



Faculty of Medicine (Graduate)
Programs, Courses and University Regulations
2016-2017

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

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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.

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1 Dean's Welcome

To Graduate Students and Postdoctoral Fellows:

I am extremely pleased to welcome you to McGill University. Graduate and Postdoctoral Studies (GPS) collaborates with the Faculties and other administrative and academic units to provide strategic leadership and vision for graduate teaching, supervision, and research across our over 400 graduate programs. GPS also oversees quality assurance in admissions and registration, the disbursement of graduate fellowships, support for postdoctoral fellows, and facilitates graduate degree completion, including the examination of theses. GPS has partnered with Enrolment Services to manage the admission and registration of graduate students and postdoctoral fellows and to offer streamlined services in a one-stop location at [Service Point](#).

McGill is a student-centred research institution that places singular importance upon the quality of graduate education and postdoctoral training. As Dean of Graduate and Postdoctoral Studies, I work closely with the Faculties, central administration, graduate students, professors, researchers, and postdoctoral fellows to provide a supportive, stimulating, and enriching academic environment for all graduate students and postdoctoral fellows.

McGill is one of Canada's most intensive research universities, ranked 24th by *QS World University Rankings 2015*. We recognize that these successes come not only from our outstanding faculty members, but also from the quality of our graduate students and postdoctoral fellows—a community into which we are very happy to welcome you.

I invite you to join us in advancing this heritage of excellence at McGill.

Josephine Nalbantoglu, Ph.D.
Dean, Graduate and Postdoctoral Studies

2 Graduate and Postdoctoral Studies

2.1 Administrative Officers

Administrative Officers

Josephine Nalbantoglu; B.Sc., Ph.D. (McG.)	Dean (Graduate and Postdoctoral Studies)
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Note: For inquiries regarding specific graduate programs, please contact the appropriate department.

2.3 General Statement Concerning Higher Degrees

Graduate and Postdoctoral Studies (GPS) oversees all programs leading to graduate diplomas, certificates, and higher degrees, with the exception of some programs in the School of Continuing Studies. It is responsible for admission policies, the supervision of graduate students' work, and for recommending to Senate those who may receive the degrees, diplomas, and certificates.

3 Important Dates 2016–2017

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

4 Graduate Studies at a Glance

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

5 Program Requirements

5.1 Master's Degrees

Residence Requirements – Master's Degrees

Refers to the number of terms (or years) students must be registered on a full-time basis to complete their program. Students are NOT permitted to graduate until they have fulfilled the residence requirement (or paid the corresponding fees) in their program.

- The following master's programs have a **minimum** residence requirement of **three full-time terms**: M.Arch., M.A., M.Eng., LL.M., M.Mus. (**except** M.Mus. in Sound Recording), M.Sc., M.S.W., M.Sc.A. (**except** M.Sc.A. in Communication Sciences and Disorders).
- The following master's programs have a **minimum** residence requirement of **four full-time terms**: M.I.St.; M.Mus. in Sound Recording; M.U.P.; M.A. (60 credits – Counselling Psychology – thesis; 78 credits – Educational Psychology); M.A. Teaching and Learning – Non-Thesis; M.Sc.A. in Communication Sciences and Disorders; S.T.M., Religious Studies.
- The residence requirement for the master's program in Education (M.Ed.); Information Studies (M.I.St.); Management (M.B.A.); Religious Studies (S.T.M.); M.A. Counselling Psychology – Non-Thesis; M.A. Teaching and Learning – Non-Thesis; M.Sc. in Public Health – Non-Thesis; M.Sc.A. Nursing; M.Sc.A. Occupational Therapy; M.Sc.A. Physical Therapy; and students in part-time programs is determined on a per course basis. Residence requirements are fulfilled when students complete all course requirements in their respective programs.
- For master's programs structured as Course, Project, or Non-Thesis options where the program is pursued on a part-time basis, residence requirements are normally fulfilled when students complete all course requirements in their respective programs (minimum 45 credits or a minimum of three full-time terms) and pay the fees accordingly.

These designated periods of residence represent minimum time requirements. There is no guarantee that the work for the degree can be completed in this time. Students must register for such additional terms as are needed to complete the program.

Coursework – Master's Degrees

Program requirements are outlined in the relevant departmental sections of the Graduate and Postdoctoral Studies [eCalendar](#).

The minimum credit requirement for any thesis or non-thesis master's degree at McGill is 45 credits.

Non-thesis degrees normally specify the course program which the candidate must follow.

The department concerned will examine the student's previous training and then decide which of the available courses in the area of specialization or related fields are required to bring the candidate to the proper level for the master's degree. Due account will be taken of relevant graduate level courses passed at any recognized university or at McGill.

The candidate is required to pass, with a grade of B- or better, all those courses that have been designated by the department as forming a part of the program, including additional requirements.

Students taking courses at another university must obtain a minimum grade of B- (65%) if the course is to be credited toward their McGill degree. In the cases where only a letter grade is used, a B- is the minimum passing grade and no equivalent percentage will be considered. In the cases where only a percentage grade is used, 65% is the minimum passing grade.

As a rule, no more than one-third of the formal coursework (excluding thesis, project, stage, or internship) of a McGill master's degree can be credited with courses from another university or degree (for example, courses taken before admission to the McGill degree, or courses taken through the IUT agreement during the McGill degree, if permitted).

Normally, if courses completed elsewhere or at McGill prior to admission to the McGill master's degree were not used to complete a degree, they could be credited toward the McGill degree, keeping in mind the one-third rule as described above. These would be entered as exemptions with credit at the time of admission.

If the courses completed elsewhere or at McGill prior to admission were used to complete a degree, exemptions may be granted without credit, i.e. the exempted course(s) must be replaced by other graduate course(s) at McGill. No double counting is allowed unless, exceptionally, the department offering the Master's degree permits it and the degree has an overall credit requirement greater than 45 credits. In other words, instances where exemptions with credit may be granted will be limited to the credit amount beyond the minimum of 45 credits for a McGill master's degree. The one-third rule as described above continues to apply.

Research and Thesis – Master's Degrees

All candidates for a research degree must present a thesis based on their own research. The total number of credits allotted to the thesis in any master's program must not be less than 24. The title of the thesis and names of examiners must be forwarded on a *Nomination of Examiners and Thesis Submission* form, available at www.mcgill.ca/gps/thesis/guidelines/initial-submission, in accordance with the dates on www.mcgill.ca/importantdates, through the Chair of the department concerned at the same time that the thesis is submitted to Graduate and Postdoctoral Studies. A thesis for the master's degree, while not necessarily requiring an exhaustive review of work in the particular field of study, or a great deal of original scholarship, must show familiarity with previous work in the field and must demonstrate the ability to carry out research and to organize results, all of which must be presented in good literate style. The thesis will not normally exceed 100 pages; in some disciplines, shorter texts are preferred. Guidelines and deadlines are available at www.mcgill.ca/gps/thesis/guidelines.

Language Requirements – Master's Degrees

Many master's degree programs do not include language requirements, but candidates who intend to proceed to a doctoral degree should take note of any language requirements and are strongly advised to take the examinations in at least one language while working for the master's degree.

5.2 Doctoral Degrees

Residence Requirements – Doctoral

Refers to the numbers of terms (or years) students must be registered on a full-time basis to complete their program. Students are not permitted to graduate until they have fulfilled the residence requirement (or paid the corresponding fees) in their program.

Candidates entering Ph.D. 1 must follow a program of at least three years' residency at the University; this is a minimum requirement, and there is no guarantee that the work of the degree can be completed in this time, but students are expected to complete within the maximum specified period. Only exceptional candidates holding a bachelor's degree will be considered for direct admission to Ph.D. 1 level.

It is required that candidates spend the greater part of each summer working on their theses, and those who do not do so are unlikely to complete a satisfactory thesis in the prescribed minimum time (see [section 8.3: Vacation Policy for Graduate Students and Postdocs](#)).

A student who has obtained a master's degree at McGill University or at an approved institution in a relevant subject and is proceeding to a Ph.D. degree will, on the recommendation of the department, be admitted to Ph.D. 2; in this case, the residency requirement for the program is two years.

In the doctoral program, students must be registered on a full-time basis for one more year after completion of the residency (i.e., Ph.D. 4 year) before continuing as Additional Session students until completion of the program.



Note: The master's degree must have been awarded before initial registration in the doctoral program; otherwise, the admission level will be at Ph.D. 1 and residency will be extended to three years. Once the level of admission is approved, it will not be changed after obtaining the master's degree if the date falls after registration in the program. If a previous awarded degree is a condition of admission, it must be fulfilled before registration in another program.

As a rule, no more than one-third of the McGill program formal coursework can be credited with courses from another university.

Comprehensive Examinations – Doctoral

The majority of doctoral programs at McGill require candidates to pass a comprehensive examination or set of examinations or equivalent, such as qualifying examinations, preliminary examinations, candidacy papers, comprehensive evaluations, thesis proposals, etc. The results of this examination determine whether or not students will be permitted to continue in their programs. The methods adopted for examination and evaluation and the areas to be examined are specified by departmental regulations and approved by Graduate and Postdoctoral Studies. It is the responsibility of students to inform themselves of these details. For more information, see [University Regulations and Resources > Graduate > Guidelines and Policies > : Ph.D. Comprehensive Policy](#).

Language Requirements – Doctoral

Many graduate departments in the Faculties of Agricultural and Environmental Sciences, Education, Engineering, Management, Medicine, and Science do not require a language examination. Students should inquire in their departments if there are any such requirements, or whether any other requirements have been substituted for those relating to languages.

Graduate departments in the Faculties of Arts, Music, and Religious Studies usually require proficiency in one or two languages other than English. In all cases, **students should consult departmental regulations concerning language requirements**.

Language requirements for the Ph.D. degree are met through demonstrated reading knowledge. The usual languages are French, German, or Russian, but in particular instances another language may be necessary.

All language requirements must be fulfilled and the grades reported **before** submission of the thesis to GPS (Thesis section).

Students must contact their departments to make arrangements to take the Language Reading Proficiency Examinations. Students may, however, demonstrate competence by a pass standing in two undergraduate language courses taken at McGill (see departmental regulations).

Candidates are advised to discharge their language requirements as early in their program as possible.

Students expecting to enrol in Professional Corporations in the province of Quebec are advised to become fluent in both spoken and written French.

French language courses are available at the French Language Centre. The teaching is intensive and class sizes are kept small. While undergraduate students are given preference, graduate students who are certain they can devote sufficient time to the work may enrol.

Thesis – Doctoral

The thesis for the Ph.D. degree must display original scholarship expressed in good literate style and must be a distinct contribution to knowledge. **Formal notice of a thesis title and names of examiners must be submitted to the Thesis section of GPS on the *Nomination of Examiners and Thesis Submission* form, available at www.mcgill.ca/gps/thesis/guidelines/initial-submission, in accordance with the dates on www.mcgill.ca/importantdates, at the same time as the thesis is submitted.** The list of examiners must be approved by the Department Chair, the supervisor and the student. The Thesis section of GPS should be notified of any subsequent change of title as early as possible. Guidelines and deadlines are available at www.mcgill.ca/gps/thesis/guidelines.

Special regulations for the Ph.D. degree in particular departments are stated in the entries of those departments.

Thesis Oral Examination – Doctoral

After the thesis has been received and approved, a final oral examination is held on the subject of the thesis and subjects intimately related to it. This is conducted in the presence of a Committee of at least five members presided over by a Pro-Dean nominated by Graduate and Postdoctoral Studies. The Chair of the candidate's department and the Thesis Supervisor are regularly invited to be members of the Committee; at least one member of the Committee is appointed from outside the candidate's department. Guidelines are available at www.mcgill.ca/gps/thesis/guidelines.

5.3 Ad Personam Programs (Thesis Option Only)

In very rare circumstances, an applicant who wishes to engage in Master's (thesis option only) or Ph.D. studies of an interdisciplinary nature involving joint supervision by two departments, each of which is authorized by the Government of Quebec to offer its own graduate programs, may be admitted to an *Ad Personam* program. For more information, see www.mcgill.ca/gradapplicants/programs and contact the relevant department.

5.4 Coursework for Graduate Programs, Diplomas, and Certificates

Upper-level undergraduate courses (excluding 500-level) may not be considered for degrees, diplomas, and certificates unless they are already listed as required courses in the approved program description. If an upper-level undergraduate course (excluding 500 level) is taken by a graduate student, it must come as a recommendation from the Graduate Program Director in the department. The recommendation must state if the undergraduate course is an additional requirement for the program (must obtain B- or better) or if the course is extra to the program (will be flagged as such on the record and fees will be charged). See document at www.mcgill.ca/gps/students/registration#courseereg.

English and French language courses offered by the French Language Centre (Faculty of Arts) or the School of Continuing Studies may not be taken for coursework credits toward a graduate program.

All substitutions for coursework in graduate programs, diplomas, and certificates must be approved by GPS.

Courses taken at other institutions to be part of the requirements of a program of study must be approved by GPS before registration. Double counting is not permitted.

6 Graduate Admissions and Application Procedures

Please refer to [University Regulations and 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 and 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 required by postdoctoral scholars 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 him/her 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

The general guidelines listed below are meant to encourage units to examine their policies and procedures to support postdoctoral education. Every unit hosting Postdocs should have explicitly stated policies and procedures for the provision of postdoctoral education as well as established means for informing Postdocs of policies, procedures, and privileges (e.g., orientation sessions, handbooks, etc.), as well as mechanisms for addressing complaints. Academic units should ensure that their policies, procedures and privileges are consistent with these guidelines and the Charter of Students' Rights. For their part, Postdocs are responsible for informing themselves of policies, procedures, and privileges.

1. Definition and Status

i. Postdoctoral status will be recognized by the University in accordance with Quebec provincial regulations. Persons may only be registered with postdoctoral status for a period of up to five years from the date they were awarded a Ph.D. or equivalent degree. Time allocated to parental or health leave is added to this period of time. Leaves for other reasons, including vacation leave, do not extend the term. Postdocs must do research under the supervision of a McGill professor, including Adjunct Professors, who is a member of McGill's academic staff qualified in the discipline in which training is being provided and with the abilities to fulfil responsibilities as a supervisor of the research and as a mentor for career development. They are expected to be engaged primarily in research with minimal teaching or other responsibilities.

2. Registration

i. Postdocs must be registered annually with the University through Enrolment Services. Initial registration will require an original or notarized copy of the Ph.D. diploma. Registration will be limited to persons who fulfil the definition above and for whom there is an assurance of appropriate funding and where the unit can provide assurance of the necessary resources to permit postdoctoral education.

ii. Upon registration, the Postdoc will be eligible for a University identity card issued by Enrolment Services.

3. Appointment, Pay, Agreement of Conditions

i. Appointments may not exceed your registration eligibility status.

ii. In order to be registered as a Postdoc, you must be assured of financial support other than from personal means during your stay at McGill University, equivalent to the minimal stipend requirement set by the University in accordance with guidelines issued by federal and provincial research granting agencies. There are no provisions for paid parental leave unless this is stipulated in the regulations of a funding agency outside the University.

iii. At the outset of a postdoctoral appointment, a written Letter of Agreement for Postdoctoral Education should be drawn up and signed by the Postdoc, the supervisor, and the department head or delegate (see template Letter of Agreement and supporting document—[Commitments of Postdoctoral Scholars and Supervisors](#)—available at www.mcgill.ca/gps/postdocs/fellows/responsibilities). This should stipulate, for example, the purpose of the postdoctoral appointment (research training and the advancement of knowledge), the duration of the fellowship/financial support, the modality of pay, the work space, travel funds, and expectations and compensation for teaching and student research supervision. Leaves from postdoctoral education 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 and Resources > Graduate > Regulations > Categories of Students > : Leave of Absence Status](#)). Any breach of these conditions may result in grievance procedures or the termination of the postdoctoral appointment.

- iv. Postdocs with full responsibility for teaching a course should be compensated over and above their fellowship at the standard rate paid to lecturers by their department. This applies to all postdocs, except those for whom teaching is part of the award (e.g., Mellon grantees).
- 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. 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 in the *Handbook on Student Rights and Responsibilities* (“Green Book”), available at www.mcgill.ca/secretariat/policies/students.
- ii. Postdocs have full graduate student borrowing privileges in McGill libraries through their identity card.
- iii. As a rule, Postdocs who are Canadian citizens or who have Permanent Resident status may take courses for credit. Admission to such courses should be sought by submitting application documents directly to the appropriate program by the Postdoc. They must be admitted by the department offering the courses as Special Students. These Postdocs may only be enrolled as part-time students in non-degree granting programs. They will be charged fees for these courses.
- iv. Postdocs may be listed in the McGill directory. The Computing Centre will grant Postdocs email privileges on the same basis as graduate students upon presentation of a valid identity card.
- v. The Department of Athletics will grant Postdocs access to sports facilities upon presentation of their identity card. A fee will be charged on an annual or term basis.
- vi. Postdocs are mandatory members of the Post-Graduate Students’ Society (PGSS) and an annual association fee is automatically charged. PGSS fees are mandatory. Postdocs are permitted membership in the Faculty Club; an annual fee will be charged for this membership.
- vii. 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.
- viii. Postdocs have access to the services provided by the Ombudsperson.
- ix. 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.
- x. Access to student services and athletic services are available to the Postdoc on an opt-in basis. Fees are applicable.

5. Responsibilities

- i. Postdocs are subject to the responsibilities outlined in the *Handbook on Student Rights and Responsibilities* (“Green Book”), available at www.mcgill.ca/secretariat/policies/students.
- 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 responsibilities of the department are:
 - to verify the Postdoc’s eligibility period for registration;
 - to provide Postdocs with departmental policy and procedures that pertain to them;
 - to oversee the registration and appointment of Postdocs;
 - to assign departmental personnel (e.g., Postdoc coordinator and Graduate Program Director) the responsibility for Postdocs;
 - 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 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 responsibilities of Postdocs are:
 - to inform themselves of and adhere to the University’s policies and/or regulations for Postdocs for leaves, for research, and for student conduct as outlined in the *Handbook on Student Rights and Responsibilities* 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.

Approved by Senate, April 2000; revised May 2014

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 and 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 and 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 www.mcgill.ca/gps/funding/students-postdocs/accepting-maintaining-awards under "Leave Policies: Funding Council Leave Policies for Graduate Students and Postdoctoral Fellows."

8.5 Postdoctoral Research Trainees

Eligibility

If your situation does not conform to the Government of Quebec's definition of 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—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 the degree/certification has not yet been awarded. The individual 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. The individual wishes to conduct the research stage or elective component of his/her program of study at McGill University under the supervision of a McGill professor. The individual will be engaged in full-time research with well-defined objectives, responsibilities, and methods of reporting. The application must be accompanied by a letter of permission from the 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/diploma;
- 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 and 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 Information on Research Policies and Guidelines, Patents, Postdocs, Associates, Trainees

Refer to [University Regulations and Resources](#) > *Graduate* > : [Research Policy and Guidelines, Patents, Postdocs, Associates, Trainees](#) for information on the following:

- Policy on Research Ethics
- Regulations on Research Policy
- Policy on Research Integrity
- Guidelines for Research Involving Human Subjects
- Guidelines for Research with Animal Subjects
- Policy on Intellectual Property
- Regulations Governing Conflicts of Interest
- Safety in Field Work
- Office of Sponsored Research
- Postdocs
- Research Associates

11 Browse Academic Units & Programs

The programs and courses in the following sections have been approved for the 2016–2017 session as listed. The Faculty/School reserves the right to introduce changes as may be deemed necessary or desirable at any time throughout the year.

11.1 Anatomy and Cell Biology

11.1.1 Location

Department of Anatomy and Cell Biology
Strathcona Anatomy and Dentistry Building
3640 University Street, Room M/28
Montreal QC H3A 0C7
Canada
Telephone: 514-398-6350
Fax: 514-398-5047
Website: www.mcgill.ca/anatomy

11.1.2 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

M.Sc. and Ph.D. students receive a minimum yearly stipend of \$18,000 and \$20,000 respectively. 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.

The **Human Systems Biology Stream** is offered as a complementary stream to the existing M.Sc. program entailing a multidisciplinary approach to achieving an M.Sc. in Cell Biology and Anatomy. The primary objective of this stream is to offer graduate students academic training in Human Systems Biology. This is an exciting and new multidisciplinary field that aims to understand molecular human diseases at the systems level.

section 11.1.5: 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 the 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. The 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 a competitive career in academic settings as well as in industry or other fields.

section 11.1.6: 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 the 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. The 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 a competitive career, in academic settings as well as in industry or other fields.

11.1.3 Anatomy and Cell Biology Admission Requirements and Application Procedures**11.1.3.1 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; 567 on the paper-based test (PBT)) with each component score of not less than 20.

or

IELTS: Minimum overall band score of 6.5.

11.1.3.2 Application Procedures

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

See [University Regulations and 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 www.mcgill.ca/anatomy/graduate-mscphd.

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 www.mcgill.ca/anatomy/graduate-mscphd.

11.1.3.2.1 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

11.1.3.3 Application Deadlines

The application deadlines listed here 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 www.mcgill.ca/gps/contact/graduate-program.

Canadian/McGill Students (any citizenship; includes fast-track and back-tracking)	International	Special/Exchange/Visiting
Fall: June 21	Fall: April 21	Fall: Same as Canadian/International

Canadian/McGill Students (any citizenship; includes fast-track and back-tracking)	International	Special/Exchange/Visiting
Winter: Nov. 10	Winter: Sept. 1	Winter: Same as Canadian/International
Summer: N/A	Summer: N/A	Summer: N/A

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

11.1.4 Anatomy and Cell Biology Faculty

Chair

Craig Mandato

Emeritus Professors

Gary C. Bennett; B.A., B.Sc.(Sir G. Wms.), M.Sc., Ph.D.(McG.)

John J.M. Bergeron; B.Sc.(McG.), D.Phil.(Oxf.)

James R. Brawer; B.Sc.(Tufts), Ph.D.(Harv.)

Sandra C. Miller; B.Sc.(Sir G. Wms.), M.Sc., Ph.D.(McG.)

Dennis G. Osmond; C.M., B.Sc., M.B., Ch.B., D.Sc.(Brist.), M.R.C.S., L.R.C.P., F.R.S.C.

Charles E. Smith; D.D.S., Ph.D.(McG.)

Hershey Warshawsky; B.Sc.(Sir G. Wms.), M.Sc., Ph.D.(McG.)

Professors

Chantal Autexier; B.Sc.(C' dia), Ph.D.(McG.)

Khanh Huy Bui; M.Sc.(Chalmers Univ. of Tech.), Ph.D.(ETH Zürich)

Samuel David; Ph.D.(Manit.) (*joint appt. with Neurology and Neurosurgery*)

Louis Hermo; B.A.(Loyola), M.Sc., Ph.D.(McG.)

Timothy Kennedy; B.Sc.(McM.), M.Phil., Ph.D.(Col.) (*joint appt. with Neurology and Neurosurgery*)

Nathalie Lamarche-Vane; B.Sc., Ph.D.(Montr.)

Marc D. McKee; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Dentistry*)

Peter McPherson; B.Sc.(Manit.), Ph.D.(Iowa) (*joint appt. with Neurology and Neurosurgery*)

Carlos R. Morales; D.V.M.(U.N., Argentina), Ph.D.(McG.)

Barry I. Posner; M.D.(Manit.), F.R.C.P.(C) (*joint appt. with Medicine*)

Dieter Reinhardt; M.S.(Kaiserslautern), Ph.D.(Munich) (*joint appt. with Dentistry*)

Alfredo Ribeiro-da-Silva; M.D., Ph.D.(Oporto) (*joint appt. with Pharmacology and Therapeutics*)

Wayne Sossin; S.B.(MIT), Ph.D.(Stan.) (*joint appt. with Neurology and Neurosurgery*)

Stefano Stifani; Ph.D.(Rome), Ph.D.(Alta.) (*joint appt. with Neurology and Neurosurgery*)

Hojatollah Vali; B.Sc., M.Sc., Ph.D.(Munich)

Dominique Walker; B.Sc., Ph.D.(Geneva) (*joint appt. with Psychiatry*)

Associate Professors

Orest W. Blaschuk; B.Sc.(Winn.), M.Sc.(Manit.), Ph.D.(Tor.) (*joint appt. with Surgery*)

Eugene Daniels; M.Sc., Ph.D.(Manit.)

Elaine Davis; B.Sc., M.Sc.(W. Ont.), Ph.D.(McG.)

Craig Mandato; B.Sc., Ph.D.(Wat.)

John F. Presley; B.A., Ph.D.(Texas)

Isabelle Rouiller; Ph.D.(Hertfordshire)

Assistant Professors

Geoffroy P. Noël; Ph.D.(Br. Col.)

Nicole Ventura; Ph.D.(Qu.)

Associate Members

Daniel Bernard (*Pharmacology and Therapeutics*)

Claire Brown (*Physiology*)

Colin Chalk (*Neurology and Neurosurgery*)

Jean-François Cloutier (*Neurology and Neurosurgery*)

Claudio Cuello (*Pharmacology and Therapeutics*)

Giovanni DiBattista (*Medicine*)

Allen Ehrlicher (*Bioengineering*)

Alyson Fournier (*Neurology and Neurosurgery*)

Lisbet Haglund (*Surgery*)

Janet Henderson (*Medicine*)

Loydie A. Jerome-Majewska (*Pediatrics and Human Genetics*)

Svetlana Komarova (*Dentistry*)

Stephane Laporte (*Medicine*)

Andréa Leblanc (*Neurology and Neurosurgery*)

Stéphanie Lehoux (*Medicine*)

Heidi McBride (*Montreal Neurological Institute*)

Peter Metrakos (*Surgery*)

Makato Nagano (*Obstetrics and Gynecology*)

Tommy Nilsson (*Medicine*)

Christian Rocheleau (*Endocrinology and Metabolism*)

Edward S. Ruthazer (*Neurology and Neurosurgery*)

Peter Siegel (*Medicine and Biochemistry*)

Thomas Stroh (*Neurology and Neurosurgery*)

Jason Tanny (*Pharmacology and Therapeutics*)

Adjunct Professors

Gregor Andelfinger; M.D.(Ulm)

Christopher Brett; Ph.D.(Johns Hop.)

Philippe Campeau; M.D.(Laval)

Michel Cayouette; Ph.D.(Laval)

Frédéric Charron; B.Sc.(Montr.), Ph.D.(McG.)

Jean-François Côté; Ph.D.(McG.)

Daniel Cyr; B.Sc., M.Sc.(C'dia), Ph.D.(Manit.)

Jacques Drouin; B.Sc., D.Sc.(Laval)

Jennifer Estall; Ph.D.(Tor.)

Patrick Freud; B.Sc., D.C.(Parker)

David Hipfner; B.Sc., Ph.D.(Qu.)

Artur Kania; Ph.D.(Baylor)

Justin Kollman; Ph.D.(Calif.-San Diego)

Adjunct Professors

Stephane Lefrancois; B.Sc., Ph.D.(McG.)

André Nantel; B.Sc., M.Sc.(Laval), Ph.D.(Chapel Hill)

Alexei Pshezhetsky; Ph.D.(Moscow St.)

Michael Sacher; Ph.D.(McG.)

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

ANAT 698 (24) M.Sc. Thesis Research 1

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 663D1 (3) Histology
 ANAT 663D2 (3) Histology
 ANAT 690D1 (3) Cell and Developmental Biology
 ANAT 690D2 (3) Cell and Developmental Biology

Human Systems Biology Stream

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) Computational Gene Regulation
 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

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.

11.1.6 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

11.2 Biochemistry

11.2.1 Location

Department of Biochemistry
McIntyre Medical Sciences Building
3655 Promenade Sir-William-Osler
Montreal QC H3G 1Y6
Canada

Christine Laberge: Student Affairs Administrator/Graduate Program Coordinator

Telephone: 514-398-2423

Fax: 514-398-7384

Email: admissions.biochemistry@mcgill.ca

Website: www.mcgill.ca/biochemistry (Chemical Biology: www.mcgill.ca/biochemistry/graduate-studies-2/chemicalbiology; Bioinformatics: www.mcgill.ca/biochemistry/graduate-studies-2/bioinformatics)

11.2.2 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 Goodman Cancer Research Centre, 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 11.2.5: 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 11.2.6: 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 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.

M.Sc. level – 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 11.2.7: 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 11.2.8: 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 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 11.2.9: 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 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.

Ph.D. level – 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 11.2.10: 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.

11.2.3 Biochemistry Admission Requirements and Application Procedures**11.2.3.1 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): Minimum acceptable scores are 86 Internet-based test (iBT) with no less than 20 in each of the four component scores or 567 on the paper-based test (PBT). CBT results will no longer be accepted, as ETS no longer reports these results.

or

- **IELTS**: Minimum overall band score of 6.5 or greater.
- International students who have received their degree outside North America should submit **GRE** scores: Subject Test in Biochemistry, Cell and Molecular Biology with a minimum score of 550 (not required, but strongly recommended).

Admission Requirements – Bioinformatics or Chemical Biology Option

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.

11.2.3.2 Application Procedures

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

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

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 www.mcgill.ca/biochemistry/research and www.mcgill.ca/biochemistry/about-us/department/faculty-members.

11.2.3.2.1 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

11.2.3.3 Application Deadlines

The application deadlines listed here 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 www.mcgill.ca/gps/contact/graduate-program.

Canadian	International	Special/Exchange/Visiting
Fall: June 15	Fall: Apr. 20	Fall: N/A
Winter: Nov. 1	Winter: Sept. 1	Winter: N/A
Summer: N/A	Summer: N/A	Summer: N/A

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

11.2.4 Biochemistry Faculty

Chair

Albert Berghuis

Emeritus Professors

Rhoda Blostein; B.Sc., M.Sc., Ph.D.(McG.), F.R.S.C.
 Philip E. Branton; B.Sc., M.Sc., Ph.D.(Tor.), F.R.S.C. (*Gilman Cheney Professor of Biochemistry*)
 Peter E. Braun; B.Sc., M.Sc.(Br. Col.), Ph.D.(Calif., Berk.)
 Robert E. MacKenzie; B.Sc.(Agr.)(McG.), M.N.S., Ph.D.(Cornell)
 Edward A. Meighen; B.Sc.(Alta.), Ph.D.(Calif., Berk.)
 Walter E. Mushynski; B.Sc., Ph.D.(McG.)
 Clifford P. Stanners; B.Sc.(McM.), M.A., Ph.D.(Tor.)
 Maria Zannis-Hadjopoulos; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Oncology and Medicine*)

Professors

Nicole Beauchemin; B.Sc., M.Sc., Ph.D.(Montr.) (*joint appt. with Oncology and Medicine*)
 Albert Berghuis; B.Sc., M.Sc.(Rijks Univ. Groningen, The Netherlands), Ph.D.(Br. Col.) (*Canada Research Chair in Structural Biology*)
 Imed Gallouzi; Maitrise, D.E.A., Ph.D.(Montpellier, France) (*Canada Research Chair in Cellular Information Systems*)
 Kalle Gehring; B.A.(Brown), M.Sc.(Mich.), Ph.D.(Calif., Berk.) (*Chercheur National du FRSQ*)
 Vincent Giguère; B.Sc., Ph.D.(Laval) (*joint appt. with Oncology and Medicine*)
 Philippe Gros; B.Sc., M.Sc.(Montr.), Ph.D.(McG.), F.R.S.C. (*James McGill Professor*)
 Roderick R. McInnes; B.Sc., M.D.(Dal.), Ph.D.(McG.)
 William Muller; B.Sc., Ph.D.(McG.) (*Canada Research Chair in Molecular Oncology*)
 Alain Nepveu; B.Sc., M.Sc.(Montr.), Ph.D.(Sher.) (*James McGill Professor*) (*joint appt. with Oncology and Medicine*)
 Morag Park; B.Sc., Ph.D.(Glas.), F.R.S.C. (*Diane and Sal Guerrera Chair in Cancer Genetics*) (*James McGill Professor*) (*joint appt. with Oncology and Medicine*)

Professors

Arnim Pause; B.Sc., M.Sc.(Konstanz), Ph.D.(McG.) (*Canada Research Chair in Molecular Oncology*)

Jerry Pelletier; B.Sc., Ph.D.(McG.) (*James McGill Professor*)

Gordon C. Shore; B.Sc.(Guelph), Ph.D.(McG.)

