesia: Steven Backman

Biomedical Engineering: Satya Prakash

Mathematics: Anthony Humphries

Medicine: Volker Blank, Mark Blostein, Andrey Cybulsky, Anne-Marie Lauzon, James Martin, Shafaat Rabbani, Simon Rousseau, Benjamin M. Smith, Mary Stevenson, Tomoko Takano, Elena Torban, Simon Wing

Microbiology and Immunology: Jörg Fritz

Neurology and Neurosurgery: Jack Antel, Daniel Guitton, Christopher Pack, Ed Ruthazer, Amir Shmuel, Jesper Sjöström, Jo Anne Stratton

Ophthalmology: Curtis Baker

Pharmacology and Therapeutics: Daniel Bernard, Derek Bowie, Terence Hebert

Psychiatry: Nicolas Cermakian

Research in Neuroscience: Charles Bourque

Adjunct Professors

M. Craig, K. Cullen, P. Haghghi, J. Martinez-Trujillo

Faculty Lecturer

Céline Aguer

12.2.8.5 Master of Science (M.Sc.) Physiology (Thesis) (45 credits)**Thesis Courses (27 credits)**

PHGY 621	(12)	Thesis 1
PHGY 622	(12)	Thesis 2
PHGY 623	(3)	M.Sc. Final Seminar

Required Courses (12 credits)

PHGY 601	(1)	M.Sc. Proposal Seminar
PHGY 602	(2)	Literature Search and Research Proposal
PHGY 604	(0)	Responsible Conduct in Research
PHGY 607	(3)	Laboratory Research 1
PHGY 608	(3)	Laboratory Research 2
PHGY 620	(3)	Progress in Research

Elective Courses (6 credits)

Students must select 6 approved credits in Physiology or Science at the 500 level or above.

12.2.8.6 Master of Science (M.Sc.) Physiology (Thesis): Bioinformatics (45 credits)

** This program is currently not offered. **

Thesis Courses (27 credits)

PHGY 621	(12)	Thesis 1
PHGY 622	(12)	Thesis 2
PHGY 623	(3)	M.Sc. Final Seminar

Required Courses (12 credits)

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar
PHGY 601	(1)	M.Sc. Proposal Seminar
PHGY 602	(2)	Literature Search and Research Proposal
PHGY 604	(0)	Responsible Conduct in Research
PHGY 607	(3)	Laboratory Research 1
PHGY 608	(3)	Laboratory Research 2

Complementary Courses (6 credits)

6 credits to be chosen from the following:

BINF 621	(3)	Bioinformatics: Molecular Biology
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BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics

12.2.8.7 Master of Science (M.Sc.) Physiology (Thesis): Chemical Biology (45 credits)

** This program is currently not offered. **

The Graduate Option in Chemical Biology is centered on the pursuit of an original research project under the direction of one or more program mentors. This research training is augmented by student participation in lecture and seminar courses and in a series of thematic workshops, all of which are designed to expose students to the diverse approaches and research issues that characterize the current state of the field. Students with training in this interdisciplinary approach will be highly qualified to seek careers in academic research as well as the pharmaceutical and biotechnology industries.

Thesis Courses (27 credits)

PHGY 621	(12)	Thesis 1
PHGY 622	(12)	Thesis 2
PHGY 623	(3)	M.Sc. Final Seminar

Required Courses (12 credits)

PHGY 601	(1)	M.Sc. Proposal Seminar
PHGY 602	(2)	Literature Search and Research Proposal
PHGY 604	(0)	Responsible Conduct in Research
PHGY 607	(3)	Laboratory Research 1
PHGY 608	(3)	Laboratory Research 2
PHGY 620	(3)	Progress in Research

Complementary Courses (6 credits)

3 credits from the following Chemical Biology seminars:

BIOC 610	(1)	Seminars in Chemical Biology 1
BIOC 611	(1)	Seminars in Chemical Biology 3
BIOC 689	(1)	Seminars in Chemical Biology 2
BIOC 690	(1)	Seminars in Chemical Biology 4

3 credits from the following:

CHEM 502	(3)	Advanced Bio-Organic Chemistry
CHEM 503	(3)	Drug Discovery
PHAR 503	(3)	Drug Discovery and Development 1

12.2.8.8 Doctor of Philosophy (Ph.D.) Physiology

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (8 credits)

PHGY 604	(0)	Responsible Conduct in Research
PHGY 701	(0)	Ph.D. Comprehensive Examination
PHGY 703	(1)	Ph.D. Progress Seminar 1
PHGY 704	(1)	Ph.D. Progress Seminar 2
PHGY 720	(1)	Ph.D. Seminar Course 1
PHGY 721	(1)	Ph.D. Seminar Course 2
PHGY 722	(1)	Ph.D. Seminar Course 3
PHGY 723	(1)	Ph.D. Seminar Course 4
PHGY 724	(1)	Ph.D. Seminar Course 5
PHGY 725	(1)	Ph.D. Seminar Course 6

Elective Courses (9 credits)

9 credits of Physiology or Science at the 500 level or above, in consultation with the GSAAC and the candidate's supervisor.

12.2.8.9 Doctor of Philosophy (Ph.D.) Physiology: Bioinformatics

** This program is currently not offered. **

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (11 credits)

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar
PHGY 604	(0)	Responsible Conduct in Research
PHGY 701	(0)	Ph.D. Comprehensive Examination
PHGY 703	(1)	Ph.D. Progress Seminar 1
PHGY 704	(1)	Ph.D. Progress Seminar 2
PHGY 720	(1)	Ph.D. Seminar Course 1
PHGY 721	(1)	Ph.D. Seminar Course 2
PHGY 722	(1)	Ph.D. Seminar Course 3
PHGY 723	(1)	Ph.D. Seminar Course 4
PHGY 724	(1)	Ph.D. Seminar Course 5
PHGY 725	(1)	Ph.D. Seminar Course 6

Complementary Courses (6 credits)

6 credits to be chosen from the following courses:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics

12.2.8.10 Doctor of Philosophy (Ph.D.) Physiology: Chemical Biology

** This program is currently not offered. **

The Graduate Option in Chemical Biology is centered on the pursuit of an original research project under the direction of one or more program mentors. This research training is augmented by student participation in lecture and seminar courses and in a series of thematic workshops, all of which are designed to expose students to the diverse approaches and research issues that characterize the current state of the field. Students with training in this interdisciplinary approach will be highly qualified to seek careers in academic research as well as the pharmaceutical and biotechnology industries.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (11 credits)

BIOC 610	(1)	Seminars in Chemical Biology 1
BIOC 611	(1)	Seminars in Chemical Biology 3
BIOC 689	(1)	Seminars in Chemical Biology 2
BIOC 690	(1)	Seminars in Chemical Biology 4
PHGY 604	(0)	Responsible Conduct in Research
PHGY 701	(0)	Ph.D. Comprehensive Examination
PHGY 703	(1)	Ph.D. Progress Seminar 1
PHGY 704	(1)	Ph.D. Progress Seminar 2
PHGY 720	(1)	Ph.D. Seminar Course 1
PHGY 721	(1)	Ph.D. Seminar Course 2
PHGY 722	(1)	Ph.D. Seminar Course 3
PHGY 723	(1)	Ph.D. Seminar Course 4
PHGY 724	(1)	Ph.D. Seminar Course 5

Complementary Courses (6 credits)

6 credits from the following:

CHEM 502	(3)	Advanced Bio-Organic Chemistry
CHEM 503	(3)	Drug Discovery
PHAR 503	(3)	Drug Discovery and Development 1

12.3 Communication Sciences and Disorders**12.3.1 Location**

School of Communication Sciences and Disorders
 2001 McGill College Avenue, Suite 800
 Montreal QC H3A 1G1
 Canada
 Telephone: 514-398-4137
 Fax: 514-398-8123
 Email: scsd@mcgill.ca
 Website: mcgill.ca/scsd

12.3.2 About Communication Sciences and Disorders

The School provides both professional and research training in communication sciences and disorders at the graduate level through its **M.Sc. (Applied)**, **M.Sc.**, and **Ph.D.** degrees. We were the first department in Canada to provide both clinical and research degrees. Our M.Sc.A. program aims to educate the next generation of well-prepared and innovative speech-language pathology professionals by providing enriched classroom training, clinical laboratory activities that enhance the transition from theory to practice, and outstanding clinical practicum experiences. Our research degrees are designed to develop leading researchers and scholars, who will go on to train future investigators in the field of communication sciences and disorders and who, through their research, will advance our understanding of the processes of human communication and its breakdown.

Our applied and research degrees may lead to employment in healthcare or educational facilities, academic settings, or private industry.

Interdisciplinary interactions are at the core of our research training approach, which includes preparation to conduct both fundamental and clinically applied investigations. Our professors have collaborative ties with many departments and institutes at McGill, including:

- psychology
- linguistics
- neuroscience
- otolaryngology
- biomedical engineering
- Montreal Neurological Institute and Hospital
- other Montreal universities

They also maintain national and international collaborations. Students can access this rich collaborative network via the [McGill Centre for Research on Brain, Language and Music](#), a world-class interdisciplinary research centre established by the School. The multilingual context in which we reside provides a unique environment for language research.

The School offers:

- a professional degree in Communication Sciences and Disorders at the M.Sc. (Applied) level with specialization in Speech Language Pathology
- two research degrees: an M.Sc. (Research) and a Ph.D. in Communication Sciences and Disorders

Requirements for Licensure

The majority of provinces in Canada and certain states in the U.S. require that those intending to practise as speech-language pathologists within their borders comply with special provincial or state licensing regulations. Graduates wishing to practise in the province of Quebec must be members of the *Ordre des Orthophonistes et Audiologistes du Québec* (OOAQ) in order to call themselves speech-language pathologists. Further information is available from the OOAQ at:

630 Sherbrooke St. W., bureau 800
 Montreal QC H3A 1E4
 Telephone: 514-282-9123
 Email: info@ooaq.qc.ca
 Website: www.ooaq.qc.ca

Quebec law requires that candidates seeking licensure in provincially recognized professions demonstrate exceptional verbal and written knowledge of the French language. See [University Regulations & Resources > Undergraduate > Admission to Professional and Graduate Studies > : Language Requirements for Professions](#).

Funding

[IODE Canada](#) funds two \$1,000 “Silence to Sound” awards for studies in hearing impairment. These in-course awards are based on academic merit, Canadian citizenship, financial need, and potential for excellence, and are awarded by the School with approval of funds by IODE Canada.

