



**Faculty of Medicine (Graduate)**  
**Programs, Courses and University Regulations**  
**2020-2021**



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## 1 Dean's Welcome

To Graduate Students and Postdoctoral Fellows:

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. We take a holistic approach to graduate student success; we support not only your academic development, but also your career-planning and professional development, and your well-being and student life. I invite you to consult the website [Resources for Your Success](#), which is a one-stop-shop for the many resources and support systems in place for you across the University.

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

*Josephine Nalbantoglu, Ph.D.*

*Dean, Graduate and Postdoctoral Studies*

## 2 Graduate and Postdoctoral Studies

### 2.1 Administrative Officers

#### Administrative Officers

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

**Dean (Graduate and Postdoctoral Studies)**

Robin Beech; B.Sc.(Nott.), Ph.D.(Edin.)

**Associate Dean (Graduate and Postdoctoral Studies)**

France Bouthillier; B.Ed., C.Admin.(UQAM), M.B.S.I.(Montr.), Ph.D.(Tor.)

**Associate Dean (Graduate and Postdoctoral Studies)**

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

**Associate Dean (Graduate and Postdoctoral Studies)**

### 2.2 Location

James Administration Building, Room 400

845 Sherbrooke Street West

Montreal QC H3A 0G4

Website: [www.mcgill.ca/gps](http://www.mcgill.ca/gps)



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

### 2.3 Graduate and Postdoctoral Studies' Mission

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

## 3 Important Dates

For all dates relating to the academic year, consult [www.mcgill.ca/importantdates](http://www.mcgill.ca/importantdates).

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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:

-

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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 pro

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



Students who have been granted such a leave will have to register for the term(s) in question and their registration will show as “leave of absence” on their record. No tuition fees will be charged for the duration of the authorized leave

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## 10 Graduate Student Services and Information

Graduate students are encouraged to refer to : *Student Services and Information* for information on the following topics:

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

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### Information on Research Policies and Guidelines, P

Website: [www.mcgill.ca/anatomy](http://www.mcgill.ca/anatomy)

### 12.1.2 About Anatomy and Cell Biology

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

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

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

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

#### **Funding**

M.Sc. and Ph.D. students receive a minimum yearly stipend of \$20,000 and \$22,000 respectively. All students are financially supported either by their supervisor or through fellowships or scholarships. Prospective students are urged to make every effort to secure their own funding. Applications may be made for a variety of fellowships administered by the University or by various federal, provincial, or private agencies. Foorarcroscope f

**Master's Program (Cell Biology)**

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

**Ph.D. Program (Cell Biology)**

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

**International Applicants**

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

**TOEFL:** Minimum score of 86 on the Internet-based test (iBT; 567 on the paper-based test (PBT)) with each component score 20 or higher.

or

**IELTS:** Minimum overall band score of 6.5.

**12.1.3.2 Application Procedures**

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

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

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

Program guidelines are listed under the "Master's" and "Doctorate" tabs at [www.mcgill.ca/anatomy/graduate](http://www.mcgill.ca/anatomy/graduate).

**12.1.3.2.1 Additional Requirements**

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

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

**12.1.3.3 Application Dates and Deadlines**

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Anatomy and Cell Biology and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at [www.mcgill.ca/gps/contact/graduate-program](http://www.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	April 21	June 21	June 21	
<b>Winter Term:</b>	Feb. 15	Sept. 1	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.

**12.1.4 Anatomy and Cell Biology Faculty**

**Chair**

Craig Mandato

**Emeritus Professors**

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

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

### Emeritus Professors

James R. Brawer; B.Sc.(Tufts), Ph.D.(Harv.)  
Louis Hermo; B.A.(Loyola), M.Sc., Ph.D.(McG.)  
Sandra C. Miller; B.Sc.(Sir G. Wms.), M.Sc., Ph.D.(McG.)  
Dennis G. Osmond; C.M., B.Sc., M.B., Ch.B., D.Sc.(Brist.), M.R.C.S., L.R.C.P., F.R.S.C.  
Hershey Warshawsky; B.Sc.(Sir G. Wms.), M.Sc., Ph.D.(McG.)

### Professors

Chantal Autexier; B.Sc.(C'dia), Ph.D.(McG.)  
Samuel David; Ph.D.(Manit.) (*joint appt. with Neurology and Neurosurgery*)  
Elaine Davis; B.Sc., M.Sc.(UWO), Ph.D.(McG.)  
Timothy Kennedy; B.Sc.(McM.), M.Phil., Ph.D.(Col.) (*joint appt. with Neurology and Neurosurgery*)  
Nathalie Lamarche-Vane; B.Sc., Ph.D.(Montr.)  
Marc D. McKee; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Dentistry*)  
Peter McPherson; B.Sc.(Manit.), Ph.D.(Iowa) (*joint appt. with Neurology and Neurosurgery*)  
Carlos R. Morales; D.V.M.(UNNE, Argentina), Ph.D.(McG.)  
Joaquin Ortega; B.Sc.(Zaragoza), Ph.D.(Autonoma, Madrid)  
Barry I. Posner; M.D.(Manit.), F.R.C.P.C. (*joint appt. with Medicine*)  
Dieter Reinhardt; M.S.(TU Kaiserslautern), Ph.D.(Munich) (*joint appt. with Dentistry*)  
Alfredo Ribeiro-da-Silva; M.D., Ph.D.(U.Porto) (*joint appt. with Pharmacology and Therapeutics*)  
Wayne Sossin; S.B.(MIT), Ph.D.(Stan.) (*joint appt. with Neurology and Neurosurgery*)  
Stefano Stifani; D.Chem.(Rome), Ph.D.(Alta.) (*joint appt. with Neurology and Neurosurgery*)  
Hojatollah Vali; B.Sc., M.Sc., Ph.D.(Munich)  
Dominique Walker; B.Sc., Ph.D.(Geneva) (*joint appt. with Psychiatry*)

### Associate Professors

Orest W. Blaschuk; B.Sc.(Winn.), M.Sc.(Manit.), Ph.D.(Tor.) (*joint appt. with Surgery*)  
Eugene Daniels; M.Sc., Ph.D.(Manit.)  
Craig Mandato; B.Sc., Ph.D.(Wat.)  
Geoffroy P. Noël; Ph.D.(Br. Col.)  
John F. Presley; B.A., Ph.D.(Texas)

### Assistant Professors

Susanne Bechstedt; B.Sc.(Flor. St.), M.Sc.(Friedrich Schiller), Ph.D.(Max Planck)  
Khanh Huy Bui; B.Sc.(UNSW), M.Sc.(Chalmers), Ph.D.(ETH Zürich)  
Sean McWatt; B.Sc., M.Sc., Ph.D.(Guelph)  
Michael Strauss; B.Ed.(Trent), B.Sc.(W. Laur.), M.Sc.(Tor.), D.Phil.(Goethe)  
Javier Vargas; Ph.D.(UCM, Spain)  
Gabriel Venne; Ph.D.(Qu.)  
Nicole Ventura; Ph.D.(Qu.)  
Mina Zeroual; M.D.(Hassan II Casablanca)  
Natalie Zeytuni; B.Sc., M.Sc., Ph.D.(Ben-Gurion)