John R. Silvius; B.Sc., Ph.D.(Alta.)

Nahum Sonenberg; M.Sc., Ph.D.(Weizmann Inst.), F.R.S.C., F.R.S. (*James McGill Professor*)

David Y. Thomas; B.Sc.(Brist.), M.Sc., Ph.D.(Univ. College, Lond.), F.R.S.C. (*Canada Research Chair in Molecular Genetics*)

Michel L. Tremblay; B.Sc., M.Sc.(Sher.), Ph.D.(McM.), F.R.S.C. (*Jeanne and Jean-Louis Levesque Chair in Cancer Research*)

Associate Professors

Maxime Bouchard; B.Sc., Ph.D.(Laval) (*Canada Research Chair in Developmental Genetics*)

Josée Dostie; B.Sc.(Sher.), Ph.D.(McG.) (*CIHR New Investigators Award; Chercheure-boursière du FRSQ*)

Thomas Duchaine; B.Sc., Ph.D.(Montr.) (*Chercheur-boursier du FRSQ*)

Bhushan Nagar; B.Sc., Ph.D.(Tor.) (*Canada Research Chair in the Structural Biology of Signal Transduction*)

Martin Schmeing; B.Sc.(McG.), Ph.D.(Yale)

Julie St-Pierre; B.Sc., M.Sc.(Laval), Ph.D.(Camb.)

Jose G. Teodoro; B.Sc.(W. Ont.), Ph.D.(McG.) (*CIHR New Investigators Award; Chercheur-boursier du FRSQ*)

Jason C. Young; B.Sc.(Tor.), Ph.D.(McM.) (*Canada Research Chair in Molecular Chaperones*)

Assistant Professors

Uri David Akavia; B.Sc., M.Sc., Ph.D.(Tel Aviv)

Sidong Huang; B.A.(Boston), Ph.D.(Calif.)

Ian Watson; B.Sc., Ph.D.(Tor.)

Associate Members

Gary Brouhard (*Dept. of Biology*)

Edward A. Fon (*Neurology and Neurosurgery*)

Jacques Genest (*Dept. of Medicine*)

Michael Hallett (*McGill Centre for Bioinformatics*)

Robert S. Kiss (*Dept. of Medicine*)

Gergely Lukacs (*Dept. of Physiology*)

Vassilios Papadopoulos (*Dept. of Medicine*)

Janusz Rak (*Dept. of Medicine*)

Stéphane Richard (*Depts. of Medicine and Oncology*)

Reza Salavati (*Inst. of Parasitology*)

Maya Saleh (*Dept. of Medicine*)

Erwin Schurr (*Ctr. for Host Resistance, MGH*)

Peter Siegel (*Goodman Cancer Ctr., Dept. of Medicine*)

Ivan Topisirovic (*Dept. of Oncology*)

Youla S. Tsantrizos (*Dept. of Chemistry*)

Bernard Turcotte (*Dept. of Medicine*)

Josie Ursini-Siegel (*Dept. of Oncology*)

Simon Wing (*Dept. of Medicine*)

Xiang-Jiao Yang (*Goodman Cancer Ctr., Dept. of Medicine*)

Adjunct ProfessorsPhilip Awadalla (*Montr.*)Mirek Cygler (*Sask.*)Jacques Drouin (*IRCM*)Anny Fortin (*Dafra Pharma Res. and Dev. Bvba*)Matthias Götte (*Alta.*)Enrico Purisima (*NRC/BRI*)René Roy (*PharmaQAM*)**11.2.5 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	(0)	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.

11.2.6 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	(0)	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.

11.2.7 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 (0) 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 504 (3) Drug Design
 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
 CHEM 655 (4) Advanced NMR Spectroscopy
 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.

11.2.8 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)	Research Seminar 2

*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	(0)	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.

11.2.9 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)	Research Seminar 2
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	(0)	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.

11.2.10 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)	Research Seminar 2

* 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	(0)	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 504	(3)	Drug Design
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
CHEM 655	(4)	Advanced NMR Spectroscopy
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.

11.3 Bioethics

11.3.1 Location

Biomedical Ethics Unit
 3647 Peel Street
 Montreal QC H3A 1X1
 Canada
 Telephone: 514-398-6668
 Fax: 514-398-8349
 Website: www.mcgill.ca/biomedicaethicsunit/masters

For information, contact the Graduate Program Director:

Jennifer Fishman – jennifer.fishman@mcgill.ca

11.3.2 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 anthropology, history, law, medicine, molecular genetics, philosophy, and sociology. 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, Faculty 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, Division of Experimental Medicine, Department of Human Genetics, Department of Family Medicine;
- Faculty of Law;
- Faculty of Religious Studies; and
- Faculty of Arts, Department of Philosophy.

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.

11.3.3 Bioethics Admission Requirements and Application Procedures

11.3.3.1 Admission Requirements

M.D., 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.

11.3.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.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 (Division of Experimental Medicine, Department of Human Genetics, Department of Family Medicine), Religious Studies, and the Department of Philosophy.

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 www.mcgill.ca/biomedicaethicsunit/masters/apply.

Applicants must be accepted by the appropriate Faculty, the Bioethics Graduate Studies Advisory Committee, and Graduate and Postdoctoral Studies.

11.3.3.3 Application 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 www.mcgill.ca/gps/contact/graduate-program.



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

11.3.4 Biomedical Ethics Unit Faculty

Director

J. Kimmelman (*Interim*)

Associate Professors

E. Bereza; B.A., M.D.,C.M.(McG.), C.C.F.P.(C)

C. Ells; R.R.T.(VGH), B.A.(St. Mary's), M.A., Ph.D.(Tenn.)

J.R. Fishman; B.A.(Calif., Berk.), Ph.D.(Calif., SF)

J. Kimmelman; B.S.(Duke), Ph.D.(Yale)

N.B. King; B.A.(Penn.), M.A., Ph.D.(Harv.)

Associate Members

F. Carnevale (*Ingram School of Nursing*)

M. Hunt (*School of Physical & Occupational Therapy*)

Y. Joly (*Human Genetics*)

B.M. Knoppers (*Centre of Genomics and Policy*)

M.E. Macdonald (*MQHRG*)

T. Maniatis (*Bioethics*)

M.H. Zawati (*Human Genetics*)

11.4 Biological and Biomedical Engineering

11.4.1 Location

Duff Medical Building
3775 University Street, Room 316
Montreal QC H3A 2B4
Canada
Website: www.mcgill.ca/bbme

11.4.2 About Biological and Biomedical Engineering

The Biological and Biomedical Engineering (BBME) graduate program is a new interfaculty program involving the Department of Bioengineering in the Faculty of Engineering and the Department of Biomedical Engineering in the Faculty of Medicine. The new BBME interfaculty program builds on the excellence and high standard of its predecessor graduate program in Biomedical Engineering. This broader interfaculty restructuring supports the growing trend in research universities toward formalized interdisciplinary studies and multifaculty collaboration.

BBME students come from a wide range of backgrounds including engineering, physics, chemistry, biology, and dentistry, among others. The multicultural diversity of our student body is a strength of the program, as networking and collaborative opportunities are vast. Students in BBME have supervisors associated with the program whose home departments will be spread primarily across the Faculties of Engineering and Medicine.

As scientists unravel the molecular and physiological mechanisms of biology, attempt to reverse-engineer naturally occurring biological solutions, devices, and procedures, or develop increasingly advanced technologies to transform patient care, graduates from the BBME program are poised to play a critical role in shaping our global future.

Please consult our [website](#) for additional information.

Research Domains

Our faculty members are particularly active in research related to the development of quantitative analysis tools and instruments for biological and biomedical research. The ultimate goal is the pursuit of answers to biological and medical questions. Ongoing biological and biomedical engineering research at McGill includes:

- signal analysis, including brain (EEG), muscles (EMG), eyes (EOG), respiration, and mass spectrometry;
- systems analysis, including neuromuscular control, and oculomotor and vestibular control;
- experimental and computational biomechanics, including orthopedic and auditory mechanics;
- biomaterials, including artificial cells;
- medical imaging and image processing;
- micro and nanotechnology and biosensors;
- nanoparticles and cell imaging;
- bioinformatics and computational biology;
- computers in medical education, including interactive 3D models and haptics;
- biological materials and mechanics;
- biomolecular and cellular engineering, regenerative medicine;
- biomedical, diagnostics, and high throughput screening engineering;
- mechanics of disease;
- tissue engineering, especially concerning 3D and nano-related biological microfluidics devices, such as fungi and cellular traffic;
- biological dynamic devices, from whole-organisms (e.g., bacteria) to nanodevices;
- information processing and storage in biological systems;
- systems and synthetic biology;
- cell mechanisms and the cytoskeleton;
- soft matter physics.

section 11.4.5: Master of Engineering (M.Eng.); Biological and Biomedical Engineering (Thesis) (45 credits)

The Biological and Biomedical Engineering Master's program focuses on the interdisciplinary application of methods, paradigms, technologies, and devices from engineering and the natural sciences to problems in biology, medicine, and the life sciences. With its unique multidisciplinary environment and taking advantage of research collaborations between staff in the Faculties of Medicine, Science, and Engineering, BBME offers thesis-based graduate degrees (M.Eng.) that span broad themes, including: biomodelling, biosignal processing, medical imaging, nanotechnology, artificial cells and organs, probiotics, bioinformatics, orthopedics, biological materials and mechanobiology, motor proteins and the cytoskeleton, biosensors and biological therapeutics, biological networks, and computational biology. BBME's internationally-renowned staff provide frequent and stimulating interactions with physicians, scientists, and the biomedical industry. Through courses and thesis research, this program will prepare students for careers in industry, academia, hospitals, and government and provide a solid basis for Ph.D. studies. Candidates should hold a Bachelor's degree in engineering, science, or medicine with a strong emphasis on mathematics, physics, chemistry, and basic biology (physiology, cell biology, or molecular biology).

For more information please consult www.mcgill.ca/bbme/prospective-students/masters-program.

section 11.4.6: Doctor of Philosophy (Ph.D.); Biological and Biomedical Engineering

The goal of the Biological and Biomedical Engineering doctoral program is to provide students with advanced training in the interdisciplinary application of methods, paradigms, technologies, and devices from engineering and the natural sciences to problems in biology, medicine, and the life sciences. The program will focus on an area of choice while integrating quantitative concepts and engineering tools for the study of natural and life sciences and/or for patient care. As part of the Ph.D. requirement, the student will integrate the scientific method, develop critical and deep thinking, and acquire advanced writing and presentation skills that will form the foundation for his/her future career. Under the guidance of his/her supervisor, the student will tackle a research challenge and make original contributions to the advancement of science and engineering in an area of Biological and Biomedical Engineering. Through independent research and thesis writing, the program will prepare students for careers in academia, industry, hospitals, and government. Students who complete the program will obtain a doctor of philosophy in Biological and Biomedical Engineering. The best preparation for this program is a master's degree in BBME or a related discipline.

For more information please consult www.mcgill.ca/bbme/prospective-students/doctoral-program.

11.4.3 Biological and Biomedical Engineering Admission Requirements and Application Procedures

11.4.3.1 Admission Requirements

For up-to-date admission requirements, please consult www.mcgill.ca/bbme/prospective-students/how-apply and [University Regulations and Resources > Graduate > Graduate Admissions and Application Procedures > : Admission Requirements \(Minimum Requirements to be Considered for Admission\)](#).

11.4.3.2 Application Procedures

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

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

Please address enquiries directly to info.bbme@mcgill.ca.

11.4.3.3 Application Deadlines

The application deadlines listed here are set by the Biological and Biomedical Engineering Graduate Program 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 www.mcgill.ca/gps/contact/graduate-program. For additional information, please consult www.mcgill.ca/bbme/prospective-students/how-apply.

Canadian	International	Special/Exchange/Visiting
Fall: Feb. 1	Fall: Feb. 1	Fall: Same as Canadian/International
Winter: Nov. 10	Winter: Sept. 10	Winter: Same as Canadian/International
Summer: N/A	Summer: N/A	Summer: 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.

11.4.4 Biological and Biomedical Engineering Faculty

Biological and Biomedical Engineering is an interfaculty program offered jointly by the *Department of Bioengineering* in the Faculty of Engineering and the *Department of Biomedical Engineering* in the Faculty of Medicine.

Please refer to : [Bioengineering Faculty](#) and [section 11.5.4: Biomedical Engineering Faculty](#) for their respective faculty listings.

11.4.5 Master of Engineering (M.Eng.); Biological and Biomedical Engineering (Thesis) (45 credits)

** NEW PROGRAM **

The Biological and Biomedical Engineering (BBME) Master's program focuses on the interdisciplinary application of methods, paradigms, technologies, and devices from engineering and the natural sciences to problems in biology, medicine, and the life sciences. With its unique multidisciplinary environment, and taking advantage of research collaborations between staff in the Faculties of Medicine, Science, and Engineering, BBME offers thesis-based graduate degrees (M.Eng.) that span broad themes in biomodelling, biosignal processing, medical imaging, nanotechnology, artificial cells and organs, probiotics, bioinformatics, bioengineering, biomaterials, and orthopaedics. BBME's internationally renowned staff provide frequent and stimulating interactions with physicians, scientists, and the biomedical industry. Through courses and thesis research, this program will prepare students for careers in industry, academia, hospitals and government and provide a solid basis for Ph.D. studies. Candidates should hold a bachelor's degree in engineering, science, or medicine with a strong emphasis on mathematics, physics, chemistry, and basic physiology or cell biology.

Thesis Courses (24 credits)

BBME 693	(6)	Thesis Research 1
BBME 694	(6)	Thesis Research 2
BBME 695	(12)	Thesis Submission

Required Courses (3 credits)

BBME 600D1	(1.5)	Seminars in Biological and Biomedical Engineering
BBME 600D2	(1.5)	Seminars in Biological and Biomedical Engineering

Complementary Courses (18 credits)

12 credits from BMDE or BIEN courses at the 500-level or higher which may also include MDPH 607, of which the following must be included:

3 credits from BMDE and 3 credits from BIEN

3 credits from the following quantitative courses, or other quantitative courses (at the 500-level or higher) approved by the Graduate Program Director.

BIEN 510	(3)	Nanoparticles in the Medical Sciences
BIEN 520	(3)	High Throughput Bioanalytical Devices
BIEN 530	(3)	Imaging and Bioanalytical Instrumentation
BIEN 550	(3)	Biomolecular Devices
BIEN 560	(3)	Biosensors
BMDE 502	(3)	BME Modelling and Identification
BMDE 503	(3)	Biomedical Instrumentation
BMDE 509	(3)	Quantitative Analysis and Modelling of Cellular Processes
BMDE 512	(3)	Finite-Element Modelling in Biomedical Engineering
BMDE 519	(3)	Biomedical Signals and Systems
BMDE 610	(3)	Functional Neuroimaging Fusion

6 credits from the list below or from other courses (at the 500-level or higher) which have both biomedical content and content from the physical sciences, engineering, or computer science, with the approval of the supervisor and Graduate Program Director.

BIEN 510	(3)	Nanoparticles in the Medical Sciences
BIEN 520	(3)	High Throughput Bioanalytical Devices
BIEN 530	(3)	Imaging and Bioanalytical Instrumentation
BIEN 550	(3)	Biomolecular Devices
BIEN 560	(3)	Biosensors
BIOT 505	(3)	Selected Topics in Biotechnology
BMDE 501	(3)	Selected Topics in Biomedical Engineering
BMDE 502	(3)	BME Modelling and Identification
BMDE 503	(3)	Biomedical Instrumentation
BMDE 504	(3)	Biomaterials and Bioperformance
BMDE 505	(3)	Cell and Tissue Engineering
BMDE 506	(3)	Molecular Biology Techniques
BMDE 508	(3)	Introduction to Micro and Nano-Bioengineering
BMDE 509	(3)	Quantitative Analysis and Modelling of Cellular Processes
BMDE 510	(3)	Topics in Astrobiology
BMDE 512	(3)	Finite-Element Modelling in Biomedical Engineering
BMDE 519	(3)	Biomedical Signals and Systems
BMDE 610	(3)	Functional Neuroimaging Fusion
BMDE 650	(3)	Advanced Medical Imaging
BMDE 651	(3)	Orthopaedic Engineering
BMDE 652	(3)	Bioinformatics: Proteomics
COMP 526	(3)	Probabilistic Reasoning and AI
COMP 546	(4)	Computational Perception
COMP 558	(3)	Fundamentals of Computer Vision
COMP 761	(4)	Advanced Topics Theory 2
ECSE 526	(3)	Artificial Intelligence
ECSE 681*	(4)	Colloquium in Electrical Engineering
EXMD 610	(3)	Molecular Methods in Medical Research
MDPH 607	(3)	Introduction to Medical Imaging

MDPH 611	(2)	Medical Electronics
MDPH 612	(2)	Computers in Medical Imaging
MECH 500*	(3)	Selected Topics in Mechanical Engineering
MECH 561	(3)	Biomechanics of Musculoskeletal Systems
PHGY 517	(3)	Artificial Internal Organs
PHGY 518	(3)	Artificial Cells

* When topic is appropriate.

11.4.6 Doctor of Philosophy (Ph.D.); Biological and Biomedical Engineering

** NEW PROGRAM **

The goal of the Biological and Biomedical Engineering Ph.D. program is for students to gain advanced training in the interdisciplinary application of methods, paradigms, technologies, and devices from engineering and the natural sciences to problems in biology, medicine, and the life sciences. The program will focus in an area of choice while integrating quantitative concepts and engineering tools for the study of life sciences and/or for patient care. As part of the Ph.D. requirement, the student will integrate the scientific method, develop critical and deep thinking, and acquire advanced writing and presentation skills that will form the foundation for his/her career. Under the guidance of his/her supervisor, the student will tackle a research challenge and make original contributions to the advancement of science and engineering in an area of Biological and Biomedical Engineering. The program will prepare students for careers in academia, industry, hospitals and government. Students who complete the program will obtain a Doctor of Philosophy in Biological and Biomedical Engineering. The best preparation for this program is a Master's degree in BBME or a related discipline.

Thesis

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 Course

BBME 700 ()

Students must be registered in this course at the time of the Thesis Proposal and Comprehensive Exam Meeting.

Further courses may be required by the supervisor(s) in consultation with the Graduate Program Director, depending on the educational background of individual students.

11.5 Biomedical Engineering



Note: New students are no longer being accepted into the M.Eng. and Ph.D. in Biomedical Engineering. Please see instead the M.Eng. and Ph.D. in [section 11.4: Biological and Biomedical Engineering](#) .

11.5.1 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: www.mcgill.ca/bme

11.5.2 About Biomedical Engineering

The Department offers graduate training programs leading to master's (M.Eng.) and Ph.D. degrees in Biomedical Engineering.

We provide instruction and opportunities for interdisciplinary research in the application of engineering, mathematics, and the physical sciences to problems in medicine and the life sciences. Courses are offered for graduate students in the life sciences, engineering, and the physical sciences.

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.

Graduate students may also be registered through the departments of Medicine, Science, and Engineering, and must then fulfil the requirements for advanced degrees imposed by their respective departments.

In addition, all students are required, through coursework and independent study, to achieve a degree of interdisciplinary competence appropriate to their area of specialization.

M.Eng. Meetings:

1. Initial
2. Progress
3. Fast-Track transfer to the Ph.D. program

Details of each meeting can be found at www.mcgill.ca/bme/students/policies-forms.

Ph.D. Meetings:

1. Preliminary
2. Comprehensive Exam Preparation
3. Thesis Proposal and Comprehensive Exam
4. Thesis Progress
5. Thesis Pre-submission

Details of each meeting can be found at www.mcgill.ca/bme/students/policies-forms.

section 11.5.5: Master of Engineering (M.Eng.); Biomedical Engineering (Thesis) (45 credits)

This program is no longer accepting new students.

section 11.5.5: Master of Engineering (M.Eng.); Biomedical Engineering (Thesis) (45 credits)

As the first Biomedical Engineering (BME) department in Canada, BME's internationally renowned staff provide frequent and stimulating interactions with physicians, scientists in many fields, and with the biomedical industry. McGill BME provides opportunities to receive training in a unique multidisciplinary environment, taking advantage of research collaborations between staff in the Faculties of Medicine, Science, and Engineering. BME offers only thesis-based graduate degrees (M.Eng.) spanning broad themes in 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, and bioinformatics in genomics and proteomics. For details, please refer to the BME website: www.mcgill.ca/bme. The best preparation is with a bachelor's degree in engineering, science, or medicine with a strong emphasis on mathematics, physics, chemistry, and basic physiology, or cell biology. Our BME graduates have secured positions in academia, biomedical and other industries, and government or regulatory sectors, either before or within a few months of graduation.

section 11.5.6: Doctor of Philosophy (Ph.D.); Biomedical Engineering

This program is no longer accepting new students.

As the first Biomedical Engineering (BME) department in Canada, BME internationally renowned staff provide frequent and stimulating interactions with physicians, scientists in many fields and with the biomedical industry. McGill BME provides opportunities to receive training in a unique multidisciplinary environment, taking advantage of research collaborations between staff in the Faculties of Medicine, Science, and Engineering. BME offers only thesis-based graduate degrees (Ph.D.) spanning broad themes in 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, and bioinformatics in genomics and proteomics. For details, please refer to the BME website: www.mcgill.ca/bme. The best preparation is with a bachelor's degree in engineering, science, or medicine and a master's degree in biomedical engineering, bioengineering, biotechnology, electrical engineering, physiology, chemical engineering, biomaterial, system engineering, imaging, or other related areas. Our BME graduates have secured positions in academia, biomedical and other industries, and government or regulatory sectors, either before or within a few months of graduation.

11.5.3 Biomedical Engineering Admission Requirements and Application Procedures**11.5.3.1 Admission Requirements**

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

11.5.3.2 Application Procedures

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

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

Please address enquiries directly to the Department.

11.5.3.3 Application Deadlines

The application deadlines listed here are set by 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 www.mcgill.ca/gps/contact/graduate-program.

Canadian	International	Special/Exchange/Visiting
Fall: April 15	Fall: March 15	Fall: Same as Canadian/International
Winter: Oct. 15	Winter: Sept. 15	Winter: Same as Canadian/International
Summer: N/A	Summer: N/A	Summer: 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.

11.5.4 Biomedical Engineering Faculty**Chair**

R.E. Kearney

Emeritus Professor

T.M.S. Chang; B.Sc., M.D.,C.M., Ph.D.(McG.), F.R.C.P.(C), F.R.S.(C) (*joint appt. with Physiology*)

Professors

D.L. Collins; B.Sc., M.Eng., Ph.D.(McG.) (*joint appt. with Neurology and Neurosurgery*)

H.L. Galiana; B.Eng., M.Eng., Ph.D.(McG.)

D. Juncker; Dipl., Ph.D.(Neuch-Switzerland)

R.E. Kearney; B.Eng., M.Eng., Ph.D.(McG.)

S. Prakash; B.Sc.(Hon.), M.Sc., M.Tech.(BHU), Ph.D.(McG.)

M. Tabrizian; B.Sc.(Iran), M.Sc., Ph.D.(PMC-France), M.B.A.(HEC) (*joint appt. with Dentistry*)

Associate Professor

W.R.J. Funnell; B.Eng., M.Eng., Ph.D.(McG.) (*joint appt. with Otolaryngology*)

Assistant Professor

A. Haidar; B.Sc.(Kuwait), M.Sc. A.(École Poly., Montr.), Ph.D.(McG.)

Associate Members

S. Baillet (*Neurology and Neurosurgery*)

C. Baker (*Ophthalmology*)

F. Barthelat (*Mechanical Engineering*)

S. Blain-Moraes (*Physical and Occupational Therapy*)

M. Chakravarty (*Psychiatry*)

K. Cullen (*Physiology*)

A. Ehrlicher (*Bioengineering*)

A.C. Evans; B.Sc.(Liv.), M.Sc.(Sur.), Ph.D.(Leeds) (*Neurology and Neurosurgery*)

J. Gotman (*Neurology and Neurosurgery*)

D. Guitton (*Neurology and Neurosurgery*)

A. Hendricks (*Bioengineering*)

R. Hoge (*Neurology and Neurosurgery*)

A. Kamen (*Bioengineering*)

A. Katsarkas (*Otolaryngology*)

J. Kinsella (*Bioengineering*)

S. Komarova (*Dentistry*)

A.M. Lauzon (*Medicine*)

R. Leask (*Chemical Engineering*)

I. Levesque (*Medical Physics and Oncology*)

N. Li-Jessen (*Communications and Science*)

T. Milner (*Kinesiology and Physical Education*)

G. Mitsis (*Bioengineering*)

L. Mongeau (*Mechanical Engineering*)

R. Mongrain (*Mechanical Engineering*)

C. Moraes (*Chemical Engineering*)

J. Near (*Psychiatry*)

D. Nicolau (*Bioengineering*)

Associate MembersD. Pasini (*Mechanical Engineering*)W. Reisner (*Physics*)A. Shmuel (*Neurology and Neurosurgery*)B. Willie (*Pediatric Surgery*)Y.B. Xia (*Bioengineering*)**Adjunct Professors**

P.G. Charette (Sher.)

I. El Naqa (Mich.)

C. Grova (C'dia)

J.-M. Lina (ETS)

M. Mekhail (Shriners)

J.L. Nadeau (Calif. Tech.)

G.B. Pike (Calg.)

A. Reader (King's, Lond.)

T. Veres (NRC)

11.5.5 Master of Engineering (M.Eng.); Biomedical Engineering (Thesis) (45 credits)

This program is no longer accepting new students.

Thesis Courses (24 credits)

BMDE 695	(12)	Thesis Submission
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12 credits selected from the following courses:

BMDE 691	(3)	Thesis Research 2
BMDE 692	(3)	Thesis Research 3
BMDE 693	(6)	Thesis Research 4
BMDE 694	(6)	Thesis Research 5

Complementary Courses (21 credits)

12 credits of courses which have both biomedical content and content from the physical sciences, engineering, or computer science selected from the following:

BIOT 505	(3)	Selected Topics in Biotechnology
BMDE 501	(3)	Selected Topics in Biomedical Engineering
BMDE 502	(3)	BME Modelling and Identification
BMDE 503	(3)	Biomedical Instrumentation
BMDE 504	(3)	Biomaterials and Bioperformance
BMDE 505	(3)	Cell and Tissue Engineering
BMDE 506	(3)	Molecular Biology Techniques
BMDE 508	(3)	Introduction to Micro and Nano-Bioengineering
BMDE 519	(3)	Biomedical Signals and Systems
BMDE 600D1	(1.5)	Seminars in Biomedical Engineering
BMDE 600D2	(1.5)	Seminars in Biomedical Engineering

BMDE 650	(3)	Advanced Medical Imaging
BMDE 651	(3)	Orthopaedic Engineering
BMDE 652	(3)	Bioinformatics: Proteomics
COMP 526	(3)	Probabilistic Reasoning and AI
COMP 546	(4)	Computational Perception
COMP 558	(3)	Fundamentals of Computer Vision
COMP 761	(4)	Advanced Topics Theory 2
ECSE 523	(3)	Speech Communications
ECSE 526	(3)	Artificial Intelligence
ECSE 529	(3)	Computer and Biological Vision
ECSE 626	(4)	Statistical Computer Vision
ECSE 681	(4)	Colloquium in Electrical Engineering
EXMD 610	(3)	Molecular Methods in Medical Research
MDPH 607	(3)	Introduction to Medical Imaging
MDPH 611	(2)	Medical Electronics
MDPH 612	(2)	Computers in Medical Imaging
MECH 500	(3)	Selected Topics in Mechanical Engineering
MECH 561	(3)	Biomechanics of Musculoskeletal Systems
PHGY 517	(3)	Artificial Internal Organs
PHGY 518	(3)	Artificial Cells

or, with the approval of the student's Graduate Advisory Committee and the Graduate Program Chair, other graduate-level courses with content of interest to biomedical engineering students.

9 credits selected from the courses listed above, or with approval of the Graduate Chair and Supervisor.

11.5.6 Doctor of Philosophy (Ph.D.); Biomedical Engineering

This program is no longer accepting new students.

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 Course

BMDE 700	(0)	Ph.D. Comprehensive
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Students must be registered in the course at the time of the Thesis Proposal and Comprehensive Exam Meeting.

11.6 Communication Sciences and Disorders

11.6.1 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: www.mcgill.ca/scsd

11.6.2 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.

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 of McGill:

- 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 and directed 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:

235 boulevard René-Lévesque est, bureau 601
Montreal QC H2X 1N8
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 a verbal and written working 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: up to \$1,000.

section 11.6.6: Master of Science, Applied (M.Sc.A.); Communication Sciences & Disorders (Non-Thesis) — Speech-Language Pathology (81 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.

section 11.6.6: Master of Science, Applied (M.Sc.A.); Communication Sciences & Disorders (Non-Thesis) — Speech-Language Pathology (81 credits)

The profession of speech-language pathology concerns assessment and intervention in speech and language disorders. In particular, the speech-language pathologist is concerned with two major parameters of communication sciences and disorders: language and speech. At present, most speech-language pathologists in Canada work in hospitals, public school systems, rehabilitation centres, and in special education 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 whereas some other programs require three years to complete. 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. 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 strong foundation in theory to address challenging clinical issues. Our M.Sc.A. graduates typically pursue a professional career 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 11.6.5: Master of Science (M.Sc.); Communication Sciences and Disorders (Thesis) (45 credits)**

Selected candidates may be accepted for the M.Sc. research degree. Each student's thesis supervisor and Thesis Committee design 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 SCS D professor(s) with relevant expertise to mentor the student through the thesis process. Graduates of our M.Sc. research program follow diverse career paths working in clinical settings (if they also have a clinical degree) or settings that combine clinical and research activities or continuing their research training at the doctoral level.

section 11.6.7: Doctor of Philosophy (Ph.D.); Communication Sciences and Disorders

Selected candidates may be accepted for the Ph.D. research degree. Each student's thesis supervisor and Thesis Committee design 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 SCS D 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 SCS D 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 11.6.8: Doctor of Philosophy (Ph.D.); Communication Sciences and Disorders — Language Acquisition

Information about this option is available from the School and from www.psych.mcgill.ca/lap.html and www.mcgill.ca/psychology/graduate/program-tracks/experimental/additional-program-opportunities. This unique interdisciplinary Ph.D. program is available for doctoral students across four departments at McGill including SCS D, 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 SCS D Ph.D. requirements, students in this program must complete 6 credits of coursework in language acquisition (including at least one course that is not in their home department), and four interdisciplinary seminars (2 credits each) and must include a faculty member in the Language Acquisition Program on their thesis committee.