Montreal League for the Hard of Hearing Award – Candidates must be enrolled at the graduate level in the School and working in the area of hearing impairment. Awarded by the School. Value: two \$750 awards.

section 12.3.6: Master of Science, Applied (M.Sc.A.) Communication Sciences & Disorders (Non-Thesis): Speech-Language Pathology (82 credits)

The professional degree leads to a Master of Science (Applied) with a specialization in Speech Language Pathology. The program involves two academic years of full-time study and related practical work followed by a Summer internship. To prepare students as creative professionals, the program emphasizes the understanding of principles and theories, and their present or potential clinical applications, in addition to the teaching of specific techniques for assessment and intervention. Active participation in the learning process is encouraged.

The profession of speech-language pathology concerns assessment and intervention in speech, language, and swallowing disorders. At present, most speech-language pathologists in Canada work in hospitals, public school systems, rehabilitation centres, special education facilities, and in private practice nursing homes and extended care facilities.

Students pursuing the M.Sc.A. complete the basic academic content and clinical practica required in preparation for clinical practice as outlined by [Speech-Language and Audiology Canada](#) (SAC). Our M.Sc.A. program is completed in two years. The emphasis on bridging theory and clinical practice is very strong in our program. Our admission requirements emphasize basic sciences and do not require completion of a specific undergraduate degree.

section 12.3.6: Master of Science, Applied (M.Sc.A.) Communication Sciences & Disorders (Non-Thesis): Speech-Language Pathology (82 credits)

This flexible entry accommodates students with undergraduate degrees in different fields and promotes diversity within our student body. Our goal is to recruit and train skillful therapists and problem-solvers who can rely on a strong foundation in theory to address challenging clinical issues. Our M.Sc.A. graduates typically pursue professional careers working in schools, hospitals, rehabilitation centres, or in private practices. A subset of our graduates will enter a doctoral program (immediately or after a period of clinical employment) to pursue a research career.

Research Degrees – M.Sc. and Ph.D.**section 12.3.5: Master of Science (M.Sc.) Communication Sciences and Disorders (Thesis) (45 credits)**

Selected candidates may be accepted into the M.Sc. research degree program. Each student's Advisory Committee designs an individualized program of study in collaboration with the student. The program can include graduate courses offered by the School and by other departments at McGill.

This program is designed for students who wish to combine research training with their clinical (M.Sc.A.) program or students from related fields who wish to gain research experience in communication sciences to prepare for doctoral studies. Students are required to take two semesters (6 credits) of statistics and complete a thesis. Admission to the M.Sc. research program requires identification of an SCSD professor(s) with relevant expertise to mentor the student through the thesis process. Graduates of our M.Sc. research program follow diverse career paths, some working in clinical settings (if they also have a clinical degree) or settings that combine clinical and research activities, and others continuing their research training at the doctoral level.

section 12.3.7: Doctor of Philosophy (Ph.D.) Communication Sciences and Disorders

Selected candidates may be accepted into the Ph.D. research degree program. Each student's Advisory Committee designs an individualized program of study in collaboration with the student. The program can include graduate courses offered by the School and by other departments at McGill.

Students pursuing a Ph.D. in SCSD have varied educational backgrounds, including both clinical and related non-clinical fields. Students who enter the program from a related field (e.g., Psychology, Linguistics) or without a master's thesis complete a Qualifying year, which includes coursework and a research project. This flexible entry attracts independent scholars with diverse backgrounds and interests, which creates a stimulating and enriched training environment. The main component of the Ph.D. program (beyond the Qualifying year) has minimal required coursework and is structured to support students as they develop and pursue an innovative, individualized program of doctoral studies. Admission to the doctoral program requires identification of a SCSD professor(s) with relevant expertise to mentor the student in this process. Ph.D. students have the opportunity to pursue an interdisciplinary specialization in language acquisition through the McGill Language Acquisition Program, which intersects with McGill departments of Linguistics, Psychology, and Education. Our Ph.D. graduates typically pursue academic careers in universities or research institutes, but some work in settings that combine research and professional activities.

section 12.3.8: Doctor of Philosophy (Ph.D.) Communication Sciences and Disorders: Language Acquisition

This unique interdisciplinary Ph.D. program is available for doctoral students across four departments at McGill including SCSD, Linguistics, Psychology, and Integrated Studies in Education. The program is designed to provide enriched training focused on the scientific exploration of language acquisition by different kinds of learners in diverse contexts. Students in the Language Acquisition Program are introduced to theoretical and methodological issues on language acquisition from the perspectives of cognitive neuroscience, theoretical linguistics, psycholinguistics, education, communication sciences and disorders, and neuropsychology. In addition to the SCSD Ph.D. requirements, students in this program must complete 3 credits of coursework in language acquisition outside their home department, and three interdisciplinary seminars (2 credits each) and must include a faculty member in the Language Acquisition Program on their thesis committee. More information about this program can be found at mcgill.ca/linguistics/graduate/lap.

12.3.3 Communication Sciences and Disorders Admission Requirements and Applications Procedures**12.3.3.1 Admission Requirements**

McGill University Graduate and Postdoctoral Studies requires that applicants to graduate programs hold an undergraduate degree with a minimum B average (3.0 on a 4.0 point scale) or better, however as admission is highly competitive the mean GPA of admitted students is generally much higher. Please note that incomplete or late applications will not be considered.

English Language Requirement for non-Canadian Students

Applicants to graduate studies whose mother tongue is not English and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit documented proof of competency in oral and written English **prior to admission**:

- the Test of English as a Foreign Language (*TOEFL*) with a minimum score of 95 on the Internet-based test with minimum component scores of 24 in both Speaking and Writing and 21 in both Reading and Listening;

OR

- the International English Language Testing System (*IELTS*) with a minimum overall band score of 7.0.

M.Sc. (Applied)

An applicant must hold an undergraduate degree in any discipline. The program is highly competitive and we have space for fewer than 10% of applicants; the mean cumulative undergraduate GPA for admitted students falls at around 3.8 on a 4.0 scale. There are 21 credits of prerequisite coursework, including

3 credits in statistics, and a total of 18 credits across the disciplines of Linguistics and Psychology or related areas (with a minimum of 6 credits each in Linguistics and Psychology). Please refer to mcgill.ca/scsd/programs/slp/how-apply/prerequisite-courses for important details on the nature of these prerequisites.

M.Sc. in Communication Sciences and Disorders

The M.Sc. provides research training for:

1. students who are also taking courses for professional qualification;
2. students who have a non-thesis professional degree in Communication Sciences and Disorders; and
3. students with degrees in related fields who wish to do research but not obtain professional qualification in Communication Sciences and Disorders.

Ph.D. in Communication Sciences and Disorders

Applicants should normally have a master's degree with thesis or its equivalent in Communication Sciences and Disorders or a related field (e.g., psychology, linguistics).

Students who possess an appropriate bachelor's degree or master's degree without thesis will also be considered for the Ph.D. program, but, if admitted, must first complete a Qualifying year of coursework and a research project. All applications received by the application deadlines are automatically considered for any internal funding or awards made available to the Department for recruitment purposes. Students who apply for Fall admission generally have the most options with respect to applying for external funding as well as for being considered for internal support.

12.3.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources](#) > [Graduate](#) > [Graduate Admissions and Application Procedures](#) > : [Application Procedures](#) for detailed application procedures.

Please see the [School of Communication Sciences and Disorders website](#) for required application materials.

12.3.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

M.Sc. (Applied)

- [Casper Online Test](#)
- 21 credits Prerequisite coursework, provide details in uApply as specified
- Brief personal statement
- Curriculum Vitae
- Two Reference Letters (one professional and one academic)

M.Sc. (Thesis) and Ph.D.

- Personal Statement
- Curriculum Vitae
- Writing Sample
- Acceptance by a research supervisor
- Two Reference Letters (academic)

If available, applicants are encouraged to submit reports of their performance on the Graduate Record Examination ([GRE](#)).

12.3.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the School of Communication Sciences and Disorders and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

Application Opening Dates		Application Deadlines		
		All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)
Fall Term:	Sept. 15	Jan. 15	Jan. 15	Jan. 15
Winter Term:	Feb. 15	Sept. 15	Sept. 15	Sept. 15
Summer Term:	N/A	N/A	N/A	N/A

12.3.4 Communication Sciences and Disorders Faculty**Director and Associate Dean**

Susan Rvachew

Graduate Program Director

Linda Polka

Professor (Post-Retirement)

Vincent Gracco

Professors

Shari R. Baum, Marc D. Pell, Linda Polka, Susan Rvachew, Karsten Steinhauer, Elin Thordardottir

Associate Professors

Meghan Clayards, Laura Gonnerman, Aparna Nadig, Nicole Yee-Key Li-Jessen

Assistant Professors

Noémie Auclair-Ouellet

Assistant Professors (Professional)

Kelly Root, Sophie Vaillancourt

Faculty Lecturers

Mariska Burger, Lauren Tittley

Assistant Professors (Part-Time)

Christina Lattermann, Rosalee Shenker

Faculty Lecturers (Part-Time)

Mary Jane Blais, Liliane Brunetti, Ariana Fraid, Lisa Massaro, Tanya Matthews, Gina Mills, Chelsea Osei, Amanda Ovardia, Eve Julie Rioux, Jordan Scholl, Marielle McCrum, Dahlia Thompson

Adjunct Professors

Krista Byers-Heinlein, David McFarland, Lucie Ménard, Doug Shiller

Associate Members

Eva Kehayia, Denise Klein, Luc Mongeau, Debra Titone

12.3.5 Master of Science (M.Sc.) Communication Sciences and Disorders (Thesis) (45 credits)**Thesis Courses (24 credits)**

SCSD 671	(12)	M.Sc. Thesis 1
SCSD 672	(12)	M.Sc. Thesis 2

Complementary Courses (21 credits)

6-21 credits chosen from:

SCSD 675	(12)	Special Topics 1
SCSD 676	(9)	Special Topics 2
SCSD 677	(6)	Special Topics 3
SCSD 678	(3)	Special Topics 4

0-15 credits chosen from:

SCSD 673	(12)	M.Sc. Thesis 3
SCSD 674	(3)	M.Sc. Thesis 4

or courses in other departments, as arranged with the student's thesis supervisor.

12.3.6 Master of Science, Applied (M.Sc.A.) Communication Sciences & Disorders (Non-Thesis): Speech-Language Pathology (82 credits)

The M.Sc.(A.) in Communication Sciences and Disorders; Non-Thesis - Speech-Language Pathology focuses on training students to enter the field of Speech-Language Pathology using a curriculum guided by a competency-based framework, including academic and supervised clinical practicum components. This professional program is accredited by The Council for Accreditation of Canadian University Programs in Audiology and Speech-Language Pathology.

