



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

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



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

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## 1 **Dean's Welcome**

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

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## 4 Graduate Studies at a Glance

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

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## 5 Program Requirements

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

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

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## 6 Graduate Admissions and Application Procedures

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

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

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

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## 7 Fellowships, Awards, and Assistantships

Please refer to [University Regulations & Resources](#) > *Graduate* > : [Fellowships, Awards, and Assistantships](#)

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## 8.2 Guidelines and Policy for Academic Units on Postdoctoral Education

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

### 1. Definition and Status

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

### 2. Registration

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

### 3. A

i. Postdocs are subject to the responsibilities outlined at [mcgill.ca/students/srr](http://mcgill.ca/students/srr) and must abide by the policies listed at [mcgill.ca/secretariat/policies-and-regulations](http://mcgill.ca/secretariat/policies-and-regulations).

ii. Each academic unit hosting postdocs should clearly identify postdocs'

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## 8.5 Postdoctoral Research Trainees

### Eligibility

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

The category of Postdoctoral Research Trainee is for:

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

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

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

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



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

### General Conditions

- The maximum duration is three years
- The individual must be engaged in full-time research
- The individual must provide copies of official transcripts/diplomas
- The individual must have the approval of a McGill professor to supervise the research and of the Unit
- The individual must have adequate proficiency in English, but is not required to provide official proof of English competency to Enrolment Services
- The individual must comply with regulations and procedures governing equi

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

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

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

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

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## 12 Browse Academic Units & Programs

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

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### 12.1 Medicine

#### 12.1.1 Location

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### **12.1.3 Medical Physics**

#### **12.1.3.1 Location**

Medical Physics Unit, DS1-4556  
McGill University Health Centre – Glen Site  
Cedars Cancer Centre  
1001 Décarie Boulevard  
Montreal QC H4A 3J1  
Telephone: 514-934-1934 ext. 44158  
Fo2WDcx0 0 1 81.693 6041175 61(McGill Uni)Tj1 8

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

Candidates applying to the Graduate Diploma must hold a Ph.D. degree and also a B.Sc. in Physics, Ph

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

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

#### 12.1.3.4 Medical Physics Faculty

##### Director

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

##### Co-Directors

S. Enger, J. Kildea, I. Levesque

##### Emeritus Professors

S.M. Lehnert, E.B. Podgorsak

##### Professors

D. Louis Collins, J. Seuntjens

##### Associate Professors

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

##### Assistant Professors

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

##### Faculty Lecturers

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

##### Affiliate Members

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

##### Adjunct Professors

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

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

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

##### Thesis Courses (18 credits)

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

##### Required Courses (27 credits)

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

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

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

#### 12.1.4.2 About Experimental Medicine

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


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

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

The objectives of this program are to give students exposure to both theoretical and practical issues relevant to the conception and conduct of a clinical research study, as well as allo

#### 12.1.4.3.3 Application Dates and Deadlines

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



### Assistant Professors

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

### Associate Members, McGill

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

### Adjunct Professors

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

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

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

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

#### Thesis Courses (36 credits)

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

#### Complementary Courses (9 credits)

9 credits at the 500 level or higher.

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

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

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

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

#### Thesis Courses (24 credits)

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

#### Required Courses (6 credits)

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



**Complementary Courses (15 credits)**

3 credits, one of the following:

- (3) Law and Health Care

EXMD 694 (12) Master's Thesis Research 5

**Required Course (3 credits)**

ENVR 615 (3) Interdisciplinary Approach Environment and Sustainability

**Complementary Courses (15 credits)**

3-6 credits from:

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

0-3 credits from:

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

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

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

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

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

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

**Thesis**

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

**Required Courses**

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

**Complementary Courses (12 or 18 Credits)**

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

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

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

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

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

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

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

**Thesis**

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

**Required Courses (3 credits)**

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

**Complementary Courses (18 or 24 credits)**

3-6 credits from:

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

0-3 credits from:

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

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

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

Or

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

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

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

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

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

**Required Courses (9 credits)**

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

**Complementary Courses (6 credits)**

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

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

The objectives of this program are to give students exposure to both theoretical and practical issues relevant to the conception and conduct of a clinical research study

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

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

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

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

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

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

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

1. constantly inform family medicine curricula innovations and continuing professional development to better f

### 12.1.5.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at [mcgill.ca/gradapplicants/apply](http://mcgill.ca/gradapplicants/apply).

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

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

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

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

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

#### **12.1.5.4 Medicine, Family Faculty**

##### **Chair**

Marion Dove

##### **Graduate Program Directors**

*Ph.D. program & Postdoctoral Fellows:* Tibor Schuster

*M.Sc. program:* Isabelle Vedel

##### **Professors**

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

##### **Associate Professors**

Eugene Bereza, Anne Cockcroft, Perle Feldman, Roland Grad, Ellen Rosenber

FMED 511	(1)	Introduction to Art in Healthcare: Making Art Accessible
FMED 525	(3)	Foundations of Translational Science
FMED 601	(3)	Advanced Topics in Family Medicine
FMED 604	(3)	Advanced Participatory Research in Health
FMED 605	(1)	AI and Analytical Decision-Making in Healthcare
FMED 606	(1)	Operational Issues in Survey Methods in Primary Care
FMED 607	(1)	Intro to Discourse Analysis & Interpretive Health Research
FMED 608	(1)	Advanced Mixed Methods Seminar in Health Research
FMED 610	(1)	Foundations of Family Medicine
FMED 611	(3)	Healthcare Systems, Policy and Performance
FMED 612	(1)	Evaluation Research and Implementation Science
FMED 615	(1)	Applied Knowledge Translation and Exchange in Health
FMED 618	(1)	Topics in Pharmacoeconomics, Drug Safety and Policy
FMED 619	(3)	Program Management in Global Health and Primary Health Care
FMED 621	(1)	Participatory Health Systems for Safe Birth
FMED 690	(3)	Advanced Ethnography: Context, Complexity and Coordination

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

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

##### Required Courses (31 credits)

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

##### Complementary Course (3 credits)

3 credits from the following:

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

##### Elective Courses (11 credits)

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

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

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



streams: (1) family physicians' professional identity formation; (2) information use and technology in the learning episodes of practicing physicians and organizational learning; (3) mentoring in family medicine education, and (4) knowledge synthesis.

**Thesis Courses (24 credits)**

Thesis subject should be related to medical education.

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

**Required Courses (13 credits)**

FMED 505	(3)	Epidemiology and Data Analysis in Primary Care 1
FMED 509	(3)	Epidemiology and Data Analysis in Primary Care 2

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## **12.1.6 Oncology**

### **12.1.6.1 Location**

Gerald Bronfman Department of Oncology  
5100 de Maisonneuve Blvd West, Suite 720  
Montreal QC H4A 3T2  
Website: [mcgill.ca/oncology/](http://mcgill.ca/oncology/)

### **12.1.6.2 Grad. Dip. in Oncology**

The Graduate Diploma in Oncology provides students the opportunity to gain e

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

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

**Required Courses (12 Credits)**

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

**Complementary Courses (12 Credits)**

6 credits from:

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

OR

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

OR

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

OR

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

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

3 credits from:

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

OR

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

3 credits from:

EPIB 671	(3)	Cancer Epidemiology and Prevention
EXMD 614	(3)	Environmental Carcinogenesis
EXMD 620	(1)	Clinical Trials and Research 1
EXMD 625	(1)	Clinical Trials and Research 2
EXMD 626	(1)	Clinical Trials and Research 3
EXMD 640	(3)	Experimental Medicine Topic 1
EXSU 505	(3)	Trends in Precision Oncology
FMED 619	(3)	Program Management in Global Health and Primary Health Care
HGEN 690	(3)	Inherited Cancer Syndromes
NUR2 705	(3)	Palliative Care
ONCO 611	(3)	Proteomics for Precision Medicine
ONCO 615	(3)	Principles and Practice of Clinical Trials
ONCO 625	(3)	Quality Improvement Principles and Methods
ONCO 635	(3)	Qualitative and Psychosocial Health Research
ONCO 645	(3)	Seminars in Global Oncology
POTH 637	(3)	Cancer Rehabilitation
PPHS 528	(3)	Economic Evaluation of Health Programs
PSYC 507	(3)	Emotions, Stress, and Illness
SWRK 668	(3)	Living with Illness, Loss and Bereavement

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

### Elective Courses (6 credits)

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

## 12.1.7 Otolaryngology – Head and Neck Surgery

### 12.1.7.1 Location

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

### 12.1.7.2 About Otolaryngology – Head and Neck Surgery

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

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

The master's program is intended for those having with a strong interest in otolaryngology research (e.g., Otolaryngologists, physicians, PhDs, dentists, veterinarians, medical professionals, engineering or science undergraduates etc.). The program addresses research questions using an interdisciplinary approach, combining methodologies of both the clinical sciences and the basic sciences. The master's program is unique in Canada and rare elsewhere.

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

Graduates of the program can better treat ear-nose-throat diseases; they are better positioned to do, and to evaluate, research in Otolaryngology. They typically obtain the most highly sought positions in their fields.

**12.1.7.3 Otolaryngology Admission Requirements and Application Procedures****12.1.7.3.1 Admission Requirements**

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

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

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

**12.1.7.3.2 Application Procedures**

McGill's online application form for graduate program candidates is available at [mcgill.ca/gradapplicants/apply](http://mcgill.ca/gradapplicants/apply).

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

Prospective students should contact research supervisors individually.