11.6.3 Communication Sciences and Disorders Admission Requirements and Applications Procedures**11.6.3.1 Admission Requirements****M.Sc. (Applied)**

An applicant must hold an undergraduate degree with a minimum B average (3.0 on a 4.0 point scale) or better in areas relevant to the selected field of specialization. Specific requirements are 6 credits in statistics, a total of 18 credits across the disciplines of psychology and linguistics (with a minimum of 6 credits in each discipline). Knowledge of physiology is also desirable.

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.

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 (iBT; 587 on the paper-based test (PBT)) 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.

11.6.3.2 Application Procedures

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

See [University Regulations and 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.

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

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.

11.6.3.2.1 Additional Requirements

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

M.Sc. (Applied)

- Syllabi of Prerequisite Statistics Courses Taken (for details, see the [School's website](#))
- 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

Applications will be considered upon receipt of supporting documents as outlined above. All applicants are strongly encouraged to submit reports of their performance on the Graduate Record Examination (*GRE*).

11.6.3.3 Application Deadlines

The application deadlines listed here 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 academic unit's website; please contact the list at www.mcgill.ca/gps/contact/graduate-program.

Canadian	International	Special/Exchange/Visiting
Fall: Jan. 15	Fall: Jan. 15	Fall: Jan. 15
Winter: Sept. 15	Winter: Sept. 10	Winter: Sept. 10
Summer: N/A	Summer: N/A	Summer: N/A

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

11.6.4 Communication Sciences and Disorders Faculty**Director and Associate Dean**

Marc Pell

Research Director

Linda Polka

Professors

Shari R. Baum; B.A.(Cornell), M.S.(Vermont), M.A., Ph.D.(Brown)

Vincent Gracco; B.A., M.A.(San Diego), Ph.D.(Wisc.-Madison)

Athanasios Katsarkas; M.D.(Thess.), M.Sc.(McG.), F.R.C.P.(C)

Marc Pell; B.A.(Ott.), M.Sc., Ph.D.(McG.)

Linda Polka; B.A.(Slippery Rock), M.A.(Minn.), Ph.D.(S. Flor.)

Susan Rvachew; B.Sc.(Alta.), M.Sc., Ph.D.(Calg.)

Karsten Steinhauer; M.Sc., Ph.D.(Dr.rer.nat)(Free Univ., Berlin)

Elin Thordardottir; B.A., M.Sc., Ph.D.(Wisc.-Madison)

Associate Professors

Laura Gonnerman; B.A.(Boston), M.A.(Middlebury), Ph.D.(USC)

Aparna Nadig; B.A.(Reed), M.S., Ph.D.(Brown)

Assistant Professors

Meghan Clayards; B.Sc.(Vic., BC), M.A., Ph.D.(Roch.)

Nicole Yee-Key Li; B.Sc., M.Phil.(HK), Ph.D.(Pitt.)

Assistant Professors (Part-Time)

Christina Lattermann; Staatlich anerkannte Logopaedin(Westfaelische Wilhelms-Universität, Muenster), M.Sc.(McG.), Ph.D.(Kassel)

Rosalee Shenker; B.Sc.(Syrac.), M.A.(Calif. St.), Ph.D.(McG.)

Faculty Lecturers

Kelly Root; B.A.(Ott.), M.Sc.(Dal.)

Sophie Vaillancourt; B.Sc., MOA(Montr.), M.B.A.(McG.)

Faculty Lecturers (Part-Time)

Anna Baudier; B.Sc.(Montr.), M.Sc.A.(McG.)

Myrto Brandeker; M.Sc.(Karolinska Inst.)

Liliane Brunetti; B.Sc.(C'dia), M.Cl.Sc.(W. Ont.)

Jesse Burns; B.A.(C'dia), M.Sc.(McG.)

Patricia Coffin; B.A.(PEI), M.Sc.(Dal.)

Kendall Kolne; B.Sc., M.Sc.(McM.)

Ariana Fraid; B.A., M.Sc.A.(McG.)

Ana Maria Gonzalez; B.Sc.(Del Rosario Univ., Colombia), M.Ed.(McG.)

Suzanne Lalonde; B.A.(Montr.), M.Sc.A.(McG.)

Tanya Matthews; B.A.(N. Carolina), M.A.(Hampton)

Gina Mills; B.Sc.(Acad.), M.Sc.(Dal.)

Aruna Sudarshan; B.Sc., M.Sc.(Institute of Speech and Hearing, Bangalore)

Faculty Lecturers (Part-Time)

Anne Vogt; B.A.(Tel Aviv), M.Sc.A.(McG.)

Associate MembersEva Kehayia (*Physical and Occupational Therapy*)Yuriko Oshima-Takane (*Psychology*)**Adjunct Members**David McFarland (*Montr.*)Lucie Menard (*UQAM*)**11.6.5 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.

11.6.6 Master of Science, Applied (M.Sc.A.); Communication Sciences & Disorders (Non-Thesis) — Speech-Language Pathology (81 credits)

The professional degree program involves two academic years of full-time study and related practical work, followed by a Summer internship.

Required Courses (75 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 616	(3)	Audiology
SCSD 617	(3)	Anatomy and Physiology: Speech and Hearing
SCSD 618	(3)	Research and Measurement Methodologies 1
SCSD 619	(3)	Phonological Development
SCSD 624	(3)	Language Processes
SCSD 631	(3)	Speech Science

SCSD 632	(3)	Phonological Disorders: Children
SCSD 633	(3)	Language Development
SCSD 636	(3)	Fluency Disorders
SCSD 637	(3)	Developmental Language Disorders 1
SCSD 638	(3)	Neurolinguistics
SCSD 639	(3)	Voice Disorders
SCSD 642	(3)	Aural Rehabilitation
SCSD 643	(3)	Developmental Language Disorders 2
SCSD 644	(3)	Applied Neurolinguistics
SCSD 646	(4)	Introductory Clinical Practicum
SCSD 669	(3)	ASD and Neurodevelopmental Disorders
SCSD 679	(12)	Advanced Clinical Practicum
SCSD 680	(3)	Deglutition and Dysphagia
SCSD 681	(1)	Practicum and Seminar 1
SCSD 682	(1)	Practicum and Seminar 2
SCSD 683	(1)	Practicum and Seminar 3
SCSD 684	(1)	Practicum and Seminar 4
SCSD 689	(1)	Management Cranio-Facial Disorders

Complementary Courses (6 credits)

6 credits from the following:

SCSD 664	(3)	Communication Sciences and Disorders 1
SCSD 666	(3)	Communication Sciences and Disorders 3
SCSD 667	(3)	Communication Sciences and Disorders 4
SCSD 670	(3)	Communication Sciences and Disorders 2
SCSD 678	(3)	Special Topics 4

11.6.7 Doctor of Philosophy (Ph.D.); Communication Sciences and Disorders

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)

SCSD 652	(3)	Advanced Research Seminar 1
SCSD 653	(3)	Advanced Research Seminar 2
SCSD 685	(3)	Research Project 1
SCSD 686	(3)	Research Project 2
SCSD 701	(0)	Doctoral Comprehensive

Complementary Courses (6 credits)

Minimum of 6 credits of graduate-level statistics from courses such as:

EDPE 676	(3)	Intermediate Statistics
EDPE 682	(3)	Univariate/Multivariate Analysis
EDPE 684	(3)	Applied Multivariate Statistics
EPIB 621	(4)	Data Analysis in Health Sciences
EPIB 622	(3)	Scientific Communication
PSYC 650	(3)	Advanced Statistics 1
PSYC 651	(3)	Advanced Statistics 2

Any other course requirements specified for the student's individual program of study.

11.6.8 Doctor of Philosophy (Ph.D.); Communication Sciences and Disorders — Language Acquisition

Students must satisfy all program requirements for the Ph.D. in their home department. The Ph.D. thesis must be on a topic relating to language acquisition, approved by the LAP 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 (14 credits)

EDSL 711	(2)	Language Acquisition Issues 3
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 credits)

3 credits of graduate-level statistics from courses such as:

EDPE 676	(3)	Intermediate Statistics
EDPE 682	(3)	Univariate/Multivariate Analysis
PSYC 650	(3)	Advanced Statistics 1
PSYC 651	(3)	Advanced Statistics 2

Students who have taken an equivalent course in statistics, or are currently taking an equivalent course as part of their Ph.D. program requirements, will be deemed to have satisfied this requirement for the Language Acquisition Option.

At least two courses, selected from the following list.

One of these two courses must be from outside Communication Sciences and Disorders.

EDSL 620	(3)	Critical Issues in Second Language Education
EDSL 623	(3)	Second Language Learning
EDSL 624	(3)	Educational Sociolinguistics
EDSL 627	(3)	Classroom-Centred Second Language Research
EDSL 629	(3)	Second Language Assessment

EDSL 632	(3)	Second Language Literacy Development
LING 555	(3)	Language Acquisition 2
LING 590	(3)	Language Acquisition and Breakdown
LING 651	(3)	Topics in Acquisition of Phonology
LING 655	(3)	Theory of L2 Acquisition
PSYC 561	(3)	Methods: Developmental Psycholinguistics
PSYC 734	(3)	Developmental Psychology and Language
PSYC 736	(3)	Developmental Psychology and Language
SCSD 619	(3)	Phonological Development
SCSD 632	(3)	Phonological Disorders: Children
SCSD 633	(3)	Language Development
SCSD 637	(3)	Developmental Language Disorders 1
SCSD 643	(3)	Developmental Language Disorders 2

11.7 Epidemiology and Biostatistics

11.7.1 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: www.mcgill.ca/epi-biostat-occh

11.7.2 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.

11.7.3 Epidemiology, Biostatistics and Occupational Health Faculty

Chair

G. Paradis

Emeritus Professors

M.R. Becklake; M.B.B.Ch., M.D.(Witw.), F.R.C.P.

J.F. Boivin; M.D.(Laval), S.M., Sc.D.(Harv.)

A. Lippman; B.A.(Cornell), Ph.D.(McG.)

J. McCusker; M.D.,C.M.(McG.), M.P.H., Ph.D.(Col.)

I.B. Pless; B.A., M.D.(W. Ont.)

S.H. Shapiro; B.S.(Bucknell), M.S., Ph.D.(Stan.)

G. Thériault; M.D.(Laval), M.I.H., Dr.P.H.(Harv.)

S. Wood-Dauphinee; B.Sc.(Phys.Ther.), Dip.Ed., M.Sc.(A.), Ph.D.(McG.)

Professors Post-Retirement

J.F. Boivin; M.D.(Laval), S.M., Sc.D.(Harv.)

A. Ciampi; M.Sc., Ph.D.(Qu.), Ph.D.(Rome)

A. Lippman; B.A.(Cornell), Ph.D.(McG.)

J. McCusker; M.D.,C.M.(McG.), M.P.H., Ph.D.(Col.)

I.B. Pless; B.A., M.D.(W. Ont.)

G. Thériault; M.D.(Laval), M.I.H., Dr.P.H.(Harv.)

S. Wood-Dauphinee; B.Sc.(Phys.Ther.), Dip.Ed., M.Sc.(A.), Ph.D.(McG.)

Professors

M. Abrahamowicz; Ph.D.(Cracow) (*James McGill Professor*)

J. Brophy; B.Eng.(McG.), M.Eng., M.D.(McM.), Ph.D.(McG.) (*joint appt. with Medicine*)

E.L.F. Franco; M.P.H., Dr.P.H.(Chapel Hill) (*joint appt. with Oncology*) (*James McGill Professor*)

R. Fuhrer; B.A.(CUNY (Brooklyn Coll.)), M.Sc., Ph.D.(Calif.-San Francisco)

T.W. Gyorkos; B.Sc.(McG.), M.Sc.(Bishop's), Ph.D.(McG.)

J.A. Hanley; B.Sc., M.Sc.(N.U.I.), Ph.D.(Wat.)

C. Infante-Rivard; M.D.(Montr.), M.P.H.(Calif.-LA), Ph.D.(McG.), F.R.C.P.(C) (*James McGill Professor*)

L. Joseph; M.Sc., Ph.D.(McG.)

J. Kaufman; B.A.(Johns Hop.), Ph.D.(Mich.) (*Canada Research Chair*)

M.S. Kramer; B.A.(Chic.), M.D.(Yale) (*joint appt. with Pediatrics*) (*James McGill Professor*)

R. Menzies; M.D.,C.M., M.Sc.(McG.) (*joint appt. with Medicine*)

O.S. Miettinen; M.D.(Helsinki), M.P.H., M.S., Ph.D.(Minn.) (*on leave Jan. to Dec. 2016*)

M. Pai; M.B.B.S.(Stanley Med. Coll.), M.D.(Christian Medical Coll.), Ph.D.(Calif., Berk.) (*Canada Research Chair*)

G. Paradis; M.D.(Montr.), M.Sc.(McG.) (*Strathcona Prof. in Epidemiology*)

R.W. Platt; B.Sc.(McG.), M.Sc.(Manit.), Ph.D.(Wash.) (*joint. appt. with Pediatrics*) (*Albert Boehringer 1st Chair in Pharmacoepidemiology*)

S. Suissa; M.Sc.(McG.), Ph.D.(Flor.) (*joint appt. with Medicine*) (*James McGill Professor*)

R. Tamblyn; M.Sc.(McM.), Ph.D.(McG.) (*joint appt. with Medicine*) (*James McGill Professor*)

C. Wolfson; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Medicine*)

Associate Professors

A. Adrien; M.D., M.Sc.(McG.)

R. Allard; B.A.(Montr.), M.D.,C.M., M.Sc.(McG.)

O. Basso; Ph.D.(Milan) (*joint appt. with Obstetrics and Gynecology*)

A. Benedetti; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Medicine*) (*on leave Sept. 2016 to Aug. 2017*)

D. Buckeridge; M.D.(Qu.), M.Sc.(Tor.), Ph.D.(Stan.) (*CIHR Applied Public Health Chair*) (*on leave May to Oct. 2016*)

J. Cox; B.Sc., B.A., M.D.(Dal.), M.Sc.(McG.), C.C.F.P., F.R.C.P.(C)

N. Dendukuri; M.Sc.(Indian IT), Ph.D.(McG.) (PT) (*joint appt. with Medicine*)

C. Greenwood; B.Sc.(McG.), M.Sc.(Wat.), Ph.D.(Tor.) (*joint appt. with Oncology*)

S. Harper; B.A.(Westminster Coll.), M.S.P.H.(S. Carolina), Ph.D.(Mich.) (*on leave Sept. 2016 to Aug. 2017*)

P. Héroux; B.Sc.(Laval), M.Sc., Ph.D.(I.N.R.S.)

E.E.M. Moodie; B.A.(Winn.), M.Phil.(Camb.), Ph.D.(Wash.) (*William Dawson Scholar*)

A. Nandi; B.S.(Coll. of New Jersey), M.P.H.(Col.), Ph.D.(Johns Hop.) (*joint appt. with Institute for Health and Social Policy*) (*Canada Research Chair*)

C. Quach-Thanh; M.D.(Montr.), M.Sc.(McG.) (*joint appt. with Pediatrics*)

A. Quesnel-Vallée; B.A., M.Sc.(Montr.), M.A., Ph.D.(Duke) (*joint appt. with Sociology*) (*Canada Research Chair*)

M. Rossignol; B.Sc., M.D.(Sher.), M.Sc.(McG.)

A. Schmidt; B.Sc., M.Sc.(Federal Rio de Janeiro), Ph.D.(Sheff.)

E. Strumpf; B.A.(Smith), Ph.D.(Harv.) (*joint appt. with Economics*) (*William Dawson Scholar*)

P. Tousignant; B.A., M.D.(Laval), M.Sc.(McG.), F.R.C.P.(C) (PT)

Assistant Professors

J. Baumgartner; B.A.(Wisc.), M.Sc.(Harv.), Ph.D.(Wisc.) (*joint appt. with Institute of Health and Social Policy*) (*CIHR New Investigator*)

P. Chaudhuri; B.Sc.(Presidency); M.Stat.(Indian Statistical Institute), M.S., Ph.D.(Wash.)

J. Chevrier; B.Sc., M.Sc.(Laval), Ph.D.(Calif., Berk.) (*Canada Research Chair*)

K. Dehghani; B.Sc.(SUNY), M.Sc.(N'western), M.D.(Tor.), M.Sc.P.H.(Harv.), C.C.F.P.(C), F.R.C.P.(C)

D. Kaiser; B.Sc., M.D.,C.M., M.Sc.(McG.)

S. Martin; M.D.(Tor.), M.Sc.(McG.) (PT)

L. Patry; B.Sc., M.D.(Laval), F.R.C.P.(C) (PT)

F. Richer; B.Sc., M.D.(Ott.), M.Sc.(McG.), F.R.C.P.(C)

G. Tan; D.Phil.(Oxf.) (PT)

S. Weichenthal; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Oncology*)

S. Yang; B.A.(Ajou), M.Sc.(McG.), Ph.D.(Mich.)

Associate Members

Biomedical Ethics Unit: J. Kimmelman, N. King

Dentistry: P. Allison, J. Feine

Dietetics and Human Nutrition: N. Basu

Family Medicine: A. Andermann, J. Haggerty, M.J.R. Lajoie, E. Robinson

Geography: N. Ross

Medicine: J. Afilalo, A. Barkun, M. Behr, S. Bernatsky, J. Bourbeau, P. Brassard, K. Dasgupta, M. Eisenberg, P. Ernst, K. Filion, M. Goldberg, C. Greenaway, S. Kahn, M. Kaminska, M. Klein, T.C. Lee, A. Marelli, N. Mayo, S. Morin, N. Pant Pai, J. Pickering, L. Pilote, E. Rahme, B. Richards, R. Sapir-Pichhadze, K. Schwartzman, M. Sewitch, I. Shrier, V. Tagalakis, G. Thanassoulis

Neurology and Neurosurgery: C. Renoux

Ob/Gyn: H. Abenhaim, R. Gagnon

Oncology: L. Azoulay

Associate Members

Pathology: B. Case

Pediatrics: M. Ben Shoshan, E. Constantin, G. Dougherty, P. Fontela, B. Foster, P.T-S. Lee, M. Zappitelli

Physical and Occupational Therapy: S. Ahmed, A. Bussieres

Psychiatry: E. Latimer, A. Malla, N. Schmitz, B. Thombs

Sociology: S. Clark

Surgery: D. Deckelbaum

Lecturers

J.P. Courteau, M. Kafka, C. Kom Mogto, S.-A. Mercure, C. Paquette, N. Savard, N. Titri, W. Wood

Adjunct Professors

Asociación Civil Selva Amazónica Peru: M. Casapia

Boehringer Ingelheim GmbH: D. Bartels

Bristol-Myers Squibb Canada: A.A. Tahami Monfared

Caro Research: J. Caro

Contex: J.P. Gauvin

DSP: M. Baillargeon, C. Dea, G. Denis, A. Kossowski, R. Lessard, R. Massé, S. Palmieri, S. Perron, M. Roy

Harvard Univ.: J. Brownstein

Hôpital Ste. Justine: M. Henderson

Independent: I. Arnold, J. Lemke, M. Schweigert, L. Scott

INESSS: D. Roy

INSPQ: E. Lo, P. Robillard, S. Stock

Montreal Chest Hospital Centre: P. Rohan

Mount Sinai: M. Baltzan

NIPHQ: C. Stich

Sanexen: P. Simon

Shire Inc.: A. Koutsavlis

Univ. of Calgary: A. Clarke

Univ. Medisch Centrum: P. Bruijning-Verhagen

Univ. de Montréal: M.E. Schnitzer, J. Siemiatycki

Univ. de Sherbrooke: C. Rochefort

Univ. of Lausanne: A. Chiolero

11.7.4 Epidemiology

The Department offers master's and doctoral programs in both Epidemiology, 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:

- 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 11.7.4.2: Master of Science (M.Sc.); Epidemiology (Thesis) (48 credits)

Applicants to the M.Sc. program should hold a bachelor's degree in the natural and quantitative sciences (e.g., microbiology, computer science, statistics, economics, geography) or social sciences (e.g., sociology, psychology, anthropology), 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 (differential and integral calculus) 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 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 11.7.4.3: 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., 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 (including differential and integral calculus) 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. With a world-renowned reputation for excellence in pharmacoepidemiology, McGill-trained pharmacoepidemiologists are known for methodological and quantitative rigour, and quantitative analytic independence.

section 11.7.4.4: Master of Science (M.Sc.); Public Health (Non-Thesis) (60 credits)

The mission of the Master's of 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 and 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). Students will study the foundations and principles of epidemiology and biostatistics, as applied to public health research and practice, in order to design, conduct, and analyze clinical, population-based, environmental, policy, and methodological public health-related research. Graduates of the program will serve as public health practitioners, research professionals, and educators, 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's of Public Health program includes a 14–16 week 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. Students who wish to focus on certain specific areas can choose to take all their elective credits in one domain and must complete their practicum in the same area (e.g., global health; health services research; program and policy development and evaluation; environmental health; etc.).

section 11.7.4.5: Master of Science (M.Sc.); Public Health (Non-Thesis) - Global Health (60 credits)

Students admitted to the M.Sc. degree in Public Health who have an interest in global health can receive additional recognition for completing the Global Health Option within their degree program. Students in the Global Health Option will undertake global health-dedicated coursework and the M.Sc. Public Health practicum requirement would be related to global health. This additional global health training will provide students with insight into the major global health challenges of today's world. For additional information, visit www.mcgill.ca/globalhealth.

section 11.7.4.6: Master of Science (M.Sc.) Public Health (Non-Thesis) — Population Dynamics (60 credits)

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 notably offers opportunities for interdisciplinary research and supervision. The option also provides a forum whereby graduate 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.

section 11.7.4.7: Doctor of Philosophy (Ph.D.); Epidemiology

This program may be of interest to students from the natural and 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, nutrition). Applicants must have an interest in health research, along with strong conceptual, analytic, and quantitative skills (differential and integral calculus) at the undergraduate level.

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 11.7.4.8: 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 the thesis would 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 www.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 11.7.4.9: 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 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 (including differential and integral calculus) 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 pharmacoepidemiology, McGill-trained pharmacoepidemiologists are known for methodological and quantitative rigour, and quantitative analytic independence.

section 11.7.4.10: 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 notably offers opportunities for interdisciplinary research and supervision. The option also provides a

section 11.7.4.10: Doctor of Philosophy (Ph.D.); Epidemiology — Population Dynamics

forum whereby graduate 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.

11.7.4.1 Epidemiology Admission Requirements and Application Procedures**11.7.4.1.1 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 require documented proof of quantitative proficiency including good grades in college-level differential and integral calculus.

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 Ph.D. programs must hold a master's degree in Epidemiology or its equivalent. In addition to the Ph.D. requirements, applicants admitted to the Ph.D. degree program without the equivalent of an M.Sc. in Epidemiology at McGill will, in their first year, have to complete required coursework equivalent to the Master's Epidemiology program, as determined by the Department.

Complete details on the Epidemiology programs are available on our [Departmental website](#). Information on the Master's of Public Health programs is available [here](#).

Language Requirement

Minimum *TOEFL* scores required, when applicable, of 100 on the Internet-based test. Minimum score for *IELTS*: 6.5.

11.7.4.1.1.1 Application Procedures

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

See [University Regulations and 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, www.mcgill.ca/epi-biostat-occh/academic-programs/grad/epidemiology/applying, for information on required documents.

11.7.4.1.1.1 Additional Requirements

Please consult www.mcgill.ca/epi-biostat-occh/academic-programs/grad/epidemiology/applying for information on our requirements.

11.7.4.1.1.2 Application Deadlines

The application deadlines listed here 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 www.mcgill.ca/gps/contact/graduate-program.

Canadian	International	Special/Exchange/Visiting
Fall: Dec. 15	Fall: Dec. 15	Fall: Apr. 30
Winter: N/A	Winter: N/A	Winter: Sept. 10
Summer: N/A	Summer: N/A	Summer: N/A

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

11.7.4.2 Master of Science (M.Sc.); Epidemiology (Thesis) (48 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 (24 credits)

EPIB 690 (24) M.Sc. Thesis

Required Courses (22 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 614	(1)	Basics of Measurement in Epidemiology
EPIB 621	(4)	Data Analysis in Health Sciences
PPHS 602	(3)	Foundations of Population Health

Complementary Course (2 credits)

2 credits of coursework, at the 500 level or higher, chosen in consultation with the student's academic adviser or supervisor.

11.7.4.3 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 614	(1)	Basics of Measurement in Epidemiology
EPIB 621	(4)	Data Analysis in Health Sciences
EPIB 631	(2)	Pharmacoepidemiology 2
EPIB 662	(1)	Pharmacological Basis of Pharmacoepidemiology
PPHS 602	(3)	Foundations of Population Health

Complementary Course (2 credits)

2 credits of coursework, at the 500 level or higher, chosen in consultation with the student's academic adviser or supervisor.

11.7.4.4 Master of Science (M.Sc.); Public Health (Non-Thesis) (60 credits)

Students will study the foundations and principles of epidemiology and biostatistics as applied to public health research and practice in order 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.

Practicum/Project (12 credits)

PPHS 630 (12) MScPH Practicum/Project

Required Courses (27 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 614	(1)	Basics of Measurement in Epidemiology
EPIB 621	(4)	Data Analysis in Health Sciences
PPHS 602	(3)	Foundations of Population Health
PPHS 612	(3)	Principles of Public Health Practice
PPHS 629D1	(.5)	MScPH Forum 1
PPHS 629D2	(.5)	MScPH Forum 1
PPHS 631D1	(.5)	MScPH Forum 2
PPHS 631D2	(.5)	MScPH Forum 2

Complementary Courses (12 credits)

12 credits of coursework at the 500 level or higher, with a minimum of 2 credits chosen from each of the following fields:

Environmental Health Sciences

GEOG 503	(3)	Advanced Topics in Health Geography
OCCH 602	(3)	Occupational Health Practice
PPHS 529	(3)	Global Environmental Health and Burden of Disease

Or other courses, at the 500 level or higher, selected with the Program's Academic Adviser.

Health Services Research Policy and Management

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

Or other courses, at the 500 level or higher, selected with the Program's Academic Adviser.

Population and Public Health Interventions (social and behavioural science)

PPHS 525	(3)	Health Care Systems in Comparative Perspective
PPHS 624	(3)	Public Health Ethics and Policy
SOCI 515	(3)	Medicine and Society
SOCI 588	(3)	Biosociology/Biodemography

Or other courses, at the 500 level or higher, selected with the Program's Academic Adviser.

Field Epidemiology or Epidemiology in Practice

OCCH 604	(3)	Monitoring Occupational Environment
PPHS 615	(3)	Introduction to Infectious Disease Epidemiology

PPHS 616 (3) Principles and Practice of Public Health Surveillance

Or other courses, at the 500 level or higher, selected with the Program's Academic Adviser.

Electives (9 credits)

9 credits of coursework, at the 500 level or higher.

Students may choose to focus on more advanced methods in epidemiology, biostatistics, geography, etc. 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.

11.7.4.5 Master of Science (M.Sc.); Public Health (Non-Thesis) - Global Health (60 credits)

This option will provide enhanced training in global health to graduate students registered in the M.Sc. Public Health degree program at McGill. Students will become familiar with topics of global health relevance and incorporate this into their core coursework and practicum or project research. The practicum or research project must be relevant to global health, conducted in a global health setting, and approved by the Global Health Coordinating Committee. Contextualizing the core training students receive in public health and in their respective substantive disciplines 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.

Practicum/Project (12 credits)

PPHS 630 (12) MScPH Practicum/Project

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 614	(1)	Basics of Measurement in Epidemiology
EPIB 621	(4)	Data Analysis in Health Sciences
PPHS 511	(3)	Fundamentals of Global Health
PPHS 602	(3)	Foundations of Population Health
PPHS 612	(3)	Principles of Public Health Practice
PPHS 629D1	(.5)	MScPH Forum 1
PPHS 629D2	(.5)	MScPH Forum 1
PPHS 631D1	(.5)	MScPH Forum 2
PPHS 631D2	(.5)	MScPH Forum 2

Complementary Courses (18 credits)

12 credits of coursework at the 500 level or higher, with a minimum of 2 credits chosen from each of the following fields:

Environmental Health Sciences

GEOG 503	(3)	Advanced Topics in Health Geography
OCCH 602	(3)	Occupational Health Practice
PPHS 529	(3)	Global Environmental Health and Burden of Disease

Or other courses, at the 500 level or higher, selected with the Program's Academic Adviser.

Health Services Research Policy and Management

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

Or other courses, at the 500 level or higher, selected with the Program's Academic Adviser.

Population and Public Health Interventions (social and behavioural science)

PPHS 525	(3)	Health Care Systems in Comparative Perspective
PPHS 624	(3)	Public Health Ethics and Policy
SOCI 515	(3)	Medicine and Society
SOCI 588	(3)	Biosociology/Biodemography

Or other courses, at the 500 level or higher, selected with the Program's Academic Adviser.

Global Health (6 credits)

6 credits from the list of pre-approved courses at the 500 level or higher, or any other courses at the 500 level or higher, approved by the Global Health Option Committee and the MScPH academic adviser, that have not been taken to satisfy other program requirements.

EPIB 681	(3)	Global Health: Epidemiological Research
GEOG 503	(3)	Advanced Topics in Health Geography
NUTR 501	(3)	Nutrition in Developing Countries
PPHS 525	(3)	Health Care Systems in Comparative Perspective
SOCI 513	(3)	Social Aspects HIV/AIDS in Africa
SOCI 519	(3)	Gender and Globalization
SOCI 545	(3)	Sociology of Population

11.7.4.6 Master of Science (M.Sc.) Public Health (Non-Thesis) — Population Dynamics (60 credits)

The Population Dynamics Option (PDO) is open to students in the M.Sc. in Public Health; Non-Thesis program in the Department of Epidemiology, Biostatistics, and Occupational Health specializing in Population Dynamics. The purpose of this program is to provide graduate training in demographic methods (including life table analyses) and enhance students' knowledge of critical population issues. Students will be required to take a course on demographic methods and an overview substantive course on the key population issues facing societies today. In addition, students will take one complementary course from Sociology; Economics; or Epidemiology, Biostatistics, and Occupational Health, which focuses on a particular population issue such as population health, migration, aging, family dynamics, and labour markets and skills acquisition. Students will attend at least five of the seminars given in the Social Statistics and Population Dynamics Seminar series. Research topics must be related to population dynamics and approved by the PDO coordinating committee.