### Associate Members

Daniel Bernard (*Pharmacology and Therapeutics*)

**Associate Members**

Claire Brown (*Physiology*)  
Colin Chalk (*Neurology and Neurosurgery*)  
Jean-François Cloutier (*Neurology and Neurosurgery*)  
Claudio Cuello (*Pharmacology and Therapeutics*)  
Giovanni Di Battista (*Medicine*)  
Allen Ehrlicher (*Bioengineering*)  
Alyson Fournier (*Neurology and Neurosurgery*)  
Lisbet Haglund (*Surgery*)  
Janet Henderson (*Medicine*)  
Loydie A. Jerome-Majewska (*Pediatrics and Human Genetics*)  
Mari T. Kaartinen (*Dentistry*)  
Svetlana Komarova (*Dentistry*)  
David Labbé (*Surgery and Urology*)  
Stephane Laporte (*Medicine*)  
Andréa Leblanc (*Neurology and Neurosurgery*)  
Stéphanie Lehoux (*Medicine*)  
Heidi McBride (*Montreal Neurological Institute*)  
Peter Metrakos (*Surgery*)  
Makato Nagano (*Obstetrics and Gynecology*)  
Christian Rocheleau (*Endocrinology and Metabolism*)  
Edward S. Ruthazer (*Neurology and Neurosurgery*)  
Peter Siegel (*Medicine and Biochemistry*)  
Charles E. Smith; D.D.S., Ph.D.(McG.)  
Thomas Stroh (*Neurology and Neurosurgery*)  
Jason Tanny (*Pharmacology and Therapeutics*)

**Adjunct Professors**

Gregor Andelfinger; M.D.(Ulm)  
Philippe Campeau; M.D.(Laval)  
Michel Cayouette; Ph.D.(Laval)  
Frédéric Charron; B.Sc.(Montr.), Ph.D.(McG.)  
Jean-François Côté; Ph.D.(McG.)  
Daniel Cyr; B.Sc., M.Sc.(C'dia), Ph.D.(Manit.)  
Jacques Drouin; B.Sc., D.Sc.(Laval)  
Jennifer Estall; Ph.D.(Tor.)  
Patrick Freud; B.Sc., D.C.(Parker)  
Michael Greenwood; B.Sc., M.Sc.(C'dia), Ph.D.(McG.)  
David Hipfner; B.Sc., Ph.D.(Qu.)  
Artur Kania; Ph.D.(Baylor)  
Justin Kollman; Ph.D.(Calif.-San Diego)  
Stéphane Lefrançois; B.Sc., Ph.D.(McG.)  
Alexei Pshezhetsky; Ph.D.(Moscow St.)

## Adjunct Professors

Isabelle Rouiller; Ph.D.(Hert.)

Michael Sacher; Ph.D.(McG.)

Elitza Tocheva; B.Sc., Ph.D.(Br. Col.)

### 12.1.5 Master of Science (M.Sc.) Cell Biology (Thesis) (45 credits)

#### Thesis Course (24 credits)

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

#### Required Course (12 credits)

ANAT 601 (3) MSc Seminar Examination

ANAT 695 (3) Seminars in Cell Biology 1

ANAT 696 (3) Seminars in Cell Biology 2

ANAT 697 (3) Seminars in Cell Biology 3

#### Complementary Courses (9 credits)

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

#### Cell Developmental Biology Stream

ANAT 663D1 (3) Histology

ANAT 663D2 (3) Histology

ANAT 690D1 (3) Cell and Developmental Biology

ANAT 690D2 (3) Cell and Developmental Biology





Master's students receive a minimum stipend of \$20,000 annually; doctoral students receive \$22,000. The Department is committed to helping graduate students secure adequate funding for their research. All students are financially supported either by their supervisor or through fellowships or scholarships. Prospective students are urged to make every effort to secure their own funding. Applications may be made for a variety of fellowships administered by the Univ

### *section 12.2.10: Doctor of Philosophy (Ph.D.) Biochemistry: Chemical Biology*

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

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

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

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

## **12.2.3 Biochemistry Admission Requirements and Application Procedures**

### **12.2.3.1 Admission Requirements**

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

#### **Master's Program**

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

#### **Doctoral Program**

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

#### **International Applicants**

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

- [TOEFL](#) (I1 86.052 274.7ga86.052)

### **12.2.3.2 Application Procedures**

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

See [University Regulations & Resources](#) > *Graduate* > *Graduate Admissions and Application Procedures* > : [Application Procedures](#) for detailed application procedures. Information for prospective students is also av

## Professors

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

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

Imed Gallouzi; Maitrise, D.E.A., Ph.D.(Montp.)

Kalle Gehring; B.A.(Brown), M.Sc.(Mich.), Ph.D.(Calif., Berk.) (*Chercheur National du FRSQ*)

Vincent Giguère; B.Sc., Ph.D.(Laval) (*joint appt. with Oncology and Medicine*)

Philippe Gros; B.Sc., M.Sc.(Montr.), Ph.D.(McG.), F.R.S.C. (*James McGill Professor*)

Alba Guarné; B.Sc., M.Sc., Ph.D.(Barcelona)

Roderick R. McInnes; B.Sc., M.D.(Dal.), Ph.D.(McG.)

William Muller; B.Sc., Ph.D.(McG.) (*Canada Research Chair in Molecular Oncology*)

Bhushan Nagar; B.Sc., Ph.D.(Tor.)

Alain Nepveu; B.Sc., M.Sc.(Montr.), Ph.D.(Sher.) (*James McGill Professor*) (*joint appt. with Oncology and Medicine*)

Morag Park; B.Sc., Ph.D.(Glas.), F.R.S.C. (*Diane and Sal Guerrero Chair in Cancer Genetics*) (*James McGill Professor*) (*joint appt. with Oncology and Medicine*)

Arnim Pause; B.Sc., M.Sc.(Konstanz), Ph.D.(McG.)

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

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



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

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

**Required Courses (6 credits)**

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

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

3 credits to be chosen from the following courses:

BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Protein Biology and Proteomics
BIOC 670	(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.

**12.2.7 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

**Complementary Courses\* (11 credits)**

Two of the following courses:

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

At least 3 credits from the following:

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

and at least 3 credits from the following:

Advanced Strategies in Genetics and Genomicswing:

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.