Required Courses (82 credits)

IPEA 500	(0)	Roles in Interprofessional Teams
IPEA 501	(0)	Communication in Interprofessional Teams
IPEA 502	(0)	Patient-Centred Care in Action
SCSD 609	(3)	Neuromotor Disorders
SCSD 611D1	(.5)	Essential Competencies for Speech-Language Pathology 1
SCSD 611D2	(.5)	Essential Competencies for Speech-Language Pathology 1
SCSD 612D1	(.5)	Essential Competencies for Speech-Language Pathology 2
SCSD 612D2	(.5)	Essential Competencies for Speech-Language Pathology 2
SCSD 613	(1)	Counselling in Speech-Language Pathology
SCSD 614	(3)	Literacy Across the Lifespan
SCSD 616	(3)	Foundations of Audiology
SCSD 617	(1)	Anatomy and Physiology for Speech-Language Pathology
SCSD 619	(3)	Phonological Development
SCSD 624	(3)	Language Development and Processes
SCSD 625	(2)	ASD and Neurodevelopmental Disorders 2
SCSD 626	(2)	Aural Rehabilitation 2
SCSD 627	(3)	Practicum and Seminar 3A
SCSD 628	(3)	Practicum and Seminar 4A
SCSD 629	(2)	Augmentative and Alternative Communication 2
SCSD 630	(2)	Research and Measurement Methodologies 2
SCSD 631	(2)	Speech Science
SCSD 632	(3)	Phonological Disorders: Children
SCSD 636	(3)	Fluency Disorders
SCSD 637	(3)	Developmental Language Disorders 1
SCSD 638	(2)	Neurolinguistics
SCSD 639	(3)	Voice Disorders
SCSD 643	(3)	Developmental Language Disorders 2
SCSD 644	(3)	Acquired Language Disorders
SCSD 646	(4)	Introductory Clinical Practicum
SCSD 679	(12)	Advanced Clinical Practicum
SCSD 680	(3)	Deglutition and Dysphagia

SCSD 681	(3)	Practicum and Seminar 1
SCSD 682	(3)	Practicum and Seminar 2
SCSD 688	(1)	Genetics in Speech-Language Pathology Practice
SCSD 689	(1)	Management Cranio-Facial Disorders

12.3.7 Doctor of Philosophy (Ph.D.) Communication Sciences and Disorders

The Ph.D. program provides a foundation for creative research and scientific problem-solving in communication sciences (speech, language, hearing, voice) in typical and atypical populations. The program structure is flexible to encourage students to customize their program through the selection of coursework, seminars, comprehensive topics, research experiences, and thesis topic. The School's doctoral program follows a mentor model and students work closely with faculty supervisors who have international reputations in their respective areas.

Students who have completed a Master's degree with research thesis in Communication Sciences and Disorders or a related area are admitted at level PhD 2. High-caliber students who have not completed a research thesis at the Master's level can enter the Qualifying Year Program (admitted at level PhD 1), which includes extra requirements (coursework and a research project) at the onset of the program.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (6 credits)

For both PhD 1 and PhD 2:

SCSD 652	(3)	Advanced Research Seminar 1
SCSD 653	(3)	Advanced Research Seminar 2
SCSD 701	(0)	Doctoral Comprehensive

Complementary Courses (6 or 21 credits)

For both PhD 1 and PhD 2: 6 credits of statistics courses at the 500 level or higher, pre-approved by the supervisor and the graduate program director.

In addition to the above, students entering at PhD 1 must take the following 15 credits:

SCSD 654	(3)	Advanced Research Seminar 3
SCSD 685	(3)	Research Project 1
SCSD 686	(3)	Research Project 2

Plus 6 credits, of graduate-level courses, pre-approved by the supervisor and the graduate program director.

12.3.8 Doctor of Philosophy (Ph.D.) Communication Sciences and Disorders: Language Acquisition

This unique interdisciplinary program focuses on the scientific exploration of language acquisition by different kinds of learners in diverse contexts. Students in the Language Acquisition Program are introduced to theoretical and methodological issues on language acquisition from the perspectives of cognitive neuroscience, theoretical linguistics, psycholinguistics, education, communication sciences and disorders, and neuropsychology.

For details go to: www.psych.mcgill.ca/lap.html.

Students who have completed a Master's degree with research thesis in Communication Sciences and Disorders or a related area are admitted at level PhD 2. High-caliber students who have not completed a research thesis at the Master's level can enter the Qualifying Year Program (admitted at level PhD 1), which includes extra requirements (coursework and a research project) at the onset of the program.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (12 credits)

For both PhD 1 and PhD 2:

LING 710	(2)	Language Acquisition Issues 2
PSYC 709	(2)	Language Acquisition Issues 1
SCSD 652	(3)	Advanced Research Seminar 1
SCSD 653	(3)	Advanced Research Seminar 2
SCSD 701	(0)	Doctoral Comprehensive
SCSD 712	(2)	Language Acquisition Issues 4

Complementary Courses (9 or 26 credits)

For both PhD 1 and PhD 2:

6 credits of statistics courses at the 500 level or higher, pre-approved by the supervisor and the graduate program director.

At least 3 credits at the 500 level or higher in language acquisition courses that have been approved by the Director of the Language Acquisition Program. For a pre-approved list go to: <https://www.mcgill.ca/scsd/programs/rt/phd/language-acquisition-courses>.

For PhD 1 students, 0-2 credits from the following:

EDPE 713	(2)	Language Acquisition Issues 5
EDSL 711	(2)	Language Acquisition Issues 3

In addition to the above, students entering at PhD 1 must take the following 15 credits:

SCSD 654	(3)	Advanced Research Seminar 3
SCSD 685	(3)	Research Project 1
SCSD 686	(3)	Research Project 2

Plus 6 credits, of graduate-level courses pre-approved by the supervisor and the graduate program director.

12.4 Population and Global Health

12.4.1 Location

School of Population and Global Health
 772 Sherbrooke Street West, 3rd floor
 Montreal QC H3A 1G1
 Telephone: 514-398-5776
 Email: spgh.med@mcgill.ca
 Website: mcgill.ca/spgh

12.4.2 Bioethics

12.4.2.1 Location

Biomedical Ethics Unit
 2001 McGill College Ave, 12th floor
 Montreal QC H3A 1G1
 Telephone: 514-398-6668
 Website: mcgill.ca/biomedicaethicsunit/teaching/masters

For information, contact the Graduate Program Director:

Jennifer Fishman – jennifer.fishman@mcgill.ca

12.4.2.2 About Bioethics

The Biomedical Ethics Unit was established in 1996 with the aim of supporting scholarly research, clinical services, teaching, and public outreach. Members of the unit have backgrounds in law, sociology, molecular genetics, history, medicine, and philosophy. We offer a master's degree specialization in biomedical ethics for selected master's students in the Division of Experimental Medicine, the Department of Family Medicine, Department of Human Genetics, Department of Philosophy, School of Religious Studies, and Faculty of Law.

Master's Specialization in Bioethics

The Master's Specialization in Bioethics is sponsored by the:

- Faculty of Medicine and Health Sciences, Division of Experimental Medicine, Department of Human Genetics, Department of Family Medicine;
- Faculty of Law; and
- Faculty of Arts, Department of Philosophy, School of Religious Studies.

Students receive an **M.A.**, **LL.M.**, or **M.Sc.** degree in the discipline chosen with a specialization in Bioethics.

Some applicants are mid-career professionals currently working as physicians, nurses, social workers, other health care providers, or lawyers. Other applicants have recently completed their undergraduate degrees in science, philosophy, law, religious studies, or other disciplines, and wish to pursue specialized master's level training in bioethics before enrolling in doctoral level studies or entering the workplace.

Students pursuing the master's degree specialization normally take two semesters of courses before beginning their master's thesis. Courses offered include Bioethics Theory, Public Health Ethics and Policy, Research Ethics, and a Practicum that includes placement in a clinical or research setting. Research and writing the thesis normally takes one year. Students must also comply with the course and thesis requirements of their home disciplines.

12.4.2.3 Bioethics Admission Requirements and Application Procedures

12.4.2.3.1 Admission Requirements

M.D. degree, professional training in a health science, or bachelor's degree in the sciences, social sciences, law, philosophy, or religious studies. Other students may be considered on an individual basis.

Enrolment is limited to 12 students.

12.4.2.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations and Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures.

Applications for the Master's Specialization in Bioethics are made initially through the Faculties of Law, Medicine and Health Sciences (Division of Experimental Medicine, Department of Human Genetics, Department of Family Medicine), and Arts (Department of Philosophy, School of Religious Studies).

Applicants must satisfy the admission criteria for their chosen discipline and those of the Bioethics Unit, which administers the program and teaches the core courses; see mcgill.ca/biomedicalethicsunit/teaching/masters/apply.

Applicants must be accepted by the appropriate Faculty, the Bioethics Graduate Studies Advisory Committee, and Graduate and Postdoctoral Studies.

12.4.2.3.3 Application Dates and Deadlines

Deadlines coincide with those of the chosen base discipline. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.



Note: Applications for Winter or Summer term admission will not be considered.

12.4.2.4 Biomedical Ethics Faculty

Director

J. Kimmelman

Professor

J. Kimmelman

Associate Professors

C. Ells, J.R. Fishman, N. King.

Assistant Professor

P. Friesen

Associate Members

G. Bartlett-Esquilant (*Department of Family Medicine*), J.S. Beaudry (*Faculty of Law*), E. Berezina (*Department of Family Medicine*), F. Carnevale (*Ingram School of Nursing*), R. Gold (*Faculty of Law*), A. Fuks (*Department of Medicine and Health Sciences*), M. Hunt (*School of Physical & Occupational Therapy*), Y. Joly (*Human Genetics*), L. Khoury (*Faculty of Law*), M.E. Macdonald (*MQHRG*), T. Maniatis (*Faculty of Medicine and Health Sciences*), B. Thombs (*Psychiatry*), D. Weinstock (*Institute for Health and Social Policy*), M.H. Zawati (*Human Genetics*), K. Voigt (*Department of Philosophy*)

12.4.3 Epidemiology and Biostatistics**12.4.3.1 Location**

Department of Epidemiology, Biostatistics and Occupational Health
 1020 Pine Avenue West
 Montreal QC H3A 1A2
 Canada
 Telephone: 514-398-6258
 Email: graduate.eboh@mcgill.ca
 Website: mcgill.ca/epi-biostat-occh

12.4.3.2 About Epidemiology and Biostatistics

The Department offers **master's and doctoral programs in both Epidemiology and Biostatistics**, as well as a **Master's of Science in Public Health**. The methods learned in these fields are used not only in the study of diseases, but also in clinical research; health services research; public health; program planning and evaluation; and policy development. Our faculty members are at the forefront of their research domains and include epidemiologists, biostatisticians, clinician scientists, medical informatics specialists, public health specialists, health economists, medical sociologists, and health geographers.