Practicum/Project (12 credits)

PPHS 630	(12)	MScPH Practicum/Project
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Required Courses (33 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 614	(1)	Basics of Measurement in Epidemiology
EPIB 621	(4)	Data Analysis in Health Sciences
PPHS 602	(3)	Foundations of Population Health

PPHS 612	(3)	Principles of Public Health Practice
PPHS 629D1	(.5)	MScPH Forum 1
PPHS 629D2	(.5)	MScPH Forum 1
PPHS 631D1	(.5)	MScPH Forum 2
PPHS 631D2	(.5)	MScPH Forum 2
SOCI 545	(3)	Sociology of Population
SOCI 626	(3)	Demographic Methods

Complementary Courses (15 credits)

12 credits of coursework at the 500 level or higher, with a minimum of 2 credits chosen from each of the following fields:

Environmental Health Sciences

GEOG 503	(3)	Advanced Topics in Health Geography
OCCH 602	(3)	Occupational Health Practice
PPHS 529	(3)	Global Environmental Health and Burden of Disease

Or other courses, at the 500 level or higher, to be selected with the program's academic adviser.

Health Services Research Policy & Management

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

Or other courses, at the 500 level or higher, to be selected with the program's academic adviser.

Population and Public Health Interventions (social and behavioural science)

PPHS 525	(3)	Health Care Systems in Comparative Perspective
PPHS 624	(3)	Public Health Ethics and Policy
SOCI 515	(3)	Medicine and Society
SOCI 588	(3)	Biosociology/Biodemography

Or other courses, at the 500 level or higher, to be selected with the program's academic adviser.

Field Epidemiology or Epidemiology in Practice

OCCH 604	(3)	Monitoring Occupational Environment
PPHS 615	(3)	Introduction to Infectious Disease Epidemiology
PPHS 616	(3)	Principles and Practice of Public Health Surveillance

Or other courses, at the 500 level or higher, to be selected with the program's academic adviser.

3 credits of coursework, at the 500 level or higher, from the list of courses approved for the Population Dynamics Option that have not been taken to satisfy other program requirements:

ECON 622	(3)	Public Finance
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 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
PPHS 615	(3)	Introduction to Infectious Disease Epidemiology
SOCI 502	(0)	Sociology of Fertility
SOCI 512	(3)	Ethnicity & 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

11.7.4.7 Doctor of Philosophy (Ph.D.); Epidemiology

Students admitted to the Ph.D. degree program with the equivalent of the M.Sc. in Epidemiology at McGill will be required to take a minimum of 27 credits of Ph.D. courses.

In addition to the Ph.D. requirements, students admitted to the Ph.D. degree program without the equivalent of an M.Sc. in Epidemiology at McGill will, in their first year, have to complete required coursework equivalent to the Master's Epidemiology program, excluding thesis research course(s), as determined by the Department.

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)

EPIB 604	(3)	Epidemiologic Analysis
EPIB 608	(3)	Advanced Epidemiology
EPIB 609	(3)	Seminar on Advanced Methods in Epidemiology
EPIB 610	(3)	Advanced Methods: Causal Inference
EPIB 623	(3)	Research Design in Health Sciences
EPIB 701	(0)	Ph.D. Comprehensive Examination
EPIB 702	(0)	Ph.D. Proposal

Complementary Courses (12 credits)

12 credits of coursework, at the 500 level or higher, with a minimum of 3 credits in ethics (medical/public health/research), 3 credits in biostatistics, 3 credits in a substantive topic (normally related to the thesis topic), 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.

11.7.4.8 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.

Students admitted to the Ph.D. in Epidemiology; Global Health degree program with the equivalent of the M.Sc. in Epidemiology at McGill will be required to take a minimum of 33 credits of Ph.D. courses.

In addition to the Ph.D. requirements, students admitted to the Ph.D. in Epidemiology; Global Health degree program without the equivalent of an M.Sc. in Epidemiology at McGill will, in their first year, have to complete required coursework equivalent to the Master's Epidemiology program, excluding thesis course(s), as determined by the Department.

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. The thesis must be relevant to global health and approved by the Global Health Coordinating Committee.

Required Courses (21 credits)

EPIB 604	(3)	Epidemiologic Analysis
EPIB 608	(3)	Advanced Epidemiology
EPIB 609	(3)	Seminar on Advanced Methods in Epidemiology
EPIB 610	(3)	Advanced Methods: Causal Inference
EPIB 623	(3)	Research Design in Health Sciences
EPIB 681	(3)	Global Health: Epidemiological Research
EPIB 701	(0)	Ph.D. Comprehensive Examination
EPIB 702	(0)	Ph.D. Proposal
PPHS 511	(3)	Fundamentals of Global Health

Complementary Courses (12 credits)

9 credits of coursework at the 500 level or higher, with a minimum of 3 credits in ethics (medical/public health/research), 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
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

11.7.4.9 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.

Students admitted to the Ph.D. in Epidemiology; Pharmacoepidemiology degree program with the equivalent of the M.Sc. in Epidemiology at McGill will be required to take a minimum of 32 credits of Ph.D. courses.

In addition to the Ph.D. requirements, students admitted to the Ph.D. degree program without the equivalent of an M.Sc. in Epidemiology at McGill will, in their first year, have to complete required coursework equivalent to the Master's Epidemiology program, excluding thesis course(s), as determined by the Department.

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 (26 credits)

EPIB 604	(3)	Epidemiologic Analysis
EPIB 608	(3)	Advanced Epidemiology
EPIB 609	(3)	Seminar on Advanced Methods in Epidemiology
EPIB 610	(3)	Advanced Methods: Causal Inference
EPIB 623	(3)	Research Design in Health Sciences
EPIB 631	(2)	Pharmacoepidemiology 2
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

Complementary Courses (6 credits)

6 credits of coursework, at the 500 level or higher, with a minimum of 3 credits in ethics (medical/public health/research), 3 credits in biostatistics, 3 credits in a substantive topic (normally related to the thesis topic), 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.

11.7.4.10 Doctor of Philosophy (Ph.D.); Epidemiology — Population Dynamics

Students admitted to the Ph.D. in Epidemiology; Population Dynamics degree program with the equivalent of the M.Sc. in Epidemiology at McGill will be required to take a minimum of 33 credits of Ph.D. courses.

In addition to the Ph.D. requirements, students admitted to the Ph.D. in Epidemiology; Population Dynamics degree program without the equivalent of an M.Sc. in Epidemiology at McGill will, in their first year, have to complete required coursework equivalent to the Master's Epidemiology program, excluding thesis research course(s), as determined by the Department.

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 (21 credits)

EPIB 604	(3)	Epidemiologic Analysis
EPIB 608	(3)	Advanced Epidemiology
EPIB 609	(3)	Seminar on Advanced Methods in Epidemiology
EPIB 610	(3)	Advanced Methods: Causal Inference
EPIB 623	(3)	Research Design in Health Sciences

EPIB 701	(0)	Ph.D. Comprehensive Examination
EPIB 702	(0)	Ph.D. Proposal
SOCI 545	(3)	Sociology of Population
SOCI 626	(3)	Demographic Methods

Complementary Courses (12 credits)

12 credits of coursework, at the 500 level or higher, with a minimum of 3 credits in ethics (medical/public health/research), 3 credits in biostatistics, 3 credits in epidemiology, and 3 credits from courses approved for the Population Dynamics Option from the list below:

ECON 622	(3)	Public Finance
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 & 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.

11.7.5 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:

- clinical trials;
- 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 11.7.5.2: Master of Science (M.Sc.); Biostatistics (Thesis) (48 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 11.7.5.3: 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 11.7.5.4: Doctor of Philosophy (Ph.D.); Biostatistics

Applicants should hold a master's degree in mathematics or statistics or its equivalent. Mastery of 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, and clinical trials. 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.

11.7.5.1 Biostatistics Admission Requirements and Application Procedures

11.7.5.1.1 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 www.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.

11.7.5.1.2 Application Procedures

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

See [University Regulations and 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 www.mcgill.ca/epi-biostat-occh/academic-programs/grad/biostatistics/applying for information on required application documents.

11.7.5.1.3 Application Deadlines

The application deadlines listed here 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 www.mcgill.ca/gps/contact/graduate-program.

Canadian	International	Special/Exchange/Visiting
Fall: Dec. 15	Fall: Dec. 15	Fall: April 30
Winter: N/A	Winter: N/A	Winter: Sept. 10
Summer: N/A	Summer: N/A	Summer: N/A

Admission to graduate studies is competitive; late and/or incomplete applications will not be considered.

11.7.5.2 Master of Science (M.Sc.); Biostatistics (Thesis) (48 credits)

Training in statistical theory and methods, applied data analysis, scientific collaboration, communication, and report writing by coursework and thesis.

Thesis Courses (24 credits)

BIOS 690	(24)	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)	Honours Regression and Analysis of Variance
MATH 556	(4)	Mathematical Statistics 1
MATH 557	(4)	Mathematical Statistics 2

11.7.5.3 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)	Honours 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.

11.7.5.4 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 (28 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 & Report Writing
MATH 523	(4)	Generalized Linear Models
MATH 533	(4)	Honours 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).

11.8 Experimental Medicine

Please see [section 11.12: Medicine, Experimental](#) for more information.

11.9 Family Medicine

Please see [section 11.13: Medicine, Family](#) for more information.

11.10 Human Genetics

11.10.1 Location

Department of Human Genetics
 Stewart Biological Sciences Building
 1205 Dr. Penfield Avenue, N5/13
 Montreal QC H3A 1B1
 Canada
 Telephone: 514-398-4198
 Fax: 514-398-2430
 Email: grad.hg@mcgill.ca
 Website: www.mcgill.ca/humangenetics

Administration

Kandace Springer – *Administrative Assistant*

Email: kandace.springer@mcgill.ca

Ross Mackay – *Graduate Program Coordinator*

Email: ross.mackay@mcgill.ca

Administration

Laura Benner (*On Leave*) – Assistant Graduate Program Coordinator

Rimi Joshi (*Acting*) – Assistant Graduate Program Coordinator

Email: dept.humangenetics@mcgill.ca

11.10.2 About Human Genetics**M.Sc. and Ph.D. Degrees in Human Genetics**

The Department of Human Genetics offers a clinical master's program in Genetic Counselling, as well as research training at both the M.Sc. and Ph.D. levels. Both the M.Sc. and Ph.D. 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. The Department also offers a Bioinformatics option; information on this option can be found at www.mcgill.ca/mcb/academic/graduate.

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

Faculty 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](#).

Students accepted into the Human Genetics research graduate program will receive a minimum stipend of \$15,000, plus tuition and fees.

Tuition Differential Fee Waivers

A certain number of tuition differential fee waivers will be offered to incoming out-of-province/international students who have demonstrated outstanding academic achievement. Students who have a **CGPA of 3.5 out of 4.0 or above** (as converted by McGill GPS guidelines) and who submit online application and documents by **March 31 (Fall), or Sept. 10 (Winter)** will automatically be considered for a tuition waiver.

section 11.10.5: 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
- neurogenetics
- bioethics
- genomics

Many of our faculty hold cross-appointments in various departments (including: biochemistry, biology, cardiology, medicine, microbiology, immunology, neurology, pathology, paediatrics, 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 11.10.6: 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

section 11.10.6: Master of Science (M.Sc.); Human Genetics (Thesis) — Bioinformatics (45 credits)

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 11.10.7: 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, Religious Studies, and Law, 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 11.10.8: 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 11.10.9: 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, paediatrics, 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 11.10.10: 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.

11.10.3 Human Genetics Admission Requirements and Application Procedures**11.10.3.1 Admission Requirements****M.Sc. in Genetic Counselling****Prerequisites:**

- Bachelor's or medical degree – minimum cumulative grade point average (CGPA) of 3.0 out of 4.0, or 3.2 out of 4.0 in the last two full-time academic years;
- Recent (within the past five years) university-level courses in basic sciences (molecular/cell biology, biochemistry, advanced genetics (preferably human), and statistics) and a minimum of two in psychology;

- Some experience (either paid or volunteer) working with adults in a counselling or advisory capacity, ideally in a crisis setting.

M.Sc. and Ph.D. in Human Genetics

Prerequisites:

- B.Sc. – minimum CGPA 3.0 out of 4.0, or 3.2 out of 4.0 in the last two full-time academic years;
- 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 director* who has agreed to provide adequate funding for the duration of the academic program and on an evaluation by the Graduate Training Committee.

Prospective graduate students should complete the online application form and indicate at least three faculty members they are interested in working with.

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* score of 100 on the Internet-based test (iBT; 600 on the paper-based test (PBT)), with each component score no less than 20, as the **minimum** standard for admission.

11.10.3.2 Application Procedures

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

See *University Regulations and Resources > Graduate > Graduate Admissions and Application Procedures > : Application Procedures* for detailed application procedures.

11.10.3.3 Application Deadlines

The application deadlines listed here 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 www.mcgill.ca/gps/contact/graduate-program.

Canadian		International			Special/Exchange/Visiting	
M.Sc. Genetic Counselling program* (Non-Thesis)	M.Sc. (Thesis) programs	Ph.D. programs	M.Sc. Genetic Counselling program* (Non-Thesis)	M.Sc. (Thesis) programs	Ph.D. programs	
Fall: Jan. 15	Fall: March 31	Fall: March 31	Fall: Jan. 15	Fall: March 31	Fall: March 31	Fall: N/A
Winter: N/A	Winter: Sept. 10	Winter: Sept. 10	Winter: N/A	Winter: Sept. 10	Winter: Sept. 10	Winter: N/A
Summer: N/A			Summer: N/A			Summer: N/A

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.**



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

11.10.4 Human Genetics Faculty

Chair
E.A. Shoubridge
Program Directors
J. Fitzpatrick – <i>M.Sc. in Genetic Counselling</i>
A. Ryan – <i>M.Sc. and Ph.D. in Human Genetics</i>
Emeritus Professors
V. Der Kaloustian; B.A.(Acad.), M.Sc., Ph.D., M.D.,C.M.(McG.), D.Sc.(Acad.), F.R.S.C., F.R.C.P.S.(C)
B. Mukherjee; B.Sc., M.Sc.(Calc.), M.Sc.(BYU), Ph.D.(Utah)

Emeritus Professors

L. Pinsky; M.D.(McG.)

C. Scriver; B.A., M.D.,C.M.(McG.)

Professors

E. Andermann; M.Sc., Ph.D., M.D.,C.M.(McG.) (*Neurology and Neurosurgery*)

G. Bourque; B.Sc.(Montr.), M.A., Ph.D.(USC) (*Genome Quebec*)

W. Foulkes; B.Sc., MB.BS., Ph.D.(Lond.) (*Medicine*)

F. Kaplan; B.A.(Col.), Ph.D.(McG.) (*Pediatrics*)

B. Knoppers; Ph.D.(Paris IV), Ad.E., O.C. (*Director; Centre of Genomics and Policy*)

M. Lathrop; B.Sc., M.Sc.(Alta.), Ph.D.(Wash.) (*Director, McGill University-Genome Quebec Innovation Centre*)

D. Malo; D.U.M., M.Sc.(Montr.), Ph.D.(McG.) (*William Dawson Scholar*) (*Medicine*)

R. McInnes; C.M.,M.D., Ph.D., F.R.S.C.(McG.) (*Alva Chair in Human Genetics*) (*Director; Lady Davis Research Institute*)

R. Palmour; B.A.(Texas W.), Ph.D.(Texas) (*Psychiatry and Biology*)

D. Radzioch; M.Sc., Ph.D.(Jagiellonian, Krakow) (*Medicine*)

D.S. Rosenblatt; M.D.,C.M.(McG.) (*Medicine, Pediatrics, and Biology*)

R. Rozen; B.Sc., Ph.D.(McG.) (*Pediatrics and Biology*)

E. Schurr; M.Sc., Ph.D.(Albert-Ludwigs, Freiburg) (*Medicine*)

E.A. Shoubridge; B.Sc., M.Sc.(McG.), Ph.D.(Br. Col.) (*Neurogenetics*)

R. St-Arnaud; B.Sc.(Montr.), Ph.D.(Laval) (*Surgery*)

P. Tonin; B.Sc., M.Sc., Ph.D.(Tor.) (*Medicine*)

J. Trasler; M.D.,C.M., Ph.D.(McG.) (*William Dawson Scholar*) (*Pathology and Pediatrics*)

S. Vidal; Ph.D.(Genève) (*Medicine*)

Associate Professors

B. Brais; M.D.,C.M., Ph.D.(McG.) (*Neurology and Neurosurgery*)

N. Braverman; B.Sc.(Cornell), M.Sc.(Sarah Lawrence), M.D.(Tulane) (*Pediatrics*)

K. Dewar; Ph.D.(Laval) (*Genome Quebec*)

Y. Joly; Ph.D.(McG.) (*Centre of Genomics and Policy*)

J. Majewski; B.Sc., M.Sc.(Stan.), Ph.D.(Wesl.)

P. Moffatt; Ph.D.(Montr.) (*Pharmacology*)

R. Nadon; B.A., M.A., Ph.D.(C' dia)

T. Pastinen; M.D., Ph.D.(Helsinki)

I. Ragoussis; Ph.D.(Tübingen)

L. Russell; B.A., M.D.(Ind.) (*Pediatrics*)

A. Ryan; Ph.D.(Qu.)

R. Slim; M.Sc.(Lebanese), M.Sc., Ph.D.(Paris VII)

Assistant Professors

L. Beitel; Ph.D.(McG.) (*Biochemistry*)

D. Buhas; M.D.(Craiova) (*Montreal Children's Hospital*)

L. Cartier; B.Sc., M.Sc.(McG.)

G. Chong; Ph.D.(Kansas)

C. Crist; B.Sc.(Br. Col.), M.Sc., Ph.D.(Tokyo)

I. De Bie; M.D.(Laval), Ph.D.(McG.) (*Montreal Children's Hospital*)

Assistant Professors

J. Fitzpatrick; M.S.(Mich.) (*Pediatrics and Medicine*)
 M. Fujiwara; M.Sc.(Alta.) (*Quantitative Genetics*)
 S. Gravel; Ph.D.(Physics)(Cornell) (*Numerical methods*)
 E. Grundberg; Ph.D.(Uppsala) (*Internal medicine*)
 C. Kleinman; Ph.D.(Montr.) (*Bioinformatics*)
 H. Najafabadi; Ph.D.(Montr.) (*Genome Innovation Centre*)
 I. Ragoussis; Ph.D.(Tübingen) (*Genome Innovation Centre*)
 Y. Riaz Alhosseini; Ph.D.(Heidel.) (*Genome Quebec*)
 J.P. Riviere; Ph.D.(Montr.) (*RI MUHC*)
 A. Ruchon; Ph.D.(Montr.) (*Biomedical Sciences*)
 V. Soleimani; Ph.D.(Ott.) (*Jewish General Hospital*)
 Y. Trakadis; M.D.(Montr.) (*Montreal Children's Hospital*)
 R. Sladek; B.A.Sc., M.D.(Tor.)
 Y. Yamanaka; Ph.D.(Osaka) (*Goodman Cancer Research Centre*)

Lecturers

N. Anoja (*Medicine*)
 L. Baret (*Medicine*)
 N. Bolduc (*Pediatrics*)
 S. Drury (*Pediatrics*)
 S. Fox (*Medicine*)
 L. Kasprzak (*Medicine*)
 M. Lalous (*Medicine*)
 L. Macrae (*Medicine*)
 N. Palfreeman (*Medicine*)
 L. Palma (*Medicine*)
 H. Rothenmund (*Medicine*)
 G. Sillon (*Medicine*)
 R. Vanneste (*Pediatrics*)
 L. Whelton (*Medicine*)
 N. Wong (*Medicine*)
 S. Zaor (*Medicine*)

Adjunct Professors

K. Anderson (*Children's Hospital of Eastern Ontario*)
 T. Chiu (*Children's Hospital of Eastern Ontario*)
 M. Cloutier (*Children's Hospital of Eastern Ontario*)
 E. Creede (*Children's Hospital of Eastern Ontario*)
 C. Goldsmith (*Children's Hospital of Eastern Ontario*)
 B. Gottlieb (*Medicine*)
 V.A. Hastings (*Children's Hospital of Eastern Ontario*)
 C. Honeywell (*Children's Hospital of Eastern Ontario*)
 A. Montpetit (*Genome Quebec*)

Adjunct Professors

S. Morrison (*Children's Hospital of Eastern Ontario*)

J. Ott (*Genome Quebec*)

Adjunct Member

D. Vinh; M.D. (*Dept. of Medical Microbiology; Medicine*)

Associate Members

Biochemistry: P. Gros, D. Thomas

Bioethics: J. Kimmelman

Cardiology: J. Genest

Cancer Genetics: G. Zogopoulos

Dentistry: L. Diatchenko

Endocrinology: C. Polychonakos, B. Richards

Epidemiology, Biostatistics and Occupational Health: C. Greenwood

Law: R. Gold

Medicine: D. Cournoyer, J. Engert, B. Gilfix, C. Haston, G. Hendy, A. Karaplis, R. Koenekoop, A. Peterson, F. Rauch, M. Trifiro

Nephrology: I. Gupta

Neurology: G. Rouleau

Obs.-Gyn.: R. Gagnon, A. Naumova

Pathology: A. Spatz

Pediatrics: G. Bernard, P. Goodyer, N. Jabado, L. Majewska, J. Mitchell

Psychiatry: R. Joober, G. Turecki, C. Ernst

Surgery: P. Roughley

11.10.5 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 671	(3)	Advances in Human Genetics 2
HGEN 690	(3)	Inherited Cancer Syndromes

HGEN 691	(3)	Host Responses to Pathogens
HGEN 693	(3)	Using Bioinformatics Resources
HGEN 694	(3)	Microarray Statistical Analysis
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.

11.10.6 Master of Science (M.Sc.); Human Genetics (Thesis) — Bioinformatics (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)

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
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.

11.10.7 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:

BIOE 682	(3)	Medical Basis of Bioethics
CMPL 642	(3)	Law and Health Care
PHIL 643	(3)	Seminar: Medical Ethics
RELG 571	(3)	Ethics, Medicine and Religion

11.10.8 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)	Intro 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
PATH 653	(3)	Reading and Conference

11.10.9 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 691	(3)	Host Responses to Pathogens
HGEN 693	(3)	Using Bioinformatics Resources
HGEN 694	(3)	Microarray Statistical Analysis
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 courses:

HGEN 670	(3)	Advances in Human Genetics 1
HGEN 671	(3)	Advances in Human Genetics 2

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

11.10.10 Doctor of Philosophy (Ph.D.); Human Genetics — 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)

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.

11.11 Medical Physics

11.11.1 Location

Medical Physics Unit, DS1-7129
 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: www.mcgill.ca/medphys

11.11.2 About Medical Physics

The Medical Physics Unit is a teaching and research unit concerned with the application of physics and related sciences in medicine, especially (but not exclusively) in radiation medicine; i.e., radiation oncology, medical imaging, and nuclear medicine. The Unit offers an M.Sc. in Medical Radiation Physics. Facilities are available for students to undertake a Ph.D. in Medical Physics through the Department of Physics.

The research interests of Unit members include various aspects of medical imaging, including:

- 3D imaging;
- the development of new imaging modalities;
- applications of imaging in radiation therapy such as radiation dosimetry and solid state; nuclear cardiology; and applications of radiation biology to therapy.

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 11.11.5: Master of Science (M.Sc.); Medical Radiation Physics (Thesis) (60 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.

11.11.3 Medical Physics Admission Requirements and Application Procedures

11.11.3.1 Admission Requirements

Candidates applying to the M.Sc. program must normally hold a B.Sc. degree (honours or major) in Physics or Engineering, with a minimum CGPA of 3.0 out of 4.0.

11.11.3.2 Application Procedures

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

See [University Regulations and 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 2017

“Department” = Medical Physics Unit

“Program” = M.Sc. Med Radiation Physics (Thesis)

“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 www.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 May 01, 2015 for a graduate application to McGill for Fall 2017. Applicants from some countries are exempt from providing evidence of English language proficiency. For more information, see www.mcgill.ca/gradapplicants/international/apply/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.

11.11.3.2.1 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.

11.11.3.3 Application Deadlines

The application deadlines listed here 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 www.mcgill.ca/gps/contact/graduate-program.

Students are admitted to the M.Sc. program only to start in the Fall term (in September) of a given academic year. Applications must be completed by January 15, 2017 to be considered for the Fall 2017 term, i.e., online application submitted and all required documents uploaded. The online application for Fall 2017 will be available by the end of September 2016.

Canadian	International	Special/Exchange/Visiting
Fall: Jan. 15	Fall: Jan. 15	Fall: Jan. 15
Winter: N/A	Winter: N/A	Winter: N/A
Summer: N/A	Summer: N/A	Summer: N/A

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

11.11.4 Medical Physics Faculty**Director**

J. Seuntjens

Emeritus Professor

E.B. Podgorsak; Dipl.Ing.(Ljubljana), M.Sc., Ph.D.(Wisc.), F.C.C.P.M., F.A.A.P.M., D.A.B.M.P., D.A.B.R.

Professors

D. Louis Collins; M.Eng., Ph.D.(McG.), Post Doc.(Rennes), F.C.C.P.M.

S.M. Lehnert; B.Sc.(Nott.), M.Sc., Ph.D.(Lond.)

J. Seuntjens; M.Sc., Ph.D.(Ghent), F.C.C.P.M., F.A.A.P.M., F.C.O.M.P.

Assistant Professors

F. DeBlois; M.Sc., Ph.D.(McG.), F.C.C.P.M.

S. Devic; M.Sc., Ph.D.(Belgrade), F.C.C.P.M.

S. Enger; Ph.D.(Uppsala), Post Doc.(Laval)

M.D.C. Evans; B.A.(Qu.), M.Sc.(McG.), F.C.C.P.M.

J. Kildea; Ph.D.(Dublin), M.Sc.(McG.)

I. Levesque; Ph.D.(McG.), Post Doc.(Stan.)

W. Parker; M.Sc.(McG.), F.C.C.P.M.

H.J. Patrocinio; M.Sc.(McG.), F.C.C.P.M., D.A.B.R.

E. Soisson; M.Sc., Ph.D.(Wisc.)

G. Stroian; M.Sc.(McG.), Ph.D.(Montpellier), F.C.C.P.M.

Affiliate Members

S. Ambareen, K. Asiev, H. Bekerat, T. Connell, S. Darvasi, S. Davis, C. Furstoss, A. Gauvin, D. Guillet, G. Hegyi, M. Hobson, C. Janicki, P. Léger, L. Liang, B. Moftah, E. Poon, M. Popovic, R. Richardson, R. Ruo, A. Sarfehnia, M. Serban, N. Tomic, N. Ybarra

Adjunct Professors

I. El Naqa; B.Sc., M.S.(Jordan), Ph.D.(Chic.), M.A.(Wash.), D.A.B.R.

G.B. Pike; B.Eng.(St. John's), M.Eng., Ph.D.(McG.)

A. Reader; B.Sc.(Kent), Ph.D.(Lond.)

A. Syme; B.Sc.(McM.), Ph.D.(Alta.), F.C.C.P.M.

11.11.5 Master of Science (M.Sc.); Medical Radiation Physics (Thesis) (60 credits)**Thesis Courses (32 credits)**

MDPH 625	(32)	M.Sc. Thesis Research
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Required Courses (28 credits)

MDPH 601	(3)	Radiation Physics
MDPH 602	(3)	Applied Dosimetry
MDPH 603	(2)	Laboratory Practicum 1
MDPH 607	(3)	Introduction to Medical Imaging
MDPH 608	(2)	Laboratory - Diagnostic Radiology and Nuclear Medicine

MDPH 609	(2)	Radiation Biology
MDPH 611	(2)	Medical Electronics
MDPH 612	(2)	Computers in Medical Imaging
MDPH 613	(2)	Health Physics
MDPH 614	(3)	Physics of Diagnostic Radiology
MDPH 615	(3)	Physics of Nuclear Medicine
MDPH 616	(1)	Selected Topics in Medical Physics

11.12 Medicine, Experimental

11.12.1 Location

Division of Experimental Medicine
Department of Medicine
Lady Meredith House, Room 101
1110 Pine Avenue West
Montreal QC H3A 1A3
Canada
Telephone: 514-398-3466
Fax: 514-398-3425
Email: experimental.medicine@mcgill.ca
Website: expmed.mcgill.ca

11.12.2 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. The Division offers various programs, each of which has different training objectives (see below). The international recognition of the high-quality training accorded our graduates is in essence what distinguishes graduates of our programs from the graduates of comparable programs in peer institutions.

section 11.12.5: 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 11.12.6: 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 11.12.7: 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 McGill School of Environment (MSE) for their graduate option. Acceptance into the option will be based on a student's academic experience and performance; availability of an MSE-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 11.12.8: 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 defense of a thesis. This program may lead to research careers in industry, government, or academia.

section 11.12.9: 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 11.12.10: 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.

11.12.3 Medicine, Experimental Admission Requirements and Application Procedures**11.12.3.1 Admission Requirements****M.Sc. or Ph.D. in Experimental Medicine**

Admission to graduate studies and research in Experimental Medicine is no longer solely restricted to students who wish to register for the Ph.D. degree. 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, a letter from the candidate's research director outlining the M.Sc. or Ph.D. project is necessary.

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. (Environment Option)

Although the requirements and application deadlines remain the same as the M.Sc., applicants wishing to apply to the Master's program (Environment Option) must submit additional documents that constitute their application to BOTH the Division of Experimental Medicine and the McGill School of Environment. Further information can be found on the [School of Environment website](#).

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 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.

11.12.3.2 Application Procedures

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

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

11.12.3.2.1 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
- Letter from the candidate's research director outlining the M.Sc. or Ph.D. project
- Additional documents (in the cases of the M.Sc. (Bioethics Option) and the M.Sc. (Environment Option))

11.12.3.3 Application Deadlines

The application deadlines listed here are set by Experimental Medicine and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill academic unit's website; please consult the list at www.mcgill.ca/gps/contact/graduate-program.

Canadian/Permanent Resident/Current International McGill students		International (except current McGill students)		Special/Exchange/Visiting students
All programs (except Bioethics Option)	M.Sc. (Bioethics Option)	All programs (except Bioethics Option)	M.Sc. (Bioethics Option)	All programs
Fall: June 15	Fall: Jan. 15	Fall: April 30	Fall: Jan. 15	Fall: Same as Canadian/International
Winter: Nov. 1	Winter: N/A	Winter: Sept. 1	Winter: N/A	Winter: Same as Canadian/International
Summer: N/A		Summer: N/A		Summer: N/A

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

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

J. Martin

Director, Division of Experimental Medicine

A.-M. Lauzon

Professors

M. Alaoui-Jamali; D.V.M.(Rabat, Morocco), Ph.D.(Paris V)

S. Ali; B.Sc.(C'dia), Ph.D.(McG.)

C. Autexier; B.Sc.(C'dia), Ph.D.(McG.)

A. Bateman; B.Sc., Ph.D.(Lond.)

G. Batist; B.Sc.(Col.), M.D.,C.M.(McG.), F.R.C.P.(C)

O. Beauchet; B.Sc.(Sainte-Etienne), M.Sc.(Claude Bernard), Ph.D.(Jean Monnet)

M. Behr; B.Sc.(Tor.), M.D.(Qu.), M.Sc.(McG.)

H. Bennett; B.A.(York, UK), Ph.D.(Brunel)

J. Bourbeau; M.D.(Laval), M.Sc.(McG.), F.R.C.P.(C)

A. Cybulsky; M.D.(Tor.), F.R.C.P.(C)

G. Di Battista; B.Sc.(C'dia), M.Sc., Ph.D.(Montr.)

A. Fuks; B.Sc., M.D.,C.M.(McG.)

Professors

A. Gatignol; M.Sc., Ph.D.(Paul Sabatier)

J. Genest Jr.; M.D.,C.M.(McG.), F.R.C.P.(C)

V. Giguere; B.Sc., Ph.D.(Laval)

M. Goldberg; B.Sc., M.Sc., Ph.D.(McG.)

D. Goltzman; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)

S.A. Grover; B.A.(Roch.), M.D.,C.M.(McG.), M.P.A.(Harv.), F.R.C.P.(C)

Q.A. Hamid; M.D.(Mosul, Iraq.), Ph.D.(Lond.)