## 12.2.8 Doctor of Philosophy (Ph.D.) Biochemistry

### Thesis

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

### Required Courses (3 credits)

BIOC 696*	(3)	Seminars in Biochemistry
BIOC 701**	(0)	Research Seminar 1
BIOC 702**	(0)	Ph.D. Thesis Proposal
BIOC 703**	(0)	Ph.D. Seminar

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

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

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

### Complementary Cour



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

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

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

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

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

3 credits from the following:

(3 and who re Advanced Strategies in Genetics and Genomics

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 504	(3)	Drug Design
CHEM 522	(3)	Stereochemistry
CHEM 582	(3)	Supramolecular Chemistry
CHEM 591	(3)	Bioinorganic Chemistry
CHEM 621	(5)	Reaction Mechanisms in Organic Chemistry
CHEM 629	(5)	Organic Synthesis
CHEM 655	(4)	Advanced NMR Spectroscopy
EXMD 510	(3)	Bioanalytical Separation Methods
EXMD 602	(3)	Techniques in Molecular Genetics
PHAR 504	(3)	Drug Discovery and Development 2
PHAR 562	(3)	Neuropharmacology
PHAR 563	(3)	Endocrine Pharmacology
PHAR 707	(3)	Topics in Pharmacology 6

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

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

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## **12.3 Bioethics**

### **12.3.1 Location**

Biomedical Ethics Unit  
3647 Peel Street  
Montreal QC H3A 1X1  
Canada  
Telephone: 514-398-6668  
Website: [T](#)



Duff Medical Building  
3775 University Street, Room 316  
Montreal QC H3A 2B4  
Canada  
Telephone: 514-398-6736  
Fax: 514-398-7461  
Website: [www.mcgill.ca/bme](http://www.mcgill.ca/bme)

## 12.4.2 About Biomedical Engineering

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

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

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

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

### *section 12.4.5: Graduate Certificate (Gr. Cert.) Translational Biomedical Engineering (15 credits)*

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

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

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

## 12.4.3 Biomedical Engineering Admission Requirements and Application Procedures

### 12.4.3.1 Admission Requirements

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

### 12.4.3.2 Application Procedures

McGill's online application form for (F)Tj1 One 1 rg0 0 1 RG/.0 1 idappliill 279.33 611.349 8.45s online appv298.478 325.601 19(s online apphe Deparatg0 0 1 RG/F2

Please address enquiries directly to the Department.

### 12.4.3.3 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 [www.mcgill.ca/gps/contact/graduate-program](http://www.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.

### 12.4.4 Biomedical Engineering Faculty

#### Chair

D. Juncker

#### Emeritus Professors

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

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

#### Professors

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

D. Juncker; Dipl., Ph.D.(Neuchâtel)

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

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

M. Tabrizian; B.Sc.(Iran), M.Sc., Ph.D.(Paris VI), M.B.A.(HEC) (*joint appt. with Dentistry*)

#### Associate Professor

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

#### Assistant Professors

D. Bzdok; M.D.(UNIL/Harv.), Ph.D.(Jülich/Texas SA), Ph.D.(HHU)

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

D.A. Rudko; B.Sc.(Br. Col.), M.Sc.(Vic., BC), Ph.D.(UWO)

C.L. Tardif; B.Eng.(McG.), M.Sc.(Imperial Coll.), Ph.D.(McG.)

#### Associate Members

M. Amabili (*Mechanical Engineering*)

S. Baillet (*Neurology and Neurosurgery*)

C. Baker (*Ophthalmology*)

F. Barthelat (*Mechanical Engineering*)

## Associate Members

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

M. Chacron (*Physiology*)

M. Chakravarty (*Psychiatry*)

M. Driscoll (*Mechanical Engineering*)

A. Ehrlicher (*Bioengineering*)

S. Enger (*Oncology*)

A. Evans (*Neurology and Neurosurgery*)

J. Gotman (*Neurology and Neurosurgery*)

D. Guitton (*Neurology and Neurosurgery*)

A. Hendricks (*Bioengineering*)

C. Hoesli (*Chemical Engineering*)

R. Hoge (*Neurology and Neurosurgery*)

Y. Iturria-Medina (*Neurology and Neurosurgery*)

A. Kamen (*Bioengineering*)

A. Katsarkas (*Otolaryngology*)

J. Kildea (*Medical Physics*)

J. Kinsella (*Bioengineering*)

S. Komarova (*Dentistry*)

A.-M. Lauzon (*Medicine*)

R. Leask (*Chemical Engineering*)

I. Levesque (*Medical Physics and Oncology*)

J. Li (*Mechanical Engineering*)

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

G. Mitsis (*Bioengineering*)

L. Mongeau (*Mechanical Engineering*)

R. Mongrain (*Mechanical Engineering*)

C. Moraes (*Chemical Engineering*)

J. Near (*Psychiatry*)

D. Nicolau (*Bioengineering*)

C. Pack (*Neurology and Neurosurgery*)

D. Pasini (*Mechanical Engineering*)

W. Reisner (*Physics*)

A. Shmuel (*Neurology and Neurosurgery*)

B. WWical EngRngineering

## Adjunct Professors

M. Mekhail; Ph.D.(McG.) (*Shriners*)

J.L. Nadeau; Ph.D.(Minn.) (*Caltech*)

G.B. Pike; Ph.D.(McG.) (*Calg.*)



BMDE 504	(3)	Biomaterials and Bioperformance
BMDE 505	(3)	Cell and Tissue Engineering

Biosensors and Devices

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

Translational Biomedical Engineering

BMDE 656	(3)	Medical Device Reimbursement
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**Communication Sciences and Disor3)T**

- two research degrees: an M.Sc. (Research) and a Ph.D. in Communication Sciences and Disorders

### **Requirements for Licensure**

The majority of provinces in Canada and certain states in the U.S. require that those intending to practise as speech-language pathologists within their borders comply with special provincial or state licensing regulations. Graduates wishing to practise in the province of Quebec must be members of the *Ordre des Orthophonistes et Audiologistes du Québec* (OOAQ) in order to call themselves speech-language pathologists. Further information is available from the OOAQ at:

630 Sherbrooke St. W., bureau 800  
Montreal QC H3A 1E4  
Telephone: 514-282-9123  
Email: [info@ooaq.qc.ca](mailto:info@ooaq.qc.ca)  
Website: [www.ooaq.qc.ca](http://www.ooaq.qc.ca)

Quebec law requires that candidates seeking licensure in provincially recognized professions demonstrate exceptional verbal and written knowledge of the French language. See [University Regulations & Resources > Undergraduate > Admission to Professional and Graduate Studies > : Language Requirements for Professions](#).

### **Funding**

*IODE Canada* funds two \$1,000 “Silence to Sound” awards for studies in hearing impairment. These in-course awards are based on academic merit, Canadian citizenship, financial need, and potential for excellence, and are awarded by the School with approval of funds by IODE Canada.

**Montreal League for the Hard of Hearing Award** – Candidates must be enrolled at the graduate level in the School and working in the area of hearing impairment. Awarded by the School. Value: two \$750 awards.

*section 12.5.7: Doctor of Philosophy (Ph.D.) Communication Sciences and Disorders*

Psychology, and Education. Our Ph.D. graduates typically pursue academic careers in universities or research institutes, but some work in settings that combine research and professional activities.

*section 12.5.8: Doctor of Philosophy (Ph.D.) Communication Sciences and Disorders: Language ychology*

### **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](#)).

### **12.5.3.3 Application Dates and Deadlines**

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the 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 [www.mcgill.ca/gps/contact/graduate-program](http://www.mcgill.ca/gps/contact/graduate-program).