**12.1.7.3.2.1 Additional Requirements**

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

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

**12.1.7.3.3 Application Dates and Deadlines**

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

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

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

**12.1.7.4 Otolaryngology – Head and Neck Surgery Faculty****Chair**

N. Sadeghi

**Graduate Program Director and Director of Research**

B. Segal

**Director of Residency Training Program**

K. Richardson

**Director of Head and Neck Oncology Program**

N. Sadeghi

**Director of Undergraduate Medical Education**

J. Young

**Director of Fellowship Training**

J. Rappaport

**Emeritus Professor**

A. Katsarkas

**Professors**



### **12.1.8.3 Pathology Admission Requirements and Application Procedures**

#### **12.1.8.3.1 Admission Requirements**

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



**Professors**

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

**Associate Professors**

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

**Assistant Professors**

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

**Associate Members**

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

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

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

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

**Thesis Courses (30 credits)**

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

**Required Courses (6 credits)**

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

**Complementary Courses (9 credits)**

3 credits, one of the following courses:

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

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

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

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

**Required Courses (12 credits)**

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

PATH 620	(3)	Research Seminar 1
PATH 622	(3)	Research Seminar 2
PATH 701	(0)	Comprehensive Examination - Ph.D. Candidates

### Complementary Courses (9 credits)

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

## 12.1.9 Psychiatry

### 12.1.9.1 Location

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

Website: [mcgill.ca/psychiatry](http://mcgill.ca/psychiatry)  
 TSN Canadian applicants with those in their mother tongue and language of education not English, will

### 12.1.9.2 About Psychiatry

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

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

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

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

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

### 12.1.9.3 Psychiatry Admission Requirements and Application Procedures

#### 12.1.9.3.1 Admission Requirements

- A strong background in science and/or social science, as demonstrated by academic achievement equivalent to a GPA of 3.3 (on a 4-point scale) or 3.5 in the last two years
- An outline of the proposed thesis research,

tThesis Master of Science: Psych

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

### 12.1.9.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at [mcgill.ca/gradapplicants/apply](http://mcgill.ca/gradapplicants/apply).

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

#### 12.1.9.3.2.1 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

### 12.1.9.3.3 Application Dates and Deadlines

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

Application Opening Dates	Application Deadlines	
	Canadian citizens/P	Current McGill Students (any citizenship)





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

The M.Sc. in Experimental Surgery; Digital Health Innovation focuses on the basics of clinical epidemiology, medical artificial intelligence, clinical innovation, and applied data science, including the use and generation of digitized health and social data using specialized software. Fundamentals of current AI applications in medicine, methods to employ big data in clinical tool development, mathematical principals underpinning digital health and big data, and design thinking methodology in clinical innovation. High-volume streams of clinical and health-related data from clinical systems,use and gener5s. Hig4.129

### 12.1.10.3 Experimental Surgery Admission Requirements and Application Procedures

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

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

#### 12.1.10.4 Surgery, Experimental Faculty

##### Director

F. Mwale

##### Professors

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

##### Associate Professors

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

##### Assistant Professors

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

##### Adjunct Professor

Louis-Nicolas Veilleux

##### Associate Members

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

##### Professors of Practice

S. Arless, S. Kozlick

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

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

##### Thesis Courses (30 credits)

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

##### Required Courses (6 credits)

EXSU 602	(3)	Knowledge Management 2
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And:

3 credits from the following:



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

**Complementary Courses (9 credits)**

9 credits, taken from 500, 600, or 700 level courses in consultation with the Research Advy mtgloCour



And:

3 credits from the following:

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

This M.Sc. in Experimental Surgery (Non Thesis) offers a graduate level training program in core fundamentals of modern surgical research. The program is based primarily on academic course work and short projects. It is designed to be flexible and provide students the opportunity to gain core disciplines whilst allowing training opportunities in more specific areas such as global surgery, innovation, education, or as the interest of the students dictates. The individual research interests of the faculty cover a wide spectrum, from injury, repair, recovery, tissue engineering, transplantation, fibrosis, cancer and stem cell biology, biomechanics, and organ failure, to surgical simulation, surgical innovation, education, and evaluative/outcomes research. Importantly, the project(s) is performed in a collaborative spirit with basic and clinician scientists working together using interdisciplinary approaches to solve the most challenging problems in the field of surgery. Upon graduation, students will have acquired core skills on statistics, knowledge management, biomedical research, epidemiology as well as education, global surgery, and innovation.

**Required Courses (12 credits)**

EXSU 500	(3)	Artificial Intelligence in Medicine
EXSU 602	(3)	Knowledge Management 2
EXSU 623	(6)	Surgery Research Project 2

**Complementary Courses (24 credits)**

3 credits selected from:

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

Or 3 credits of a research design or statistics course at the 500 level or higher.

3 credits selected from:

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

6 credits selected from the following\*:

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

\*Note: Students either take EDPE 637 and EDPH 689; or EPIB 521 and PPHS 528; or EXSU 620 and EXSU 621; or EXSU 505 and any course in the course grouping available in a given year if the number of registered students has not exceeded the projected enrolment.

12 credits selected from:

BMDE 653	(3)	Patents in Biomedical Engineering
BMDE 654	(3)	Biomedical Regulatory Affairs - Medical Devices
BMDE 655	(3)	Biomedical Clinical Trials - Medical Devices
DENT 669	(3)	Extracellular Matrix Biology
EDPE 637	(3)	Issues in Health Professions Education
EDPE 687	(3)	Qualitative Methods in Educational Psychology
EDPH 689	(3)	Teaching and Learning in Higher Education
EPIB 681	(3)	Global Health: Epidemiological Research

EXMD 609	(3)	Cellular Methods in Medical Research
EXMD 610	(3)	Molecular Methods in Medical Research
EXSU 501	(6)	Medical Technology Internship 1
EXSU 601	(3)	Knowledge Management 1
EXSU 605	(3)	Biomedical Research Innovation
EXSU 620	(3)	Surgical Innovation 1
EXSU 621	(3)	Surgical Innovation 2
EXSU 622D1	(6)	Surgery Research Project 1
EXSU 622D2	(6)	Surgery Research Project 1
EXSU 684	(3)	Signal Transduction
FMED 619	(3)	Program Management in Global Health and Primary Health Care
PHGY 518	(3)	Artificial Cells
PHGY 550	(3)	Molecular Physiology of Bone
PPHS 511	(3)	Fundamentals of Global Health
PPHS 529	(3)	Global Environmental Health and Burden of Disease

### Elective Courses (9 credits)

9 credits taken from 500-, 600-, or 700-level courses at the University, which may include courses from the list above, will be taken with the approval of the director of the program/adviser.

Revision, June 2022. End of revision.

### 12.1.10.12 Doctor of Philosophy (Ph.D.) Experimental Surgery

#### Thesis

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

### Required Courses (3 credits)

EXSU 700	(0)	Comprehensive Examination
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And:

3 credits from the following:

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

### Complementary Courses (12 credits)

6 credits from the following:

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

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

**Complementary Courses (9 credits)**

9 credits from the following:

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

Or:

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

**Elective Courses (6 credits)**

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

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

**12.2 Biomedical Sciences****12.2.1 Location**

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

**12.2.2 Anatomy and Cell Biology****12.2.2.1 Location**

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

**12.2.2.2 About Anatomy and Cell Biology**

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

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

- neurobiology;
- aging.

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

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

### **Funding**

The minimum yearly stipend for Canadian Citizens and Permanent Residents is \$20,000 for MSc students, and \$22,000 for PhD students. MSc and PhD International students will receive a minimum yearly stipend of \$24,000 to compensate for tu5 w





## **Associate Members**

*Biomedical Engineering:* Maryam Tabrizian

*Dental Medicine and Oral Health Sciences:* Mari T. Kaartinen, Svetlana Komarova

*Endocrinology & Metabolism*

3 credits selected from:

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

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

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

#### Thesis

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

#### Required Courses

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

### 12.2.3 Biochemistry

#### 12.2.3.1 Location

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

#### 12.2.3.2 About Biochemistry

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

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

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

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

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

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

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

Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering.



**Associate Professors**

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

**Assistant Professors**

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

**Associate Members**

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

**Adjunct Professors**

Jacques Drouin, Enrico Purisima, Julie St-Pierre.

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

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

**Required Course (3 credits)**

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

At least 3 credits must be chosen from the following:

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

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

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

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

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

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

**Required Courses (6 credits)**

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

**Complementary Courses\* (9 credits)**

3 credits to be chosen from the following courses:

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

Plus 6 credits from the following courses:

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

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

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

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

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

**Required Course (3 credits)**

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

Two of the following courses:

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



BIOC 690

(1)

Seminars in Chemical Biology 4

At least 3 credits from the follo

BIOC 701\*\*

(0)

Research Seminar 1

Ph.D. Thesis Propn49 72a11 0 0 1 165.864 725.54 Tm(Thes)

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

### Complementary Courses\*\*\* (9 credits)

3 credits from the following:

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

Plus 6 credits from the following:

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

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

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

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

#### Thesis

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

#### Required Courses (7 credits)

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

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

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

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

### Complementary Courses\*\*\* (9 credits)

At least 3 credits from the following:

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

At least 3 credits from the following:

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

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

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

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

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

## 12.2.4 Biomedical Engineering

### 12.2.4.1 Location

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

Telephone: 514-398-6736

Fax: 514-398-7461

Website: [mcgill.ca/bme](http://mcgill.ca/bme)

### 12.2.4.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at [mcgill.ca/gradapplicants/apply](http://mcgill.ca/gradapplicants/apply).