J. Henderson; B.Sc., Ph.D.(McG.)

G. Hendy; B.Sc.(Sheff.), Ph.D.(Lond.)

L.J. Hoffer; B.Sc., M.D.,C.M.(McG.), Ph.D.(MIT)

S. Hussain; M.D.(Baghdad), Ph.D.(McG.)

A.C. Karaplis; B.Sc., M.D., Ph.D.(McG.)

L. Kleiman; B.Sc.(Ill.), Ph.D.(Johns Hop.)

R. Kremer; M.D., Ph.D.(Paris VI)

A.-M. Lauzon; B.Sc., M.Sc., Ph.D.(McG.)

J.-J. Lebrun; B.Sc., M.Sc.(Rennes), Ph.D.(Paris V)

M.S. Ludwig; M.D.(Manit.), F.R.C.P.(C)

S. Magder; M.D.(Tor.), F.R.C.P.(C)

D. Malo; D.V.M., M.Sc.(Montr.), Ph.D.(McG.)

O.A. Mamer; B.Sc., Ph.D.(Windsor)

J. Martin; B.Sc., M.B., B.Ch., M.D.(Cork), F.R.C.P.(C)

W.H. Miller; A.B.(Princ.), Ph.D.(Rock.), M.D.(Cornell)

W.J. Muller; B.Sc., Ph.D.(McG.)

A. Nepveu; B.Sc., M.Sc.(Montr.), Ph.D.(Sher.)

T. Nilsson; B.Sc., Ph.D.(Uppsala)

M. Olivier; B.Sc., M.Sc.(Montr.), Ph.D.(McG.)

L. Panasci; B.Sc., M.D.(G'town)

K. Pantopoulos; B.Sc., Ph.D.(Aristotelian, Greece)

V. Papadopoulos; D.Pharm.(Athens), Ph.D.(Paris VI)

M. Park; B.Sc., Ph.D.(Glas.)

A.C. Peterson; B.Sc.(Vic., BC), Ph.D.(Br. Col.)

B.J. Petrof; M.D.(Laval)

M.N. Pollak; M.D.,C.M.(McG.), F.R.C.P.(C)

P. Ponka; M.D., Ph.D.(Charles Univ., Prague)

B. Posner; M.D.(Manit.), F.R.C.P.(C)

W.S. Powell; B.A.(Sask.), Ph.D.(Dal.)

S. Rabbani; M.B.B.S.(King Edward Med. Coll., Lahore)

D. Radziach; M.Sc., Ph.D.(Jagiellonian, Cracow)

S. Richard; B.Sc., Ph.D.(McG.)

J.-P. Routy; B.Sc., M.D., Ph.D.(Aix-Marseille)

D. Sasseville; M.D.(Laval), F.R.C.P.(C)

E. Schiffrin; M.D.(Buenos Aires), Ph.D.(McG.)

Professors

E. Schurr; Diplom., Ph.D.(Al. Ludwigs U., Freiburg)
 A. Schwertani; D.V.M.(Baghdad), M.D., Ph.D.(Lond.)
 A.D. Sniderman; M.D.(Tor.)
 M.M. Stevenson; B.A.(Hood), M.Sc., Ph.D.(Catholic U. of Amer.)
 T. Takano; M.D., Ph.D.(Tokyo)
 D.M.P. Thomson; M.D.(W. Ont.), Ph.D.(Lond.), F.R.C.P.(C)
 P. Tonin; B.Sc., M.Sc., Ph.D.(Tor.)
 M. Trifiro; B.Sc., M.D.,C.M.(McG.)
 C. Tsoukas; B.Sc.(McG.), M.Sc.(Hawaii), M.D.(Athens), F.R.C.P.(C)
 M. Wainberg; B.Sc.(McG.), Ph.D.(Col.)
 B.J. Ward; M.D.,C.M.(McG.), M.Sc.(Oxf.), F.R.C.P.(C)
 J. White; B.Sc., M.Sc.(Car.), Ph.D.(Harv.)
 S. Wing; B.Sc., M.Sc.(McG.)
 X.-J. Yang; B.Sc.(Zhejiang), Ph.D.(Shanghai)

Associate Professors

D. Baran; M.D.,C.M.(McG.), F.R.C.P.(C)
 N. Bernard; B.Sc.(McG.), Ph.D.(Duke)
 V. Blank; B.Sc., M.Sc.(Konstanz, Germany), Ph.D.(Inst. Pasteur)
 M. Blostein; M.D.,C.M.(McG.)
 P. Brassard; B.Sc., M.D.(Montr.), M.Sc.(McG.), F.R.C.P.(C)
 L. Chalifour; B.Sc., Ph.D.(Manit.), M.A.(Harv.)
 S.R. Cohen; B.Sc., M.Sc., Ph.D.(McG.)
 D. Cournoyer; M.D.(Sher.), F.R.C.P.(C)
 M. Culty; B.Sc., M.Sc.(Lyon), Ph.D.(Grenoble)
 S. Daskalopoulou; M.D.(Athens)
 J.C. Engert; B.A.(Colby), Ph.D.(Boston)
 V. Essebag; M.D.,C.M., M.Sc., Ph.D.(McG.), F.R.C.P.(C)
 E. Fixman; B.Sc.(Col.), Ph.D.(Johns Hop.)
 B. Gilfix; B.Sc.(Manit.), Ph.D.(W. Ont.), M.D.,C.M.(McG.), F.R.C.P.(C)
 S.B. Gottfried; M.D.(Penn.)
 C. Haston; B.Sc.(W. Ont.), M.Sc.(Tor.), Ph.D.(Texas)
 T. Jagoe; B.A., M.D.(Camb.), Ph.D.(Newcastle, UK), F.R.C.P.(C)
 B. Jean-Claude; B.Sc., M.Sc.(Moncton), Ph.D.(McG.)
 M. Kokoeva; B.Sc.(Lomonosov Moscow), Ph.D.(Acad. of Sci., Moscow)
 A. Kristof; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)
 P. Laneuville; B.Sc.(McM.), M.D.(Ott.), F.R.C.P.(C)
 S. Laporte; B.Sc., M.Sc., Ph.D.(Sher.)
 L. Larose; B.Sc., Ph.D.(Montr.)
 S. Lehoux; B.Sc.(Bishop's), Ph.D.(Sher.)
 S. Lemay; M.D.(Montr.), F.R.C.P.(C)
 C. Liang; B.Sc., Ph.D.(Nankai)

Associate Professors

R. Lin; B.Sc., B.Sc.(Xiamen), M.Sc.(Peking Union), Ph.D.(C'dia)
 M. Lipman; M.D.,C.M.(McG.), F.R.C.P.(C)
 J.-L. Liu; B.Sc., M.Sc.(Beijing), Ph.D.(McG.)
 J.A. Morais; M.D.(Montr.), F.R.C.P.(C)
 A. Mouland; B.A., B.Sc., Ph.D.(McG.)
 M. Murshed; M.Sc.(Brussels), Ph.D.(Cologne)
 S. Qureshi; B.Sc., M.D.(Alta.), F.R.C.P.(C)
 J. Rauch; B.Sc., Ph.D.(McG.)
 C. Rocheleau; B.A.(Assum. Coll.), Ph.D.(Mass.)
 S. Rousseau; B.Sc., M.Sc., Ph.D.(Laval)
 M. Saleh; B.Sc., M.Sc.(Beirut), Ph.D.(McG.)
 C. Seguin; B.Sc.(McG.), M.D.(Montr.), F.R.C.P.(C)
 D. Sheppard; M.D.(Tor.), F.R.C.P.(C)
 P. Siegel; B.Sc., Ph.D.(McM.)
 R. Sladek; B.Sc., M.D.(Tor.), F.R.C.P.(C)
 E. Torban; B.Sc.(Moscow St. Inst. of Food Ind.), M.Sc.(Moscow Inst. of Genetics of Microorganisms), Ph.D.(McG.)
 B. Turcotte; B.Sc., Ph.D.(Laval)

Assistant Professors

J. Afilalo; M.D.,C.M., M.Sc.(McG.), F.R.C.P.(C)
 R. Aloyz; B.A., M.Sc., Ph.D.(Buenos Aires)
 A. Baass; B.Sc.(McG.), M.D., M.Sc.(Montr.), F.R.C.P.(C)
 C. Baglolle; B.Sc., M.Sc.(PEI), Ph.D.(Calg.)
 I. Colmegna; M.Sc.(El Salvador)
 M. Divangahi; B.Sc.(McM.), Ph.D.(McG.)
 N. Johnson; B.Sc.(C'dia), M.D.(Ott.), Ph.D.(Br. Col.), F.R.C.P.(C)
 M. Kaminska; B.Sc., M.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)
 B. McDonald Smith; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)
 E. Nashi; B.Sc., M.D.(Alta.), M.Sc.(McG.), Ph.D.(Northshore Medical Ctr.), F.R.C.P.(C)
 M. Ndao; B.Sc., D.V.M.(Senegal), M.Sc., Ph.D.(Belgium)
 D. Nguyen; M.D.,C.M.(McG.), F.R.C.P.(C)
 M. Paliouras; B.Sc.(Tor.), M.Sc.(Flor.), Ph.D.(McG.)
 M. Sebag; B.Sc., Ph.D.(McG.), M.D.(Tor.), F.R.C.P.(C)
 G. Sebastiani; M.D.(Padova)
 G. Thanassoulis; B.Sc., M.Sc.(McG.), M.D.(Tor.), F.R.C.P.(C)
 D.C. Vinh; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)

Associate Members, McGill

B. Abdulkarim, H. Abenhaim, M. Basik, M. Ben-Shoshan, D. Boivin, M. Bouchard, P. Brodt, K. Brown, S. Chevalier, R.-C. Chian, H. Clarke, T. Coderre, L. Diatchenko, T. Duchaine, D. Dufort, C. Ells, K. Eppert, M. Fabian, L. Ferri, C. Goodyer, P. Goodyer, W. Gotlieb, I. Gupta, M. Hunt, N. Jabado, D. Juncker, M. Kaartinen, J. Kimmelman, A. Koromilas, L. Koski, L. Lands, J. Lapointe, C. Mandato, K. Mann, P. Martineau, B. Mazer, L. McCaffrey, C. McCusker, T. Muanza, M. Nagano, J. Nalbantoglu, C. O'Flaherty, A. Orthwein, A. Pause, C. Piccirillo, C. Polychronakos, S. Prakash, R. Rajan, J. Rak, G. Rouleau, A. Ryan, S. Sabri, G. Sant'Anna, R. Slim, N. Sonenberg, I. Topisirovic, M. Tremblay, J. Ursini-Siegel, M. Witcher, J.-H. Wu, M. Zappitelli, G. Zogopoulos

Associate Members, Université de Montréal

J. Archambault, M. Cayouette, F. Charron, C. Cheong, E. Cohen, C.F. Deschepper, J.M. Di Noia, J. Drouin, J. Estall, M. Ferron, N. Francis, H. Gu, J. Gutkowska, P. Hamet, D. Hipfner, P. Jolicoeur, A. Kania, M. Kmita, E. Lecuyer, T. Moroy, F. Ni, M. Oeffinger, R. Rabasa-Lhoret, E. Racine, N. Seidah, W.-K. Suh, H. Takahashi, M. Trudel, W.Y. Tsang, J. Vacher, A. Veillette, E. Wang, C. Wu, J. Zwaagstra

11.12.5 Master of Science (M.Sc.); Experimental Medicine (Thesis) (45 credits)**Thesis Courses (36 credits)**

24-36 credits selected from the following:

EXMD 690	(3)	Master's Thesis Research 1
EXMD 691	(6)	Master's Thesis Research 2
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 (21 credits)

9-21 credits of courses at the 500, 600, or 700 level chosen in consultation with the Supervisor. A minimum of 9 course credits is required for students entering the program with a bachelor's or M.D. degree.

11.12.6 Master of Science (M.Sc.); Experimental Medicine (Thesis) — Bioethics (45 credits)**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:

BIOE 682	(3)	Medical Basis of Bioethics
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.

11.12.7 Master of Science (M.Sc.); Experimental Medicine (Thesis) — Environment (45 credits)**Thesis Courses (24 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

Required Courses (6 credits)

ENVR 610 (3) Foundations of Environmental Policy
 ENVR 650 (1) Environmental Seminar 1
 ENVR 651 (1) Environmental Seminar 2
 ENVR 652 (1) Environmental Seminar 3

Complementary Courses (15 credits)

3 credits from one of the following courses*:

ENVR 519 (3) Global Environmental Politics
 ENVR 544 (3) Environmental Measurement and Modelling
 ENVR 620 (3) Environment and Health of Species
 ENVR 622 (3) Sustainable Landscapes
 ENVR 630 (3) Civilization and Environment
 ENVR 680 (3) Topics in Environment 4

* or another course at the 500, 600, or 700 level recommended by the Advisory Committee and approved by the Environment Option Committee.

12 credits of courses at the 500, 600, or 700 level chosen in consultation with the student's academic supervisor.

11.12.8 Doctor of Philosophy (Ph.D.); Experimental Medicine

A minimum of 12 course credits is required for students entering the program with a prior master's degree. Students having only a B.Sc. or M.D. degree and who have been either admitted directly or fast-tracked to the Ph.D. must complete a total of 18 credits. The following courses are highly recommended: EXMD 604D1/D2 Recent Advances in Cellular and Molecular Biology; EXMD 610 Biochemical Methods in Medical Research.

After consultation with their research supervisor and the Director of the Division, students may choose their courses from those offered by Experimental Medicine, Physiology, and Biochemistry, as well as other graduate and advanced undergraduate courses in the medical and allied sciences. Where necessary, students may enrol for credit in courses offered in the physical and mathematical sciences.

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 (18 credits)

(12-18 credits)

A minimum of 12 course credits is required for students entering the program with a prior master's degree. Students having been fast-tracked to the Ph.D. must complete a total of 18 credits (9 credits in addition to the 9 which were originally requested upon entry into the M.Sc. program).

11.12.9 Doctor of Philosophy (Ph.D.); Experimental Medicine — Environment

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)

ENVR 610	(3)	Foundations of Environmental Policy
ENVR 650	(1)	Environmental Seminar 1
ENVR 651	(1)	Environmental Seminar 2
ENVR 652	(1)	Environmental Seminar 3
EXMD 701D1	(0)	Comprehensive Oral Examination
EXMD 701D2	(0)	Comprehensive Oral Examination

Complementary Courses (12 credits)

(6-12 credits)

One of the following courses:*

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling
ENVR 620	(3)	Environment and Health of Species
ENVR 622	(3)	Sustainable Landscapes
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

* or another course at the 500, 600, or 700 level recommended by the Advisory Committee and approved by the Environment Option Committee.

One to three courses at the 500, 600, or 700 level chosen in consultation with the student's academic supervisor.

11.12.10 Graduate Diploma (Gr. Dip.); Clinical Research (30 credits)

The core element of the diploma is the Practicum in Clinical Research. It is a six-step program with active "clerkship" or "intern/resident type" participation in each component that is essential to the successful development and evaluation of a clinical trial.

Required Courses (6 credits)

EXMD 617	(1)	Workshop in Clinical Trials 1
EXMD 618	(1)	Workshop in Clinical Trials 2
EXMD 619	(1)	Workshop: 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

Complementary Courses (6 credits)

Two courses chosen from: Experimental Medicine (EXMD), Pharmacology and Therapeutics (PHAR), Epidemiology and Biostatistics (EPIB). With approval, courses from other Allied Health Sciences departments may be considered.

Required Practicum (18 credits)

EXMD 627	(18)	Practicum in Clinical Research
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11.13 Medicine, Family

11.13.1 Location

Department of Family Medicine
 5858 Côte-des-Neiges Road, Suite 300
 Montreal QC H3S 1Z1
 Telephone: 514-399-9103
 Fax: 514-398-4202
 Email: graduateprograms.fammed@mcgill.ca
 Website: www.mcgill.ca/familymed/research-grad/graduate-programs

11.13.2 About Family Medicine

The McGill Family Medicine Department is home to an exceptional community of 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:

- 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;
- 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.

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.

Ph.D. (*Ad Hoc*)

The Department of Family Medicine offers the possibility of entering a Ph.D. program on an *ad hoc* basis.

section 11.13.5: 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 six family medicine clinical sites located around Montreal and Quebec.

section 11.13.6: 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 11.13.7: 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.

section 11.13.7: Master of Science (M.Sc.); Family Medicine (Thesis) — Medical Education (45 credits)

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.

11.13.3 Medicine, Family Admission Requirements and Application Procedures**11.13.3.1 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; 567 on the paper-based test (PBT)), with each component score not less than 20.



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.

11.13.3.2 Application Procedures

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

See [University Regulations and 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.
- **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 ad hoc Ph.D. in Family Medicine.
- **Curriculum Vitae:** Please upload the latest version of your resumé, which should include a listing of previous research experience and publications.
- **Letters of Reference:** Two (2) 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 abilities and aptitudes. 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 describe their background, research interests, and reasons for undertaking 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 the McGill admissions processing system and an official transcript must be sent at a later time when the letter of acceptance has been sent by Graduate and Postdoctoral Studies via Minerva (since this will be a condition of the letter). **Please note:** Official transcripts are not required for studies conducted at McGill University (students may upload a Minerva copy of their McGill transcript with their application and this will be sufficient).
- **Writing Sample (for ad hoc Ph.D. only):** Applicants to our ad hoc Ph.D. program must upload a writing sample to review, preferably a thesis or a published article.

11.13.3.21 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 ad hoc Ph.D. only)

11.13.3.3 Application Deadlines

The application deadlines listed here are set by graduate departments 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 www.mcgill.ca/gps/contact/graduate-program.

Canadian	International	Special/Exchange/Visiting
Fall: March 1	Fall: March 1	Fall: March 1
Winter: N/A	Winter: N/A	Winter: N/A
Summer: N/A	Summer: N/A	Summer: N/A

All supporting documents must be received by March 1. Admissions are preferable for the Fall term. Students may be accepted to the Winter term on a case-by-case basis.

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

11.13.4 Medicine, Family Faculty

Chair

Howard Bergman

Graduate Program Director

Gillian Bartlett

Professors

Neil Andersson; M.D., M.Sc., M.Phil.(Lond.), Ph.D.(City, UK), M.F.P.H.(UK)

Howard Bergman; B.Sc.(McG.), M.D.,C.M.(McG.), C.C.F.P, F.C.F.P.

Jeannie Haggerty; B.Sc.(S. Fraser), M.Sc., Ph.D.(McG.)

Ann Macaulay; M.B., Ch.B.(St. And.), C.C.F.P.

Pierre Pluye; M.D.(P. Sabatier), M.Sc., Ph.D.(Montr.)

Mark Yaffe; B.Sc., M.D.,C.M.(McG.), M.Cl.Sc.(W. Ont.), C.C.F.P., F.C.F.P.

Associate Professors

Gillian Bartlett; B.Sc., M.Sc., Ph.D.(McG.)

Eugene Bereza; B.A., M.D.,C.M.(McG.), C.C.F.P.

Anne Cockcroft; M.B., B.S., M.D.(Lond.), F.R.C.P., F.F.O.M., D.I.H.(UK)

Roland Grad; M.D.,C.M.(McG.), M.Sc.(McM.), C.C.F.P.

Susan Law; B.Sc.(Guelph), M.H.Sc.(Tor.), Ph.D.(Lond.)

Charo Rodriguez; M.D.(Alicante), M.P.H.(Valencia), Ph.D.(Montr.)

Ellen Rosenberg; B.A.(Smith), M.D.,C.M.(McG.), C.C.F.P.

Mark Ware; B.A.(Qu.), M.B., B.S.(W. Indies), M.Sc.(Lond.)

Assistant Professors

Anne Andermann; B.Sc., M.D.,C.M.(McG.), M.Phil.(Camb.), D.Phil.(Oxf.), C.C.F.P., F.R.C.P.(C), F.F.P.H.(UK)

Yves Bergevin; B.Sc.(Coll. Stanislas, Montreal), M.D.,C.M., M.Sc.(McG.), C.C.F.P., F.R.C.P.(C), F.C.F.P.

Alexandra De Pokomandy; M.D.,C.M., M.Sc.(McG.)

Bertrand Lebouche; M.D., M.A., Ph.D.(Laval)

Peter Nugus; M.A., M.Ed., Ph.D.(New South Wales)

Tibor Schuster; B.Sc., M.Sc.(Ludwig Maximilians), Ph.D.(TU Berlin)

Isabelle Vedel; M.D.(Paris XI), D.E.A.(Sciences Po), Ph.D.(Reims Champagne-Ardenne)

Machelle Wilchesky; B.A., M.A.(Qu.), Ph.D.(McG.)

Associate Members

Sara Ahmed (*Physical and Occupational Therapy*)

David Buckeridge (*Epidemiology*)

Carolyn Ells (*Bioethics*)

Jennifer Fishman (*Bioethics*)

Danielle Groleau (*Psychiatry*)

Richard Hovey (*Dentistry*)

Patricia Li (*Pediatrics*)

Francesca Luconi (*Continuing Professional Development – Faculty of Medicine*)

Melissa Park (*Physical and Occupational Therapy*)

Daniel Weinstock (*Institute of Health and Social Policy*)

Meredith Young (*Centre of Medical Education*)

Adjunct Professors

Tracie Barnett (Institut Armand Frappier)

Julie Bruneau (Montr.)

Yves Couturier (Sher.)

Catherine Hudon (Sher.)

Marie-Thérèse Lussier (Montr.)

Janusz Kaczorowski (Montr.)

Edeltraut Kroger (CEVQ)

Christian Rochefort (Sher.)

11.13.5 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 (15 credits)

FMED 505	(3)	Basic Analysis for Health Data
FMED 509	(3)	Foundations of Epidemiology in Family Medicine
FMED 600	(1)	Mixed Studies Reviews
FMED 603	(1)	Participatory Research: Patient & Public Engagement

FMED 616	(1)	Applied Literature Reviews
FMED 625	(3)	Qualitative Health Research
FMED 672	(3)	Applied Mixed Methods in Health Research

Complementary Courses (6 credits)

6 credits chosen from:

FMED 504D1	(.5)	Family Medicine Research Seminars
FMED 504D2	(.5)	Family Medicine Research Seminars
FMED 525	(3)	Foundations of Translational Science
FMED 601	(3)	Advanced Topics in Family Medicine: Knowledge Translation
FMED 604	(3)	Advanced Participatory Research in Health
FMED 605	(1)	Canadian Healthcare Policy and Decision-Making
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	(2)	Foundations of Family Medicine
FMED 611	(1)	Healthcare Systems and Primary Care Reform
FMED 612	(1)	Program Evaluation and Implementation Science
FMED 618	(1)	Topics in Pharmacoeconomics, Drug Safety and Policy
FMED 619	(3)	Program Management in Global Health & Primary Health Care
FMED 690	(3)	Advanced Ethnography: Context, Complexity & Coordination

11.13.6 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 (33 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 604	(3)	Advanced Participatory Research in Health

Complementary Course (3 credits)

3 credits from the following:

FMED 505	(3)	Basic Analysis for Health Data
FMED 625	(3)	Qualitative Health Research

Elective Course (9 credits)

9 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.

11.13.7 Master of Science (M.Sc.); Family Medicine (Thesis) — Medical Education (45 credits)

The M.Sc. in Family Medicine; Medical Education option is a thesis program designed to provide research training to family physicians, and exceptionally, other health professionals, and students interested in medical education research. This M.Sc. Option 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 McGill's Department of Family Medicine in 2005. 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 through four interrelated streams: (1) family physicians' professional identity formation; (2) information use and technology in the learning episodes of practicing physician and organizational learning; (3) program evaluation of educational innovations, 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 (14 credits)

FMED 505	(3)	Basic Analysis for Health Data
FMED 509	(3)	Foundations of Epidemiology in Family Medicine
FMED 600	(1)	Mixed Studies Reviews
FMED 603	(1)	Participatory Research: Patient & Public Engagement
FMED 625	(3)	Qualitative Health Research
FMED 672	(3)	Applied Mixed Methods in Health Research

Complementary Courses (3 credits)

3 credits from the following:

EDPE 555	(3)	Introduction to Learning Sciences
EDPE 635	(3)	Theories of Learning and Instruction
EDPH 689	(3)	Teaching and Learning in Higher Education

Elective Courses (4 credits)

4 credits, at the 500 level or higher, chosen in consultation with the student's academic supervisor, specifically involving educational issues, and always relating to the student's thesis topic within the medical education field.

11.14 Microbiology and Immunology**11.14.1 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: www.mcgill.ca/microimm

11.14.2 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 11.14.5: 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, and three current topics). 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 11.14.6: 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 his/her 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.

11.14.3 Microbiology and Immunology Admission Requirements and Application Procedures

11.14.3.1 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)
- TOEFL Paper-Based Test (PBT): a minimum score of 567
- 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.

11.14.3.2 Application Procedures

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

See [University Regulations and 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.

11.14.3.2.1 Additional Requirements

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

- [Supervisor Confirmation Form](#)

11.14.3.3 Application Deadlines

The application deadlines listed here 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 www.mcgill.ca/gps/contact/graduate-program.

Canadian	International	Special/Exchange/Visiting
Fall: June 13	Fall: April 22	Fall: Same as Canadian/International
Winter: Oct. 27	Winter: Sept. 10	Winter: Sept. 10
Summer: March 25	Summer: Jan. 6	Summer: Jan. 6

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

11.14.4 Microbiology and Immunology Faculty**Chair**

J. Madrenas

Emeritus Professors

N. Acheson, Z. Ali-Khan, M. Baines, J.W. Coulton

Professors

A. Berghuis; M.Sc.(Rijks Univ. Groningen), Ph.D.(Br. Col.)

J. Madrenas; M.D.(Barcelona), M.Sc., Ph.D.(Alta.)

G.J. Matlashewski; B.Sc.(C'dia), Ph.D.(Ohio)

R.A. Murgita; B.Sc.(Maine), M.S.(Vermont), Ph.D.(McG.)

M. Olivier; B.Sc.(Montr.), Ph.D.(McG.)

C. Piccirillo; B.Sc., Ph.D.(McG.)

D. Sheppard; M.D.(Tor.)

M. Stevenson; M.Sc., Ph.D.(Catholic Univ. of Amer.)

M.A. Wainberg; B.Sc.(McG.), Ph.D.(Col.)

Associate Professors

D.J. Briedis; B.A., M.D.(Johns Hop.)

B. Cousineau; B.Sc., M.Sc., Ph.D.(Montr.)

S. Fournier; Ph.D.(Montr.)

S. Gruenheid; B.Sc.(Br. Col.), Ph.D.(McG.)

H. Le Moual; Ph.D.(Montr.)

G. T. Marczynski; B.Sc., Ph.D.(Ill.)

Assistant Professors

J. Fritz; Ph.D.(Vienna)
 I. King; B.Sc.(Ohio St.), M.Sc.(Pitt. St.), Ph.D.(Roch.)
 C. Krawczyk; Ph.D.(Tor.)
 C. Maurice; M.S., Ph.D.(Montpellier II)
 M. Richer; B.Sc.(McG.), M.Sc.(Montr.), Ph.D.(Br. Col.)
 S. Sagan; B.Sc.(McG.), Ph.D.(Ott.)

Associate Members

Epidemiology and Infectious Diseases: M. Behr, A. Dascal, V. Loo
Immunology, Autoimmunity, Host Defense: J. Antel, A. Bar-Or, M. Burnier, P. Gros, A. Kristof, J. Mandl, A. Orthwein, J. Rauch, M. Saleh, M. Tremblay, C. Tsoukas, S. Vidal
Immunology and Parasitology: P. Rohrbach, B. Ward, M. Ndao, J. Zhang
Microbiology: D. Cuong Vinh, M. Divangahi, C. Liang, D. Nguyen, M. Reed
Molecular Biology: N. Cermakian, S. Hussain, A. Jardim, A. Mouland, K. Pantopoulos, B. Turcotte, J. Xia
Virology: A. Gatignol, A.E. Koromilas, R. Lin, J.Teodoro

Adjunct Professors

J. Archambault
 A. Descoteaux
 A. Finzi
 M. Gotte
 N. Grandvaux
 G. Kukulj
 P. Lau
 S. Lesage
 S.L. Liu
 C. Paradis-Bleau
 A. Petronela
 W-K. Suh

11.14.5 Master of Science (M.Sc.); Microbiology and Immunology (Thesis) (45 credits)**Thesis Courses (24 credits)**

MIMM 697	(8)	Master's Research 1
MIMM 698	(8)	Master's Research 2
MIMM 699	(8)	Master's Research 3

Required Courses (15 credits)

MIMM 611	(3)	Graduate Seminars 1
MIMM 612	(3)	Graduate Seminars 2
MIMM 613	(3)	Current Topics 1
MIMM 614	(3)	Current Topics 2
MIMM 615	(3)	Current Topics 3

Complementary Courses (6 credits)

Minimum 6 credits from:

MIMM 607	(3)	Biochemical Pathology
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

Any life sciences-related 500-level or above course (3 credits). Department approval required.

* Not offered in every academic year.

11.14.6 Doctor of Philosophy (Ph.D.); Microbiology and Immunology**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 (18 credits)

MIMM 611	(3)	Graduate Seminars 1
MIMM 612	(3)	Graduate Seminars 2
MIMM 613	(3)	Current Topics 1
MIMM 614	(3)	Current Topics 2
MIMM 615	(3)	Current Topics 3
MIMM 701	(0)	Comprehensive Examination-Ph.D. Candidate
MIMM 713	(3)	Graduate Seminars 3

Complementary Courses (12 credits)

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.

11.15 Neuroscience (Integrated Program)**11.15.1 Location**

Montreal Neurological Institute, Room 141
3801 University Street
Montreal QC H3A 2B4
Canada
Telephone: 514-398-1905; 514-398-6243; or 514-398-1229
Fax: 514-398-4621
Email: ipn@mcgill.ca or ipn.admissions@mcgill.ca

Website: www.mcgill.ca/ipn

11.15.2 About the Integrated Program in Neuroscience

Montreal is home to the largest concentration of neuroscientists in North America. Neuroscience research at McGill University is internationally renowned, and its Integrated Program in Neuroscience (IPN) provides graduate training in this outstanding research environment. With approximately 340 M.Sc. and Ph.D. students and more than 190 supervisors, the IPN is the largest graduate program in the Faculty of Medicine and one of the largest neuroscience graduate programs in North America.

Neuroscience training within the IPN spans the full spectrum of research fields, from cellular and molecular neuroscience to behavioural and cognitive neuroscience. In addition to laboratory research, the IPN offers an extensive range of courses, hosts an annual *Neuroscience Retreat*, and maintains a seminar program to facilitate communication between students in different neuroscience disciplines. Neuroscience trainees from McGill have gone on to successful careers in academia and industry.