Research in the Department spans a broad range of areas, including:

- biostatistics;
- clinical and public health informatics;
- environmental and occupational health;
- health care delivery and organization;
- infectious diseases;
- pharmacoepidemiology;
- population and public health;
- social epidemiology;
- epidemiologic methods;
- chronic diseases;
- reproductive and perinatal epidemiology;
- genetic epidemiology;
- global health;
- causal inference;
- and many cross-disciplinary activities.

Faculty members may have funding available for students through their research grants. We provide rich research environments at five university-affiliated hospitals, public health agencies, and university research centres. Graduates pursue careers in academia, clinical settings, government agencies, NGOs, and industry.

12.4.3.3 Epidemiology, Biostatistics and Occupational Health Faculty**Chair**

R. Platt (*Interim*)

Emeritus Professors

J.-F. Boivin, L. Joseph, M.S. Kramer, J. McCusker, O.S. Miettinen, I.B. Pless, S.H. Shapiro, G. Thériault, S. Wood-Dauphinee

Professors (Post-Retirement)

L. Joseph, I.B. Pless

Associate Professors (Post-Retirement)

B. Case, A. Ciampi

Professors

M. Abrahamowicz, J. Brophy, D. Buckeridge, T. Evans, E.L.F. Franco, R. Fuhrer, C. Greenwood, T.W. Gyorkos, C. Hankins, J.A. Hanley, C. Infante-Rivard, J. Kaufman, R. Menzies, E.E.M. Moodie, M. Pai, G. Paradis, R.W. Platt, A. Quesnel-Vallée, A. Schmidt, S. Suissa, R. Tamblyn, C. Wolfson

Associate Professors

A. Adrien, R. Allard, L. Azoulay, O. Basso, N. Basta, J. Baumgartner, A. Benedetti, J. Chevrier, J. Cox, K. Filion, S. Harper, P. Héroux, A. Nandi, M. Rossignol, E. Strumpf, S. Yang

Assistant Professors

A. Banerjee, S. Bhatnagar, G. Cadieux, K. Dehghani, M. Drouin, S. Golchi, D. Kaiser, A. Koski, M. Maheu-Giroux, S. Martin, C.T. Nguyen, D. Panagiotoglou, L. Patry, S. Pénicaud, M. Roy, C. Stich, S. Weichenthal

Associate Members

Biomedical Ethics Unit: J. Kimmelman, N. King

Dentistry: P. Allison, J. Feine, B. Nicolau

Family Medicine: A. Andermann

Geography: N. Ross

Human Genetics: S. Gravel

Human Nutrition: N. Basu

Internal Medicine, MUHC: N. Dayan, M. Young

Medicine: J. Afilalo, F. Ahmad Kahn, D. Assayag, A. Barkun, M. Behr, S. Bernatsky, J. Bourbeau, P. Brassard, K. Dasgupta, N. Dendukuri, A. Douros, M. Eisenberg, P. Ernst, N. Ezer, I. Fortier, M. Goldberg, A.V. Gonzalez, C. Greenaway, S. Kahn, M. Kaminska, M. Klein, N. Kronfli, T.C. Lee, A. Marelli, N. Mayo, S. Morin, S. Pamidi, N. Pant Pai, L. Pilote, E. Rahme, B. Richards, R. Sapir-Pichhadze, K. Schwartzman, G. Sebastiani, M. Sewitch, J. Shahin, I. Shrier, B. M. Smith, V. Tagalakakis, G. Thanassoulis, E. Vinet

Neurology and Neurosurgery: C. Renoux

Ob/Gyn: H. Abenhaim, R. Gagnon

Pediatrics: G. Altit, M. Beltempo, M. Ben Shoshan, B. Burstein, E. Constantin, G. Dougherty, P. Fontela, B. Foster, P.T-S. Lee, M. Nakhla, M. Oskoui, J. Papenburg

Physical and Occupational Therapy: S. Ahmed

Psychiatry: S.N. Iyer, E. Latimer, A. Malla, X. Meng, N. Schmitz, J. Shah, B. Thombs

Sociology: S. Clark

Surgery: A. Andalib, D. Deckelbaum, S. Dumitra, F-H. (L) Lee, A. N. Merguerditchian

Lecturers

J.P. Courteau, C. Fuller, M. Kafka, E. Manthorp, C. Kom Mogto, S.-A. Mercure, C. Paquette, B. Pinard, N. Savard

Adjunct Professors

Asociación Civil Selva Amazónica Peru: M. Casapia

Bristol-Myers Squibb Canada: A.A. Tahami Monfared

Carleton University: P. Villeneuve

Caro Research: J. Caro

CISSS Abitibi-Témiscamingue: O. Sobanjo

Concordia University: P.E. Boileau, P. Gasparrini

Context: J.P. Gauvin

DRSP Montréal: C. Dea, G. Denis, A. Guyon, Y. Jen, A. Kossowski, R. Lessard, R. Massé, S. Palmieri

Harvard Univ.: J. Brownstein

Adjunct Professors

Health Canada: C. Gravel

Hôpital Ste. Justine: M. Henderson

Independent: I. Arnold, E. Braithwaite, K. Krishnan, C. Larson, K. Morrison, L. Scott

INESSS: D.A. Roy

INSPQ: N. Auger, N. Damestoy, E. Lo, S. Perron, S. Stock

Montreal Chest Hospital Centre: P. Rohan

Mount Sinai: M. Baltzan

Shire Inc.: A. Koutsavlis

Univ. de Montréal: M. Keezer, J. Le Lorier, A. Motulsky, C. Quach-Thanh, M.E. Schnitzer, J. Siemiatycki, K. Zinszer

Univ. of Bern: A. Chiolero

Univ. of Bonn: D. Bartels

Affiliate Professors

Independent: L. De Montigny, J. Merckx

Univ. Hospital Basel : J.R. Young

12.4.3.4 Epidemiology

The Department offers master's and doctoral degrees in Epidemiology. The methods learned in these fields are used not only in the study of diseases, but also in clinical research, health services research, public health, program planning and evaluation, and policy development. Our faculty members are at the forefront of their research domains and include epidemiologists, biostatisticians, clinician scientists, medical informatics specialists, public health specialists, health economists, medical sociologists, and health geographers. Research in the Department spans a broad range of areas, including:

- clinical and public health informatics;
- environmental and occupational health;
- health care delivery and organization;
- infectious diseases;
- pharmacoepidemiology;
- population and public health;
- social epidemiology;
- epidemiologic methods;
- chronic diseases;
- reproductive and perinatal epidemiology;
- genetic epidemiology;
- global health;
- causal inference;
- and many cross-disciplinary activities.

Faculty members may have funding available for students through their research grants. We provide rich research environments at five university-affiliated hospitals, public health agencies, and university research centres. Graduates pursue careers in academia, clinical settings, government agencies, NGOs, and industry.

section 12.4.3.4.3: Master of Science (M.Sc.) Epidemiology (Thesis) (45 credits)

Applicants to the M.Sc. program should preferably hold a bachelor's degree in the natural sciences (e.g., chemistry, microbiology, human genetics), quantitative sciences (e.g., computer science, statistics), or social sciences (e.g., sociology, psychology, economics, geography), or hold a degree in one of the health professional sciences (e.g., medicine, nursing, social work, nutrition). Applicants must have an interest in health research, along with strong conceptual, analytic, and quantitative skills (e.g., differential and integral calculus, statistics) at the undergraduate level.

The program leading to a master's degree is designed to provide training in both theory and practice in the selected discipline. Courses require intellectual and academic rigour, and the program provides students with an opportunity to synthesize the training in the form of a thesis. Students will study the foundations and principles of epidemiology and applied biostatistics, in order to design, conduct, and analyze clinical, population-based, environmental, pharmaco-epidemiological, policy, and methodological health-related research. Graduates of the program often go on to do doctoral work or become research associates in public, private, and academic settings. McGill graduates are known for methodological and quantitative rigour, and quantitative

section 12.4.3.4.3: Master of Science (M.Sc.) Epidemiology (Thesis) (45 credits)

analytic independence. While their core training is in methods, rather than specific substantive areas, students learn about substantive areas in the context of their research and through elective courses.

section 12.4.3.4.4: Master of Science (M.Sc.) Epidemiology (Non-Thesis): Environmental & Occupational Health (48 credits)

This program provides in-depth training in methods used in Environmental and Occupational Health (EOH) and the application of these methods to study the effects of environmental and occupational exposures on human health. Students will be provided with tools to critically evaluate studies in EOH and be able to participate in these studies; learn how to apply specific methods to environmental and occupational problems; and understand how to apply research results to public health or policy. Career opportunities exist in academia, industry, and the public health sectors. Each student will be assigned a supervisor to provide guidance for their project. Research topics must relate to environmental and occupational health and receive approval from the program coordinating committee.

section 12.4.3.4.5: Master of Science (M.Sc.) Epidemiology (Non-Thesis): Pharmacoepidemiology (48 credits)

Applicants to the Pharmacoepidemiology Option of the M.Sc. (Non-Thesis) program should hold a bachelor's degree in the natural or quantitative sciences (e.g., chemistry, microbiology, computer science, statistics, economics) or hold a degree in one of the health professional sciences (e.g., medicine, pharmacy). Applicants must have an interest in the epidemiology of medications, along with strong conceptual, analytic, and quantitative skills (e.g., differential and integral calculus, statistics) at the undergraduate level. The Pharmacoepidemiology Option is designed to provide training in both theory and practice of pharmacoepidemiology. Students will study the foundations and principles of epidemiology and applied biostatistics in order to design, conduct, and analyze pharmacoepidemiological research. Courses require intellectual and academic rigour, and the program provides students with an opportunity to obtain specialized training in pharmacoepidemiology, including pharmacoepidemiologic methods, pharmacology for pharmacoepidemiologists, and practical experience in the form of a research project. Graduates of the program often go on to do doctoral work or become research associates in public, private, and academic settings. McGill has a world-renowned reputation for excellence in pharmacoepidemiology, and McGill-trained pharmacoepidemiologists are known for methodological and quantitative rigour, and quantitative analytic independence.

section 12.4.3.4.7: Doctor of Philosophy (Ph.D.) Epidemiology

This program may be of interest to students from the natural or quantitative sciences (e.g., microbiology, computer science, statistics, economics, geography), quantitative social sciences (e.g., sociology, psychology), or the health professions (e.g., medicine, nursing, social work, nutrition). Applicants must have an interest in health research, along with strong conceptual, analytic, and quantitative skills (e.g., differential and integral calculus, statistics) at the undergraduate and master's levels.