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

Please address enquiries directly to the Department.

### 12.2.4.3.3 Application Dates and Deadlines

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

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

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



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

### 12.2.4.4 Biomedical Engineering Faculty

#### Chair

D. Juncker

#### Emeritus Professors

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

#### Professors

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

#### Associate Professors

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

#### Assistant Professors

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

#### Associate Members

M. Amabili; S. Baillet; C. Baker; S. Blain-Moraes; M. Chacron; X. Chai; M. Chakravarty; J. Ding; M. Driscoll;

The program consists of three main components that are unique to the translational process in biomedical engineering, including: 1) translational course on intellectual property, regulatory affairs, quality management systems, clinical trials and reimbursement; 2) fundamental science courses in biomedical engineering; and 3) an experiential component, comprising of a closely supervised 4-month internship in the biomedical engineering industry.

None of the courses taken in the graduate certificate in Translational Biomedical Engineering can be credited towards the M.Sc.(Applied) once the graduate certificate has been awarded.

### Required Courses (30 credits)

BMDE 653	(3)	Patents in Biomedical Engineering
BMDE 654	(3)	Biomedical Regulatory Affairs - Medical Devices
BMDE 655	(3)	Biomedical Clinical Trials - Medical Devices
BMDE 656	(3)	Medical Device Reimbursement
BMDE 657D1	(9)	Biomedical Engineering Industry Internship
BMDE 657D2	(9)	Biomedical Engineering Industry Internship

### Complementary Courses (15 credits)

15 credits to be chosen listed from courses below, or other relevant 500-, 600- or 700-level courses chosen in consultation and with approval of the Program Director and the concerned offering unit/department.

#### General Biomedical Engineering

BMDE 501	(3)	Selected Topics in Biomedical Engineering
BMDE 600D1	(1.5)	Seminars in Biomedical Engineering
BMDE 600D2	(1.5)	Seminars in Biomedical Engineering

#### Biomedical Signals and Systems

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

#### Medical Imaging

BMDE 610	(3)	Functional Neuroimaging Fusion
BMDE 650	(3)	Advanced Medical Imaging
BMDE 660	(3)	Advanced MR Imaging and Spectroscopy of the Brain
MDPH 607	(3)	Medical Imaging

#### Biomaterials and Tissue Engineering

BMDE 503	(3)	Biomedical Instrumentation
BMDE 508	(3)	Introduction to Micro and Nano-Bioengineering

#### Rehab Engineering

BMDE 525D1	(3)	Design of Assistive Technologies: Principles and Praxis
BMDE 525D2	(3)	Design of Assistive Technologies: Principles and Praxis

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



## 12.2.5 Human Genetics

### 12.2.5.1 Location

Department of Human Genetics  
Strathcona Anatomy & Dentistry Building  
3640 University Street, Room 2/38F  
Montreal QC H3A 0C7  
Canada  
Telephone: 514-398-4198  
Fax: 514-398-2430  
Email: [dept.humangenetics@mcgill.ca](mailto:dept.humangenetics@mcgill.ca)  
Website: [mcgill.ca/humangenetics](http://mcgill.ca/humangenetics)

### Administration

Ross MacKay – *Student Affairs Advisor*

Email: [ross.mackay@mcgill.ca](mailto:ross.mackay@mcgill.ca)

Rimi Joshi – *Student Affairs Coordinator*

Email: [grad.hg@mcgill.ca](mailto:grad.hg@mcgill.ca)

### 12.2.5.2 About Human Genetics

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

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

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

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

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

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

The Graduate Training Committee requires that students who have been accepted into the M.Sc. or Ph.D. in Human Genetics research graduate program have a guaranteed minimum stipend of \$15,000, plus the full amount of tuition and fees. Detailed information regarding financing the 16..

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

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

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

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

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

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

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

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

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

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

The M.Sc. in Genetic Counselling program provides the academic foundation and clinical training required for the contemporary practice of genetic counselling. Genetic counsellors are health professionals who provide information and support to families who have members with birth defects or genetic disorders and to families who may be at risk for a variety of inherited conditions. Genetic counsellors investigate

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

Institute and Hospital, the McGill Life Sciences Complex, the *McGill University & Genome Quebec Innovation Centre*, the Biomedical Ethics Unit, and the *Centre for Genomics and Policy*.

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

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

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

### **12.2.5.3 Human Genetics Admission Requirements and Application Procedures**

#### **12.2.5.3.1 Admission Requirements**

##### **M.Sc. in Genetic Counselling**

##### **Prerequisites:**

- Bachelor's or medical degree – minimum cumulativ

**M.Sc. Genetic Counselling program\* (Non-Thesis)**

<b>Application Opening Dates</b>		<b>Application Deadlines</b>		
		<b>All Applicants</b>	<b>Non-Canadian citizens (incl. Special, Visiting &amp; Exchange)</b>	<b>Canadian citizens/Perm. residents of Canada (incl. Special, Visiting &amp; Exchange)</b>
<b>Fall Term:</b>	Sept. 15	Jan. 01	Jan. 01	Jan. 01
<b>Winter Term:</b>	N/A	N/A	N/A	N/A
<b>Summer Term:</b>	N/A	N/A	N/A	N/A

**M.Sc. (Thesis) and Ph.D. Human Genetics programs****A****Application Deadlines**

### Adjunct Professors

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

### Adjunct Member

D. Vinh

### Associate Members

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

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

### Thesis Courses (33 credits)

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

**Required Courses (6 credits)**

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.

**12.2.5.7 Master of Science (M.Sc.) Human Genetics (Thesis): Bioethics (45 credits)****Thesis Courses (30 credits)**

30 credits selected as follows:

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

**Required Courses (12 credits)**

12 credits from:

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

**Complementary Courses (3 credits)**

3 credits from the following:

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

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

HGEN 600D1	(3)	Genetic Counselling Practicum
HGEN 600D2	(3)	Genetic Counselling Practicum
HGEN 601	(3)	Genetic Counselling Principles
HGEN 610D1	(3)	Genetic Counselling: Independent Studies
HGEN 610D2	(3)	Genetic Counselling: Independent Studies

HGEN 617	(3)	Principles of Medical Genetics
HGEN 620	(3)	Introductory Field Work Rotations 1
HGEN 621	(6)	Introductory Field Work Rotations 2
HGEN 630D1	(6)	Advanced Field Work Rotations
HGEN 630D2	(6)	Advanced Field Work Rotations
HGEN 640	(3)	Second Year Practicum 1
HGEN 641	(3)	Second Year Practicum 2
IPEA 503	(0)	Managing Interprofessional Conflict
PATH 653	(3)	Reading and Conference

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

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

#### Thesis

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

#### Required Courses (3 credits)

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

#### Complementary Courses (15 credits)

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

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

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

Students are restricted to taking the following course.

HGEN 670	(3)	Advances in Human Genetics 1
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Note: The Graduate Advisory Committee may stipulate additional coursework depending on the background of the candidate.

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

\*\* This program is currently not offered. \*\*

#### Thesis

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

#### Required Courses (6 credits)

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar
HGEN 692	(3)	Human Genetics
HGEN 701	(0)	Ph.D. Comprehensive Examination

#### Complementary Courses (6 credits)

\* Two courses from the following:

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

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

## 12.2.6 Microbiology and Immunology

### 12.2.6.1 Location

Department of Microbiology and Immunology  
Duff Medical Building, Room 511  
3775 University Street



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

The primary goal of this program is to pro

**Application Opening  
Dates**

**Application Deadlines**

**Curr**

**Required Courses (6 credits)**

MIMM 611	(3)	Graduate Seminars 1
MIMM 612	(3)	Graduate Seminars 2

**Complementary Courses (6 credits)**

Minimum 6 credits from:

MIMM 607	(3)	Biochemical Pathology
MIMM 616	(3)	Reading and Conference 1
MIMM 617*	(3)	Reading and Conference 2
MIMM 618*	(3)	Reading and Conference 3
MIMM 619*	(3)	Reading and Conference 4
NEUR 502	(3)	Basic and Clinical Aspects of Neuroimmunology

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

\* Not offered in every academic year.

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

The primary goal of the Ph.D. program is to create a self-propelled researcher, proficient in experimental designs and advanced methodologies parallel b

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](mailto:gradstudies.pharmacology@mcgill.ca)  
Website: [mcgill.ca/pharma](http://mcgill.ca/pharma)

#### **12.2.7.2 About Pharmacology and Therapeutics**

The Department of Pharmacology and Therapeutics offers training leading to **M.Sc.** (Thesis) and **Ph.D.** degrees.

Pharmacology is a multidisciplinary science that deals with all aspects of drugs and their interactions with li

### ***section 12.2.7.9: Graduate Certificate (Gr. Cert.) Biomedical Science Translational Research (15 credits)***

The Graduate Certificate in Biomedical Science Translational Research is an introduction to relevant clinical aspects of translating scientific discovery as a means of bridging the gap between research and application in clinical settings, while promoting future collaboration among scientists, clinicians and clinician-scientists while promoting future collaboration. The program includes clinical mentorship.

#### **12.2.7.3 Pharmacology and Therapeutics Admission Requirements and Application Procedures**

##### **12.2.7.3.1 Admission Requirements**

Candidates are required to hold a B.Sc. degree in a discipline relevant to the proposed field of study; those with the M.D., D.D.S., or D.V.M. degrees are also eligible to apply. A background in the health sciences is recommended, but programs in biology, chemistry, mathematics, and physical sciences may be acceptable.