A prospective graduate student may *identify a supervisor* from one of several research streams, spanning the full spectrum of neuroscience research. A student with a bachelor's degree may apply to the **M.Sc.** program; it is common to transfer to the **Ph.D.** program if suitable progress is made. Students with M.Sc. degrees may apply directly to the Ph.D. program. IPN also offers a Ph.D. Rotation program each September.

GENERAL

1. Students must select an Advisory Committee, in conjunction with their thesis supervisor. This committee will consist of the thesis supervisor and two other individuals who will participate in discussions with students about their research program.
2. All Ph.D. students are required to complete a candidacy examination before the end of Ph.D. 3. The exam serves to evaluate the students' ability to perform original scholarship and to demonstrate their suitability for a Ph.D. degree. An M.Sc. student may be eligible to transfer to the Ph.D. program without submitting a master's thesis by taking the *Transfer Seminar/Candidacy Exam*. This exam is allowed if the master's CGPA is 3.3 or higher and if the student's Advisory Committee recommends the student as an appropriate candidate for Ph.D. studies. M.Sc. students who wish to pursue a Ph.D. degree, but who have not obtained the minimum 3.3 CGPA in their M.Sc. coursework while in the IPN, must submit a master's thesis and apply for the Ph.D. level afterwards.
3. Students are required to submit a written thesis proposal (18 months after the start of the program for M.Sc. students, and at least one month prior to the candidacy exam for Ph.D. students). This document must state the hypothesis being tested, the relevant literature, and a summary of the methods that will be used to address the research question. This proposal will then be orally presented to the student's Advisory Committee, which will review the written proposal and communicate its recommendations to the student.
4. Students will present a formal seminar on their research work prior to writing their thesis. This presentation will be attended by the student's Advisory Committee who will report their impressions and recommendations to the student.
5. Before final thesis submission, Ph.D. students must successfully complete an oral defence, which is a final, in-depth, formal presentation of their research.
6. An annual oral informal presentation of research work accomplished will be presented to the student's Advisory Committee.
7. The Graduate Program Committee has instituted a mentorship program by which each student will be matched with a specific member of the Committee. The Program Mentor ensures that the student, the supervisor(s), and other members of the Advisory Committee are aware of and meet key milestones, in a timely manner, throughout the course of the student's graduate study.
8. All incoming students are required to take the workshops on Responsible Conduct of Research. These will be included as part of the milestones for annual progress reports.

section 11.15.5: Master of Science (M.Sc.); Neuroscience (Thesis) (45 credits)

The M.Sc. program offers opportunities to a great diversity of individual interests and backgrounds, and prepares our students for scientific careers in neuroscience and related fields. Programs leading to an M.Sc. degree require the completion of 45 credits of academic and research training.

section 11.15.6: Doctor of Philosophy (Ph.D.); Neuroscience

The IPN offers a highly competitive Ph.D. degree program that prepares students for successful scientific careers in the field of neuroscience. Over half of the students registered in the neuroscience graduate program at McGill University are in the doctoral stream.

11.15.3 Neuroscience (Integrated Program) Admission Requirements and Application Procedures

11.15.3.1 Admission Requirements

General

Applicants must hold a bachelor's degree, or its equivalent, from a recognized institution in a field related to the subject selected for graduate work, and must display an adequate background in basic sciences.

The applicant must present evidence of high academic achievement. A standing equivalent to a cumulative grade point average (CGPA) of 3.0 out of a possible 4.0 is required by Graduate and Postdoctoral Studies; however, the Integrated Program in Neuroscience (IPN) prefers applicants to show a higher academic standing, and requires a minimum CGPA of 3.3.

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 results

of the *TOEFL* exam with their application and have a minimum score of 86 on the Internet-based test (iBT; 567 on the paper-based test [PBT]) with each component score not less than 20.

M.Sc. Degree

Bachelor's degree with adequate background in basic sciences, or an M.D.

Ph.D. Degree

Applicants must hold a graduate-level degree in a field related to neuroscience or have an M.D. degree, preferably with postgraduate training. Applicants will also be considered for admission if enrolled in the : *Doctor of Medicine & Master of Surgery with Ph.D. (Joint M.D., C.M. & Ph.D.)* program through the Faculty of Medicine at McGill University.

Students currently registered in the Master's in Neuroscience may be permitted to transfer to the Ph.D. program without submitting a master's thesis. Applicants are expected to have attained a high scholastic standing equal to, or greater than, the minimum cumulative grade point average of 3.3 out of 4.0 in all levels of study. In exceptional circumstances, a student **may** enter the Ph.D. program directly from their undergraduate degree if a CGPA of 3.7 is attained and if the student already presents extensive research experience.

Applicants are expected to have a high academic standing in their previous academic studies and research.

To meet the diversity of individual interests and backgrounds, the graduate program for each student is designed at the time of entry. As part of the admission process, each applicant will identify, with the participation of the prospective thesis supervisor and the Graduate Studies Committee, a research thesis topic and the coursework required to complete the training deemed necessary for the degree. These decisions become an integral part of the graduation requirements for the student.

11.15.3.2 Application Procedures

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

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

11.15.3.2.1 Additional Requirements

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

- Curriculum Vitae
- Personal Statement

11.15.3.3 Application Deadlines

The application deadlines listed here are set by the IPN 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 www.mcgill.ca/gps/contact/graduate-program.

Canadian	International	Special/Exchange/Visiting
Fall: June 1	Fall: March 15	Fall: Same as Canadian/International
Winter: Nov. 10	Winter: Sept. 10	Winter: Same as Canadian/International
Summer: N/A	Summer: N/A	Summer: N/A

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

11.15.4 Neuroscience (Integrated Program) Faculty

Director

J. Rochford

Associate Director

E. Ruthazer

Emeritus Professors

B. Collier; Ph.D. (*Dept. of Pharmacology*)

M. Diksic; Ph.D. (*Dept. of Neurology and Neurosurgery*)

K. Franklin; Ph.D. (*Dept. of Psychology*)

P.C. Holland; B.A.(Lanc.), Ph.D.(Newcastle, UK) (*Dept. of Neurology and Neurosurgery*)

C. Thompson; D.Sc., F.C.C.P.M. (*Dept. of Neurology and Neurosurgery*)

Emeritus Professors

N. White; B.A.(McG.), Ph.D.(Pitt.) (*Dept. of Psychology*)

Professors

A. Aguayo; M.D.(Cordoba Nat.), F.R.C.P.(C) (*Dept. of Neurology and Neurosurgery*)
 G. Almazan; B.Sc.(N'eastern), Ph.D.(McG.) (*Dept. of Pharmacology and Therapeutics*)
 E. Andermann; M.D.,C.M., M.Sc., Ph.D.(McG.), F.C.C.M.G. (*Dept. of Neurology and Neurosurgery*)
 F. Andermann; B.A., B.Sc.(McG.), M.D.(Montr.), F.R.C.P.(C) (*Dept. of Neurology and Neurosurgery*)
 J. Antel; M.D., B.Sc.(Med.)(Manit.), F.R.C.P.(C) (*Dept. of Neurology and Neurosurgery*)
 D. Arnold; B.Sc., M.D.(Cornell), F.R.C.P.(C) (*James McGill Professor*) (*Dept. of Neurology and Neurosurgery*)
 M. Avoli; M.D.(Rome), Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
 S. Baillet; Ph.D.(Paris XI) (*Dept. of Neurology and Neurosurgery*)
 C. Baker; Ph.D.(Calif.-San Diego) (*Dept. of Ophthalmology*)
 P. Barker; Ph.D.(Alta.), B.Sc.(S. Fraser) (*Dept. of Neurology and Neurosurgery*)
 A. Bar-Or; M.D.,C.M.(McG.), F.R.C.P.(C), D.A.B.N.P. (*Dept. of Neurology and Neurosurgery*)
 S. Baum; Ph.D.(Brown) (*School of Communication Sciences and Disorders*)
 C. Benkelfat; M.D., C.S.P.Q., D.E.R.B.H. (*Dept. of Psychiatry*)
 G. Bennett; Ph.D.(Virg. Commonwealth) (*Dept. of Anesthesia*)
 D. Bernard; Ph.D. (Johns Hop.) (*Dept. of Pharmacology*)
 A. Bernasconi; M.D.(Basel) (*Dept. of Neurology and Neurosurgery*)
 P. Boksa; Ph.D.(McG.) (*Dept. of Psychiatry*)
 C. Bourque; B.Sc.(Ott.), Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
 D. Bowie; Ph.D.(Lond.) (*Dept. of Pharmacology and Therapeutics*)
 P. Braun; Ph.D.(Calif., Berk.) (*Dept. of Biochemistry*)
 J.C.S. Breitner; M.D.(Penn.), MPH (Johns Hop.) (*Dept. of Psychiatry*)
 C. Bushnell; Ph.D.(Amer.) (*Dept. of Anaesthesia*)
 S. Carbonetto; M.Sc.(Mass.), Ph.D.(N. Carolina) (*Dept. of Neurology and Neurosurgery*)
 F. Cervero; M.D., Ph.D.(Madrid), D.Sc.(Edin.) (*Dept. of Anesthesia*)
 H. Chertkow; M.D.(W. Ont.), F.R.C.P.(C) (*Dept. of Neurology and Neurosurgery*)
 P. Clarke; M.A.(Camb.), Ph.D.(Lond.) (*Dept. of Pharmacology and Therapeutics*)
 T. Coderre; Ph.D.(McG.) (*Depts. of Anesthesia, Neurology and Neurosurgery, Psychology, and Experimental Medicine*)
 D.L. Collins; M.Eng., Ph.D.(McG.) (*Depts. of Neurology and Neurosurgery, Biomedical Engineering*)
 E. Cooper; Ph.D.(McM.) (*Dept. of Physiology*)
 C. Cuello; M.D.(Buenos Aires), M.A., D.Sc.(Oxf.) (*Dept. of Pharmacology and Therapeutics*)
 K. Cullen; Ph.D.(Chic.) (*Dept. of Physiology*)
 S. Daniel; M.D.,C.M., M.Sc.(McG.) (*Dept. of Otolaryngology – Head and Neck Surgery*)
 S. David; Ph.D.(Manit.) (*Dept. of Neurology and Neurosurgery*)
 R. Del Maestro; Ph.D.(Uppsala) (*Dept. of Neurology and Neurosurgery*)
 L. Diatchenko; M.D., Ph.D.(RNRMU) (*Dept. of Anesthesia, Faculties of Dentistry and Medicine*)
 H. Durham; M.Sc.(W. Ont.), Ph.D.(Alta.) (*Dept. of Neurology and Neurosurgery*)
 S. El Mestikawy; Ph.D.(Paris VI) (*Dept. of Psychiatry*)
 A. Evans; M.Sc.(Sur.), Ph.D.(Leeds) (*Dept. of Neurology and Neurosurgery*)
 L. Fellows; B.Sc.(McG.), D.Phil.(Oxf.), M.D.,C.M.(McG.) (*Dept. of Neurology and Neurosurgery*)

Professors

- C. Flores; Ph.D.(C' dia) (*Dept. of Psychiatry*)
- E. Fombonne; M.D.(Paris V), M.Sc.(Paris V & Inserm) (*Dept. of Psychiatry*)
- E. Fon; M.D.(Montr.), F.R.C.P.(C) (*Dept. of Neurology and Neurosurgery*)
- S.G. Gauthier; B.A., M.D.(Montr.), F.R.C.P.(C) (*Dept. of Neurology and Neurosurgery*)
- B. Giros; M.Sc., Ph.D.(Paris VI) (*Dept. of Psychiatry*)
- J. Gotman; M.Eng.(Dart.), Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- V. Gracco; Ph.D.(Wisc.) (*School of Communication Sciences and Disorders*)
- A. Gratton; Ph.D.(C' dia) (*Dept. of Psychiatry*)
- J. Grodzinsky; Ph.D.(Brandeis) (*Dept. of Linguistics*)
- D. Guitton; Dipl. IVK(Univ. Libre de Brux.), B.Eng., M.Eng., Ph.D.(Eng.), Ph.D.(Physiol.)(McG.) (*Dept. of Neurology and Neurosurgery*)
- D. Haegert; M.D.(Br. Col.), F.R.C.P.(C) (*Dept. of Pathology*)
- E. Hamel; B.Sc.(Sher.), Ph.D.(Montr.) (*Dept. of Neurology and Neurosurgery*)
- K. Hastings; B.Sc., Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- R.T. Hepple; Ph.D.(Tor.) (*Dept. of Kinesiology and Physical Education*)
- R. Hess; Ph.D.(Melb.), D.Sc.(Aston, UK) (*Dept. of Ophthalmology*)
- B. Jones; B.A., M.A., Ph.D.(Delaware) (*Dept. of Neurology and Neurosurgery*)
- M. Jones-Gotman; B.A.(Calif.), M.A., Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- T. Kennedy; B.Sc.(McM.), Ph.D.(Col.) (*Dept. of Neurology and Neurosurgery*)
- B. Kieffer; Ph.D.(Strasbourg) (*Dept. of Psychiatry*)
- F. Kingdom; Ph.D.(Reading) (*Dept. of Ophthalmology*)
- P. Lachapelle; Ph.D.(Montr.) (*Dept. of Ophthalmology*)
- N. Lamarche; Ph.D.(Montr.) (*Dept. of Anatomy and Cell Biology*)
- A. LeBlanc; M.Sc.(Moncton), Ph.D.(Dal.) (*Dept. of Neurology and Neurosurgery*)
- M.F. Levin; Ph.D.(P.T.)(McG.) (*School of Physical and Occupational Therapy*)
- M. Leyton; M.A., Ph.D.(C' dia) (*Dept. of Psychiatry*) (*William Dawson Scholar*)
- G. Luheshi; Ph.D.(Newcastle, UK) (*Dept. of Psychiatry*)
- D. Maysinger; M.Sc., Ph.D.(Calif.-LA) (*Dept. of Pharmacology and Therapeutics*)
- H.M. McBride; Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- P.S. McPherson; M.Sc.(Manit.), Ph.D.(Iowa) (*James McGill Professor*) (*Dept. of Neurology and Neurosurgery*)
- M.J. Meaney; B.A.(Loyola), M.A., Ph.D.(C' dia.) (*Dept. of Psychiatry*)
- B. Milner; B.A., Sc.D.(Cant.), Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- T.E. Milner; B.Sc., M.Sc., Ph.D.(Alta.) (*Dept. of Kinesiology and Physical Education*)
- J.S. Mogil; Ph.D.(Calif.-LA) (*Dept. of Psychology*)
- K. Mullen; Ph.D.(Camb.) (*Dept. of Ophthalmology*)
- G. Multhaup; Ph.D.(Cologne) (*Dept. of Pharmacology and Therapeutics*)
- A. Olivier; M.D.(Montr.), Ph.D.(Laval), F.R.C.S.(C) (*Dept. of Neurology and Neurosurgery*)
- D.J. Ostry; B.A.Sc., M.A.Sc., Ph.D.(Tor.) (*Dept. of Psychology*)
- O. Overbury; Ph.D.(C' dia) (*Dept. of Ophthalmology*)
- C. Palmer; B.Sc., M.Sc., Ph.D.(Cornell) (*Dept. of Psychology*)
- M. Pell; B.A.(Ott.), M.Sc., Ph.D.(McG.) (*School of Communication Sciences and Disorders*)
- M. Petrides; B.Sc., M.Sc.(Lond.), Ph.D.(Cant.) (*James McGill Professor*) (*Depts. of Neurology and Neurosurgery, Psychology*)
- G. Plourde; M.D.(Laval), M.Sc.(Ott.) (*Dept. of Anesthesia*)

Professors

J. Poirier; Ph.D.(Montr.) (*Dept. of Psychiatry and Medicine*)

A. Ptito; Ph.D.(Montr.) (*Dept. of Neurology and Neurosurgery*)

M. Rasminsky; B.A.(Tor.), M.D.(Harv.), Ph.D.(Lond.), F.R.C.P.(C) (*Dept. of Neurology and Neurosurgery*)

A. Ribeiro-da-Silva; M.D., Ph.D.(Porto) (*Dept. of Pharmacology and Therapeutics*)

R.J. Riopelle; M.D.(Ott.), F.R.C.P.(C) (*Dept. of Neurology and Neurosurgery*)

A. Sadikot; M.D., C.M.(McG.), Ph.D.(Laval), F.R.C.S.(C) (*Dept. of Neurology and Neurosurgery*)

H.U. Saragovi; Ph.D.(Miami) (*Dept. of Pharmacology and Therapeutics*)

H. Schipper; M.D., Ph.D.(McG.), F.R.C.P.(C) (*Dept. of Neurology and Neurosurgery*)

G. Sebire; M.D., Ph.D.(Paris VI) (*Dept. of Pediatrics*)

T. Shultz; M.Phil., Ph.D.(Yale) (*Dept. of Psychology*)

P. Seguela; Doct. 3e Cycle(Bord.), Ph.D.(Montr.) (*Dept. of Neurology and Neurosurgery*)

M. Shevell; B.Sc., M.D.(Vanderbilt) (*Dept. of Neurology and Neurosurgery*)

E. Shoubridge; M.Sc., Ph.D.(Br. Col.) (*Dept. of Neurology and Neurosurgery*)

W. Sossin; B.S.(MIT), Ph.D.(Stan.) (*Dept. of Neurology and Neurosurgery*)

L. Srivastava; Ph.D.(J. Nehru) (*Dept. of Psychiatry*)

S. Stifani; D.Chem.(Rome), Ph.D.(Alta.) (*Dept. of Neurology and Neurosurgery*)

M. Sullivan; B.A.(McG.), M.A., Ph.D.(C' dia) (*Dept. of Psychology*)

G. Tannenbaum; M.Sc., Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)

D. Titone; B.A.(NYU), M.A., Ph.D.(SUNY) (*Dept. of Psychology*)

G. Turecki; M.D.(Fed. Univ. São Paulo), Ph.D.(McG.) (*Dept. of Psychiatry*)

C.-D. Walker; Ph.D.(Geneva) (*Dept. of Psychiatry*)

C. Wolfson; Ph.D.(McG.) (*Dept. of Epidemiology and Biostatistics*)

R.J. Zatorre; A.B.(Boston), M.Sc., Ph.D.(Brown) (*Dept. of Neurology and Neurosurgery*)

D. Zuroff; B.A.(Harv.), M.A., Ph.D.(Conn.) (*Dept. of Psychology*)

Associate Professors

P. Archambault; B.Sc.(McG.), M.Sc., Ph.D.(Montr.) (*Dept. of Physical and Occupational Therapy*)

J. Armony; Ph.D.(NYU) (*Dept. of Psychiatry*)

E. Balaban; Ph.D.(Rockefeller) (*Dept. of Psychology*)

S. Beaulieu; M.D., Ph.D., F.R.C.P.(C) (*Dept. of Psychiatry*)

V. Bohbot; Ph.D.(Ariz.) (*Dept. of Psychiatry*)

D. Boivin; M.D.(Laval), Ph.D.(Montr.) (*Dept. of Psychiatry*)

A. Brunet; Ph.D.(Montr.) (*Dept. of Psychiatry*)

M. Cayouette; M.Sc., Ph.D.(Laval) (*Depts. of Anatomy and Cell Biology, Biology, and Experimental Medicine*)

N. Cermakian; Ph.D.(Montr.) (*Dept. of Psychiatry*)

M.J. Chacron; B.Sc., Ph.D.(Ott.) (*Dept. of Physiology*)

Y. Chudasama; B.Sc., Ph.D.(Cardiff) (*Dept. of Psychology*)

F. Charron; B.Sc., Ph.D.(McG.) (*Institut de Recherches Clinique de Montreal, Depts. of Anatomy and Cell Biology, Biology, and Experimental Medicine*)

J.-F. Cloutier; B.Sc.(C' dia), Ph.D.(McG.) (*Depts. of Neurology and Neurosurgery, and Anatomy and Cell Biology*)

E. Cook; B.Sc.(Ariz. St.), M.Sc.(Rice), Ph.D.(Baylor) (*Dept. of Physiology*)

A. Dagher; M.Eng.(McG.), M.D.(Tor.), F.R.C.P.(C) (*Dept. of Neurology and Neurosurgery*)

B. Debruille; M.D.(Paris XI), Ph.D.(Paris VI) (*Dept. of Psychiatry*)

Associate Professors

- C. Flores; Ph.D.(C' dia) (*Dept. of Psychiatry*)
- A. Fournier; B.Sc., Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- I. Gold; B.A.(McG.), Ph.D.(Princ.) (*Dept. of Psychiatry*)
- R. Gruber; Ph.D.(Tel Aviv) (*Dept. of Psychiatry*)
- R.D. Hoge; Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- R. Joobar; M.D.(Tunisia), Ph.D.(McG.) (*Dept. of Psychiatry*)
- D. Juncker; Dipl., Ph.D.(Neuchâtel) (*Dept. of Biomedical Engineering*)
- A. Kania; Ph.D.(Baylor) (*Depts. of Biology, Anatomy and Cell Biology, and Experimental Medicine*)
- S. King; B.A.(McG.), M.Ed., Ed.S.(James Madison Univ.), Ph.D.(Virginia Tech) (*Dept. of Psychiatry*)
- B. Knauper; Dr.Phil.(Mannheim) (*Dept. of Psychology*)
- A. Lamontagne; Ph.D.(Laval) (*School of Physical and Occupational Therapy*)
- A. McKinney; Ph.D.(Ulster) (*Dept. of Pharmacology and Therapeutics*)
- N. Mechawar; Ph.D.(Montr.) (*Dept. of Psychiatry*)
- J. Mendola; Ph.D.(MIT) (*Dept. of Ophthalmology*)
- K. Murai; Ph.D.(Calif.) (*Dept. of Neurology and Neurosurgery*)
- K. Nader; B.Sc., Ph.D.(Tor.) (*Dept. of Psychology*)
- J. Nalbantoglu; B.Sc., Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- C. Pack; B.Sc.(Tufts), Ph.D.(Boston) (*Dept. of Neurology and Neurosurgery*)
- H. Paudel; Ph.D.(Okla.), M.Sc.(Nepal) (*Dept. of Neurology and Neurosurgery*)
- A. Peterson; B.Sc.(Vic., BC), Ph.D.(Br. Col.) (*Dept. of Neurology and Neurosurgery*)
- K. Petrecca; B.Sc., M.D., Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- M. Pompeiano; M.D.(Pisa), Ph.D.(Scuola Sup. Pisa) (*Dept. of Psychology*)
- J.C. Pruessner; Ph.D.(Trier) (*Depts. of Psychiatry, Psychology, Neurology, and Neurosurgery*)
- D. Ragsdale; B.S.(Ill.), Ph.D.(Calif.) (*Dept. of Neurology and Neurosurgery*)
- N. Rajah; Ph.D.(Tor.) (*Dept. of Psychiatry*)
- Y. Rao; B.Sc.(Sichuan), Ph.D.(Tor.) (*Dept. of Neurology and Neurosurgery*)
- A. Raz; M.Sc., Ph.D.(Hebrew) (*Dept. of Psychiatry*)
- A. Reader; Ph.D.(King's Coll., Lond.) (*Dept. of Neurology and Neurosurgery*)
- J. Rochford; Ph.D.(C' dia) (*Dept. of Psychiatry*)
- B. Rosenblatt; B.Sc., M.D., C.M.(McG.), F.R.C.P.(C) (*Dept. of Neurology and Neurosurgery*)
- E. Ruthazer; A.B.(Princ.), Ph.D.(Calif.-SF) (*Dept. of Neurology and Neurosurgery*)
- R. Schirmacher; Ph.D.(Mainz) (*Dept. of Neurology and Neurosurgery*)
- A. Shmuel; B.Med., M.Sc.(Hebrew), Ph.D.(Weizmann Institute of Science) (*Dept. of Neurology and Neurosurgery*)
- D. Stellwagen; B.Sc.(Brown), Ph.D.(Calif.) (*Dept. of Neurology and Neurosurgery*)
- L. Stone; Ph.D.(Minn.) (*Dept. of Dentistry*)
- K.-F. Storch; Ph.D.(Max Planck) (*Dept. of Psychiatry*)
- A. Thiel; Ph.D.(Cologne), M.D.(Bonn) (*Dept. of Neurology and Neurosurgery*)
- D. Van Meyel; Ph.D.(W. Ont.) (*Dept. of Neurology and Neurosurgery*)
- S. Williams; Ph.D.(Montr.) (*Dept. of Psychiatry*)

Assistant Professors

- A. Adamantidis; M.Sc., Ph.D.(Liege) (*Dept. of Psychiatry*)

Assistant Professors

- B. Bedell; B.S.(Leigh), M.D.,C.M.(McG.), Ph.D.(Texas) (*Dept. of Neurology and Neurosurgery*)
- F. Bedford; Ph.D.(Lond.) (*Dept. of Anatomy and Cell Biology*)
- M. Berlim; M.D., M.Sc.(UFRGS) (*Dept. of Psychiatry*)
- A. Bertone; M.A.(C' dia), M.A., Ph.D.(Montr.) (*Dept. of Educational and Counselling Psychology*)
- M-H. Boudrias; B.Sc.(Montr.), Ph.D.(KUMC) (*School of Physical and Occupational Therapy*)
- M. Brandon; B.A.(Conn.), Ph.D.(Boston) (*Dept. of Psychiatry*)
- J.P. Britt; Ph.D.(Chic.) (*Dept. of Psychology*)
- M. Brodeur; Ph.D.(McM.) (*Dept. of Psychiatry*)
- M. Chakravarty; B.Eng.(Wat.), M.Eng., Ph.D.(McG.) (*Dept. of Psychiatry*)
- B. Chen; Ph.D.(SUNY) (*Dept. of Neurology and Neurosurgery*)
- E. de Villers-Sidani; M.D.(McG.)
- M. Elsabbagh; B.Sc.(McG.), Ph.D.(UQAM) (*Dept. of Psychiatry*)
- C. Ernst; B.Sc.(McG.), M.Sc.(Br. Col.), Ph.D.(McG.) (*Dept. of Psychiatry*)
- R. Farivar; B.Sc.(Vic., BC), Ph.D.(McG.) (*Dept. of Ophthalmology*)
- C. Grova; Ph.D.(Rennes) (*Depts. of Biomedical Engineering & Neurology and Neurosurgery*)
- P. Haghighi; Ph.D.(McG.) (*Dept. of Physiology*)
- A. Hendricks; Ph.D.(Mich.) (*Dept. of Bioengineering*)
- M. Hendricks; B.A.(Bowdoin), Ph.D. (Sing.) (*Dept. of Biology*)
- F. Jollant; M.D., M.Sc., Ph.D.(Montpellier) (*Dept. of Psychiatry*)
- D. Klein; B.A., Ph.D.(Witw./S. Af.) (*Dept. of Neurology and Neurosurgery*)
- E. Kobayashi; M.D., Ph.D.(Campinas State) (*Dept. of Neurology and Neurosurgery*)
- M. Kokoeva; Ph.D.(Russian Acad. of Sci.) (*Faculty of Medicine*)
- L. Koski; B.Sc.(Tor.), Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- A. Kostikov; Ph.D.(Georgia) (*Dept. of Neurology and Neurosurgery*)
- N. Ladbon-Bernasconi; M.D.(Lausanne), Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- A. Lamontagne; Ph.D.(Laval) (*School of Physical and Occupational Therapy*)
- G. Leonard; Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- W. Ma; M.D.(Tongji), M.Sc., Ph.D.(McG.) (*Dept. of Psychiatry*)
- J. Marcoux; M.Sc., M.D.(Montr.) (*Dept. of Neurology and Neurosurgery*)
- G. Mitsis; Dipl.(Nat. Tech., Athens), M.Sc., Ph.D.(USC) (*Dept. of Bioengineering*)
- L. Münter; Ph.D.(Berlin) (*Dept. of Pharmacology and Therapeutics*)
- P. Rosa-Neto; M.D., M.Sc.(UFRGS), Ph.D.(Aarhus) (*Depts. of Neurology and Neurosurgery, Psychiatry*)
- J.T. Sakata; B.A.(Cornell), Ph.D.(Texas-Austin) (*Dept. of Biology*)
- P. Schweinhardt; M.D.(Heidelberg), Ph.D.(Oxf.) (*Dentistry, Dept. of Neurology and Neurosurgery*)
- R. Sharif; Ph.D.(McG.) (*Dept. of Physiology*)
- D. Sinclair; B.Sc., Ph.D.(Dal.) (*Dept. of Neurology and Neurosurgery*)
- P.J. Sjoström; M.Sc.(Uppsala), Ph.D.(Brandeis) (*Dept. of Neurology and Neurosurgery*)
- K. Steinhauer; M.Sc., Ph.D.(Dr.rer.nat)(Free Univ., Berlin) (*School of Communication Sciences and Disorders*)
- T. Stroh; Dip.(J. Liebig Univ. Giessen), Ph.D.(Max Planck) (*Dept. of Neurology and Neurosurgery*)
- V. Sziklas; Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- T. Taivassalo; B.Sc., Ph.D.(McG.) (*Dept. of Kinesiology and Physical Education*)
- H. Takahashi; M.D., Ph.D.(Gunma), (*IRCM, Dept. of Experimental Medicine*)

Assistant Professors

H. Tsuda; M.D.(Kobe), Ph.D.(Kyoto) (*Dept of Neurology and Neurosurgery*)

M. Vollrath; Ph.D.(Baylor) (*Dept. of Neurology and Neurosurgery*)

A. Watt; Ph.D.(Brandeis) (*Dept. of Biology*)

P. Wintermark; M.D.(Lausanne) (*Dept. of Pediatrics*)

S.C. Woolley; B.Sc.(Duke), Ph.D.(Texas-Austin) (*Dept of Biology*)

T.P. Wong; Ph.D.(McG.) (*Dept. of Psychiatry*)

J. Zhang; M.D.(Shanghai II Medical U.), M.Sc.(Paris XI), Ph.D.(Laval) (*Dept. of Neurology and Neurosurgery*)

Lecturer

S. Antel

Adjunct Professors

G. Duncan

M. Ptito

E. Racine; B.A.(Ott.), M.A., Ph.D.(Montr.) (*Dept. of Neurology and Neurosurgery*)

11.15.5 Master of Science (M.Sc.); Neuroscience (Thesis) (45 credits)**Required Courses (36 credits)**

NEUR 696	(6)	Master's Thesis Research
NEUR 697	(9)	Master's Thesis Proposal
NEUR 698	(9)	Master's Seminar Presentation
NEUR 699	(12)	Master's Thesis Submission
NEUR 705	(0)	Responsible Research Conduct

Complementary Courses (9 credits)

3 credits from the following:

NEUR 630	(3)	Principles of Neuroscience 1
NEUR 631	(3)	Principles of Neuroscience 2

And 6 credits in other courses at the 500 level or higher that are relevant to the program.

Upon recommendation, depending upon their particular background and needs, students may be requested to take additional selected courses at the 500 level or higher.

Note: All M.Sc.-level students must register for a minimum of 12 credits per term during the first three terms of their master's program.

11.15.6 Doctor of Philosophy (Ph.D.); Neuroscience

Students with an M.Sc. degree continuing in this Department will receive credit exemptions for graduate coursework accomplished (including NEUR 630 or NEUR 631). It may be recommended that they take specialty courses related to their field of study in neuroscience. Students with an M.Sc. degree from another program will be required to take NEUR 630 and NEUR 631 and/or other courses listed under the M.Sc. degree depending upon their background and field of study.