<b>Application Opening Dates</b>	<b>Application Deadlines</b>	<b>Current McGill Students (any citizenship)</b>
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**Assistant Professors**

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

**Assistant Professors (Professional)**

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

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

**F**

SCSD 671	(12)	M.Sc. Thesis 1
SCSD 672	(12)	M.Sc. Thesis 2

**Complementary Courses (21 credits)**

6-21 credits chosen from:

SCSD 675	(12)	Special Topics 1
SCSD 676	(9)	Special Topics 2
SCSD 677	(6)	Special Topics 3
SCSD 678	(3)	Special Topics 4

0-15 credits chosen from:

SCSD 673	(12)	M.Sc. Thesis 3
SCSD 674	(3)	M.Sc. Thesis 4

or courses in other departments, as arranged with the student's thesis supervisor.

**12.5.6 Master of Science, Applied (M.Sc.A.) Communication Sciences & Disorders (Non-Thesis): Speech-Language Pathology (82 credits)**

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

**Required Courses (79 credits)**

IPEA 500	(0)	Roles in Interprofessional Teams
IPEA 501	(0)	Communication in Interprofessional Teams
IPEA 502	(0)	Patient-Centred Care in Action
SCSD 609	(3)	Neuromotor Disorders
SCSD 616	(3)	Audiology
SCSD 617	(3)	Anatomy and Physiology: Speech and Hearing
SCSD 618	(3)	Research and Measurement Methodologies 1
SCSD 619	(3)	Phonological Development
SCSD 624	(3)	Language Processes
SCSD 631	(3)	Speech Science
SCSD 632	(3)	Phonological Disorders: Children
SCSD 633	(3)	Language Development
SCSD 636	(3)	Fluency Disorders
SCSD 637	(3)	Developmental Language Disorders 1
SCSD 638	(3)	Neurolinguistics
SCSD 639	(3)	Voice Disorders
SCSD 642	(3)	Aural Rehabilitation
SCSD 643	(3)	Developmental Language Disorders 2
SCSD 644	(3)	Applied Neurolinguistics
SCSD 646	(4)	Introductory Clinical Practicum
SCSD 664	(3)	Augmentative and Alternative Communication
SCSD 669	(3)	ASD and Neurodevelopmental Disorders
SCSD 679	(12)	Advanced Clinical Practicum

SCSD 680	(3)	Deglutition and Dysphagia
SCSD 681	(1)	Practicum and Seminar 1
SCSD 682	(1)	Practicum and Seminar 2
SCSD 683	(1)	Practicum and Seminar 3
SCSD 684	(1)	Practicum and Seminar 4
SCSD 688	(1)	Genetics in Speech-Language Pathology Practice
SCSD 689	(1)	Management Cranio-Facial Disorders

### **Complementary Courses (3 credits)**

3 credits from the following:

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

## **12.5.7 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.

### 12.5.8 Doctor of Philosophy (Ph.D.) Communication Sciences and Disorders: Language Acquisition

This unique interdisciplinary program focuses on the scientific exploration of language acquisition by different kinds of learners in diverse contexts. Students in the Language Acquisition Program are introduced to theoretical and methodological issues on language acquisition from the perspectives of cognitive neuroscience, theoretical linguistics, psycholinguistics, education, communication sciences and disorders, and neuropsychology.

For details go to: [www.psych.mcgill.ca/lap.html](http://www.psych.mcgill.ca/lap.html).

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

#### Thesis

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

#### Required Courses (12 credits)

For both PhD 1 and PhD 2:

LING 710	(2)	Language Acquisition Issues 2
PSYC 709	(2)	Language Acquisition Issues 1
SCSD 652	(3)	Advanced Research Seminar 1
SCSD 653	(3)	Advanced Research Seminar 2
SCSD 701	(0)	Doctoral Comprehensive
SCSD 712	(2)	Language Acquisition Issues 4

#### Complementary Courses (9 or 26 credits)

For both PhD 1 and PhD 2:

6 credits of statistics courses at the 500 level or higher, pre-approved by the supervisor and the graduate program director.

At least 3 credits at the 500 level or higher in language acquisition courses that have been approved by the Director of the Language Acquisition Program.

For a pre-approved list go to: <https://www.mcgill.ca/scsd/programs/rt/phd/language-acquisition-courses>.

For PhD 1 students, 0-2 credits from the following:

EDSL 711	(2)	Language Acquisition Issues 3
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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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## 12.6 Epidemiology and Biostatistics

### 12.6.1 Location

Department of Epidemiology, Biostatistics and Occupational Health  
1020 Pine Avenue West  
Montreal QC H3A 1A2  
Canada  
Telephone: 514-398-6258



Email: [graduate](mailto:graduate)

## Associate Professors Post-Retirement

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

## Professors

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

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

D. Buckeridge; M.D.(Qu.), M.Sc.(Tor.), Ph.D.(Stan.) (*CIHR Applied Public Health Chair*)

T. Evans; B.Sc.(Ott.), D.Phil.(Oxf.), M.D.(McM.)

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

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

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

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

C. Hankins; B.A., M.D.(Calg.), M.Sc.(Lond.), Ph.D.(Amster.), C.C.F.P., F.R.C.P.(C)

J.A. Hanley; B.Sc., M.Sc.(NUI), Ph.D.(Wat.) (*joint appt. with Medicine*)

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

J. Kaufman; B.A.(Johns Hop.), Ph.D.(Mich.)

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

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

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

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

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

R.W. Platt; B.Sc.(McG.), M.Sc.(Manit.), Ph.D.(Wash.) (*joint. appt. with Pediatrics*) (

**Associate Professors**

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

**Assistant Professors**

S. Bhatnagar; B.Sc.(C'dia), M.Sc.(Qu.)

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

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

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

M. Drouin; M.D.(Sher.), M.Sc.(Montr.), F.R.C.P.(C)

S. Golchi; B.Sc.(U.Tehran), M.Sc.(ATU, Tehran), Ph.D.(S. Fraser)

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

A. Koski; B.Sc.(Mich. Tech.), M.P.H.(Emory), Ph.D.(McG.)

M. Maheu-Giroux; B.Sc.(Montr.), M.Sc.(McG.), D.Sc.(Harv.)

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

C.T. Nguyen; B.A.(McG.), M.Sc., Ph.D.(Montr.), F.R.C.P.(C)

D. Panagiotoglou; B.Sc.(Tor.), M.Sc.(Col.), Ph.D.(Br. Col.)

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

S. Pénicaud; B.Sc., M.Sc.(McG.), M.D.(Laval), F.R.C.P.(C)

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

M. Roy; M.D.(Montr.), M.P.H.(Erasmus), F.R.C.P.(C)

P. Saha Chaudhuri; B.Sc.(Presidency Univ., Kolkata), M.Stat.(IIT Delhi), M.S., Ph.D.(Wash.)

C. Stich; M.Sc.(Free Univ., Berlin), Ph.D.(Free Univ., Berlin/Toulouse II)

S. Weichenthal; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Oncology*) (*Cancer Research Society/FRQ-S*)

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

**Associate Members**

*Biomedical Ethics Unit:* J. Kimmelman, N. King

*Dentistry:* P. Allison, J. Feine, 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, 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, J. Pickering, L. Pilote, E. Rahme, B. Richards, R. Sapir-Pichhadze, K. Schwartzman, G. Sebastiani, M. Sewitch, J. Shahin, I. Shrier, B. M. Smith, V. Tagalakis, G. Thanassoulis, E. Vinet

*Neurology and Neurosurgery:* C. Renoux

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

*Pediatrics:* M. Beltempo, M. Ben Shoshan, 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



- causal inference;
- and many cross-disciplinary activities.