The Ph.D. program prepares students with the advanced epidemiological research skills needed to undertake original contributions to new knowledge related to the determinants of health and disease, prevention, prognosis, treatment, and outcomes. The program is generally completed in four to five years. Graduates will be prepared to engage in scientific collaboration, and communicate results to other scientists and diverse audiences. They will go on to careers in public health, health planning, and quality monitoring in local, regional, federal, and international health authorities, statistical and technology assessment agencies, the pharmaceutical industry, and in clinical and academic research organizations. McGill graduates are known for their methodological and quantitative rigour and quantitative analytic independence. While their core training is in methods, rather than specific substantive areas, students learn about substantive areas in the context of their research and through elective courses.

section 12.4.3.4.8: Doctor of Philosophy (Ph.D.) Epidemiology: Global Health

Students admitted to the Ph.D. degree in Epidemiology who have an interest in global health can receive additional recognition for completing the Global Health Option within their degree program. Students can fulfill the requirements for both the Ph.D. and the Global Health Option within the normal Ph.D. timeline. Over and above the core Ph.D. training, students in the Global Health Option will undertake global health-dedicated coursework and their thesis will be of relevance to global health. This additional global health training will provide students with insight into the major global health challenges of today's world. This area of study, research, and practice prioritizes improving health and achieving equity in health for all people worldwide. McGill and its affiliated hospitals have close to 200 researchers involved in global health work, from basic biomedical research on tropical diseases to large-scale population studies on the social determinants of health. Students at McGill can be exposed to the work of 20 teams working in all major areas of global health, including Infectious and Tropical Diseases; Global Environmental Health; and Global Mental Health, among others. For more information, visit mcgill.ca/globalhealth. With this additional Global Health qualification, Ph.D. graduates will benefit from opportunities for future training or work in those institutions or organizations that are active in global health.

section 12.4.3.4.9: Doctor of Philosophy (Ph.D.) Epidemiology: Pharmacoepidemiology

The Pharmacoepidemiology Option of the Ph.D. Program may be of interest to students from the natural or quantitative sciences (e.g., microbiology, computer science, biostatistics, statistics, economics), Public or Population Health, or Epidemiology, or who hold a degree in one of the health professional sciences (e.g., medicine, pharmacy). Applicants must have an interest in the epidemiology of medications, along with strong conceptual, analytic, and quantitative skills (e.g., differential and integral calculus, statistics) at the undergraduate level. The Pharmacoepidemiology Option prepares students with the advanced epidemiological research skills needed to undertake original contributions to new knowledge related to pharmacoepidemiology. The program is generally completed in four to five years. In addition to obtaining advanced training in the foundations and principles of epidemiology and applied biostatistics as part of the Ph.D. program, students in the Pharmacoepidemiology Option receive specialized training in pharmacoepidemiology, including advanced pharmacoepidemiologic methods, pharmacology for pharmacoepidemiologists, and practical experience in pharmacoepidemiology through their doctoral thesis. Graduates will be prepared to engage in scientific collaboration, and communicate results to other scientists and diverse audiences. They will go on to careers in pharmacoepidemiology in public, private, and academic settings. With a world-renowned reputation for excellence in

section 12.4.3.4.9: Doctor of Philosophy (Ph.D.) Epidemiology: Pharmacoepidemiology

pharmacoepidemiology, McGill-trained pharmacoepidemiologists are known for methodological and quantitative rigour, and quantitative analytic independence.

section 12.4.3.4.10: Doctor of Philosophy (Ph.D.) Epidemiology: Population Dynamics

The Population Dynamics Option (PDO) is a cross-disciplinary, cross-faculty graduate program offered by the *Centre on Population Dynamics* (CPD) as an option within existing master's and doctoral programs in the Departments of Sociology, Economics, and Epidemiology, Biostatistics and Occupational Health (EBOH) at McGill University. Students who have been admitted through their home department or faculty may apply for admission to the option. The option is coordinated by the CPD, in partnership with participating academic units.

Thus, in addition to the rigorous training provided in the Department of EBOH, graduate students who choose this option become *Centre on Population Dynamics* (CPD) student trainees. This affiliation offers opportunities for interdisciplinary research and supervision. The option also provides a forum whereby students bring their disciplinary perspectives together and enrich each other's learning through structured courses, a weekly seminar series, and informal discussions and networking.

With interdisciplinary research being increasingly important to understanding complex social and biological processes, CPD student trainees benefit from both a strong disciplinary foundation from their departmental affiliations, as well as from the sharing of knowledge across disciplinary boundaries through CPD activities.

12.4.3.4.1 Public Health

The Department offers a Master of Science in Public Health. Students apply the methods they learn to the study of diseases, clinical research, health services research, public health, program planning and evaluation, and policy development. Our faculty members are at the forefront of research in epidemiology, biostatistics, clinical medicine, biomedical informatics, public health, health economics, medical sociology, and health geography.

Faculty members in the Department draw on extensive contacts in the public health community locally, nationally, and internationally to facilitate practicum placements in many areas, including:

- urban public health practice;
- clinical and public health informatics;
- environmental and occupational health;
- health care delivery and organization;
- infectious diseases;
- maternal and child health;
- aboriginal health;
- global health.

Graduates are highly sought after for careers in government agencies, NGOs, clinical settings, research, and industry.

section 12.4.3.4.6: Master of Science (M.Sc.) Public Health (Non-Thesis) (60 credits)

The mission of the Master of Science in Public Health is to train outstanding public health professionals and future leaders by offering a rigorous academic program in methods, research, and practice. This program may be of interest for students from the natural or quantitative sciences (e.g., microbiology, computer science, statistics, economics, geography), social sciences (e.g., sociology, psychology, anthropology), or the health professions (e.g., medicine, nursing, social work, physical and occupational therapy, nutrition). Through a core series of courses, a wide range of electives, and a practicum, students will acquire knowledge and skills in all the core competencies of public health, including public health sciences; assessment and analysis; policy and program planning, implementation and evaluation. Graduates of the program will serve as public health practitioners or research professionals and will possess the competencies and professionalism to carry out broad public health functions in local, provincial, national, and international settings. In exceptional circumstances, the Admissions Committee may take professional experience into account for mid-career or returning/re-entry applicants.

The Master of Science in Public Health program includes a 14–16 week field-based practicum after the first year, which will provide the student with the opportunity to use knowledge and skills acquired in the academic program in a public health practice or research setting.

12.4.3.4.2 Epidemiology & Public Health Admission Requirements and Application Procedures**12.4.3.4.2.1 Admission Requirements**

The graduate programs in Epidemiology (M.Sc. and Ph.D.) and Public Health (M.Sc.) require substantial quantitative skills. The Admission Committees for these programs will look for proof of quantitative proficiency such as good grades in undergraduate-level courses in differential or integral calculus or in statistics (for M.Sc. applicants) and in master's-level courses (for Ph.D. applicants).

The *GRE* is required of candidates who are health professional graduates from universities outside North America.

Master's in Epidemiology

Applicants to the M.Sc. in Epidemiology programs must hold a bachelor's degree in a related area.

Master's of Public Health

Applicants to the Master's of Public Health programs must hold a bachelor's degree. Experience in this field is an asset.

Ph.D.

Applicants to the Ph.D. program must hold a Master's degree in Epidemiology, or Public Health, or its equivalent. Applicants who hold a Master's degree in another area can sometimes be considered. Applicants who are admitted to the Ph.D. Epidemiology program without an M.Sc. in Epidemiology are expected to ensure that they have sufficient preparation for the Ph.D. level courses.

Complete details on the Epidemiology programs are available on our [Departmental website](#). Information on the Master's of Public Health program is available [here](#).

Language Requirement

Minimum *TOEFL* scores required, when applicable, of 100 on the Internet-based test. Minimum score for *IELTS*: 6.5.

124.342.1.1 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures.

Completed applications, with all supporting documents, must be uploaded directly to the McGill admissions processing system by the application deadlines.

Please see our website, mcgill.ca/epi-biostat-occh/academic-programs/grad/epidemiology/applying, for information on required documents.

124.342.1.1.1 Additional Requirements

Please consult mcgill.ca/epi-biostat-occh/academic-programs/grad/epidemiology/applying for information on our requirements.

124.342.1.2 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Epidemiology, Biostatistics, and Occupational Health and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

	Application Opening Dates		Application Deadlines		
	All Applicants	Non-Canadian citizens	Canadian citizens/Perm. residents of Canada	Current McGill Students (any citizenship)	Special, Visiting & Exchange Students
Fall Term:	Sept. 15	Dec. 1	Dec. 1	Dec. 1	April 30
Winter Term:	Feb. 15	N/A	N/A	N/A	Sept. 10
Summer Term:	N/A	N/A	N/A	N/A	N/A

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

12.4.3.4.3 Master of Science (M.Sc.) Epidemiology (Thesis) (45 credits)

Students will study the foundations and principles of epidemiology and applied biostatistics, in order to design, conduct, and analyze clinical, population-based, environmental, policy, and methodological health-related research. Graduates will be prepared to engage in scientific collaboration, and communicate results to other scientists and diverse audiences.

Thesis Course (21 credits)

EPIB 690 (21) M.Sc. Thesis

Required Courses (21 credits)

Students exempted from any of the courses listed below must replace them with additional complementary course credits.

EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 603	(4)	Intermediate Epidemiology
EPIB 605	(1)	Critical Appraisal in Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 613	(1)	Introduction to Statistical Software
EPIB 621	(4)	Data Analysis in Health Sciences
PPHS 602	(3)	Foundations of Population Health

Complementary Course (3 credits)

3 credits of coursework, at the 500 level or higher, chosen in consultation with the student's academic adviser or supervisor.