Students with an M.D. degree proceeding directly into a Ph.D. program will be required to take NEUR 630 and NEUR 631. They will also be required to take 6 credits of graduate-level courses.

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)

NEUR 630	(3)	Principles of Neuroscience 1
NEUR 631	(3)	Principles of Neuroscience 2
NEUR 700	(0)	Doctoral Candidacy Examination
NEUR 705	(0)	Responsible Research Conduct

(6 credits)

6 credits at the 500, 600, or 700 level, approved by the graduate program adviser.

11.16 Occupational Health**11.16.1 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: www.mcgill.ca/epi-biostat-occh

11.16.2 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 may be granted to 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 Ph.D. or the M.Sc.A. (Distance) programs until further notice.

section 11.16.5: Master of Science, Applied (M.Sc.A.); Occupational Health (Non-Thesis) (Resident) (45 credits)

A one-year program in health and hygiene appropriate for physicians, nurses, and graduates from engineering and basic sciences. Occupational health training allows candidates to evaluate work environments and attenuate work hazards using prevention and control.

section 11.16.6: Master of Science, Applied (M.Sc.A.); Occupational Health (Non-Thesis) (Distance) (45 credits)

This program is currently not accepting applicants.

A three-and-a-half-year program completed mostly over the Internet.

section 11.16.7: Doctor of Philosophy (Ph.D.); Occupational Health

This program is currently not accepting applicants.

The objective of this program is to train independent researchers in the field of work environment and health.

11.16.3 Occupational Health Admission Requirements and Application Procedures**11.16.3.1 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.).

11.16.3.2 Application Procedures

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

See [University Regulations and 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 his/her supervisor, and who will guide him/her in the preparation of a definite research protocol.

11.16.3.2.1 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

11.16.3.3 Application Deadlines

The application deadlines listed here 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 www.mcgill.ca/gps/contact/graduate-program.

Canadian	International	Special/Exchange/Visiting
Fall: Jan. 15	Fall: Jan. 15	Fall: Apr. 30
Winter: N/A	Winter: N/A	Winter: Sept. 10
Summer: N/A	Summer: N/A	Summer: 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.

11.16.4 Occupational Health Faculty

Please see [section 11.7.3: Epidemiology, Biostatistics and Occupational Health Faculty](#).

11.16.5 Master of Science, Applied (M.Sc.A.); Occupational Health (Non-Thesis) (Resident) (45 credits)

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.

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 605	(6)	Physical Health Hazards
OCCH 608	(3)	Biological Hazards
OCCH 612	(3)	Principles of Toxicology
OCCH 614	(3)	Topics in Occupational Health
OCCH 615	(3)	Occupational Safety Practice
OCCH 616	(3)	Occupational Hygiene

11.16.6 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.

11.16.7 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.

11.17 Otolaryngology – Head and Neck Surgery

11.17.1 Location

Department of Otolaryngology – Head and Neck Surgery
Jewish General Hospital
3755 Chemin de la Côte-Sainte-Catherine, Suite E-903
Montreal QC H3T 1E2
Canada
Telephone: 514-340-8222, ext. 3179
Fax: 514-340-7934
Website: www.mcgill.ca/ent

11.17.2 About Otolaryngology – Head and Neck Surgery

The Master of Science degree in Otolaryngology trains otolaryngologists and physicians for clinical or basic science research in Otolaryngology – Head and Neck Surgery. 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 11.17.5: Master of Science (M.Sc.); Otolaryngology (Thesis) (45 credits)

The master's program is intended for otolaryngologists or for physicians with a strong interest in otolaryngology research. Under exceptional circumstances, others (Ph.D.s, dentists, veterinarians, medical professionals, etc.) may be considered. 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. Medical professionals graduating from 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.

11.17.3 Otolaryngology Admission Requirements and Application Procedures

11.17.3.1 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 or 567 on the paper-based test [PBT]) 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).

11.17.3.2 Application Procedures

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

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

Prospective students should contact research supervisors individually.

11.17.3.2.1 Additional Requirements

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

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

11.17.3.3 Application Deadlines

The application deadlines listed here 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 academic unit's website; please consult the list at www.mcgill.ca/gps/contact/graduate-program.

Canadian	International	Special/Exchange/Visiting
Fall: March 15	Fall: March 15	Fall: March 15
Winter: Sept. 15	Winter: Sept. 10	Winter: Same as Canadian/International
Summer: Jan. 15	Summer: Jan. 15	Summer: Jan. 15

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

11.17.4 Otolaryngology – Head and Neck Surgery Faculty

Chair

S. Frenkiel

Graduate Program Director and Director of Research

B. Segal

Director of Residency Training Program

J. Manoukian

Director of Head and Neck Oncology Program

M.J. Black

Co-Directors of Undergraduate Medical Education

M. Tewfik, J. Young

Director of Fellowship Training

J. Rappaport

Emeritus Professor

J.D. Baxter; M.D.,C.M., M.Sc.(McG.), F.R.C.S.(C)

Professors

S. Daniel; M.D.,C.M., M.Sc.(Otol.)(McG.), F.R.C.S.(C)

S. Frenkiel; B.Sc., M.D.,C.M.(McG.), F.R.C.S.(C)

A. Katsarkas; M.D.(Thess.), M.Sc.(Otol.)(McG.), F.R.C.S.(C)

K. Kost; M.D.,C.M.(McG.), F.R.C.S.(C)

M. Samaha; M.D.(Qu.), M.Sc.(Otol.)(McG.), F.R.C.S.(C)

M.D. Schloss; M.D.(Br. Col.), F.R.C.S.(C)

T.L. Tewfik; M.D.(Alex.), F.R.C.S.(C)

Associate Professors

M.J. Black; M.D.,C.M.(McG.), F.R.C.S.(C)

M. Desrosiers; M.D.(Montr.), F.R.C.S.(C)

N. Fanous; M.B., B.CH.(Cairo), F.R.C.S.(C)

W.R.J. Funnell; B.Eng., M.Eng., Ph.D.(McG.)

M. Hier; M.D.,C.M.(McG.), F.R.C.S.(C)

J. Manoukian; M.B., Ch.B.(Alex.), F.R.C.S.(C)

L. HP. Nguyen; M.D.,C.M.(McG.), M.Sc.(Otol.)(McG.), F.R.C.S.(C)

W.H. Novick; M.D.(Qu.), F.R.C.S.(C)

R. Payne; M.D.,C.M., M.Sc.(Otol.)(McG.), F.R.C.S.(C)

J. Rappaport; M.D.(Dal.), F.R.C.S.(C)

B. Segal; B.Sc., B.Eng., M.Eng., Ph.D.(McG.)

R.S. Shapiro; M.D.,C.M.(McG.), F.R.C.S.(C)

A.G. Zeitouni; M.D.(Sher.), M.Sc.(Otol.)(McG.), F.R.C.S.(C)

Assistant Professors

F. Chagnon; M.D.,C.M.(McG.), F.R.C.S.(C)

M. Duval; M.D.(Ott.), C.M., M.Sc.(Epid.)(Lond.), F.R.C.S.(C)

V.I. Forest; M.D., M.Sc.(Exp. Med.)(Laval), F.R.C.S.(C)

Y. Lacroix; M.D.(Laval), F.R.C.S.(C)

R. Lafleur; M.D.(Ott.), F.R.C.S.(C)

Assistant Professors

A. Lehmann; B.Sc.(Franche-Comté), M.Eng.(MINES ParisTech), M.Sc.(Pierre et Marie Curie), Ph.D.(Collège de France)
 T. Mijovic; M.D.
 A. Mlynarek; M.D.,C.M., M.Sc.(Otol.)(McG.), F.R.C.S.(C)
 K. Richardson; M.D.
 G. Sejean; M.D.(Beirut), F.R.C.S.(C)
 R. Sweet; M.D.,C.M.(McG.)
 L. Tarantino; M.D.(Naples), F.R.C.S.(C)
 M. Tewfik; M.D.,C.M., M.Sc.(Otol.)(McG.), F.R.C.S.(C)
 S.D. Wurzba; D.D.S., M.Sc., Ph.D.
 J. Young; M.D.,C.M.(McG.), F.R.C.S.(C)

Associate Members

K. E. Cullen; Ph.D.(McG.)
 H.L. Galiana; B.Eng., M.Eng., Ph.D.(McG.)
 Q. Hamid; M.D.(Iraq), Ph.D.Med.(Lond.)
 M. Henry; Ph.D.(UQAM)
 N.Y.K. Li; B.Sc.(HK), M.Phil.(HK)
 L. Mongeau; B.Sc., M.Sc.(Montr.), Ph.D.(Penn. St.)
 M. Paliouras; B.Sc.(Hons.), M.S., Ph.D.
 M. Sewitch; Ph.D.

Lecturers

C. Boucher; M.D.
 R. Caouette; M.D.
 A. Finesilver; M.D.,C.M.(McG.), F.R.C.S.(C)
 O. Houle; M.D.
 V. Iordanescu; M.D.
 L. Monette; M.D.
 J. Rothstein; M.D.,C.M.(McG.), F.R.C.S.(C)
 T.T. Vi Vu; M.D.(Montr.), F.R.C.S.(C)

Adjunct Professors

J. Oghalai; M.D.
 L. Picard; M.D.(Montr.), F.R.C.S.(C)

11.17.5 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.

11.18 Pathology**11.18.1 Location**

Department of Pathology
Duff Medical Building
3775 University Street
Montreal QC H3A 2B4
Canada
Telephone: 514-934-1934, ext. 32929
Email: pathologyteaching.med@mcgill.ca
Website: www.mcgill.ca/pathology

11.18.2 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, biochemical, or functional perspective at any level, from the intact organism down to specific components of the individual cell.

The Pathology Department offers research training in a wide variety of areas such as immunology and transplantation, neoplasia, ophthalmic pathology, cell biology, pulmonary vascular and airways disease, pulmonary edema, neurodegenerative disorders, and smooth muscle pathophysiology.

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

section 11.18.5: 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 11.18.6: 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.

11.18.3 Pathology Admission Requirements and Application Procedures

11.18.3.1 Admission Requirements

Applicants must have a B.Sc. or an equivalent degree with an extensive background in the physical 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.

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 GRE and TOEFL examinations in order to be properly evaluated as to 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.) and have some 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.

11.18.3.2 Application Procedures

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

See [University Regulations and 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.

11.18.3.2.1 Additional Requirements

- Personal Statement
- Curriculum Vitae
- Research Proposal
- GRE may be required for non-Canadian applicants

11.18.3.3 Application Deadlines

The application deadlines listed here 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 www.mcgill.ca/gps/contact/graduate-program.

Canadian	International	Special/Exchange/Visiting
Fall: June 21	Fall: May 1	Fall: Same as Canadian/International
Winter: Nov. 10	Winter: Sept. 10	Winter: Same as Canadian/International
Summer: Apr. 1	Summer: Jan. 15	Summer: Same as Canadian/International

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

11.18.4 Pathology Faculty

Chair

Z. Gao

Director of Graduate Program

E. Zorychta

Professors

M. Auger; M.D., C.M.(McG.), F.R.C.P.(C)

M.N. Burnier Jr.; M.D., M.Sc., Ph.D.

A. Ferenczy; B.A., B.Sc., M.D.(Montr.)

R. Fraser; B.Sc., M.D., C.M.(McG.), M.Sc.(Glas.), F.R.C.P.(C)

Professors

Z. Gao; M.D., M.Sc.(Qingdao), Ph.D.(Peking), F.R.C.P.(C)
 D. Haegert; M.D.(Br. Col.), F.R.C.P.(C)
 Q.A. Hamid; M.D.(Mosul), Ph.D.(Lond.) (*James McGill Professor*) (*joint appt. with Medicine*)
 R.P. Michel; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)
 J.B. Richardson; B.Sc., M.D.,C.M., Ph.D.(McG.), F.R.C.P.(C) (*Miranda Fraser Professor of Comparative Pathology*)
 A. Spatz; M.Sc.(Paris XI), M.D.(Paris VI)

Associate Professors

L. Alpert; M.D., Ph.D.(Tufts)
 J. Arseneau; M.D.(Laval), F.R.C.P.(C)
 C. Bernard; M.D.(Sher.), F.R.C.P.(C)
 S. Camilleri-Broët; M.D., Ph.D.(Paris VI)
 B. Case; B.Sc., M.D.,C.M., M.Sc.(McG.), Dipl. Occ. Hyg., F.R.C.P.(C)
 M.F. Chen; M.B., B.S.(Monash), F.R.C.P.(C)
 M.-C. Guiot; B.Sc., M.D.(Bordeaux)
 T. Haliotis; M.D.(Athens), Ph.D.(Qu.), F.R.C.P.(C)
 V.A. Marcus; M.D.,C.M.(McG.), F.R.C.P.(C)
 R. Onerheim; M.D.(Alta.), F.R.C.P.(C)
 M. Pelmus; M.D., Ph.D.(Athens)
 L. Rochon; M.D.(Sher.), F.R.C.P.(C)
 I. Roy; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)
 A.K. Watters; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)
 E. Zorychta; B.Sc.(St. FX), M.Sc., Ph.D.(McG.)

Assistant Professors

O.E. Ajise; M.D., F.C.A.P., F.R.C.P.(C)
 M. Alameldin; M.D.(Alexandria), F.R.C.P.(C)
 S. Albrecht; M.D.(Sher.), F.R.C.P.(C)
 O. Aleynikova; M.D.(Dal.), F.R.C.P.(C)
 R.D. Amre; M.B.B.S.(KIMS), F.R.C.P.(C)
 K. Bakdounes; M.D.(Damascus), F.R.C.P.(C)
 M. Blumenkrantz; M.D.,C.M.(McG.), F.R.C.P.(C)
 F. Brimo; M.D.(Damascus), F.R.C.P.(C)
 D. Caglar; M.D.(Gazi)
 J. Chepovetsky; M.D.(Mount Sinai Sch. of Medicine, New York)
 A. Florea; M.D.(Iuliu Ha ieganu)
 L. Fu; M.D.,C.M.(McG.), M.Sc.(McG.), F.R.C.P.(C)
 A. Gologan; M.D.(Carol Davila, Bucharest)
 S.-M. Jung; M.D.(Chonnam Nat.)
 Y. Kanber; M.D.(Marmara)
 J. Karamchandani; M.D.(Stan.)
 J. Lavoie; B.Sc., M.Sc., Ph.D.(Laval)
 H.R. Lopez-Valle; M.D.(Univ. Autonoma, San Luis Potosi)

Assistant Professors

A.T. Marcus; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)
 V.-H. Nguyen; M.D.(Montr.), F.R.C.P.(C)
 A. Omeroglu; M.D.(Istanbul)
 G. Omeroglu-Altinel; M.D.(Istanbul)
 S. Sandhu; M.B., B.S.(India)
 J. St. Cyr; M.D.,C.M.(McG.), F.R.C.P.(C)
 H. Wang; M.D.(China), F.R.C.P.(C)

Associate Members

B.S. Abulkarim; M.D., Ph.D.(Paris XI), F.R.C.P.(C)
 C.J. Baglole; M.Sc.(PEI), Ph.D.(Calg.)
 P.J. Chauvin; M.Sc.(W.Ont.), D.D.S.(McG.)
 M. Divangahi; Ph.D.(McG.)
 P. Metrakos; M.D.,C.M.(McG.), F.R.C.S.(C)
 V. Papadopoulos; D.Pharm.(Athens), Ph.D.(Paris VI)
 M. Park; Ph.D.(Glasgow), F.R.S.C.
 S. Sabri; Ph.D.(Paris VII)
 A. Schwertani; M.D.,C.M., Ph.D.(Lond.)

11.18.5 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.

11.18.6 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.

11.19 Pharmacology and Therapeutics

11.19.1 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: www.mcgill.ca/pharma

11.19.2 About Pharmacology and Therapeutics

The Department of Pharmacology and Therapeutics offers training leading to **M.Sc.** (Thesis) and **Ph.D.** degrees.

The Department also offers the Chemical Biology Interdisciplinary Graduate Option, together with the Departments of Biochemistry and Chemistry. Students interested in training in this option must first be accepted for graduate studies by one of the participating departments. Information on this option can be found at www.mcgill.ca/biochemistry/graduate-studies-2/chemicalbiology.

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 55 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, Merck Frosst Canada Inc., and MUHC Glen site. The participation of researchers from both industry and government ensures the relevance of the Department's applications-oriented training programs.

section 11.19.5: 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 11.19.6: Master of Science (M.Sc.); Pharmacology (Thesis) — Chemical Biology (47 credits)

This program is currently not accepting applicants.

The Chemical Biology Thematic Group is engaged in a diverse range of research topics that 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 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.

section 11.19.7: 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 11.19.8: Doctor of Philosophy (Ph.D.); Pharmacology — Chemical Biology

This program is currently not accepting applicants.

The Chemical Biology Thematic Group is engaged in a diverse range of research topics that 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 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.

11.19.3 Pharmacology and Therapeutics Admission Requirements and Application Procedures

11.19.3.1 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.

Admissions Requirements – Chemical Biology Option

As for the regular graduate programs of the participating departments, acceptance into the Chemical Biology option consists of two steps:

1. Preliminary approval by the Department's Graduate 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 those for the regular graduate programs of the participating departments.
2. Acceptance by an individual research director. For students wishing to participate in the Chemical Biology option, 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 Chemical Biology Program Committee.

11.19.3.2 Application Procedures

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

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

11.19.3.2.1 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
- Acceptance by a Chemical Biology research director (Chemical Biology option only)

11.19.3.3 Application Deadlines

The application deadlines listed here 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 academic unit's website; please consult the list at www.mcgill.ca/gps/contact/graduate-program.

Canadian	International	Special/Exchange/Visiting
Fall: May 15	Fall: March 15	Fall: March 15
Winter: Oct. 15	Winter: Sept. 10	Winter: Same as Canadian/International
Summer: N/A	Summer: N/A	Summer: 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.

11.19.4 Pharmacology and Therapeutics Faculty**Chair**

G. Multhaup

Graduate Program Director

B. F. Hales

Emeritus Professors

R. Capek; M.D., Ph.D.(Prague)

H.H. Zingg; M.D., Ph.D.(McG.)

Professors

G. Almazan; Ph.D.(McG.)

D. Bernard; Ph.D.(Johns Hop.)

D. Bowie; B.Sc., Ph.D.(Lond.)

P.B.S. Clarke; M.A.(Camb.), Ph.D.(Lond.)

A.C. Cuello; M.D.(Buenos Aires), M.A., D.Sc.(Oxf.), F.R.S.C.

B.F. Hales; Ph.D.(McG.)

Professors

T. Hébert; Ph.D.(Tor.)
 D. Maysinger; Ph.D.(USC)
 A. McKinney; Ph.D.(Ulster)
 P.J. McLeod; M.D.(Manit.), F.R.C.P.(C)
 G. Multhaup; Ph.D.(Cologne)
 A. Ribeiro-da-Silva; M.D., Ph.D.(Oporto)
 B. Robaire; Ph.D.(McG.)
 H. Saragovi; Ph.D.(Miami)
 M. Szyf; Ph.D.(Hebrew)
 J. Trasler; M.D.,C.M., Ph.D.(McG.)

Associate Professors

S. Nattel; M.D.,C.M.(McG.)
 E. Zorychta; Ph.D.(McG.)

Assistant Professors

B. Castagner; Ph.D.(Col.)
 L. Münter; Ph.D.(Free Univ., Berlin)
 J. Tanny; Ph.D.(Harv.)
 J.F. Trempe; Ph.D.(Oxf.)

Associate Members

M. Alaoui-Jamali; Ph.D.(Paris IV)
 M. Culty; Ph.D.(Fr.)
 L. Diatchenko; M.D., Ph.D.(RNRMU)
 L. Fellows; M.D., C.M.(McG.) Ph.D.(Oxf.)
 S. Gauthier; M.D.(Montr.)
 T. Geary; Ph.D.(Mich.)
 B. Jean-Claude; Ph.D.(McG.)
 S. Kimmins; Ph.D.(Dal.)
 S. Laporte; Ph.D.(Sher.)
 C. O'Flaherty; Ph.D.(Buenos Aires)
 V. Pappadopoulis; Ph.D.(Paris VI)
 S. Rousseau; Ph.D.(Laval)
 Y. Shir; M.D.(Israel), Ph.D.(Johns Hop.)
 L. Stone; Ph.D.(Minn.)
 M. Ware; M.B.B.S.(West Indies)
 T. P. Wong; Ph.D.(McG.)

Adjunct Professors

B. Allen, B. Boivin, M. Boucher, L. Breton, M. Bruno, S. Chemtob, Y. De Koninck, L. Garofalo, J. Gillard, J. S. Joyal, J.M.A. Laird, J. Mancini, K. Meerovitch, G. Miller, T. Sanderson

11.19.5 Master of Science (M.Sc.); Pharmacology (Thesis) (45 credits)

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.

Thesis Courses (24 credits)

PHAR 696	(3)	Thesis Preparation
PHAR 698	(9)	Thesis Preparation 2
PHAR 699	(12)	Thesis Preparation 3

Required Courses (12 credits)

PHAR 601	(6)	Comprehensive
PHAR 609	(1)	Research Professionalism for Pharmacologists
PHAR 610	(2)	Scientific Communication for Pharmacologists
PHAR 712	(3)	Statistics for Pharmacologists

Complementary Courses (9 credits)

9 credits, from the following courses:

PHAR 503*	(3)	Drug Discovery and Development 1
PHAR 505*	(3)	Structural Pharmacology
PHAR 562	(3)	Neuropharmacology
PHAR 563	(3)	Endocrine Pharmacology

Or completion of an equivalency exam

Or an exemption granted by the Graduate Training Committee (GTC) on the basis of previous courses.

* Students may take PHAR 503 or PHAR 505 but not both.

Students who have taken these courses as part of their undergraduate degree, passed the equivalency exam, or been exempted, will register for the following course:

PHAR 697	(6)	Thesis Preparation 1
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3 credits, at the 700-level PHAR course(s), or the equivalent, upon approval by the GTC.

11.19.6 Master of Science (M.Sc.); Pharmacology (Thesis) — Chemical Biology (47 credits)

This program is currently not accepting applicants.

Thesis Courses (24 credits)

PHAR 696	(3)	Thesis Preparation
PHAR 698	(9)	Thesis Preparation 2
PHAR 699	(12)	Thesis Preparation 3

Required Courses (9 credits)

PHAR 601	(6)	Comprehensive
PHAR 712	(3)	Statistics for Pharmacologists

Complementary Courses (14 credits)

2 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

6 credits, from the following courses:

PHAR 562	(3)	Neuropharmacology
PHAR 563	(3)	Endocrine Pharmacology

or, for students who have taken PHAR 562 and PHAR 563 as part of their undergraduate degree, they can be replaced with two of the following courses:

BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
CHEM 504	(3)	Drug Design
CHEM 522	(3)	Stereochemistry
CHEM 591	(3)	Bioinorganic Chemistry
CHEM 621	(5)	Reaction Mechanisms in Organic Chemistry
CHEM 629	(5)	Organic Synthesis
CHEM 655	(4)	Advanced NMR Spectroscopy
PHAR 504	(3)	Drug Discovery and Development 2
PHAR 707	(3)	Topics in Pharmacology 6

3 credits, one of the following courses:

PHAR 700	(3)	Seminars in Pharmacology
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

3 credits, one of the following courses:

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

11.19.7 Doctor of Philosophy (Ph.D.); Pharmacology**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.

Students must successfully complete, or be exempted from, the same courses as for the equivalent M.Sc. in Pharmacology, plus one additional 700-level graduate course (for a total of three).

11.19.8 Doctor of Philosophy (Ph.D.); Pharmacology — Chemical Biology

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 (13 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
PHAR 601	(6)	Comprehensive
PHAR 712	(3)	Statistics for Pharmacologists

Complementary Courses (14 credits)

6 credits, from the following courses:

PHAR 562	(3)	Neuropharmacology
PHAR 563	(3)	Endocrine Pharmacology

or, for students who have taken PHAR 562 and PHAR 563 as part of their undergraduate degree, they can replace them with two of the following courses:

BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
CHEM 504	(3)	Drug Design
CHEM 522	(3)	Stereochemistry
CHEM 591	(3)	Bioinorganic Chemistry
CHEM 621	(5)	Reaction Mechanisms in Organic Chemistry
CHEM 629	(5)	Organic Synthesis
CHEM 655	(4)	Advanced NMR Spectroscopy
PHAR 504	(3)	Drug Discovery and Development 2
PHAR 707	(3)	Topics in Pharmacology 6

two of the following courses:

PHAR 700	(3)	Seminars in Pharmacology
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

one of the following courses:

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

11.20 Physiology

11.20.1 Location

Department of Physiology
 McIntyre Medical Sciences Building
 3655 Promenade Sir-William-Osler
 Montreal QC H3G 1Y6
 Canada
 Telephone: 514-398-4343
 Fax: 514-398-7452
 Website: www.mcgill.ca/physiology

11.20.2 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 www.mcgill.ca/physiology/graduate-studies/financial-other-assistance.

section 11.20.5: 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 in 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 11.20.6: 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 11.20.7: 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 11.20.8: 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 in 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 11.20.9: 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 11.20.10: 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.

11.20.3 Physiology Admission Requirements and Application Procedures**11.20.3.1 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, following successful completion of the comprehensive exam. 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 required for anyone who does not have a degree from a North American university.

Language Requirements

Test of English as a Foreign Language (*TOEFL*): minimum score of 100 on the Internet-based test (iBT; 600 on the paper-based test (PBT)) with each component score not less than 20. 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.

11.20.3.2 Application Procedures

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

See [University Regulations and 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.

11.20.3.2.1 Additional Requirements

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

- Curriculum Vitae
- Personal Statement
- GRE and TOEFL – for applicants whose undergraduate degree is not from a North American university
- List of supervisor preferences

11.20.3.3 Application Deadlines

The application deadlines listed here 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 www.mcgill.ca/gps/contact/graduate-program.

Canadian	International	Special/Exchange/Visiting
Fall: May 15	Fall: March 1	Fall: N/A
Winter: Sept. 1	Winter: Aug. 15	Winter: N/A
Summer: N/A	Summer: N/A	Summer: 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.

11.20.4 Physiology Faculty

Chair

John Orłowski

Graduate Program Director

John White

Emeritus Professors

Thomas M.S. Chang; B.Sc., M.D.,C.M., Ph.D.(McG.), F.R.C.P.(C)

Kresimir Krnjevic; O.C., B.Sc., Ph.D., M.B., Ch.B.(Edin.), F.R.S.C.

Wayne S. Lapp; M.S.A.(Tor.), Ph.D.(McG.)

Mortimer Levy; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C) (*joint appt with Medicine*)

George Mandl; B.Sc.(C'dia); Ph.D.(McG.)

Geoffrey Melvill Jones; B.A., M.A., M.B., B.Ch., M.D.(Cant.)

Joseph Milic-Emili; M.D.(Milan) (*joint appt with Medicine*)

Canio Polosa; M.D., Ph.D.(McG.)

Douglas G.D. Watt; M.D., Ph.D.(McG.)

Professors

Monroe W. Cohen; B.Sc., Ph.D.(McG.)

Ellis J. Cooper; B.Eng.(Sir G. Wms.), M.Sc.(Surr.), Ph.D.(McM.)

Kathleen Cullen; B.Sc.(Brown), Ph.D.(Chic.)

Leon Glass; B.S.(Brooklyn), Ph.D.(Chic.) (*Rosenfeld Professor of Medicine*) (*joint appt. with Medicine*)

Phil Gold; C.C., B.Sc., M.Sc., Ph.D., M.D.,C.M.(McG.), F.R.C.P.(C), F.R.S.C. (*Douglas G. Cameron Professor of Medicine*) (*joint appt. with Medicine*)

John Hanrahan; Ph.D.(Br. Col.)

Gergely Lukacs; M.D., Ph.D.(Budapest)

Michael Mackey; B.A., Ph.D.(Wash.) (*Drake Professor of Medicine*)

Sheldon Magder; M.D.(Tor.) (*joint appt. with Medicine*)

Jacopo P. Mortola; M.D.(Milan)

John Orłowski; B.Sc.(McG.), M.Sc., Ph.D.(Qu.) (*James McGill Professor*)

Premysl Ponka; M.D., Ph.D.(Prague) (*joint appt. with Medicine*)

Alvin Shrier; B.Sc.(C'dia), Ph.D.(Dal.) (*Hosmer Professor of Physiology*)

John White; B.Sc., M.Sc.(Car.), Ph.D.(Harv.) (*joint appt. with Medicine*)

Associate Professors

Maurice Chacron; Ph.D.(Ott.)

Erik Cook; Ph.D.(Baylor Coll., Tx)

Mladen Glavinovic; B.Sc.(Zagreb), M.Sc.(Tor.), Ph.D.(McG.)

Associate Professors

Michael Guevara; Ph.D.(McG.)

Russell Jones; Ph.D.(Tor.)

Ursula Stochaj; Ph.D.(Cologne)

Ann Wechsler; B.A.(Tor.), M.Sc., Ph.D.(McG.)

Assistant Professors

Claire Brown; B.Sc.(St. Mary's), Ph.D.(W. Ont.)

Anmar Khadra; B.Sc.(C'dia), M.Sc., Ph.D.(Wat.)

Connie Krawczyk; B.Sc.(Guelph), Ph.D.(Tor.) (*joint appt. with Microbiology & Immunology*)

Judith Natalia Mandl; B.Sc.(Warw.), Ph.D.(Emory)

Anastasiya Nyzhnyk; M.Biochem., Ph.D.(Oxf.)

Reza Sharif-Naeini; B.Sc.(Montr.), M.Sc., Ph.D.(McG.)

Melissa Vollrath; B.Sc.(Wisc.), Ph.D. (Baylor Coll., Houston)

Associate Members*Anaesthesia:* Steven Backman*Biomedical Engineering:* Robert Kearney, Satya Prakash*Biomedical Ethics:* Jennifer Fishman*Kinesiology and Physical Education:* Dilson Rassier*Medicine:* Nicole Bernard, Volker Blank, Mark Blostein, Andrey Cybulsky, Geoffrey Hendy, Louise Larose, Anne-Marie Lauzon, Serge Lemay, James Martin, Barry Posner, Shafaat Rabbani, Simon Rousseau, Mary Stevenson, Tomoko Takano, Elena Torban, Simon Wing*Microbiology and Immunology:* Jörg Fritz*Neurology and Neurosurgery:* Jack Antel, Massimo Avoli, Daniel Guitton, Christopher Pack, David Ragsdale, Ed Ruthazer, Amir Shmuel, Jesper Sjöström*Ophthalmology:* Curtis Baker*Otolaryngology:* Bernard Segal*Pediatrics:* Charles Rohlicek*Pharmacology and Therapeutics:* Daniel Bernard, Terence Hebert*Psychiatry:* Nicolas Cermakian, Bernardo Dubrovsky*Research in Neuroscience:* Charles Bourque, Sal. T. Carbonetto**Adjunct Professors**

P. Haghighi, J. Martinez-Trujillo

11.20.5 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.