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

#### ***section 12.6.4.3: Master of Science (M.Sc.) Epidemiology (Thesis) (48 credits)***

Applicants to the M.Sc. program should preferably hold a bachelor's degree in the natural sciences (e.g., chemistry, microbiology, human genetics), quantitative sciences (e.g., computer science, statistics), or social sciences (e.g., sociology, psychology, economics, geography), or hold a degree in one of the health professional sciences (e.g., medicine, nursing, social work, nutrition). Applicants must have an interest in health research, along with strong conceptual, analytic, and quantitative skills (e.g., differential and integral calculus, statistics) at the undergraduate level.

The program leading to a master's degree is designed to provide training in both theory and practice in the selected discipline. Courses require intellectual and academic rigour, and the program provides students with an opportunity to synthesize the training in the form of a thesis. Students will study the foundations and principles of epidemiology and applied biostatistics, in order to design, conduct, and analyze clinical, population-based, environmental, pharmaco-epidemiological, policy, and methodological health-related research. Graduates of the program often go on to do doctoral work or become research associates in public, private, and academic settings. McGill graduates are known for methodological and quantitative rigour, and quantitative analytic independence. While their core training is in methods, rather than specific substantive areas, students learn about substantive areas in the context of their research and through elective courses.

#### ***section 12.6.4.4: Master of Science (M.Sc.) Epidemiology (Non-Thesis): Environmental & Occupational Health (48 credits)***

This program provides in-depth training in methods used in Environmental and Occupational Health (EOH) and the application of these methods to study the effects of environmental and occupational exposures on human health. Students will be provided with tools to critically evaluate studies in EOH and be able to participate in these studies; learn how to apply specific methods to environmental and occupational problems; and understand how to apply research results to public health or policy. Career opportunities exist in academia, industry, and the public health sectors. Each student will be assigned a supervisor to provide guidance for their project. Research topics must relate to environmental and occupational health and receive approval from the program coordinating committee.

#### ***section 12.6.4.5: Master of Science (M.Sc.) Epidemiology (Non-Thesis): Pharmacoepidemiology (48 credits)***

Applicants to the Pharmacoepidemiology Option of the M.Sc. (Non-Thesis) program should hold a bachelor's degree in the natural or quantitative sciences (e.g., chemistry, microbiology, computer science, statistics, economics) or hold a degree in one of the health professional sciences (e.g., medicine, pharmacy). Applicants must have an interest in the epidemiology of medications, along with strong conceptual, analytic, and quantitative skills (e.g., differential and integral calculus, statistics) at the undergraduate level. The Pharmacoepidemiology Option is designed to provide training in both theory and practice of pharmacoepidemiology. Students will study the foundations and principles of epidemiology and applied biostatistics in order to design, conduct, and analyze pharmacoepidemiological research. Courses require intellectual and academic rigour, and the program provides students with an opportunity to obtain specialized training in pharmacoepidemiology, including pharmacoepidemiologic methods, pharmacology for pharmacoepidemiologists, and practical experience in the form of a research project. Graduates of the program often go on to do doctoral work or become research associates in public, private, and academic settings. McGill has a world-renowned reputation for excellence in pharmacoepidemiology, and McGill-trained pharmacoepidemiologists are known for methodological and quantitative rigour, and quantitative analytic independence.

#### ***section 12.6.4.7: Doctor of Philosophy (Ph.D.) Epidemiology***

This program may be of interest to students from the natural or quantitative sciences (e.g., microbiology, computer science, statistics, economics, geography), quantitative social sciences (e.g., sociology, psychology), or the health professions (e.g., medicine, nursing, social work, nutrition). Applicants must have an interest in health research, along with strong conceptual, analytic, and quantitative skills (e.g., differential and integral calculus, statistics) at the undergraduate and master's levels.

The Ph.D. program prepares students with the advanced epidemiological research skills needed to undertake original contributions to new knowledge related to the determinants of health and disease, prevention, prognosis, treatment, and outcomes. The program is generally completed in four to five years. Graduates will be prepared to engage in scientific collaboration, and communicate results to other scientists and diverse audiences. They will go on to careers in public health, health planning, and quality monitoring in local, regional, federal, and international health authorities, statistical and technology assessment agencies, the pharmaceutical industry, and in clinical and academic research organizations. McGill graduates are known for their methodological and quantitative rigour and quantitative analytic independence. While their core training is in methods, rather than specific substanti

#### ***section 12.6.4.8: Doctor of Philosophy (Ph.D.) Epidemiology: Global Health***

population studies on the social determinants of health. Students at McGill can be exposed to the work of 20 teams working in all major areas of global health, including Infectious and Tropical Diseases; Global Environmental Health; and Global Mental Health, among others. For more information, visit [www.mcgill.ca/globalhealth](http://www.mcgill.ca/globalhealth). With this additional Global Health qualification, Ph.D. graduates will benefit from opportunities for future training or work in those institutions or organizations that are active in global health.

#### ***section 12.6.4.9: Doctor of Philosophy (Ph.D.) Epidemiology: Pharmacoepidemiology***

The Pharmacoepidemiology Option of the Ph.D. Program may be of interest to students from the natural or quantitative sciences (e.g., microbiology, computer science, biostatistics, statistics, economics), Public or Population Health, or Epidemiology, or who hold a degree in one of the health professional sciences (e.g., medicine, pharmacy). Applicants must have an interest in the epidemiology of medications, along with strong conceptual, analytic, and quantitative skills (e.g., differential and integral calculus, statistics) at the undergraduate level. The Pharmacoepidemiology Option prepares students with the advanced epidemiological research skills needed to undertake original contributions to new knowledge related to pharmacoepidemiology. The program is generally completed in four to five years. In addition to obtaining advanced training in the foundations and principles of epidemiology and applied biostatistics as part of the Ph.D. program, students in the Pharmacoepidemiology Option receive specialized training in pharmacoepidemiology, including advanced pharmacoepidemiologic methods, pharmacology for pharmacoepidemiologists, and practical experience in pharmacoepidemiology through their doctoral thesis. Graduates will be prepared to engage in scientific collaboration, and communicate results to other scientists and diverse audiences. They will go on to careers in pharmacoepidemiology in public, private, and academic settings. With a world-renowned reputation for excellence in pharmacoepidemiology, McGill-trained pharmacoepidemiologists are known for methodological and quantitative rigour, and quantitative analytic independence.