Admission is based on a student's academic record, letters of assessment, and, whenever possible, interviews with staff members. Students are required to take the Graduate Record Examination Aptitude Test (*GRE*) and the Test of English as a Foreign Language (*TOEFL*) or the equivalent, except as follows: in accordance with McGill policy, only those whose mother tongue is English, who graduated from a recognized Canadian institution (anglophone or francophone), or who completed an undergraduate or graduate degree at a recognized foreign institution where English is the language of instruction are exempt from providing proof of competency in English.

Inquiries relating to all aspects of graduate study should be directed to the *Graduate Coordinator*, Department of Pharmacology and Therapeutics, as early as possible in each academic year.

##### **12.2.7.3.2 Application Procedures**

McGill's online application form for graduate program candidates is available at [mcgill.ca/gradapplicants/apply](http://mcgill.ca/gradapplicants/apply).

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

##### *12.2.7.3.2.1 Additional Requirements*

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

- Curriculum Vitae
- Personal Statement
- GRE – required for degrees from outside North America

##### **12.2.7.3.3 Application Dates and Deadlines**

### Emeritus Professors

R. Capek, B. Collier, P. McLeod, H.H. Zingg,

### Professors

D. Bernard, D. Bowie, P.B.S. Clarke, A.C. Cuello, B.F. Hales, T. Hébert, D. Maysinger, A. McKinney, G. Multhaup, A. Ribeiro-da-Silva, B. Robaire, H. Saragovi, M. Szyf, J. Trasler

### Associate Professors

B. Castagner, L. Münter, J. Tanny, J.F. Trempe

### Assistant Professors

M. McKeague, A. Thanabalasuriar

### Associate Members

C. Baglolle, S. Gauthier, S. Laporte, N. Luedtke, K. Mann, S. Nattel, C. O'Flaherty, S. Rousseau, E. Zorychta

### Adjunct Professors

B. Allen, S. Chemtob, Y. De Koninck, G. FitzHarris, J. S. Joyal, F. Le Boeuf, T. Sanderson, L. Stone

### Affiliate Members

M. Boucher, L. Breton, L. Garolalo, J. Gillard, J. Mancini, K. Meerovitch, C. Wright

#### 12.2.7.5 Master of Science (M.Sc.) Pharmacology (Thesis) (45 credits)

The M.Sc. in Pharmacology focuses on research methodology, conducting a research project, analyzing data, and writing a thesis. It involves training in research professionalism, scientific communication, and statistics, critically analyzing scientific literature, and developing and conducting an original research project for scientific publication.

#### Thesis Courses (30 credits)

PHAR 696	(3)	Thesis Preparation
PHAR 697	(6)	Thesis Preparation 1
PHAR 698	(9)	Thesis Preparation 2
PHAR 699	(12)	Thesis Preparation 3

#### Required Courses (15 credits)

PHAR 601	(6)	Research Seminar
PHAR 602	(3)	Principles of Pharmacology
PHAR 609	(1)	Research Professionalism for Pharmacologists
PHAR 610	(2)	Scientific Communication for Pharmacologists
PHAR 712	(3)	Statistics for Pharmacologists

#### 12.2.7.6 Master of Science (M.Sc.) Pharmacology (Thesis): Environmental Health Sciences (45 credits)

The M.Sc. in Pharmacology; Environmental Health Sciences program is designed to train professionals for advanced basic research, teaching 0 0 M70.16 M.Sc663 Mg61

PHAR 699	(12)	Thesis Preparation 3
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### Required Courses (21 credits)

PHAR 601	(6)	Research Seminar
PHAR 602	(3)	Principles of Pharmacology
PHAR 609	(1)	Research Professionalism for Pharmacologists
PHAR 610	(2)	Scientific Communication for Pharmacologists
PHAR 670	(3)	Principles of Environmental Health Sciences 1
PHAR 671	(3)	Principles of Environmental Health Sciences 2
PHAR 712	(3)	Statistics for Pharmacologists

### 12.2.7.7 Doctor of Philosophy (Ph.D.) Pharmacology

The Ph.D. in Pharmacology focuses on research methodology, conducting a research project, analyzing data, and writing a thesis. It involves training in research professionalism, scientific communication, and statistics, critically analyzing scientific literature, and developing and conducting an original research project for scientific publication.

#### Thesis

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

### Required Courses (9 credits)

PHAR 602	(3)	Principles of Pharmacology
PHAR 609	(1)	Research Professionalism for Pharmacologists
PHAR 610	(2)	Scientific Communication for Pharmacologists
PHAR 701	(0)	Ph.D. Comprehensive Exam
PHAR 712	(3)	Statistics for Pharmacologists

### Complementary Courses (3 credits)

3 credits from the following:

PHAR 702	(3)	Topics in Pharmacology 1
PHAR 703	(3)	Topics in Pharmacology 2
PHAR 704	(3)	Topics in Pharmacology 3
PHAR 705	(3)	Topics in Pharmacology 4
PHAR 706	(3)	Topics in Pharmacology 5

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

**Required Courses (15 credits)**

PHAR 602	(3)	Principles of Pharmacology
PHAR 609	(1)	Research Professionalism for Pharmacologists
PHAR 610	(2)	Scientific Communication for Pharmacologists
PHAR 670	(3)	Principles of Environmental Health Sciences 1
PHAR 671	(3)	Principles of Environmental Health Sciences 2
PHAR 701	(0)	Ph.D. Comprehensive Exam
PHAR 712	(3)	Statistics for Pharmacologists

**Complementary Courses (3 credits)**

3 credits from the following:

PHAR 702	(3)	Topics in Pharmacology 1
PHAR 703	(3)	Topics in Pharmacology 2
PHAR 704	(3)	Topics in Pharmacology 3
PHAR 705	(3)	Topics in Pharmacology 4
PHAR 706	(3)	Topics in Pharmacology 5
PHAR 707	(3)	Topics in Pharmacology 6

or the equivalent, upon approval by the Graduate Training Committee (GTC.)

**12.2.7.9 Graduate Certificate (Gr. Cert.) Biomedical Science Translational Research (15 credits)**

The Graduate Certificate in Biomedical Science Translational Research is an introduction to relevant clinical aspects of translating scientific discovery as a means of bridging the gap between research and application in clinical settings, while promoting future collaboration among scientists, clinicians and clinician-scientists while promoting future collaboration. The program includes clinical mentorship.

**Required Courses (12 credits)**

FMED 525	(3)	Foundations of Translational Science
PHAR 522D1	(3)	Fundamentals of Disease Therapy
PHAR 522D2	(3)	Fundamentals of Disease Therapy
PHAR 524	(3)	Clinical Mentorship

**Complementary Courses (3 credits)**

3 credits from:

BMDE 655	(3)	Biomedical Clinical Trials - Medical Devices
EPIB 507	(3)	Biostats for Health Sciences
EXMD 617	(1)	Workshop in Clinical Trials 1
EXMD 618	(1)	Workshop in Clinical Trials 2
EXMD 619	(1)	Workshop in Clinical Trials 3
EXMD 620	(1)	Clinical Trials and Research 1
EXMD 633	(3)	Clinical Aspects of Research in Respiratory Diseases
EXMD 640	(3)	Experimental Medicine Topic 1



PHAR 508	(3)	Drug Discovery and Development 3
PHAR 529	()	

## 12.2.8 Physiology

### 12.2.8.1 Location

Department of Physiology  
 McIntyre Medical Sciences Building  
 3655 Promenade Sir-William-Osler  
 Montreal QC H3G 1Y6 Canada  
 Telephone: 514-398-4343  
 Website: [mcgill.ca/physiology](http://mcgill.ca/physiology)

### 12.2.8.2 About Physiology

The Physiology Department offers training leading to **M.Sc.** and **Ph.D.** degrees. The scope of the ongoing research, and close connections with the McGill teaching hospitals, offer excellent opportunities for collaborations with hospital-based scientists. Research in the Department covers a broad range of topics from systems neuroscience to molecular and cellular biology. Interests include studies of nuclear and membrane receptors, transporters, channels, and signal transduction pathways, to the broader integration of physiological systems (cardiovascular, respiratory, renal, endocrine, immune, and central nervous systems) using an array of molecular and cellular approaches as well as quantitative techniques in data collection, analysis, and mathematical modelling by computational means.

All graduate students in Physiology receive financial support. Any faculty or associate member who agrees to supervise a graduate student who does not hold a fellowship is financially responsible for that student. Students are encouraged to apply for a fellowship; further information is available at [mcgill.ca/physiology/graduate-studies/financial-other-assistance](http://mcgill.ca/physiology/graduate-studies/financial-other-assistance).

#### *section 12.2.8.5: Master of Science (M.Sc.) Physiology (Thesis) (45 credits)*

The M.Sc. program is intended for students from an academic background wishing to pursue careers in academia, industry, or medicine. The multidisciplinary nature of the Department exposes students to a vast array of research interests and experimental approaches. Thesis work is available in a broad range of disciplines from molecular and cellular to systems physiology covering multiple organ systems. Students wishing to continue to the doctoral program have the option of transferring to the Ph.D., and waiving the M.Sc. thesis submission.

#### *section 12.2.8.6: Master of Science (M.Sc.) Physiology (Thesis): Bioinformatics (45 credits)*

The intention of the Bioinformatics option is to train M.Sc. students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating of bioinformatics data, the integration of biological databases, and the use of algorithms and statistics. Students successfully completing the Bioinformatics option will be fluent in the concepts, language, approaches, and limitations of the field. The option consists of a number of interdisciplinary courses and a seminar designed to bring students from many backgrounds together and to provide a thorough overview of research in this field.