12.4.3.4.4 Master of Science (M.Sc.) Epidemiology (Non-Thesis): Environmental & Occupational Health (48 credits)

This program provides in-depth training for graduate students in methods used in Environmental and Occupational Health (EOH) and the application of these methods to study the effects of environmental and occupational exposures on human health. Students will be provided with tools to critically evaluate studies in EOH, as well as to be able to participate in these studies, learn how to apply specific methods to environmental and occupational problems, and understand how to apply research results to public health or policy. Career opportunities exist in academia, industry, and the public health sectors. Each student will be assigned a supervisor to provide guidance for their project. Research topics must be related to environmental and occupational health and approved by the program coordinating committee.

Research (12 credits)

EPIB 691	(12)	Research Project in Epidemiology
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Required Courses (30 credits)

Students exempted from any of the courses listed below must replace them with additional complementary course credits.

EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 603	(4)	Intermediate Epidemiology
EPIB 605	(1)	Critical Appraisal in Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 613	(1)	Introduction to Statistical Software
EPIB 621	(4)	Data Analysis in Health Sciences
EPIB 684	(3)	Principles of Environmental Health Sciences 1
EPIB 685	(3)	Principles of Environmental Health Sciences 2
EPIB 686	(3)	Environmental Health Seminar
PPHS 602	(3)	Foundations of Population Health

Complementary Courses (6 credits)

6 credits of coursework, at the 500 level or higher, chosen in consultation with the student's academic adviser or supervisor. Complementary courses are meant to further the student's general knowledge in environment, environmental health, methodologies, and related aspects to a student's project.

12.4.3.4.5 Master of Science (M.Sc.) Epidemiology (Non-Thesis): Pharmacoepidemiology (48 credits)

This program provides in-depth training for graduate students on pharmacoepidemiologic methods and the application of these methods to study the population effects (benefits and harm) of pharmaceutical products. Students will develop knowledge and capacity to critically evaluate pharmacoepidemiologic studies, learn how to apply specific methods and understand how to apply research results for knowledge translation or policy purpose. Career opportunities for graduates are multiple and include work in industry, government, or academia. Students will be required to participate in the Pharmacoepidemiology Journal Club. Research topics must be related to pharmacoepidemiology and approved by the program coordinating committee.

Research (12 credits)

EPIB 691	(12)	Research Project in Epidemiology
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Required Courses (25 credits)

Students exempted from any of the courses listed below must replace them with additional complementary course credits at the 500 level or higher.

EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 603	(4)	Intermediate Epidemiology
EPIB 605	(1)	Critical Appraisal in Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 613	(1)	Introduction to Statistical Software
EPIB 621	(4)	Data Analysis in Health Sciences

EPIB 634	(3)	Fundamentals of Pharmacoepidemiology
EPIB 662	(1)	Pharmacological Basis of Pharmacoepidemiology
PPHS 602	(3)	Foundations of Population Health

Complementary Courses (11 credits)

11 credits of coursework, at the 500 level or higher, chosen in consultation with the student's academic adviser or supervisor. Courses must be approved by the program's academic adviser.

12.4.3.4.6 Master of Science (M.Sc.) Public Health (Non-Thesis) (60 credits)

The M.Sc. in Public Health; Non-Thesis focuses on the foundations and principles of epidemiology and biostatistics as applied to public health research and practice, and to design, conduct, and analyze clinical, population-based, environmental, policy, and methodological public health-related research. The program will include a three-month practicum after the first year.

Required Courses (36 Credits)

Students exempted from any of the courses listed below must replace them with additional complementary course credits.

EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 603	(4)	Intermediate Epidemiology
EPIB 605	(1)	Critical Appraisal in Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 613	(1)	Introduction to Statistical Software
EPIB 621	(4)	Data Analysis in Health Sciences
PPHS 602	(3)	Foundations of Population Health
PPHS 612	(3)	Principles of Public Health Practice
PPHS 630	(12)	MScPH Practicum/Project

Practicum/Project

If a stream is chosen as part of the complementary courses, the practicum must be related to the subject of the selected stream.

Complementary Courses (9-18 Credits)

Environmental Health Sciences

3 credits from:

GEOG 503	(3)	Advanced Topics in Health Geography
OCCH 602	(3)	Occupational Health Practice
OCCH 604	(3)	Monitoring Occupational Environment
PPHS 529	(3)	Global Environmental Health and Burden of Disease

Or other course, at the 500 level or higher, selected with the Program's Academic Adviser.

Health Services Research Policy and Management

3 credits from:

PPHS 525	(3)	Health Care Systems in Comparative Perspective
PPHS 527	(3)	Economics for Health Services Research and Policy
PPHS 528	(3)	Economic Evaluation of Health Programs
PPHS 617	(3)	Impact Evaluation

Or other course, at the 500 level or higher, selected with the Program's Academic Adviser.

Population and Public Health Interventions (social and behavioural science)

3 credits from:

EPIB 632	(3)	Mental Disorders: Population Perspectives and Methods
PPHS 614	(3)	Knowledge Translation and Public Health Leadership
PPHS 616	(3)	Principles and Practice of Public Health Surveillance
PPHS 618	(3)	Program Planning and Evaluation in Public Health

Or other course, at the 500 level or higher, selected with the Program's Academic Adviser.

0-9 credits from one of the following six streams.

In consultation with and approval by the program's academic adviser, students may focus on one of the following areas.

Courses may not satisfy more than one program requirement.

Stream 1: Epidemiology

9 credits from:

EPIB 628	(3)	Measurement in Epidemiology
EPIB 629	(3)	Knowledge Synthesis
EPIB 637	(3)	Advanced Modeling: Survival and Other Multivariable Data
EPIB 638	(3)	Mathematical Modeling of Infectious Diseases
EPIB 648	(3)	Methods in Social Epidemiology

Stream 2: Global Health

3 credits in:

PPHS 613	(3)	The Practice of Global Health
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6 credits from:

EPIB 681	(3)	Global Health: Epidemiological Research
PPHS 511	(3)	Fundamentals of Global Health
PPHS 525	(3)	Health Care Systems in Comparative Perspective
PPHS 529	(3)	Global Environmental Health and Burden of Disease
PPHS 614	(3)	Knowledge Translation and Public Health Leadership
PPHS 615	(3)	Introduction to Infectious Disease Epidemiology
PPHS 618	(3)	Program Planning and Evaluation in Public Health

Stream 3: Population Dynamics

6 credits in:

SOCI 545	(3)	Sociology of Population
SOCI 626	(3)	Demographic Methods

3 credits from:

EPIB 648	(3)	Methods in Social Epidemiology
EPIB 681	(3)	Global Health: Epidemiological Research
PPHS 525	(3)	Health Care Systems in Comparative Perspective
PPHS 527	(3)	Economics for Health Services Research and Policy
PPHS 528	(3)	Economic Evaluation of Health Programs

PPHS 529	(3)	Global Environmental Health and Burden of Disease
SOCI 512	(3)	Ethnicity and Public Policy
SOCI 520	(3)	Migration and Immigrant Groups
SOCI 535	(3)	Sociology of the Family
SOCI 588	(3)	Biosociology/Biodemography

Stream 4: Health Policy and Ethics

3 credits in:

PPHS 624	(3)	Public Health Ethics and Policy
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6 credits from:

PPHS 527	(3)	Economics for Health Services Research and Policy
PPHS 528	(3)	Economic Evaluation of Health Programs
PPHS 614	(3)	Knowledge Translation and Public Health Leadership

Stream 5: Infectious Disease

3 credits in:

PPHS 615	(3)	Introduction to Infectious Disease Epidemiology
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6 credits from:

EPIB 638	(3)	Mathematical Modeling of Infectious Diseases
PPHS 527	(3)	Economics for Health Services Research and Policy
PPHS 528	(3)	Economic Evaluation of Health Programs
PPHS 615	(3)	Introduction to Infectious Disease Epidemiology
PPHS 618	(3)	Program Planning and Evaluation in Public Health
PPHS 624	(3)	Public Health Ethics and Policy

Stream 6: Environmental Health

9 credits from:

EPIB 684	(3)	Principles of Environmental Health Sciences 1
EPIB 685	(3)	Principles of Environmental Health Sciences 2
PPHS 529	(3)	Global Environmental Health and Burden of Disease

Or other courses, at the 500-level or higher, selected with the Academic Adviser.

Elective Courses (6-15 Credits)

6-15 credits of coursework, at the 500 level or higher. Students may choose to focus on more advanced methods in epidemiology, biostatistics, geography, or substantive areas such as environmental or occupational health, or to select a variety of courses that will deepen their general knowledge of the disciplines that influence population and public health.

Courses will be selected with and approved by the Program's Academic Adviser.

12.4.3.4.7 Doctor of Philosophy (Ph.D.) Epidemiology

Epidemiology is the study and analysis of the patterns and causes of disease in human populations. It forms the core discipline of public health by identifying excess illness and by gaining the etiologic understanding to intervene toward the improvement of population health. The PhD program in epidemiology at McGill trains scientists and health professionals to design and conduct studies, analyze health data and effectively communicate scientific results, and to gain novel insights into the causes and prevention of diseases at the population level. Epidemiologic work at the doctoral level involves a thorough integration

of biological knowledge of pathogenesis, statistical knowledge of quantitative analysis and causal inference, and sociological knowledge to place these insights in the context of dynamic and interconnected human populations. Major areas of strength at McGill include epidemiologic methods, clinical epidemiology, infectious diseases, social epidemiology, pharmacoepidemiology, public and population health, global health, environmental epidemiology, chronic diseases and aging, and perinatal epidemiology.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (16 credits)

EPIB 701	(0)	Ph.D. Comprehensive Examination
EPIB 702	(0)	Ph.D. Proposal
EPIB 703	(2)	Principles of Study Design
EPIB 704	(4)	Doctoral Level Epidemiologic Methods 1
EPIB 705	(4)	Doctoral Level Epidemiologic Methods 2
EPIB 706	(3)	Doctoral Seminar in Epidemiology
EPIB 707	(3)	Research Design in Health Sciences

Complementary Courses (9 credits)

9 credits of coursework, at the 500 level or higher, with a minimum of 3 credits in biostatistics and 6 credits in epidemiology and/or substantive topic (normally related to the thesis topic). Courses must be chosen in consultation with the student's supervisor and/or the degree program's director or adviser.

12.4.3.4.8 Doctor of Philosophy (Ph.D.) Epidemiology: Global Health

This option will provide enhanced training in global health to graduate students registered in the Ph.D. in Epidemiology: Global Health degree program at McGill. Students will become familiar with topics of global health relevance and incorporate this into their core coursework and thesis research. The thesis must be relevant to global health and approved by the Global Health Coordinating Committee. Contextualizing the core training students receive in epidemiology and in their respective substantive discipline within the global health research domain will enhance their academic experience. Graduates of this option will be prepared to pursue further training in global health or to undertake a variety of career opportunities in global health in Canada or internationally.