#### ***section 12.6.4.10: Doctor of Philosophy (Ph.D.) Epidemiology: Population Dynamics***

The Population Dynamics Option (PDO) is a cross-disciplinary, cross-faculty graduate program offered by the *Centre on Population Dynamics* (CPD) as an option within existing master's and doctoral programs in the Departments of Sociology, Economics, and Epidemiology, Biostatistics and Occupational Health (EBOH) at McGill University. Students who have been admitted through their home department or faculty may apply for admission to the option. The option is coordinated by the CPD, in partnership with participating academic units.

Thus, in addition to the rigorous training provided in the Department of EBOH, graduate students who choose this option become *Centre on Population Dynamics* (CPD) student trainees. This affiliation offers opportunities for interdisciplinary research and supervision. The option also provides a forum whereby students bring their disciplinary perspectives together and enrich each other's learning through structured courses, a weekly seminar series, and informal discussions and networking.

With interdisciplinary research being increasingly important to understanding complex social and biological processes, CPD student trainees benefit from both a strong disciplinary foundation from their departmental affiliations, as well as from the sharing of knowledge across disciplinary boundaries through CPD activities.

### **12.6.4.1 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.



**12.6.4.3 Master of Science (M.Sc.) Epidemiology (Thesis) (48 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.

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

This program pro



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 & Public Policy
SOCI 520	(3)	Migration and Immigrant Groups
SOCI 535	(3)	Sociology of the Family
SOCI 588	(3)	Biosociology/Biodemography

**Stream 4: Health Policy and Ethics**

3 credits in:

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

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

**Stream 5: Infectious Disease**

3 credits in:

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

EPIB 638	(3)	Mathematical Modeling of Infectious Diseases
PPHS 527	(3)	Economics for Health Services Research and Policy

PPHS 528	(3)	Economic Evaluation of Health Programs
PPHS 615	(3)	Introduction to Infectious Disease Epidemiology Program Planning and Ev



EPIB 662

(1)

Pharmacological Basis of Pharmacoepidemiology  
Ph.D. Comprehensi

PPHS 525	(3)	Health Care Systems in Comparative Perspective
PPHS 528	(3)	Economic Evaluation of Health Programs
PPHS 529	(3)	Global Environmental Health and Burden of Disease
PPHS 615	(3)	Introduction to Infectious Disease Epidemiology
SOCI 502	(3)	Sociology of Fertility
SOCI 512	(3)	Ethnicity & Public Policy
SOCI 513	(3)	Social Aspects HIV/AIDS in Africa
SOCI 520	(3)	Migration and Immigrant Groups
SOCI 525	(3)	Health Care Systems in Comparative Perspective
SOCI 535	(3)	Sociology of the Family
SOCI 588	(3)	Biosociology/Biodemography

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

### 12.6.5 Biostatistics

Biostatistics involves the development and application of statistical methods to scientific research in areas such as medicine, epidemiology, public health, occupational and environmental health, genetics, and ecology. Biostatisticians play key roles in designing studies—from helping to formulate the questions that can be answered by data collection to the decisions on how best to collect the data—and in analyzing the resulting data. Our biostatistics faculty work in close collaboration with epidemiologists, clinicians, public health specialists, basic scientists, and other health researchers. They also develop new statistical methods for such data. Students will take courses, and may do research, on topics such as:

- generalized linear models;
- longitudinal data;
-





MATH 556	(4)	Mathematical Statistics 1
MATH 557	(4)	Mathematical Statistics 2

### 12.6.5.3 Master of Science (M.Sc.) Biostatistics (Non-Thesis) (48 credits)

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

#### Research Project (6 credits)

BIOS 630	(6)	Research Project/Practicum in Biostatistics
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#### Required Courses (24 credits)

Students exempted from any of the courses listed below must replace them with additional complementary course credits.

BIOS 601	(4)	Epidemiology: Introduction and Statistical Models
BIOS 602	(4)	Epidemiology: Regression Models
MATH 523	(4)	Generalized Linear Models
MATH 533	(4)	Honours Regression and Analysis of Variance
MATH 556	(4)	Mathematical Statistics 1
MATH 557	(4)	Mathematical Statistics 2

#### Complementary Courses (18 credits)

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

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).

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## 12.7 Experimental Medicine

Please see [section 12.11: Medicine, Experimental](#) for more information.

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## 12.8 Family Medicine

Please see [section 12.12: Medicine, Family](#) for more information.

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## 12.9 Human Genetics

### 12.9.1 Location

Department of Human Genetics  
Strathcona Anatomy & Dentistry Building  
3640 University Street, Room W-315  
Montreal QC H3A 0C7  
Canada  
Telephone: 514-398-4198  
Fax: 514-398-2430  
Email: [dept.humangenetics@mcgill.ca](mailto:dept.humangenetics@mcgill.ca)  
Website: [www.mcgill.ca/humangenetics](http://www.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)

### 12.9.2 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 hav

***section 12.9.8: Master of Science (M.Sc.) Genetic Counselling (Non-Thesis) (48 credits)***

inheritance patterns and risks of recurrence, and review available options with the family. Some counsellors also work in administrative and academic capacities, and many engage in research activities.

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

***section 12.9.9: Doctor of Philosophy (Ph.D.) Human Genetics***

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

***section 12.9.10: Doctor of Philosophy (Ph.D.) Human Genetics: Bioinformatics***

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

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**

Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit a *TOEFL* or *IELTS* test score to McGill University. Minimum scores of 600 on the TOEFL paper-based test, 250 on the computer-based test or 100 on the Internet-based test are required. Each component or subsection score requires a minimum score of 20. On the IELTS the minimum standard for consideration is 7.

**Note:** T

## Emeritus Professors

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

K. Morgan; Ph.D.(Mich.)

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

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

## Professors

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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## Assistant Professors

G. Chong; Ph.D.(Kansas St.)

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

M-D. D'Agostino; M.D., M.Sc., F.R.C.P.C.