#### *section 12.2.8.7: Master of Science (M.Sc.) Physiology (Thesis): Chemical Biology (45 credits)*

The Chemical Biology option is designed to expose students to aspects of drug design and development, as well as their application to the study of physiological and pathophysiological processes. In addition to thesis work with appropriate mentors, students will participate in lectures, seminar courses, and thematic workshops, all of which are designed to familiarize students with the current state of the field. This interdisciplinary approach will develop researchers interested in academic careers or in the pharmaceutical and biotechnology industries.

#### *section 12.2.8.8: Doctor of Philosophy (Ph.D.) Physiology*

The doctoral program is intended for students from a strong academic background wishing to pursue research-intensive careers in academia, industry, or medicine. The multidisciplinary nature of the Department exposes students to a vast array of research interests and experimental approaches. Thesis work provides in-depth training in a broad range of disciplines from molecular and cellular to systems physiology covering multiple organ systems.

#### *section 12.2.8.9: Doctor of Philosophy (Ph.D.) Physiology: Bioinformatics*

The intention of the Bioinformatics option is to train Ph.D. students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating of bioinformatics data, the integration of biological databases, and the use of algorithms and statistics. Students successfully completing the Bioinformatics option will be fluent in concepts, language, approaches, and limitations of the field. The option consists of a number of interdisciplinary courses and a seminar designed to bring students from many backgrounds together and to provide a thorough overview for

### *section 12.2.8.10: Doctor of Philosophy (Ph.D.) Physiology: Chemical Biology*

The Chemical Biology option is designed to expose students to aspects of drug design and development, as well as their application to the study of physiological and pathophysiological processes. In addition to thesis work with appropriate mentors, students will participate in lectures, seminar courses, and thematic workshops—all of which are designed to familiarize students with the current state of the field. This interdisciplinary approach will develop researchers interested in academic careers or in the pharmaceutical and biotechnology industries.

#### **12.2.8.3 Physiology Admission Requirements and Application Procedures**

##### **12.2.8.3.1 Admission Requirements**

Admission to the graduate program is based on an evaluation by the Graduate Student Admissions and Advisory Committee (GSAAC), and on being accepted by a research supervisor. Final acceptance is contingent upon approval of the recommendation of the applicant by Enrolment Services, from whom official notification will be received.

Candidates for the M.Sc. degree must hold a B.Sc. degree or its equivalent. Candidates who have completed an M.Sc. may be admitted directly to the Ph.D. program. M.Sc. students interested in a Ph.D. may fast track to the Ph.D. program after 12–18 months. The M.Sc. thesis requirement is then waived. Candidates with exceptional academic records may be considered to proceed directly to the Ph.D. degree from the B.Sc. degree.

A minimum CGPA of 3.2 out of 4.0 or a GPA of 3.4 in the last two years is required for an application to be considered.

The *GRE* General Test is no longer required.

##### **Language Requirements**

Test of English as a Foreign Language (*TOEFL*): minimum score of 86 on the Internet-based test with each component score not less than 20 OR IELTS (International English Language Testing System) with an overall band of 6.5 or greater. Only those whose mother tongue is English, who graduated from a North American institution (anglophone or francophone) or who completed an undergraduate or graduate degree at a foreign institution where English is the language of instruction are exempt from providing proof of competency in English.

##### **12.2.8.3.2 Application Procedures**

McGill's online application form for graduate program candidates is available at [mcgill.ca/gradapplicants/apply](http://mcgill.ca/gradapplicants/apply).

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures

#### **12.2.8.4 Physiology Faculty**

##### **Chair**

John White

##### **Graduate Program Director**

Alvin Shrier

##### **Emeritus Professors**

Thomas M.S. Chang, Leon Glass, Kresimir Krnjevic, Wayne S. Lapp, Mortimer Levy, Michael Mackey, George Mandl, Geoffrey Melvill Jones, Joseph Milic-Emili, Canio Polosa, Douglas G.D. Watt

##### **Associate Professor (Post-Retirement)**

Ann Wechsler

##### **Professors**

Maurice Chacron, Monroe W. Cohen, Ellis J. Cooper, Phil Gold, John Hanrahan, David Goltzman, Steve Lomber, Gergely Lukacs, Sheldon Magder, John Orłowski, Alvin Shrier, John White

##### **Associate Professors**

Claire Bro

PHGY 622	(12)	Thesis 2
PHGY 623	(3)	M.Sc. Final Seminar

**Required Courses (12 credits)**

PHGY 601	(1)	M.Sc. Proposal Seminar
PHGY 602	(2)	Literature Search and Research Proposal
PHGY 604	(0)	Responsible Conduct in Research
PHGY 607	(3)	Laboratory Research 1
PHGY 608	(3)	Laboratory Research 2
PHGY 620	(3)	Progress in Research

**Elective Courses (6 credits)**

Students must select 6 approved credits in Physiology or Science at the 500 level or above.

**12.2.8.6 Master of Science (M.Sc.) Physiology (Thesis): Bioinformatics (45 credits)**

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**Thesis Courses (27 credits)**

PHGY 621	(12)	Thesis 1
PHGY 622	(12)	Thesis 2
PHGY 623	(3)	M.Sc. Final Seminar

**Required Courses (12 credits)**

PHGY 601	(1)	M.Sc. Proposal Seminar
PHGY 602	(2)	Literature Search and Research Proposal
PHGY 604	(0)	Responsible Conduct in Research
PHGY 607	(3)	Laboratory Research 1
PHGY 608	(3)	Laboratory Research 2
PHGY 620	(3)	Progress in Research

**Complementary Courses (6 credits)**

3 credits from the following Chemical Biology seminars:

BIOC 610	(1)	Seminars in Chemical Biology 1
BIOC 611	(1)	Seminars in Chemical Biology 3
BIOC 689	(1)	Seminars in Chemical Biology 2
BIOC 690	(1)	Seminars in Chemical Biology 4

3 credits from the following:

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

**12.2.8.8 Doctor of Philosophy (Ph.D.) Physiology****Thesis**

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

**Required Courses (8 credits)**

PHGY 604	(0)	Responsible Conduct in Research
PHGY 701	(0)	Ph.D. Comprehensive Examination
PHGY 703	(1)	Ph.D. Progress Seminar 1
PHGY 704	(1)	Ph.D. Progress Seminar 2
PHGY 720	(1)	Ph.D. Seminar Course 1
PHGY 721	(1)	Ph.D. Seminar Course 2
PHGY 722	(1)	Ph.D. Seminar Course 3
PHGY 723	(1)	Ph.D. Seminar Course 4
PHGY 724	(1)	Ph.D. Seminar Course 5

PHGY 725

(1)

Ph.D. Seminar Course 6

**Elective Courses (9 credits)**

9 credits of Physiology or Science at the 500 level or above, in consultation with the GSAA

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

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**Communication Sciences and Disorders**

- 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 [Mc 0 0CII Cs cr0 1 146.162 70nrng39 gB682.5](#)





### 12.3.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at [mcgill.ca/gradapplicants/apply](http://mcgill.ca/gradapplicants/apply).

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

Please see the [School of Communication Sciences and Disorders website](#) for required application materials.

#### 12.3.3.2.1 Additional Requirements

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

##### M.Sc. (Applied)

- [Casper Online Test](#)
- 21 credits Prerequisite coursework, provide details in uApply as specified
- Brief personal statement
- Curriculum Vitae
- Two Reference Letters (one professional and one academic)

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

- Personal Statement
- Curriculum Vitae
- Writing Sample
- Acceptance by a research supervisor
- Two Reference Letters (academic)

If available, applicants are encouraged to submit reports of their performance on the Graduate Record Examination ([GRE](#)).

### 12.3.3.3 Application Dates and Deadlines

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

**Application Opening  
Dates**

**Application Deadlines**

**Current McGill Students (any**

**Assistant Professors**

Noémie Auclair-Ouellet

**Assistant Professors (Professional)**

Kelly Root, Sophie Vaillancourt

**Faculty Lecturers**

Mariska Burger, Lauren Tittley

**Assistant Professors (Part-Time)**

Christina Lattermann, Rosalee Shenker

**Faculty Lecturers (Part-Time)**

Mary Jane Blais, Liliane Brunetti,

IPEA 501	(0)	Communication in Interprofessional Teams
IPEA 502	(0)	Patient-Centred Care in Action
SCSD 609	(3)	Neuromotor Disorders
SCSD 611D1	(.5)	Essential Competencies for Speech-Language Pathology 1
SCSD 611D2	(.5)	Essential Competencies for Speech-Language Pathology 1
SCSD 612D1	(.5)	Essential Competencies for Speech-Language Pathology 2
SCSD 612D2	(.5)	Essential Competencies for Speech-Language Pathology 2
SCSD 613	(1)	Counselling in Speech-Language Pathology
SCSD 614	(3)	Literacy Across the Lifespan
SCSD 616	(3)	Foundations of Audiology
SCSD 617	(1)	Anatomy and Physiology for Speech-Language Pathology
SCSD 619	(3)	Phonological Development
SCSD 624	(3)	Language Development and Processes
SCSD 625	(2)	ASD and Neurodevelopmental Disorders 2
SCSD 626	(2)	Aural Rehabilitation 2
SCSD 627	(3)	Practicum and Seminar 3A
SCSD 628	(3)	Practicum and Seminar 4A
SCSD 629	(2)	Augmentative and Alternative Communication 2
SCSD 630	(2)	Research and Measurement Methodologies 2
SCSD 631	(2)	Speech Science
SCSD 632	(3)	Phonological Disorders: Children
SCSD 636	(3)	Fluency Disorders
SCSD 637	(3)	Developmental Language Disorders 1
SCSD 638	(2)	Neurolinguistics
SCSD 639	(3)	Voice Disorders
SCSD 643	(3)	Developmental Language Disorders 2
SCSD 644	(3)	Acquired Language Disorders
SCSD 646	(4)	Introductory Clinical Practicum
SCSD 679	(12)	Advanced Clinical Practicum
SCSD 680	(3)	Deglutition and Dysphagia
SCSD 681	(3)	Practicum and Seminar 1
SCSD 682	(3)	Practicum and Seminar 2
SCSD 688	(1)	Genetics in Speech-Language Pathology Practice
SCSD 689	(1)	Management Cranio-Facial Disorders