Required Courses (22 credits)

EPIB 623	(0)	
EPIB 681	(3)	Global Health: Epidemiological Research
EPIB 701	(0)	Ph.D. Comprehensive Examination
EPIB 702	(0)	Ph.D. Proposal
EPIB 703	(2)	Principles of Study Design
EPIB 704	(4)	Doctoral Level Epidemiologic Methods 1
EPIB 705	(4)	Doctoral Level Epidemiologic Methods 2
EPIB 706	(3)	Doctoral Seminar in Epidemiology
EPIB 707	(3)	Research Design in Health Sciences
PPHS 511	(3)	Fundamentals of Global Health

Complementary Courses (9 credits)

6 credits of coursework at the 500 level or higher, with a minimum of 3 credits in biostatistics, and 3 credits in epidemiology. Courses must be chosen in consultation with the student's supervisor and/or the degree program's director or adviser.

3 credits of coursework at the 500 level or higher from this list, or any other course approved by the Global Health Option Committee that have not been taken to satisfy other program requirements.

GEOG 503	(3)	Advanced Topics in Health Geography
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NUTR 501	(3)	Nutrition in Developing Countries
PPHS 525	(3)	Health Care Systems in Comparative Perspective
PPHS 527	(3)	Economics for Health Services Research and Policy
PPHS 529	(3)	Global Environmental Health and Burden of Disease
SOCI 513	(3)	Social Aspects HIV/AIDS in Africa
SOCI 519	(3)	Gender and Globalization
SOCI 545	(3)	Sociology of Population

12.4.3.4.9 Doctor of Philosophy (Ph.D.) Epidemiology: Pharmacoepidemiology

This program provides in-depth training for graduate students on pharmacoepidemiologic methods and the application of these methods to study the population effects (benefits and harm) of pharmaceutical products. Students will acquire the skills to become independent investigators and conduct original research in pharmacoepidemiology. Career opportunities for graduates are multiple and include work in industry, government, or academia. Students will be required to participate in the Pharmacoepidemiology Journal Club. Research topics must be related to pharmacoepidemiology and approved by the program coordinating committee.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (25 credits)

EPIB 623	(0)	
EPIB 639	(4)	Pharmacoepidemiologic Methods
EPIB 654	(2)	Pharmacoepidemiology 4
EPIB 661	(2)	Pharmacoepidemiology 3
EPIB 662	(1)	Pharmacological Basis of Pharmacoepidemiology
EPIB 701	(0)	Ph.D. Comprehensive Examination
EPIB 702	(0)	Ph.D. Proposal
EPIB 703	(2)	Principles of Study Design
EPIB 704	(4)	Doctoral Level Epidemiologic Methods 1
EPIB 705	(4)	Doctoral Level Epidemiologic Methods 2
EPIB 706	(3)	Doctoral Seminar in Epidemiology
EPIB 707	(3)	Research Design in Health Sciences

Complementary Courses (3 credits)

3 credits of coursework in biostatistics at the 500 level or higher. Courses must be chosen in consultation with the student's supervisor and/or the degree program's director or adviser.

12.4.3.4.10 Doctor of Philosophy (Ph.D.) Epidemiology: Population Dynamics

The Ph.D. in Epidemiology; Population Dynamics program focuses on training in demographic methods (including life table analysis) and critical population dynamic issues such as population health, migration, aging, family dynamics, and labour markets.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (22 credits)

EPIB 701	(0)	Ph.D. Comprehensive Examination
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EPIB 702	(0)	Ph.D. Proposal
EPIB 703	(2)	Principles of Study Design
EPIB 704	(4)	Doctoral Level Epidemiologic Methods 1
EPIB 705	(4)	Doctoral Level Epidemiologic Methods 2
EPIB 706	(3)	Doctoral Seminar in Epidemiology
EPIB 707	(3)	Research Design in Health Sciences
SOCI 545	(3)	Sociology of Population
SOCI 626	(3)	Demographic Methods

Complementary Courses (9 credits)

9 credits of coursework, at the 500 level or higher, with a minimum of 3 credits in biostatistics, 3 credits in epidemiology, and 3 credits from courses approved for the Population Dynamics Option from the list below:

ECON 634	(3)	Economic Development 3
ECON 641	(3)	Labour Economics
ECON 734	(3)	Economic Development 4
ECON 741	(3)	Advanced Labour Economics
ECON 742	(3)	Empirical Microeconomics
ECON 744	(3)	Health Economics
EPIB 648	(3)	Methods in Social Epidemiology
EPIB 681	(3)	Global Health: Epidemiological Research
PPHS 525	(3)	Health Care Systems in Comparative Perspective
PPHS 528	(3)	Economic Evaluation of Health Programs
PPHS 529	(3)	Global Environmental Health and Burden of Disease
PPHS 615	(3)	Introduction to Infectious Disease Epidemiology
SOCI 502	(3)	Sociology of Fertility
SOCI 512	(3)	Ethnicity and Public Policy
SOCI 513	(3)	Social Aspects HIV/AIDS in Africa
SOCI 520	(3)	Migration and Immigrant Groups
SOCI 525	(3)	Health Care Systems in Comparative Perspective
SOCI 535	(3)	Sociology of the Family
SOCI 588	(3)	Biosociology/Biodemography

Courses must be chosen in consultation with the student's supervisor and/or the degree program's director or adviser.

12.4.3.5 Biostatistics

Biostatistics involves the development and application of statistical methods to scientific research in areas such as medicine, epidemiology, public health, occupational and environmental health, genetics, and ecology. Biostatisticians play key roles in designing studies—from helping to formulate the questions that can be answered by data collection to the decisions on how best to collect the data—and in analyzing the resulting data. Our biostatistics faculty work in close collaboration with epidemiologists, clinicians, public health specialists, basic scientists, and other health researchers. They also develop new statistical methods for such data. Students will take courses, and may do research, on topics such as:

- generalized linear models;
- longitudinal data;
- mathematical statistics;
- causal inference;
- statistical methods for epidemiology;
- survival analysis.

The Department of Epidemiology, Biostatistics, and Occupational Health has one of the largest concentrations of Ph.D.-level statisticians in health sciences in any Canadian university. Faculty members may have funding available for students through their research grants. We provide rich research environments at five university-affiliated hospitals, public health agencies, and university research centres. Graduates pursue careers in academia, clinical settings, government agencies, NGOs, and industry.

section 12.4.3.5.2: Master of Science (M.Sc.) Biostatistics (Thesis) (45 credits)

M.Sc. Thesis students study a foundational set of courses, and write a thesis on a topic of their choice. Thesis students should have a strong interest in research. These students are well-placed to either continue in a Ph.D. program or to work in academic research in statistics or medicine; they will also have relevant qualifications for the pharmaceutical industry and government.

section 12.4.3.5.3: Master of Science (M.Sc.) Biostatistics (Non-Thesis) (48 credits)

The M.Sc. Non-Thesis program is designed to expose students to a wide range of topics including statistical methods for epidemiology, generalized linear models, survival analysis, longitudinal data, and clinical trials. Skills in data analysis, statistical consulting, communication, and report writing are emphasized, and students graduate ready to work in the pharmaceutical and biotechnology industries, in government, or in academic medical research.

section 12.4.3.5.4: Doctor of Philosophy (Ph.D.) Biostatistics

Applicants should hold a master's degree in statistics or biostatistics. Previous coursework in calculus, linear algebra, real analysis, and mathematical statistics is essential. Exposure to data analysis is an asset. Ph.D. students typically work on development of statistical methods, and can specialize in statistical methods for epidemiology, generalized linear models, Bayesian methods, survival analysis, longitudinal data, causal inference, or other topics. Skills in data analysis, statistical consulting, and report writing are emphasized. Ph.D. graduates typically work as faculty in universities, in research institutes, in government, or in the pharmaceutical industry.

12.4.3.5.1 Biostatistics Admission Requirements and Application Procedures

12.4.3.5.1.1 Admission Requirements

An undergraduate degree in mathematics or statistics or its equivalent (an honours degree is preferred, but not required). At least three semesters of calculus; two semesters of linear algebra; at least one (but preferably two) semesters of real analysis; and a full-year course/sequence in mathematical statistics, preferably at an honours level, e.g., MATH 356/MATH 357. Exposure to data analysis is an asset.

M.Sc.

Students admitted into the M.Sc. program will, in general, meet the requirements above.

Ph.D.

Students with the above qualifications, in addition to an M.Sc. degree in Statistics or Biostatistics, will be considered for Ph.D. admission.

Complete details on the Biostatistics programs are available on our departmental website at mcgill.ca/epi-biostat-occh/academic-programs/grad/biostatistics.

Language Requirement

The minimum *TOEFL* score required, when applicable, is 100 on the Internet-based test. The minimum score for *IELTS* is 6.5.

12.4.3.5.1.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures.

Completed applications, with all supporting documents, must be uploaded directly to the McGill [graduate admissions system](#) by the application deadlines.

Please see our website at mcgill.ca/epi-biostat-occh/academic-programs/grad/biostatistics/applying for information on required application documents.

12.4.3.5.1.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Epidemiology, Biostatistics, and Occupational Health and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

	Application Opening Dates		Application Deadlines		
	All Applicants	Non-Canadian citizens	Canadian citizens/Perm. residents of Canada	Current McGill Students (any citizenship)	Special, Visiting & Exchange Students
Fall Term:	Sept. 15	Dec. 1	Dec. 1	Dec. 1	April 30
Winter Term:	Feb. 15	N/A	N/A	N/A	Sept. 10
Summer Term:	N/A	N/A	N/A	N/A	N/A

Admission to graduate studies is competitive; late and/or incomplete applications will not be considered.

12.4.3.5.2 Master of Science (M.Sc.) Biostatistics (Thesis) (45 credits)

Training in statistical theory and methods, applied data analysis, scientific collaboration, communication, and report writing by coursework and thesis.

Thesis Courses (21 credits)

BIOS 690	(21)	M.Sc. Thesis
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Required Courses (24 credits)

Students exempted from any of the courses listed below must replace them with complementary course credits, at the 500 level or higher, chosen in consultation with the student's academic adviser or supervisor.