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

J. Fitzpatrick; M.S.(Mich.) (*Pediatrics and Medicine*)

S. Gravel; Ph.D.(PhMich.) (

**Adjunct Professors**

B. Gottlieb (*Medicine*)  
 E-L. Grundberg (*The Children's Mercy Hospital*)  
 V.A. Hastings (*Children's Hospital of Eastern Ontario*)  
 C. Honeywell (*Children's Hospital of Eastern Ontario*)  
 T-M. Pastinen (*The Children's Mercy Hospital*)  
 J. Rutberg (*Children's Hospital of Eastern Ontario*)

**Adjunct Member**

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

**Associate Members**

*Biochemistry*: P. Gros, D. Thomas  
*Bioethics*: J. Kimmelman  
*Cardiology*: J. Genest  
*Core Molecular Diagnostic Laboratory - Cytogenetics*: J. Lavoie  
*Dentistry*: L. Diatchenko  
*Endocrinology*: C. Polychonakos, B. Richards  
*Epidemiology, Biostatistics and Occupational Health*: C. Greenwood  
*Experimental Medicine*: S. Ali, S. Richard, S-A. Rabbani  
*Law*: R. Gold  
*Medicine*: D. Cournoyer, J. Engert, L. Garzia, B. Gilfix, C. Gilpin, G.Hendy, R. Koenekoop, A. Peterson, F. Rauch, M. Trifiro  
*Nephrology*: I. Gupta  
*Neurology*: G. Rouleau, Z. Gan-Or, M. Srour  
*Obs.-Gyn.*: A. Naumova  
*Pediatrics*: C. Goudie, N. Jabado, L. Majewska, J. Mitchell, J. Rak  
*Psychiatry*: R. Joober, G. Turecki, C. Ernst

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

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

**Required Courses (6 credits)**

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

**Complementary Courses (6 credits)**

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

HGEN 660	(3)	Genetics and Bioethics
HGEN 661	(3)	Population Genetics
HGEN 663	(3)	Beyond the Human Genome



HGEN 670	(3)	Advances in Human Genetics 1
HGEN 671	(3)	Advances in Human Genetics 2
HGEN 690	(3)	Inherited Cancer Syndromes
HGEN 691	(3)	Host Responses to Pathogens
HGEN 693	(3)	Using Bioinformatics Resources
HGEN 695	(3)	Psychiatric Genetics
HGEN 696	(3)	Advanced Readings in Genetics 1
HGEN 697	(3)	Advanced Readings in Genetics 2
HGEN 698	(3)	Advanced Readings in Genetics 3
HGEN 699	(3)	Advanced Readings in Genetics 4

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

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

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

#### Thesis Courses (33 credits)

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

#### Required Courses (6 credits)

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

#### Complementary Courses (6 credits)

6 credits from the following courses:

BINF 621	(3)	Bioinformatics: Molecular Biology
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.

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

#### Thesis Courses (30 credits)

30 credits selected as follows:

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

#### Required Courses (12 credits)

12 credits from:

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

#### **Complementary Courses (3 credits)**

3 credits from the following:

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

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

#### **Required Courses (48 credits)**

HGEN 600D1	(3)	Genetic Counselling Practicum
HGEN 600D2	(3)	Genetic Counselling Practicum
HGEN 601	(3)	Genetic Counselling Principles
HGEN 610D1	(3)	Genetic Counselling: Independent Studies
HGEN 610D2	(3)	Genetic Counselling: Independent Studies
HGEN 617	(3)	Principles of Medical Genetics
HGEN 620	(3)	Introductory Field Work Rotations 1
HGEN 621	(6)	Intro Field Work Rotations 2
HGEN 630D1	(6)	Advanced Field Work Rotations
HGEN 630D2	(6)	Advanced Field Work Rotations
HGEN 640	(3)	Second Year Practicum 1
HGEN 641	(3)	Second Year Practicum 2
PATH 653	(3)	Reading and Conference

### **12.9.9 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

**Complementary Courses (15 credits)**

\* 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.

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## **12.10 Medical Physics**

### **12.10.1 Location**

Medical Physics Unit, DS1-7129  
McGill University Health Centre – Glen Site  
Cedars Cancer Centre  
1001 Décarie Boulevard  
Montreal QC H4A 3J1  
Telephone: 514-934-1934 ext. 44158  
Fax: 514-934-8229  
Email:

### section 12.10.6: Graduate Diploma (Gr. Dip.) Medical Radiation Physics (31 credits)

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

## 12.10.3 Medical Physics Admission Requirements and Application Procedures

### 12.10.3.1 Admission Requirements

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

### 12.10.3.2 Application Procedures

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

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

Only complete applications will be considered.



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

**Under Program choice:**

"Application type" = Degree, certificate, or diploma

"Term" = Fall 2021

"Department" = Medical Physics Unit

"Program" = M.Sc. Med Radiation Physics (Thesis)

"Area of study" = Medical Radiation Physics-T

"Status" = Full Time

**Under Additional Questions:**

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

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

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



## Adjunct Professors

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

C. Janicki; B.Sc., M.Sc., Ph.D.(Montr.)

B. Mofteh; B.Sc.(Winn.), M.Sc., Ph.D.(Br. Col.)

G.B. Pike; B.Eng.(Nfld.), M.Eng., Ph.D.(McG.)

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

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

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

### 12.10.5 Master of Science (M.Sc.) Medical Radiation Physics (Thesis) (52 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 (24 credits)

MDPH 690	(24)	M.Sc. Thesis Research
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#### Required Courses (28 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 612	(3)	Instrumentation and Computation in Medical Physics
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

### 12.10.6 Graduate Diploma (Gr. Dip.) Medical Radiation Physics (31 credits)

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

#### Required Courses (31 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

Instrumentation and Computation in Medical Ph28.725 Tm(Laboratory Radr2ati11 Ph)Tj1 410 13.005 Tm((5 Tm((3))Tj)

MDPH 613	(2)	Health Physics
MDPH 614	(3)	Physics of Diagnostic Radiology
MDPH 615	(2)	Physics of Nuclear Medicine
MDPH 618	(3)	Anatomy and Physiology for Medical Physics
PHIL 643	(3)	Seminar: Medical Ethics

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## 12.11 Medicine, Experimental

### 12.11.1 Location

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

### 12.11.2 About Experimental Medicine

Experimental Medicine is a Division of the Department of Medicine charged with the task of providing graduate education in the Department, and enabling professors located in the research institutes of the McGill teaching hospitals and other centres to supervise graduate students. The Division offers various programs, each of which has different training objectives (see below). The internationally-recognized high-quality training our graduates receive is in essence what distinguishes graduates of our programs from the graduates of comparable programs in peer institutions.

#### *section 12.11.5: Master of Science (M.Sc.) Experimental Medicine (Thesis) (45 credits)*

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

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

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

#### *section 12.11.6: Master of Science (M.Sc.) Experimental Medicine (Thesis): Bioethics (45 credits)*

Applicants for the M.Sc. Bioethics Option program must hold an M.D.; a Nursing degree; a Physical and Occupational Therapy degree; and/or any other professional health training degree. P 1 168.709 20g0 j1 0 0 1 473.882 428.C not fitRGET1 0 0 1 168.70ational TheTj1 0 0 1 of medicine innng 370.922 Tm(Th4ali24 )



***section 12.11.7: Master of Science (M.Sc.) Experimental Medicine (Thesis): Environment (45 credits)***

seminars, and informal discussions and networking. The graduate option in Environment provides students with an appreciation for the role of science in informed decision-making in the environmental sector, and its influence on political, socio-economic, and ethical judgments.