### 12.3.7 Doctor of Philosophy (Ph.D.) Communication Sciences and Disorders

The Ph.D. program provides a foundation for creative research and scientific problem-solving in communication sciences (speech, language, hearing, voice) in typical and atypical populations. The program structure is flexible to encourage students to customize their program through the selection of coursework, seminars, comprehensive topics, research experiences, and thesis topic. The School's doctoral program follows a mentor model and students work closely with faculty supervisors who have international reputations in their respective areas.

Students who have completed a Master's degree with research thesis in Communication Sciences and Disorders or a related area are admitted at level PhD 2. High-caliber students who have not completed a research thesis at the Master's level can enter the Qualifying Year Program (admitted at level PhD 1), which includes extra requirements (coursework and a research project) at the onset of the program.

#### Thesis

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

**Required Courses (6 credits)**

For both PhD 1 and PhD 2:

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

**Complementary Courses (6 or 21 credits)**

For both PhD 1 and PhD 2: 6 credits of statistics courses at the 500 level or higher, pre-approved by the supervisor and the graduate program director.

In addition to the above, students entering at PhD 1 must take the following 15 credits:

SCSD 654	(3)	Advanced Research Seminar 3
SCSD 685	(3)	Research Project 1
SCSD 686	(3)	Research Project 2

Plus 6 credits, of graduate-level courses, pre-approved by the supervisor and the graduate program director.

**12.3.8 Doctor of Philosophy (Ph.D.) Communication Sciences and Disorders: Language Acquisition**

This unique interdisciplinary program focuses on the scientific

EDPE 713	(2)	Language Acquisition Issues 5
EDSL 711	(2)	Language Acquisition Issues 3

In addition to the above, students entering at PhD 1 must take the following 15 credits:

SCSD 654	(3)	Advanced Research Seminar 3
SCSD 685	(3)	Research Project 1
SCSD 686	(3)	Research Project 2

Plus 6 credits, of graduate-level courses pre-approved by the supervisor and the graduate program director.

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## 12.4 Population and Global Health

### 12.4.1 Location

School of Population and Global Health  
 2001 McGill College Avenue  
 Suite 1200  
 Montreal QC H3A 1G1  
 Telephone: 514-398-5776  
 Email: [spgh.med@mcgill.ca](mailto:spgh.med@mcgill.ca)  
 Website: [mcgill.ca/spgh](http://mcgill.ca/spgh)

### 12.4.2 Bioethics

#### 12.4.2.1 Location

Biomedical Ethics Unit  
 2001 McGill College Ave, 12th floor  
 Montreal QC H3A 1G1  
 Telephone: 514-398-6668  
 Website: [mcgill.ca/biomedicalethics/unit/teaching/masters](http://mcgill.ca/biomedicalethics/unit/teaching/masters)

For information, contact the Graduate Program Director:

Jennifer Fishman – [jennifer.fishman@mcgill.ca](mailto:jennifer.fishman@mcgill.ca)

#### 12.4.2.2 About Bioethics

The Biomedical Ethics Unit was established in 1996 with the aim of supporting scholarly research, clinical services, teaching, and public outreach. Members of the unit have backgrounds in law, sociology, molecular genetics, history, medicine, and philosophy. We offer a master's degree specialization in biomedical ethics for selected master's students in the Division of Experimental Medicine, the Department of Family Medicine, Department of Human Genetics, Department of Philosophy, School of Religious Studies, and Faculty of Law.

#### Master's Specialization in Bioethics

The Master's Specialization in Bioethics is sponsored by the:

- Faculty of Medicine and Health Sciences, Division of Experimental Medicine, Department of Human Genetics, Department of Family Medicine;
- Faculty of Law; and
- Faculty of Arts, Department of Philosophy, School of Religious Studies.

Students receive an **M.A.**, **LL.M.**, or **M.Sc.** degree in the discipline chosen with a specialization in Bioethics.

Some applicants are mid-career professionals currently working as physicians, nurses, social workers, other health care providers, or lawyers. Other applicants have recently completed their undergraduate degrees in science, philosophy, law, religious studies, or other disciplines, and wish to pursue specialized master's level training in bioethics before enrolling in doctoral level studies or entering the workplace.

Students pursuing the master's degree specialization normally take two semesters of courses before beginning their master's thesis. Courses offered include Bioethics Theory, Public Health Ethics and Policy, Research Ethics, and a Practicum that includes placement in a clinical or research setting. Research and writing the thesis normally takes one year. Students must also comply with the course and thesis requirements of their home disciplines.

### 12.4.2.3 Bioethics Admission Requirements and Application Procedures

#### 12.4.2.3.1 Admission Requirements

M.D. degree, professional training in a health science, or bachelor's degree in the sciences, social sciences, law, philosophy, or religious studies. Other students may be considered on an individual basis.

Enrolment is limited to 12 students.

#### 12.4.2.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at [mcgill.ca/gradapplicants/apply](http://mcgill.ca/gradapplicants/apply).

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

Applications for the Master's Specialization in Bioethics are made initially through the Faculties of Law, Medicine and Health Sciences (Division of Experimental Medicine, Department of Human Genetics, Department of Family Medicine), and Arts (Department of Philosophy, School of Religious Studies).

Applicants must satisfy the admission criteria for their chosen discipline and those of the Bioethics Unit, which administers the program and teaches the core courses; see [mcgill.ca/biomedicalethicsunit/teaching/masters/apply](http://mcgill.ca/biomedicalethicsunit/teaching/masters/apply).

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

#### 12.4.2.3.3 Application Dates and Deadlines

Deadlines coincide with those of the chosen base discipline. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at [mcgill.ca/gps/contact/graduate-program](http://mcgill.ca/gps/contact/graduate-program).



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

#### 12.4.2.4 Biomedical Ethics Faculty

##### Director

J. Kimmelman

##### Professor

J. Kimmelman

##### Associate Professors

C. Ells, J.R. Fishman, N. King.

##### Assistant Professor

P. Friesen

##### Associate Members

G. Bartlett-Esquilant (*Department of Family Medicine*), J.S. Beaudry (*Faculty of Law*), E. Bereza (*Department of Family Medicine*), F. Carnevale (*Ingram School of Nursing*), R. Gold (*Faculty of Law*), A. Fuks (*Department of Medicine and Health Sciences*), M. Hunt (*School of Physical & Occupational Therapy*), Y. Joly (*Human Genetics*)

### 12.4.3.2 About Epidemiology and Biostatistics

The Department offers **master's and doctoral programs in both Epidemiology and Biostatistics**, as well as a **Master's of Science in Public Health**. The methods learned in these fields are used not only in the study of diseases, but also in clinical research; health services research; public health; program planning and evaluation; and policy development. Our faculty members are at the forefront of their research domains and include epidemiologists, biostatisticians, clinician scientists, medical informatics specialists, public health specialists, health economists, medical sociologists, and health geographers.

Research in the Department spans a broad range of areas, including:

- biostatistics;
- clinical and public health informatics;
- environmental and occupational health;
- health care delivery and organization;
- infectious diseases;
- pharmacoepidemiology;
- population and public health;
- social epidemiology;
- epidemiologic methods;
- chronic diseases;
- reproductive and perinatal epidemiology;
- genetic epidemiology;
- global health;
- causal inference;
- and many cross-disciplinary activities.

Faculty members may have funding available for students through their research grants. We provide rich research environments at five university-affiliated hospitals, public health agencies, and university research centres. Graduates pursue careers in academia, clinical settings, government agencies, NGOs, and industry.