11.20.6 Master of Science (M.Sc.); Physiology (Thesis) — Bioinformatics (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)

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
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics

11.20.7 Master of Science (M.Sc.); Physiology (Thesis) — Chemical Biology (45 credits)

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

11.20.8 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.

11.20.9 Doctor of Philosophy (Ph.D.); Physiology — 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 (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

11.20.10 Doctor of Philosophy (Ph.D.); Physiology — Chemical Biology

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

11.21 Psychiatry**11.21.1 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.caWebsite: www.mcgill.ca/psychiatry**11.21.2 About Psychiatry**

McGill University's Department of Psychiatry is one 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.

Ph.D. (Ad Hoc)

The Department of Psychiatry also offers the possibility of directly entering a Ph.D. program on an *ad hoc* basis.

section 11.21.5: Master of Science (M.Sc.); Psychiatry (Thesis) (45 credits)

The graduate program in Psychiatry 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.

11.21.3 Psychiatry Admission Requirements and Application Procedures**11.21.3.1 Admission Requirements**

- A B.Sc., B.A., B.N., or M.D. degree
- 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
- A written agreement from the proposed research supervisor, and student's statement of purpose for seeking an M.Sc
- 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

- Sufficient funding to support their studies
- *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; or 550 on the paper-based test [PBT]), with each component score not less than 20, or 6.5 on the IELTS test

11.21.3.2 Application Procedures

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

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

11.21.3.2.1 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

11.21.3.3 Application Deadlines

The application deadlines listed here 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 www.mcgill.ca/gps/contact/graduate-program.

Canadian	International	Special/Exchange/Visiting
Fall: March 15	Fall: March 15	Fall: March 15
Winter: Sept. 15	Winter: Sept. 10	Winter: Same as Canadian/International
Summer: N/A	Summer: N/A	Summer: N/A

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

11.21.4 Psychiatry Faculty

Chair

G. Turecki

Director of Graduate Program

N. Mechawar

Emeritus Professors

M.K. Birmingham; B.A.(Bennington), M.Sc., Ph.D.(McG.)

F. Engelsmann

N. Frasure-Smith; B.A. Ph.D.(Johns Hop.)

A. M. Ghadirian

S. Young

Professors

L. Annable; B.Sc.(Liv.), Dipl. in Stat.(Edin.)

C. Benkelfat; M.D.(Rabat) (*James McGill Professor*)

D. Boivin; Ph.D.(Montr.)

P. Boksa; B.Sc., Ph.D.(McG.)

M. Bond; B.Sc., M.D.,C.M.(McG.)

J. Breitner; B.A.(Harv.), M.P.H.(Johns Hop.), M.D.(Penn.)

A. Brunet; Ph.D.(Montr.)

N. Cermakian; B.Sc.(UQTR), M.Sc., Ph.D.(Montr.)

Professors

M. Cole; B.Sc., M.D.,C.M.(McG.)
 S. El Mestikawy; Ph.D.(Paris VI)
 S. Gauthier; B.A., M.D.(Montr.)
 B. Giros; M.Sc., Ph.D.(Paris VI)
 A. Gratton; Ph.D.(C'dia)
 J. Guzder; B.Sc., M.D.,C.M., F.R.C.P.
 L.T. Hechtman; B.Sc., M.D.,C.M.(McG.)
 R. Joober; M.D.(Tunisia), Ph.D.(McG.)
 B. Kieffer; Ph.D.(Strasbourg)
 S. King; Ph.D.(Virg.)
 L.J. Kirmayer; B.Sc., M.D.,C.M., Dipl.Psych.(McG.) (*James McGill Professor*)
 E. Latimer; B.A.Sc.(Wat.), M.S., Ph.D.(Carn. Mell)
 M. Lepage; B.A.(C'dia), Ph.D.(UQAM)
 M. Leyton; Ph.D.(C'dia) (*William Dawson Scholar*)
 G. Luheshi; Ph.D.(Newcastle, UK)
 A. Malla; M.B.B.S.(Panjab)
 M.J. Meaney; B.A.(Loyola), M.A., Ph.D.(C'dia) (*James McGill Professor*)
 V.N.P. Nair; M.B., B.S.(Kerala), D.P.M.(Mys.)
 R. Palmour; B.A., Ph.D.(Texas)
 J. Paris; M.D.,C.M.(McG.)
 J.C. Perry; M.D.(Duke)
 R.O. Pihl; B.A.(Lawrence), Ph.D.(Ariz.) (*Psychology*)
 J. Poirier; Ph.D.(Montr.)
 J. Pruessner; Ph.D.(Trier)
 R. Quirion; M.Sc., Ph.D.(Sher.)
 C. Rousseau; M.Sc.(McG.), M.D.,C.M.(Sher.)
 L.K. Srivastava; B.Sc., M.Sc.(Allahabad), Ph.D.(J. Nehru)
 H. Steiger; Ph.D.(McG.)
 B. Thombs; B.A.(N'western), M.A.(Ariz.), Ph.D.(NYU)
 G. Turecki; M.Sc., M.D.,C.M., Ph.D.(McG.) (*William Dawson Scholar*)
 C.-D. Walker; B.Sc., Ph.D.(Geneva)
 A. Young; B.A., M.A., Ph.D.(Penn.)

Associate Professors

J. Armony; B.Sc.(Buenos Aires), M.Sc., Ph.D.(NYU)
 P. Assalian; Dip.Psychol.(McG.), M.B.,Ch.B.(Cairo)
 S. Beaulieu; M.D./Ph.D.(Laval)
 M. Berlim; M.Med., M.D.(Rio Grande do Sul)
 V. Bohbot; B.A.(McG.), M.A., Ph.D.(Ariz.)
 M.J. Brouillette; M.D.,C.M.(Sher.)
 J. Caron; B.A., M.A.(Moncton), Ph.D.(UQAM)
 N. Casacalenda; M.D.(Sher.), F.R.C.P.

Associate Professors

D. Charney; M.D.,C.M.(McG.)

A. Crocker; Ph.D.(Montr.) (*William Dawson Scholar*)

J.B. Debruille; M.D.(Paris XI), Ph.D.(Paris VI)

S. Dongier-Montagnac; M.D.,C.M.(Provence Aix-Marseille)

B.O. Dubrovsky; M.D.(Buenos Aires)

D. Dunkley; B.Sc.(Tor.), Ph.D.(McG.)

F. Elgar; M.Sc.(Nfld.), Ph.D.(Dal.)

P. Étienne; M.D.(Liege)

C. Fichten; B.Sc.(McG.), M.Sc.(C'dia), Ph.D.(McG.)

M.-J. Fleury; M.A., Ph.D.(Montr.)

C. Flores; B.Sc., M.A., Ph.D.(C'dia)

D. Frank; Dip.Psychol., M.D.,C.M.(McG.)

R. I. Fraser; M.D.(Dal.)

G. Galbaud du Fort; M.D., Ph.D.(Paris) (*joint appt. with Epidemiology and Biostatistics*)

K.G. Gill; B.Sc.(Br. Col.), M.A., Ph.D.(C'dia)

G. Gobbi; M.D.(Rome), Ph.D.(Cagliari)

I. Gold; Ph.D.(Princ.)

A. Granich; M.D.(McG.), F.R.C.P.

B. Greenfield; M.D.(Wash.)

N. Grizenko; M.D.,C.M.(Sher.)

D. Groleau; B.Sc., M.Sc., Ph.D.(Montr.)

R. Gruber; B.A., M.S., Ph.D.(Tel Aviv)

K. Igartua; M.D.,C.M. F.R.C.P.(C)(McG.)

M. Israël; B.Sc., Gr.Dip.Psych.(McG.), M.A.(Qu.), M.D.,C.M.(McG.)

E. Jarvis; M.D.(Alta.), M.Sc.(McG.), F.R.C.P.

T. Kolivakis; M.D.(Athens)

A. Labbe; M.Sc.(Montr.), Ph.D.(Wat.)

M. Lalinec-Michaud; B.A., M.D.,C.M.(Paris IV)

K. Looper; B.Sc., M.D.(Ott.), M.Sc.(McG.)

O. Mantere; M.D.(Helsinki)

H. C. Margolese; M.D.(McG.), C.M., M.Sc.

N. Masrouha; M.D.(Sher.)

N. Mechawar; B.Sc., M.Sc., Ph.D.(Montr.)

R. Montoro; M.D.,C.M., M.Sc., F.R.C.P.(C)

G. Myhr; M.D.,C.M., M.Sc.(McG.)

L. Nadeau; M.D.(Montr.)

J. Naiman; B.A., M.D.,C.M.(McG.)

J. Palacios-Boix; M.D., F.R.C.P.(C)

J. Pecknold; B.Sc.(C'dia), M.D.,C.M.(McG.)

D. Pedersen; M.D.(Buenos Aires)

M. Perreault; Ph.D.(Montr.)

A. Propst; B.Sc., Dip.Psychol., M.D.,C.M.(McG.)

Associate Professors

M.N. Rajah; B.Sc., M.A., Ph.D.(Tor.)
 R.A. Ramsay; B.Sc., Gr.Dip.Psychiat., M.D.,C.M.(McG.)
 A. Raz; M.Sc., Ph.D.(Hebrew)
 J. Renaud; M.Sc., M.D.(Montr.)
 S. Renaud; M.D.(Laval)
 B.M. Robertson; Dip.Psychol.(McG.), M.B.,Ch.B.(Otago)
 J. Rochford; M.A.(Qu.), Ph.D.(C'dia)
 P. Rosa; M.D.(Rio Grande do Sul), Ph.D.(Aarhus)
 Z. Rosberger; Ph.D.(C'dia)
 R. Russell; M.D.(McG.)
 N. Schmitz; Dipl., Ph.D.(Univ. Dortmund)
 S. Singh; M.D.(Calg.), F.R.C.P.
 D. Sookman; B.A.(McG.), M.A.(Guelph), Ph.D.(C'dia)
 W. Steiner; M.D.,C.M.(McG.)
 F.K. Storch; M.Sc.(Munich); Ph.D.(Max Planck Inst. Biochem.)
 B. Suranyi-Cadotte; B.Sc., M.Sc.(McG.), M.D.,C.M.(Montpellier)
 S. Williams; Ph.D.(Montr.)
 G. Wiviott; B.Sc.(Wisc.), Gr.Dip.Psychiat.(McG.), M.D.,C.M.(NYU)
 T.P. Wong; B.Sc., M.Ph.(HK), Ph.D.(McG.)
 P. Zelkowitz; Ph.D.(McG.)
 M. Zoccolillo; B.Sc.(New Orleans), M.D.(Norfolk)

Assistant Professors

L. Amirali; M.D.(Athens)
 D. Awad; M.D.(Montr.)
 S.M. Bailes; Ph.D.(C'dia)
 P. Bajsarowicz; M.D.(McG.), F.R.C.P.(C)
 E. Banon; M.D.,C.M.(McG.)
 M. Barbarosie; M.D., Ph.D.(Montr.)
 L. Beauclair; B.Sc., M.D.(Laval)
 D. Belisle; M.D.(Laval)
 C. Benerakis; Gr.Dip.Psychiat.(McG.), M.D.(Trin. Coll.,Tor.)
 M. Bernard-Brodeur; M.Sc., Ph.D.(Montr.)
 R. Biskin; M.D., M.Sc.(McG.)
 P. Bleau; B.Sc., Gr.Dip.Psychiat., M.D.,C.M.(Sher.)
 D. Bloom; B.Sc.(Regina), M.D.(Qu.)
 M. Boily; B.Sc., M.D.(Laval)
 J. Bond; M.D.(Laval)
 F. Bourque; M.D.(Laval), Ph.D.(KCNS)
 I. Bradley; M.Sc.(Tor.), Ph.D.(Wat.)
 E. J. Brahm; M.D.
 M. Brandon; Ph.D.(Boston)

Assistant Professors

R. Brown; B.Sc., M.D.,C.M.(McG.)
 T.G. Brown; Ph.D.(C' dia)
 A. Bucatel; M.D.(Nicolae Testemitanu St. Univ. of Med. and Pharm.)
 J. Canfield; B.A.(New Br.), M.D.,C.M.(Dal.)
 P. Cervantes; Dip.Psychol.(McG.), M.D.,C.M.(UAEM)
 J.-G. Chabot; Ph.D.(Sher.)
 E. Chachamovich; M.D.(Rio Grande do Sul), Ph.D.(Edin.)
 M. Chakavarty; Ph.D.(McG.)
 R.M.E. Chenard-Soucy; M.D.(Montr.)
 S. Choudhury; Ph.D.(Univ. Coll. Lond.)
 D. Claveau; M.D.(Laval)
 P. Cote; B.A.(Laval), M.D.,C.M.(Laval/Ott.)
 L. Creti; Ph.D.(C' dia)
 H. Cvejic; M.D.(NUI)
 L. Dabby; M.D.(Tor.)
 M.E. Davis; Dip.Psychol., M.D.,C.M.(McG.)
 P. Des Rosiers; M.D.(Sher.)
 R. Desautels; B.Sc., M.D.,C.M.(McG.)
 J. Desmarais; M.D.,C.M.(McG.)
 M. Di Tomasso; M.D.(McG.)
 S. Ducharme; M.D.(Montr.)
 M. Elie; B.Sc., M.D.,C.M.(McG.)
 M. Elsabbagh; Ph.D.(Qu.)
 C.P. Ernst; B.Sc.(McG.), M.Sc.(Br. Col.), Ph.D.(McG.)
 J. Errunza; M.D.(McG.)
 K. Faridi; M.D.(Calg.)
 K. Fathalli; M.D.(Tunis)
 A. Fielding; M.D.,C.M.(McG.)
 E. Foley; B.Sc.(Tor.)
 R.E. Franck; B.A., M.D.,C.M.(McG.)
 R. Fraser; B.A., M.D.(Dal.)
 J. Friedland; M.D.(Calg.)
 G. Gagnon
 M. Gauthier; M.D.,C.M.(Montr.)
 K. Geagea; M.D.,C.M.(SJU)
 M.-C. Geoffroy; Ph.D.(Montr.)
 J. Glass; B.A.(Boston), M.D.,C.M.(McG.)
 K. Goddard; M.D.,C.M.(Manit.)
 M. Grignon; B.A.(Montr./Ott.), M.A.(Ott.)
 J.M. Guile; Gr.Dip.Psychiat.(Aix-Marseilles)
 P. Habib; M.D.(Beirut Med. Sch.)
 M. Habra; B.A.(McG.), M.A., Ph.D.(Br. Col.)

Assistant Professors

B. Hayton; B.A.(Williams), M.D.,C.M.(McG.)

L. Hoffman; M.D.(McG.)

F. Ianni; B.Sc.(McG.), M.D.,C.M.(Montr.)

H. Iskandar; Dip.Psychol.(McG.), M.B.,Ch.B.(Alexandria)

S. Iyer; M.A.(Mumbai), Ph.D.(Nebraska–Lincoln)

C. Jolicoeur; M.D.,C.M.(Laval)

J. Joly; M.D.,C.M.(McG.)

M. Kapuscinska; M.D.,C.M.(Medical U. Gdansk)

S. Karama; Ph.D.(Montr.)

R. Keller; M.D.,C.M.(Manit.)

F. Key

M. Koch; M.D.(McM.)

T. Kolivakis; M.D.(Athens)

R. Kuyumjian; M.D.,C.M.(McG.)

P. Lageix; B.Sc., M.D.,C.M.(Paris IV)

S. Lamarre; B.A., M.D.,C.M.(Laval)

M. Laporta; Dip.Psychol., M.D.,C.M.(McG.)

L. Laporte; B.A.(McG.), M.Psychol., Ph.D.(Montr.)

M. Larose; M.D.(Laval)

M. Lashley; Ph.D.(McG.)

J.D. Leccia; M.D.(Provence Aix-Marseille)

E. Levy; Gr.Dip.Psychiat.(McG.), M.Ed.(Sher.)

E. Libman; B.A., M.Sc., Ph.D.(McG.)

E. Lizondo; M.D.,C.M.(Nat. Univ. Central Buenos Aires)

G.L. Low; B.A.(Qu.), Dip.Psychol.(McG.), M.D.,C.M.(Ott.)

N.C.P. Low; M.D., M.Sc.(McG.)

W. Ma; M.D., M.Sc.(Tongji), Ph.D.(McG.)

R. Martins; Ph.D.(Montr.)

T. Measham; B.Sc., M.D.(McG.)

M. Messier; B.A.(Montr.), M.B.A.(HEC)

G. Meterissian; Gr.Dip.Psychiat.(McG.), M.D.,C.M.(Montr.)

T.M. Milroy; B.Sc., M.D.,C.M.(Md.), Gr. Dip. Psychiat.(McG.)

M. Miresco; M.D.,C.M.(McG.)

J.P. Near; Ph.D.(W. Ont.)

T. V. Nguyen; M.D.

J.A. O'Neil; B.A.(C'dia), Dip.Psychol., M.D.,C.M.(McG.)

M.A. Ouimet; D.M.D.(Sher.), Gr.Dip.Psychiat.(McG.)

M. Piat; Ph.D.(Laval)

L. Pinard; M.D.(Montr.), F.R.C.P.(C)

Z. Prelevic; Dip.Psychol.(McG.), M.D.,C.M.(Belgrade)

M. Pruessner; M.Sc., Ph.D.(Trier)

M. Rabinovitch; B.Sc., M.D.,C.M.(McG.)

Assistant Professors

S.B. Rosenbloom; B.A.(C'dia), M.A.(York)

C. Roy; B.Sc.(McG.), M.D.,C.M.(Dal.)

M. Ruiz Casares Yebenes; Ph.D.(Cornell)

J. Russell; Ph.D.(McG.)

T. Said; B.Sc.(McG.), M.D.,C.M.(Sher.)

H. Schwartz; M.D.(McG.)

M. Segal; B.A.(C'dia), B.Sc.(O.T.)(McG.), M.D.,C.M.(Ott.)

J. Seguin; B.A., B.Sc., M.D.,C.M.(Ott.)

T. Semeniuk; B.Sc., M.Ed., M.D.,C.M.(Alta.)

J. Shah; M.Sc.(Lond.), M.D.(Tor.)

M. Sigman; B.A.(McG.), M.A., Ph.D.(C'dia)

M.L. Solomon; Dip.Psychol.(McG.), M.D.,C.M.(Qu.)

I. Spector; B.A.(McG.), M.Sc., Ph.D.(Syrac.)

K.A. Steger; M.D., Ph.D.(Texas, Southwest. Med. Cent.)

L. Stern; M.D.(McG.)

A. St-Hilaire; M.Sc.(McG.), Ph.D.(Ohio)

M. St-Laurent; M.D.(Montr.)

N. Szkrumelak; B.Sc., M.D.,C.M.(McG.)

K. Tabbane; M.D., Ph.D.(Tunisia)

P. Tetreault; M.D.,C.M.(Sher.)

L. Thaler; Ph.D.(Nevada)

J.X. Thavundayil; B.Sc., M.B.B.S.(Kerala)

L. Tourian; M.D.(McG.)

A. Traicu; M.D.(McG.)

J. Tremblay; B.A.(Montr.), M.Sc.(McG.), M.D.,C.M.(Montr.)

F. van den Eynde; M.A.(Florence), Ph.D.(King's College), M.D.(Ghent)

S. Vida; B.Sc.(Ott.), M.D.,C.M.(McG.)

S. Villeneuve; Ph.D.(Montr.)

J. Vogel; M.D.,C.M.(Manit.)

A. Wazana; B.A.(McM.), M.Sc.(Col.), M.Sc.(McG.), M.D.(McM.)

R. Whitley; B.S., M.S., Ph.D.(Lond.)

A. Wilner; B.A., M.D.,C.M.(McG.)

M.A. Wolf; M.Sc., M.D.,C.M.(Strasbourg)

Y. Wolf; M.D.(McG.)

G. Zahirney; M.D.(McG.)

T. Y. Zhang; Ph.D.(McG.)

V. Zicherman; B.Sc., M.D.,C.M.(McG.)

D. Zigman; M.D.(McG.)

E. Zikos; M.D.(Montr.)

Lecturers

F. Amdiss, S. Attia-Galand, A.D. Basque, N. Beauchemin, L. Beaudry, T. Bedrossian, J.F. Belair, D. Bertrand, I. Blais, C. Blake, J.M. Bourque, C.M.J. Brebion, E. Casimir, E. Cauchois, P. Chan, M. Coward, W. Darwich, M.H.N. Dinh, H.C. Dube, H. Dymetryszyn, J.A. Farquhar, H. Goldhaar, L. Gouriou,

Lecturers

D. Groenewege, P. Harden, J. Harvey, M. Heyman, M. Hodgson, I. Iordache, H.G. Jean-Francois, D. Kunin, N. Kuperstok, P. Lamoureux, A.G. Maccordick, S.K. Margolese, V. Mbekou, D. Michaud, D.F.S. Monti, K. Myron, A. Navidzadeh, T. Ngo-Minh, J.P. O'Donnell, R. Orenman, R. Payeur, L. Peters, G. Pierre-Louis, M. Quintal, T. Reyburn, K. Richter, D.T. Rochon, A. Schiavetto, V. Tagalakis, F.C. Toma, N. Vachon, S. Wisebord, D. Zack, C. Zarowsky

Associate Members

S. Bond
J.L. Derevensky; Ph.D.
M. Drapeau
A. Evans; Ph.D.
L. McVey
S. Neron
G. O'Driscoll
D. Zuroff

Adjunct Professors

A. Adamantidis
M. Alda; M.D.
P. Blier; M.D., Ph.D.
L. Booij; Ph.D.
W. Brender
M. Cargo; Ph.D.
A. Daigneault
M. Desjardins
A. Duffy; M.D.
D. Fikretoglu
R. Fugere; M.D.
A. Gagnon
J.P. Harris
F. Jollant
V. Kovess-Masfety; M.D., Ph.D.
O. Lapierre
A. Lesage
F. Lesperance; M.D.
S. J. Lloyd
S. Richard-Devantoy
S. Sultan
C. Tranulis
A. Zangen

Post-Retirement

D. P. Dastoor
J. P. Ellman
C. Gianoulakis
K. Minde

Post-Retirement

J.C. Negrete

G. Pinard

A. Surkis

11.21.5 Master of Science (M.Sc.); Psychiatry (Thesis) (45 credits)

The M.Sc. in Psychiatry is administered by the Graduate Training Committee. Each student selects a Supervisory Committee composed of the research supervisor plus two to four other faculty who are knowledgeable about the student's research area and who can advise both on appropriate coursework and on the thesis research project. The student will meet with this Supervisory Committee at least once during each year of matriculation for the purpose of evaluating academic and research progress of the student. The Supervisory Committee will also act as a resource body for the student, both with respect to academic and administrative matters.

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.

11.22 Surgery, Experimental**11.22.1 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: www.mcgill.ca/experimentalsurgery

11.22.2 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 general stream, those who are interested have a new opportunity to choose a concentration in Surgical Innovation or Surgical Education. 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 institutes of the different McGill teaching hospitals. The scope of the research and close connections with other 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 11.22.5: Master of Science (M.Sc.); Experimental Surgery (Thesis) (45 credits)

The M.Sc. 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 11.22.6: 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 11.22.7: 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 11.22.8: 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 11.22.9: 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 11.22.10: Graduate Certificate (Gr Cert.); Surgical Innovation (15 credits)

The core 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 core 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.

11.22.3 Experimental Surgery Admission Requirements and Application Procedures**11.22.3.1 Admission Requirements****M.Sc. Programs**

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.

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

The graduate certificate is open to health care and research professionals, surgical and medical residents, pharmacists, nurses, and those with a GPA in an undergraduate degree of 3.0 or higher in the medical and allied sciences, or two or more years experience in the medical sector.

11.22.3.2 Application Procedures

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

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

11.22.3.2.1 Additional Requirements

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

- Curriculum Vitae
- Research Project Proposal
- Confirmation of Supervisor
- Memorandum of Agreement
- Tuition Assistance

Additional Requirements for the Concentrations in Surgical Education and in 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.

11.22.3.3 Application Deadlines

The application deadlines listed here 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: www.mcgill.ca/gps/contact/graduate-program.

Canadian	International	Special/Exchange/Visiting
Fall: June 15	Fall: April 30	Fall: Same as Canadian/International
Winter: Nov. 1	Winter: Sept. 1	Winter: Same as Canadian/International
Summer: N/A	Summer: N/A	Summer: N/A

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

11.22.4 Surgery, Experimental Faculty

Director

A. Philip

Associate Director

L. Haglund

Professors

J. Antoniou; M.D.,C.M., Ph.D.(McG.), F.R.C.S.(C)

A. Aprikian; M.D.(Sher.), F.R.C.S.(C)

J. Barkun; M.D., M.Sc.(McG.)

J. Barralet Beng; Ph.D.(Lond.)

J.D. Bobyng; B.Sc., M.Sc.(McG.), Ph.D.(Tor.)

P. Brodt; B.Sc.(Bar-Ilan), M.Sc.(Ott.), Ph.D.(McG.)

M.M. Elhilali; M.B., B.Ch., D.S., DU, M.Ch.(Cairo), Ph.D.(McG.)

L. Feldman; M.D.,C.M., M.Sc.(McG.)

G.M. Fried; B.Sc., M.D.,C.M.(McG.)

F. Glorieux; M.D.(Louvain), M.Sc.(Montr.), Ph.D.(McG.)

P.H. Gordon; M.D.(Sask.)

R. Hamdy; M.Sc., M.D.(Egypt), F.R.C.S.(C)

E. Harvey; B.Sc.(Ont.), M.D.,C.M., M.Sc.(McG.)

J.E. Henderson; Ph.D.(McG.)

Professors

J.M. Laberge; M.D.(Laval)
 S. Meterissian; M.D.,C.M., M.Sc.(McG.)
 D.S. Mulder; M.D.(Sask.), M.Sc.(McG.)
 A. Philip; M.Sc., Ph.D.(McG.)
 L. Rosenberg; M.Sc., M.D., Ph.D.(McG.)
 R. St. Arnaud; Ph.D.(Laval)
 M. Tanzer; M.D.,C.M.(McG.), F.R.C.S.(C)
 C.I. Tchervenkov; B.Sc., M.D.,C.M.(McG.), F.R.C.S.(C)
 R. Turcotte; M.D.(Montr.)

Associate Professors

M. Basik; M.D.,C.M., M.Sc.(McG.)
 O. Blaschuk; B.Sc.(Winn.), M.Sc.(Manit.), Ph.D.(Tor.)
 S. Chevalier; B.Sc., M.Sc., Ph.D.(Montr.)
 P. Chan; M.D.,C.M., M.Sc.(McG.), F.R.C.S.(C)
 R. Cecere; M.D.,C.M., B.Sc.(McG.), F.R.C.S.(C), A.B.S., F.A.C.S.
 M. Chevrette; B.Sc., M.Sc., Ph.D.(Laval)
 S. Emil; M.D.,C.M.(McG.), F.R.C.S.(C)
 L. Ferri; M.D.,C.M., M.Sc.(McG.)
 D. Fleischer; B.Sc., M.D.,C.M.(McG.)
 S. Fraser; B.Sc., M.D.(Tor.), M.Sc.(McG.), F.R.C.S.(C)
 K.J. Lachapelle; M.Sc., M.D.,C.M.(McG.)
 J. Lapointe; M.D., Ph.D.(Laval)
 L. Lessard; B.Sc., M.D.(Laval), F.R.C.S.(C)
 P. Metrakos; B.Sc., M.D.(McG.), F.R.C.S.(C)
 S. Paraskevas; M.D., Ph.D.(Laval)
 P. Puligandla; M.D., M.Sc.(W. Ont.), F.R.C.S.(C)
 J. Sampalis; M.Sc., Ph.D.(McG.)
 D. Shum-Tim; M.Sc., M.D.,C.M.(McG.)
 T. Steffen; M.D.(Switz.), Ph.D.(McG.)
 T. Taketo-Hosotani; B.Sc., M.Sc., Ph.D.(Kyoto)
 J.I. Tchervenkov; M.D.,C.M.(McG.), F.R.C.S.(C)
 A. Thomson; Ph.D.(Lond.)
 D. Zukor; B.Sc., M.D.,C.M.(McG.)

Assistant Professors

S. Bergman; M.Sc., M.D.,C.M.(McG.), F.R.C.S.(C)
 A. Dragomir; M.Sc., Ph.D.(Montr.)
 J. Faria; M.D.,C.M., M.Sc.(McG.), F.R.C.S.(C)
 M. Gilardino; M.D.,C.M., M.Sc.(McG.), F.R.C.S.(C), F.A.C.S.
 L. Haglund; B.Sc., Ph.D.(Lund)
 T.E. Hebert; Ph.D.(Tor.)
 O. Huk; B.Sc., M.D.,C.M.(McG.), M.Sc.(Montr.)

Assistant Professors

P. Jarzem; B.Sc., M.D.(Qu.)
 E. Lee; B.A.(Boston), M.Sc., Ph.D.(McG.)
 K. Mackenzie; B.Sc.(Br. Col.), M.D.,C.M.(McG.), F.R.C.S.(C)
 A. Merguerditchian; M.D., M.Sc.(Montr.), F.R.C.S., F.A.C.S.
 E. Mitmaker; M.D.(TJU), M.Sc.(McG.), F.R.C.S.(C)
 C. O'Flaherty; D.V.M., Ph.D.(Buenos Aires)
 M. Petropavlovskaja; M.Sc., Ph.D.(Moscow)
 N. Saran; M.D., B.Sc.(Br. Col.)
 K. Shaw; M.D.,C.M., M.Sc.(McG.)

11.22.5 Master of Science (M.Sc.); Experimental Surgery (Thesis) (45 credits)**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 601	(6)	Knowledge Management
EXSU 605	(3)	Biomedical Research Innovation
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.

11.22.6 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 (12 credits)

EPIB 507	(3)	Biostats for Health Sciences
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EPIB 521	(3)	Regression Analysis for Health Sciences
EXSU 601	(6)	Knowledge Management

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

11.22.7 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 (12 credits)

EDPE 637	(3)	Issues in Health Professions Education
EDPH 689	(3)	Teaching and Learning in Higher Education
EXSU 605	(3)	Biomedical Research Innovation
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 backgrounds, students may be asked by their Research Advisory Committee to take additional courses.

11.22.8 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 multi-disciplinary teams in the creation of a 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 605	(3)	Biomedical Research Innovation
EXSU 606	(3)	Statistics for Surgical Research
EXSU 620	(3)	Surgical Innovation 1

EXSU 621 (3) Surgical Innovation 2

Complementary Courses (3 credits)

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

11.22.9 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 (12 credits)

EXSU 601	(6)	Knowledge Management
EXSU 605	(3)	Biomedical Research Innovation
EXSU 606	(3)	Statistics for Surgical Research
EXSU 700	(0)	Comprehensive Examination

Complementary Course (3 credits)

One graduate-level course in the student's specialty, selected in consultation with the Research Supervisory Committee.

11.22.10 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)

EXSU 605	(3)	Biomedical Research Innovation
EXSU 606	(3)	Statistics for Surgical Research
EXSU 620	(3)	Surgical Innovation 1
EXSU 621	(3)	Surgical Innovation 2

Elective Courses (3 credits)

3 credits at the 500 level or higher, chosen in consultation with the program director.

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