BIOS 601	(4)	Epidemiology: Introduction and Statistical Models
BIOS 602	(4)	Epidemiology: Regression Models
MATH 523	(4)	Generalized Linear Models
MATH 533	(4)	Regression and Analysis of Variance
MATH 556	(4)	Mathematical Statistics 1
MATH 557	(4)	Mathematical Statistics 2

12.4.3.5.3 Master of Science (M.Sc.) Biostatistics (Non-Thesis) (48 credits)

Training in statistical theory and methods, applied data analysis, scientific collaboration, communication, and report writing by coursework and project.

Research Project (6 credits)

BIOS 630	(6)	Research Project/Practicum in Biostatistics
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Required Courses (24 credits)

Students exempted from any of the courses listed below must replace them with additional complementary course credits.

BIOS 601	(4)	Epidemiology: Introduction and Statistical Models
BIOS 602	(4)	Epidemiology: Regression Models
MATH 523	(4)	Generalized Linear Models
MATH 533	(4)	Regression and Analysis of Variance
MATH 556	(4)	Mathematical Statistics 1
MATH 557	(4)	Mathematical Statistics 2

Complementary Courses (18 credits)

18 credits of coursework, at the 500 level or higher, chosen in consultation with the student's academic adviser or supervisor.

12.4.3.5.4 Doctor of Philosophy (Ph.D.) Biostatistics

Students will study theoretical and applied statistics and related fields; the program will train them to become independent scientists able to develop and apply statistical methods in medicine and biology and make original contributions to the theoretical and scientific foundations of statistics in these disciplines. Graduates will be prepared to develop new statistical methods as needed and apply new and existing methods in a range of collaborative projects. Graduates will be able to communicate methods and results to collaborators and other audiences, and teach biostatistics to biostatistics students, students in related fields, and professionals in academic and other settings.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses

BIOS 700	(0)	Ph.D. Comprehensive Examination Part A
BIOS 701	(0)	Ph.D. Comprehensive Examination Part B
BIOS 702	(0)	Ph.D. Proposal

Complementary Courses (46 credits)

0-28 credits from the following list: (if a student has not already successfully completed them or their equivalent)

BIOS 601	(4)	Epidemiology: Introduction and Statistical Models
BIOS 602	(4)	Epidemiology: Regression Models
BIOS 624	(4)	Data Analysis and Report Writing
MATH 523	(4)	Generalized Linear Models
MATH 533	(4)	Regression and Analysis of Variance
MATH 556	(4)	Mathematical Statistics 1
MATH 557	(4)	Mathematical Statistics 2

12 credits (chosen and approved in consultation with the student's academic adviser), at the 500 level or higher, in statistics/biostatistics.

6 credits (chosen and approved in consultation with the student's academic adviser), at the 500 level or higher, in related fields (e.g., epidemiology, social sciences, biomedical sciences).

12.4.4 Occupational Health

12.4.4.1 Location

Department of Epidemiology, Biostatistics and Occupational Health
 Purvis Hall
 1020 Pine Avenue West
 Montreal QC H3A 1A2
 Canada
 Telephone: 514-398-6258
 Email: graduate.eboh@mcgill.ca
 Website: mcgill.ca/epi-biostat-occh

12.4.4.2 About Occupational Health

The Department offers two graduate degree programs: a **master's** (M.Sc.A.) and **doctoral** (Ph.D.) in occupational health sciences. The master's program is available on campus or in distance education format. Special Student status is encouraged for students who wish to take only specific courses from our M.Sc. program, but there is a maximum of 12 credits overall, with a maximum of 6 credits per semester, for those with Special Student status.

Students are required to have access to a computer and the Internet, as some of the course material is most readily available online.



Note: We are not accepting applications for the Occupational Health M.Sc.A. (Distance) or Ph.D. programs until further notice.

section 12.4.4.5: Master of Science, Applied (M.Sc.A.) Occupational Health (Non-Thesis) (Resident) (46 credits)

A three-term program leading to the degree of Master of Science (Applied) (M.Sc.A.) in Occupational Health Sciences, appropriate for graduates from engineering and basic sciences, physicians, and nurses. Occupational health training allows candidates to evaluate work environments and reduce or eliminate work hazards using prevention and control.

section 12.4.4.6: Master of Science, Applied (M.Sc.A.) Occupational Health (Non-Thesis) (Distance) (45 credits)

A three-and-a-half-year program completed mostly over the Internet.

section 12.4.4.7: Doctor of Philosophy (Ph.D.) Occupational Health

The objective of this program is to train independent researchers in the field of work environment and health.

12.4.4.3 Occupational Health Admission Requirements and Application Procedures**12.4.4.3.1 Admission Requirements**

Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit documented proof of competency in oral and written English by appropriate exams, e.g., *TOEFL* (Test of English as a Foreign Language) with a minimum score of 86 on the Internet-based test (iBT), with each component score not less than 20.

M.Sc. Applied Program (Resident) (on campus)

Candidates should have completed, with a standing equivalent to a minimum cumulative grade point average (CGPA) of 3.0 out of 4.0, one of the requisites below:

- a Bachelor of Science degree or its equivalent, in a discipline relevant to occupational health or hygiene such as chemistry, engineering, environmental sciences, or physics
- an M.D. (medicine)
- a B.Sc. in health sciences or nursing

Distance Education

Note: We are not accepting applications for the Occupational Health Distance program until further notice.

Candidates should have completed, with a standing equivalent to a minimum cumulative grade point average (CGPA) of 3.0 out of 4.0, one of the requisites below:

- a Bachelor of Science degree, or its equivalent, in a discipline relevant to occupational health or hygiene such as chemistry, engineering, environmental sciences, or physics
- an M.D. (medicine)
- a B.Sc. in health sciences or nursing

Candidates should have at least three years of experience in industrial hygiene and/or in safety.

For medical doctors and nurses, priority will be given to candidates with at least three years of experience in occupational health.

Ph.D. Program

Note: We are not accepting applications for the Occupational Health Ph.D. program until further notice.

Candidates must hold an M.Sc. degree or its equivalent in occupational health sciences, or in a relevant discipline, such as: community health, environmental health, epidemiology, chemistry, engineering, physics, or health sciences (medicine, nursing, etc.).

12.4.4.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/apply.

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures.

Resident (on campus)

Applications are considered for Fall term only. Applications for Winter/Summer term admission will not be considered, with the exception of admission as Special Students in the Winter term.

Distance Education

Students are required to have access to a computer and the Internet as the course material is available through the web.

Ph.D. Program

Each student will be assigned to one academic staff member of the Department, who will act as their supervisor, and who will guide them in the preparation of a definite research protocol.

12.4.4.3.2.1 Additional Requirements

The items and clarifications below are additional requirements set by this department:

M.Sc. Applied (Resident)

- Curriculum Vitae

- Personal Statement

M.Sc. Applied (Distance Education)

- Curriculum Vitae
- Personal Statement

Ph.D. Program

- Curriculum Vitae
- Personal Statement
- Research Proposal

12.4.4.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Epidemiology, Biostatistics and Occupational Health and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

	Application Opening Dates		Application Deadlines		
	All Applicants	Non-Canadian citizens	Canadian citizens/Perm. residents of Canada	Current McGill Students (any citizenship)	Special, Visiting & Exchange Students
Fall Term:	Sept. 15	Dec. 1	Dec. 1	Dec. 1	Apr. 30
Winter Term:	Feb. 15	N/A	N/A	N/A	Sept. 10
Summer Term:	N/A	N/A	N/A	N/A	N/A

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.



Note: Applications for Winter/Summer term admission will not be considered, with the exception of admission as Special Students in the Winter term.

12.4.4.4 Occupational Health Faculty

Please see [section 12.4.3.3: Epidemiology, Biostatistics and Occupational Health Faculty](#).

12.4.4.5 Master of Science, Applied (M.Sc.A.) Occupational Health (Non-Thesis) (Resident) (46 credits)

A three-term program leading to the degree of Master of Science(Applied) [M.Sc.(A.)] in Occupational Health; Non-Thesis, appropriate for graduates from engineering and basic sciences, physicians, and nurses. Occupational health training includes evaluation of work environments and reduction or elimination of work hazards using prevention and control.

Research Project (15 credits)

OCCH 699 (15) Project Occupational Health and Safety

Required Courses (31 credits)

EPIB 507 (3) Biostats for Health Sciences
 EPIB 601 (4) Fundamentals of Epidemiology
 OCCH 602 (3) Occupational Health Practice
 OCCH 604 (3) Monitoring Occupational Environment
 OCCH 605 (6) Physical Health Hazards
 OCCH 608 (3) Biological Hazards
 OCCH 612 (3) Principles of Toxicology
 OCCH 615 (3) Occupational Safety Practice
 OCCH 616 (3) Occupational Hygiene

12.4.4.6 Master of Science, Applied (M.Sc.A.) Occupational Health (Non-Thesis) (Distance) (45 credits)

This program is currently not accepting applicants.

Research Project (15 credits)

OCCH 699 (15) Project Occupational Health and Safety

Required Courses (30 credits)

Note: Students must pass the Master's Integrative Examination (OCCH 600) before writing their Project.

Each course has a final (proctored) examination at the end of the term.

OCCH 600	(0)	Master's Integrative Exam
OCCH 602	(3)	Occupational Health Practice
OCCH 603	(3)	Work and Environment Epidemiology 1
OCCH 604	(3)	Monitoring Occupational Environment
OCCH 608	(3)	Biological Hazards
OCCH 612	(3)	Principles of Toxicology
OCCH 615	(3)	Occupational Safety Practice
OCCH 616	(3)	Occupational Hygiene
OCCH 617	(3)	Occupational Diseases
OCCH 624	(3)	Social and Behavioural Aspects - Occupational Health
OCCH 625	(3)	Work and Environment Epidemiology 2
OCCH 626	(3)	Basics: Physical Health Hazards
OCCH 627	(3)	Work Physiology and Ergonomics
OCCH 630	(3)	Occupational Diseases for OHNS
OCCH 635	(3)	Environmental Risks to Health

On-campus practicum may be held at the discretion of each professor. These sessions are held in Montreal on the McGill University campus. Their aim is to offer students additional specific learning activities. Participation in the practicum is an essential component of the program.

12.4.4.7 Doctor of Philosophy (Ph.D.) Occupational Health

This program is currently not accepting applicants.

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (2 credits)

OCCH 700	(0)	Ph.D. Comprehensive Examination
OCCH 706	(2)	Ph.D. Seminar on Occupational Health and Hygiene

Students are encouraged to take up to 12 credits in areas pertinent to their specialty or in areas necessary to complete their knowledge of occupational health.