### 12.4.3.3 Epidemiology, Biostatistics and Occupational Health Faculty

#### Chair

Josée Dupuis

#### Emeritus Professors

J.-F. Boivin, L. Joseph, M.S. Kramer, J. McCusker, O.S. Miettinen, I.B. Pless, S.H. Shapiro, G. Thériault, S. Wood-Dauphinee

#### IR



**Associate Members**

*Dental Medicine and Oral Health Sciences:* P. Allison, J. Feine, B. Nicolau

*Family Medicine:* A. Andermann

*Geography:* N. Ross

*Human Genetics:* S. Gravel

*Human Nutrition:* N. Basu

*Internal Medicine, MUHC:* N. Dayan, M. Young

*Medicine:* J. Afilalo, F. Ahmad Kahn, D. Assayag, A. Barkun, M. Behr, S. Bernatsky, J. Bourbeau, P. Brassard, K. Dasgupta, N. Dendukuri, A. Douros, M. Eisenberg, P. Ernst, N. Ezer, I. Fortier, M. Goldberg, A.V. Gonzalez, C. Greenaway, S. Kahn, M. Kaminska, M. Klein, N. Kronfli, T.C. Lee, A. Marelli, N. Mayo, S. Morin, S. Pamidi, N. Pant Pai, L. Pilote, E. Rahme, B. Richards, R. Sapir-Pichhadze, K. Schwartzman, G. Sebastiani, M. Sewitch, J. Shahin, I. Shrier, B. M. Smith, V. Tagalakakis, G. Thanassoulis, E. Vinet

*Neurology and Neurosurgery:* C. Renoux

*Ob/Gyn:* H. Abenhaim, R. Gagnon

*Pediatrics:* G. Altit, M. Beltempo, M. Ben Shoshan, B. Burstein, E. Constantin, G. Dougherty, P. Fontela, B. Foster, P.T-S. Lee, M. Nakhla, M. Oskoui, J. Papenburg

*Physical and Occupational Therapy:* S. Ahmed

*Psychiatry:* S.N. Iyer, E. Latimer, A. Malla, X. Meng, N. Schmitz, J. Shah, B. Thombs

*Sociology:* S. Clark

*Surgery:* A. Andalib, D. Deckelbaum, S. Dumitra, F-H. (L) Lee, A. N. Merguerditchian

**Lecturers**

J.P. Courteau, C. Fuller, M. Kafka, E. Manthorp, C. Kom Mogto, S.-A. Mercure, C. Paquette, B. Pinard, N. Savard

**Adjunct Professors**

*Asociación Civil Selva Amazónica Peru:* M. Casapia

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

*Carleton University:* P. Villeneuve

*Caro Research:* J. Caro

*CISSS Abitibi-Témiscamingue:* O. Sobanjo

*Concordia University:* P.E. Boileau, P. Gasparrini

*Contex:* J.P. Gauvin

*DRSP Montréal:* C. Dea, G. Denis, A. Guyon, Y. Jen, A. Kossowski, R. Lessard, R. Massé, S. Palmieri

*Harvard Univ.:* J. Brownstein

*Health Canada:* C. Gravel

*Hôpital Ste. Justine:* M. Henderson

*Independent:* I. Arnold, E. Braithwaite, K. Krishnan, C. Larson, K. Morrison, L. Scott

*INESSS:* D.A. Roy

*INSPQ:* N. Auger, N. Damestoy, E. Lo, S. Perron, S. Stock

*Montreal Chest Hospital Centre:* P. Rohan

*Mount Sinai:* M. Baltzan

*Shire Inc.:* A. Koutsavlis

*Univ. de Montréal:* M. Keezer, J. Le Lorier, A. Motulsky, C. Quach-Thanh, M.E. Schnitzer, J. Siemiatycki, K. Zinszer

*Univ. of Bern:* A. Chiolero

*Univ. of Bonn:* D. Bartels

## Affiliate Professors

*Independent:* L. De Montigny, J. Merckx

*Univ. Hospital Basel :* J.R. Young

### 12.4.3.4 Epidemiology

The Department offers master's and doctoral degrees in Epidemiology. The methods learned in these fields are used not only in the study of diseases, but also in clinical research, health services research, public health, program planning and evaluation, and policy development. Our faculty members are at the forefront of their research domains and include epidemiologists, biostatisticians, clinician scientists, medical informatics specialists, public health specialists, health economists, medical sociologists, and health geographers. Research in the Department spans a broad range of areas, including:

- clinical and public health informatics;
- environmental and occupational health;
- health care delivery and organization;
- infectious diseases;
- pharmacoepidemiology;
- population and public health;
- social epidemiology;
- epidemiologic methods;
- chronic diseases;
- reproductive and perinatal epidemiology;
- genetic epidemiology;
- global health;
- causal inference;
- and many cross-disciplinary activities.

Faculty members may have funding available for students through their research grants.

*section 12.4.3.4.5: Master of Science (M.Sc.) Epidemiology (Non-Thesis): Pharmacoepidemiology (48 credits)*

analyze pharmacoepidemiological research. Courses require intellectual and academic rigour, and the program provides students with an opportunity to obtain specialized training in pharmacoepidemiology

#### 12.4.3.4.1 Public Health

The Department offers a Master of Science in Public Health. Students apply the methods they learn to the study of diseases, clinical research, health services research, public health, program planning and evaluation, and policy development. Our faculty members are at the forefront of research in epidemiology, biostatistics, clinical medicine, biomedical informatics, public health, health economics, medical sociology, and health geography.

Faculty members in the Department draw on extensive contacts in the public health community locally, nationally, and internationally to facilitate practicum placements in many areas, including:

- urban public health practice;
- clinical and public health informatics;
- environmental and occupational health;
- health care delivery and organization;
- infectious diseases;
- maternal and child health;
- aboriginal health;
- global health.

Graduates are highly sought after for careers in government agencies, NGOs, clinical settings, research, and industry.

#### *section 12.4.3.4.6: Master of Science (M.Sc.) Public Health (Non-Thesis) (60 credits)*

The mission of the Master of Science in Public Health is to train outstanding public health professionals and future leaders by offering a rigorous academic program in methods, research, and practice. This program may be of interest for students from the natural or quantitative sciences (e.g., microbiology, computer science, statistics, economics, geography), social sciences (e.g., sociology, psychology, anthropology), or the health professions (e.g., medicine, nursing, social work, physical and occupational therapy, nutrition). Through a core series of courses, a wide range of electives, and a practicum, students will acquire knowledge and skills in all the core competencies of public health, including public health sciences; assessment and analysis; policy and program planning, implementation and evaluation. Graduates of the program will serve as public health practitioners or research professionals and will possess the competencies and professionalism to carry out broad public health functions in local, provincial, national, and international settings. In exceptional circumstances, the Admissions Committee may take professional experience into account for mid-career or returning/re-entry applicants.

Please consult [mcgill.ca/epi-biostat-occh/academic-programs/grad/epidemiology/applying](http://mcgill.ca/epi-biostat-occh/academic-programs/grad/epidemiology/applying) for information on our requirements.

#### 12.4.34.2.1.2 Application Dates and Deadlines

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

Application Opening Dates	Application Deadlines			
	Non-Canadian citizens	Canadian citizens/Perm. residents of Canada	Current McGill Students (any citizenship)	Special, Visiting & Exchange Students

EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 603	(4)	Intermediate Epidemiology
EPIB 605	(1)	Critical Appraisal in Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 613	(1)	Introduction to Statistical Software
EPIB 621	(4)	Data Analysis in Health Sciences
EPIB 684	(3)	Principles of Environmental Health Sciences 1
EPIB 685	(3)	Principles of Environmental Health Sciences 2
EPIB 686	(3)	Environmental Health Seminar
PPHS 602	(3)	Foundations of Population Health

### **Complementary Courses (6 credits)**

6 credits of coursework, at the 500 level or higher, chosen in consultation with the student's academic adviser or supervisor. Complementary courses are meant to further the student's general knowledge in environment, environmental health, methodologies, and related aspects to a student's project.

### **12.4.3.4.5 Master of Science (M.Sc.) Epidemiology (Non-Thesis): Pharmacoepidemiology (48 credits)**

This program provides in-depth training for graduate students on pharmacoepidemiologic methods and the application of these methods to study the population effects (benefits and harm) of pharmaceutical products. Students will develop knowledge and capacity to critically evaluate pharmacoepidemiologic studies, learn how to apply specific methods and understand how to apply research results for knowledge translation or policy purpose. Career opportunities for graduates are multiple and include work in industry, government, or academia. Students will be required to participate in the Pharmacoepidemiology Journal Club. Research topics must be related to pharmacoepidemiology and approved

EPIB 603	(4)	Intermediate Epidemiology
EPIB 605	(1)	Critical Appraisal in Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 613	(1)	Introduction to Statistical Software
EPIB 621	(4)	Data Analysis in Health Sciences
PPHS 602	(3)	Foundations of Population Health
PPHS 612	(3)	Principles of Public Health Practice
PPHS 630	(12)	MScPH Practicum/Project

Practicum/Project

If a stream is chosen as part of the complementary courses, the practicum must be related to the subject of the selected stream.

### Complementary Courses (9-18 Credits)

#### Environmental Health Sciences

3 credits from:

GEOG 503	(3)	Advanced Topics in Health Geography
OCCH 602	(3)	Occupational Health Practice
OCCH 604	(3)	Monitoring Occupational Environment
PPHS 529	(3)	Global Environmental Health and Burden of Disease

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

#### Health Services Research Policy and Management

3 credits from:

PPHS 525	(3)	Health Care Systems in Comparative Perspective
PPHS 527	(3)	Economics for Health Services Research and Policy
PPHS 528	(3)	Economic Evaluation of Health Programs
PPHS 617	(3)	Impact Evaluation

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

#### Population and Public Health Interventions (social and behavioural science)

3 credits from:

EPIB 632	(3)	Mental Disorders: Population Perspectives and Methods
PPHS 614	(3)	Knowledge Translation and Public Health Leadership
PPHS 616	(3)	Principles and Practice of Public Health Surveillance
PPHS 618	(3)	Program Planning and Evaluation in Public Health

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

0-9 credits from one of the following six streams.

In consultation with and approval by the program's academic adviser, students may focus on one of the following areas.

Courses may not satisfy more than one program requirement.

#### Stream 1: Epidemiology

9 credits from:

EPIB 628	(3)	Measurement in Epidemiology
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EPIB 629	(3)	Knowledge Synthesis
EPIB 637	(3)	Advanced Modeling: Survival and Other Multivariable Data
EPIB 638	(3)	Mathematical Modeling of Infectious Diseases
EPIB 648	(3)	Methods in Social Epidemiology

**Stream 2: Global Health**

3 credits in:

PPHS 613	(3)	The Practice of Global Health
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6 credits from:

EPIB 681	(3)	Global Health: Epidemiological Research
PPHS 511	(3)	Fundamentals of Global Health
PPHS 525	(3)	Health Care Systems in Comparative Perspective
PPHS 529	(3)	Global Environmental Health and Burden of Disease
PPHS 614	(3)	Knowledge Translation and Public Health Leadership
PPHS 615	(3)	Introduction to Infectious Disease Epidemiology
PPHS 618	(3)	Program Planning and Evaluation in Public Health

**Stream 3: Population Dynamics**

6 credits in:

SOCI 545	(3)	Sociology of Population
SOCI 626	(3)	Demographic Methods

3 credits from:

EPIB 648	(3)	Methods in Social Epidemiology
EPIB 681	(3)	Global Health: Epidemiological Research
PPHS 525	(3)	Health Care Systems in Comparative Perspective
PPHS 527	(3)	Economics for Health Services Research and Policy
PPHS 528	(3)	Economic Evaluation of Health Programs
PPHS 529	(3)	Global Environmental Health and Burden of Disease
SOCI 512	(3)	Ethnicity and Public Policy
SOCI 520	(3)	Migration and Immigrant Groups
SOCI 535	(3)	Sociology of the Family
SOCI 588	(3)	Biosociology/Biodemography

**Stream 4: Health Policy and Ethics**

3 credits in:

PPHS 624	(3)	Public Health Ethics and Policy
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6 credits from:

PPHS 527	(3)	Economics for Health Services Research and Policy
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PPHS 528	(3)	Economic Evaluation of Health Programs
PPHS 614	(3)	Knowledge Translation and Public Health Leadership

### Stream 5: Infectious Disease

3 credits in:

PPHS 615	(3)	Introduction to Infectious Disease Epidemiology
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6 credits from:

EPIB 638	(3)	Mathematical Modeling of Infectious Diseases
PPHS 527	(3)	Economics for Health Services Research and Policy
PPHS 528	(3)	Economic Evaluation of Health Programs
PPHS 615	(3)	Introduction to Infectious Disease Epidemiology
PPHS 618	(3)	Program Planning and Evaluation in Public Health
PPHS 624	(3)	Public Health Ethics and Policy

### Stream 6: Environmental Health

9 credits from:

EPIB 684	(3)	Principles of Environmental Health Sciences 1
EPIB 685	(3)	Principles of Environmental Health Sciences 2
PPHS 529	(3)	Global Environmental Health and Burden of Disease

Or other courses, at the 500-level or higher, selected with the Academic Adviser.

### Elective Courses (6-15 Credits)

6-15 credits of coursework, at the 500 level or higher. Students may choose to focus on more advanced methods in epidemiology, biostatistics, geography, or substantive areas such as environmental or occupational health, or to select a variety of courses that will deepen their general knowledge of the disciplines that influence population and public health.

Courses will be selected with and approved by the Program's Academic Adviser.

#### 12.4.3.4.7 Doctor of Philosophy (Ph.D.) Epidemiology

Epidemiology is the study and analysis of the patterns and causes of disease in human populations. It forms the core discipline of public health by identifying excess illness and by gaining the etiologic understanding to intervene toward the improvement of population health. The PhD program in epidemiology at McGill trains scientists and health professionals to design and conduct studies, analyze health data and effectively communicate scientific results, and to gain novel insights into the causes and prevention of diseases at the population level. Epidemiologic work at the doctoral level involves a thorough integration of biological knowledge of pathogenesis, statistical knowledge of quantitative analysis and causal inference, and sociological knowledge to place these insights in the context of dynamic and interconnected human populations. Major areas of strength at McGill include epidemiologic methods, clinical

EPIB 705	(4)	Doctoral Level Epidemiologic Methods 2
EPIB 706	(3)	Doctoral Seminar in Epidemiology
EPIB 707	(3)	Research Design in Health Sciences

### **Complementary Courses (9 credits)**

9 credits of coursework, at the 500 level or higher, with a minimum of 3 credits in biostatistics and 6 credits in epidemiology and/or substantive topic (normally related to the thesis topic). Courses must be chosen in consultation with the student's supervisor and/or the degree program's director or adviser.

#### **12.4.3.4.8 Doctor of Philosophy (Ph.D.) Epidemiology: Global Health**

This option will provide enhanced training in global health to graduate students registered in the Ph.D. in Epidemiology; Global Health degree program at McGill. Students will become familiar with topics of global health relevance and incorporate this into their core coursework and thesis research. The thesis must be relevant to global health and approved by the Global Health Coordinating Committee. Contextualizing the core training students receive in epidemiology and in their respective substantive discipline within the global health research domain will enhance their academic experience. Graduates of this option will

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

#### Required Courses (25 credits)

EPIB 623	(0)	
EPIB 639	(4)	Pharmacoepidemiologic Methods
EPIB 654	(2)	Pharmacoepidemiology 4
EPIB 661	(2)	Pharmacoepidemiology 3
EPIB 662	(1)	Pharmacological Basis of Pharmacoepidemiology
EPIB 701	(0)	Ph.D. Comprehensive Examination
EPIB 702	(0)	Ph.D. Proposal
EPIB 703	(2)	Principles of Study Design
EPIB 704	(4)	Doctoral Level Epidemiologic Methods 1
EPIB 705	(4)	Doctoral Level Epidemiologic Methods 2
EPIB 706	(3)	Doctoral Seminar in Epidemiology
EPIB 707	(3)	Research Design in Health Sciences

#### Complementary Courses (3 credits)

3 credits of coursework in biostatistics at the 500 level or higher. Courses must be chosen in consultation with the student's supervisor and/or the degree program's director or adviser.

#### 12.4.3.4.10 Doctor of Philosophy (Ph.D.) Epidemiology: Population Dynamics

The Ph.D. in Epidemiology; Population Dynamics program focuses on training in demographic methods (including life table analyses) and critical population dynamic issues such as population health, migration, aging, family dynamics, and labour markets.

#### Thesis

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

#### Required Courses (22 credits)

EPIB 701	(0)	Ph.D. Comprehensive Examination
EPIB 702	(0)	Ph.D. Proposal
EPIB 703	(2)	Principles of Study Design
EPIB 704	(4)	Doctoral Level Epidemiologic Methods 1
EPIB 705	(4)	Doctoral Level Epidemiologic Methods 2
EPIB 706	(3)	Doctoral Seminar in Epidemiology
EPIB 707	(3)	Research Design in Health Sciences
SOCI 545	(3)	Sociology of Population
SOCI 626	(3)	Demographic Methods

#### Complementary Courses (9 credits)

9 credits of coursework, at the 500 level or higher, with a minimum of 3 credits in biostatistics, 3 credits in epidemiology, and 3 credits from courses approved for the Population Dynamics Option from the list below:

ECON 634	(3)	Economic Development 3
ECON 641	(3)	Labour Economics

ECON 734	(3)	Economic Development 4
ECON 741	(3)	Advanced Labour Economics
ECON 742	(3)	Empirical Microeconomics
ECON 744	(3)	Health Economics
EPIB 648	(3)	Methods in Social Epidemiology
EPIB 681	(3)	Global Health: Epidemiological Research
PPHS 525	(3)	Health Care Systems in Comparative Perspective
PPHS 528	(3)	Economic Evaluation of Health Programs
PPHS 529	(3)	Global Environmental Health and Burden of Disease
PPHS 615	(3)	Introduction to Infectious Disease Epidemiology
SOCI 502	(3)	Sociology of Fertility
SOCI 512	(3)	Ethnicity and Public Policy
SOCI 513	(3)	Social Aspects HIV/AIDS in Africa
SOCI 520	(3)	Migration and Immigrant Groups
SOCI 525	(3)	Health Care Systems in Comparative Perspective
SOCI 535	(3)	Sociology of the Family
SOCI 588	(3)	Biosociology/Biodemography

Courses must be chosen in consultation with the student's supervisor and/or the degree program's director or adviser.

#### **12.4.3.5 Biostatistics**

Biostatistics involves the dev

*section 12.4.3.5.4: Doctor of Philosophy (Ph.D.) Biostatistics*

statistical methods for epidemiology, generalized linear models, Bayesian methods, survival analysis, longitudinal data, causal inference, or other topics. Skills in data analysis, statistical consulting, and report writing are emphasized. Ph.D. graduates typically work as faculty in universities, in research institutes, in government, or in the pharmaceutical industry.

**12.4.3.5.1 Biostatistics Admission Requirements and Application Procedures**

*12.4.3.5.1.1 Admission Requirements*

An undergraduate de



MATH 557

(4)

Mathematical Statistics 2

12 credits (chosen and approved in consultation with the student's academic adviser), at the 500 level or higher, in statistics/biostatistics.

6 credits (chosen and approved in consultation with the student's academic adviser), at the 500 level or higher, in related fields (e.g., epidemiology, social sciences, biomedical sciences).

## **12.4.4 Occupational Health**

### **12.4.4.1 Location**

Department of Epidemiology, Biostatistics and Occupational Health  
Purvis Hall  
1020 Pine Avenue West  
Montreal QC H3A 1A2  
Canada  
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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