***section 12.11.8: Doctor of Philosophy (Ph.D.) Experimental Medicine***

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

***section 12.11.9: Doctor of Philosophy (Ph.D.) Experimental Medicine: Environment***

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

***section 12.11.10: 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.

## Graduate Diploma in Clinical Research

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

### 12.11.3.2 Application Procedures

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

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

#### 12.11.3.2.1 Additional Requirements

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

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

- Personal Statement
- Curriculum Vitae
- Acceptance by a research director (*Confirmation of Supervision* form duly completed)
- Letter from the candidate's research director outlining the M.Sc. or Ph.D. project
- Additional documents (in the cases of the M.Sc. (Bioethics Option) and the M.Sc. or Ph.D. (Environment Option))

### 12.11.3.3 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 [www.mcgill.ca/gps/contact/graduate-program](http://www.mcgill.ca/gps/contact/graduate-program).

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

  

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

## 12.11.4 Medicine, Experimental Faculty

### Chair, Department of Medicine

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

### Director, Division of Experimental Medicine

A.-M. Lauzon



## Professors

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

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

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

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

K. Pantopoulos; B.Sc., Ph.D.(Thessaloniki)

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

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

L. Pilote; M.D.,C.M.(McG.), M.Sc.(Harv.), Ph.D.(Calif.)

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

P

**Associate Professors**

N. Dendukuri; M.Sc.(Indian IT), Ph.D.(McG.)

M. Divangahi; B.Sc.(McM.), Ph.D.(McG.)

J.C. Engert; B.A.(Colby), Ph.D.(Boston)

V. Essebag; M.D.,C.M., M.Sc., Ph.D.(McG.), F.R.C.P.(C)

E. Fixman; B.Sc.(Col.), Ph.D.(Johns Hop.)

N.S. Giannetti; M.D.,C.M.(McG.)

B. Gilfix; B.Sc.(Manit.), Ph.D.(UWO), M.D.,C.M.(McG.), F.R.C.P.(C)

S.B. Gottfried; M.D.(Penn.)

M. Hudson; M.D.,C.M.(McG.), M.Sc.(Col.)

T. Jagoe; B.A., M.D.(Camb.), Ph.D.(Newcastle, UK), F.R.C.P.(C)

B. Jean-Claude; B.Sc., M.Sc.(Moncton), Ph.D.(McG.)

N. Johnson; B.Sc.(C'dia), M.D.(Ott.), Ph.D.(Br. Col.), F.R.C.P.(C)

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

M. Kokoeva; B.Sc.(Lomonosov MSU), Ph.D.(RAS)

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

P. Laneuville; B.Sc.(McM.), M.D.(Ott.), F.R.C.P.(C)

L. Larose; B.Sc., Ph.D.(Montr.)

S. Lehoux; B.Sc.(Bishop's), Ph.D.(Sher.)

S. Lemay; M.D.(Montr.), F.R.C.P.(C)

R. Lin; B.Sc., B.Sc.(XMU), M.Sc.(PUMC), Ph.D.(C'dia)

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

J.-L. Liu; B.Sc., M.Sc.(Beijing), Ph.D.(McG.)

J.A. Morais; M.D.(Montr.), F.R.C.P.(C)

S. Morin; B.Sc., M.D.(Laval), M.Sc.(McG.)

M. Murshed; M.Sc.(Brussels), Ph.D.(Cologne)

M. Ndao; B.Sc., D.V.M.(UCAD, Senegal), M.Sc., Ph.D.(Belgium)

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

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

S. Qureshi; B.Sc., M.D.(Alta.), F.R.C.P.(C)

E. Rahme; B.Sc.(Lebanese), Ph.D.(Penn. St.), M.Sc., Ph.D.(McG.)

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

C. Rocheleau; B.A.(Assum. Coll.), Ph.D.(Mass.)

S. Rousseau; B.Sc., M.Sc., Ph.D.(Laval)

M. Saleh; B.Sc., M.Sc.(Beirut), Ph.D.(McG.)

G. Sebastiani; M.D.(Padua)

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

P. Siegel; B.Sc., Ph.D.(McM.)

R. Sladek; B.Sc., M.D.(Tor.), F.R.C.P.(C)

G. Thanassoulis; B.Sc., M.Sc.(McG.), M.D.(Tor.), F.R.C.P.(C)

E. Torban; B.Sc.(MSUFP, Russia), M.Sc.(Moscow Inst. of Genetics of Microorganisms), Ph.D.(McG.)

B. Turcotte; B.Sc., Ph.D.(Laval)

E. Vinet; M.D.(Laval), M.Sc., Ph.D.(McG.)

### Associate Professors

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

### Assistant Professors

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

R. Aloyz; B.A., M.Sc., Ph.D.(Buenos Aires)

I. Azuelos; M.D.,C.M., M.Sc.(McG.)

A. Baass; B.Sc.(McG.), M.D., M.Sc.(Montr.), F.R.C.P.(C)

C. Costiniuk; B.A.(UWO), B.Sc.(Nfld.), M.D.(McM.), M.Sc.(Ott.)

N. Ezer; B.Sc., M.D.,C.M.(McG), M.P.H.(ISMMS)

M. Goldfarb; B.Sc.(Tor.), M.D.,C.M.(McG.), M.Sc.(McG.)

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

T.C. Lee; B.Sc., M.D.(Tor.), M.Sc.(Harv.)

I. Litvinov; B.Sc., B.A.(Kent'y), Ph.D.(Johns Hop.), M.D.,C.M.(McG.)

E.G. McDonald; B.Sc.(C'dia), M.D.,C.M., M.Sc.(McG.)

F. Mercier; M.D.,C.M.(McG.)

M. Paliouras; B.Sc.(Tor.), M.Sc.(Flor.), Ph.D.(McG.)

S. Pamidi; B.Sc.(McG.), M.D.(Tor.), M.Sc.(McG.)

## Adjunct Professors

M. Kmita; Ph.D.(URCA, France)  
E. Lecuyer; B.Sc.(UQAM), Ph.D.(Montr.)  
T. Moroy; M.Sc.(Tübingen), Ph.D.(LMU Munich)  
M. Oeffinger; M.Sc.(Vienna), Ph.D.(Edin.)  
R. Rabasa-Lhoret; (Paris VI), M.D., Ph.D.(Montp.)  
E. Racine; B.A.(Ott.), M.A., Ph.D.(Montr.)  
F. Robert; B.Sc., Ph.D.(Sher.)  
N. Seidah; B.Sc.(AUC), Ph.D.(G'town)  
W.-K. Suh; B.Sc., M.Sc.(Seoul), Ph.D.(Tor.)  
H. Takahashi; M.D., Ph.D.(Gunma)  
M. Trudel; B.Sc.(McG.), Ph.D.(Paris VI)  
W.Y. Tsang; B.Sc., Ph.D.(Alta.)  
J. Vacher; M.Sc., Ph.D.(Paris VII)  
A. Veillette; M.D.(Laval)  
C. Wu; B.Sc., M.Sc.(Nankai), Ph.D.(McG.)

### 12.11.5 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.

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

#### Thesis Courses (24 credits)

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

#### Required Courses (6 credits)

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

**Complementary Courses (15 credits)**

3 credits, one of the following:

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

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

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

The M.Sc. 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 Courses (27 credits)**

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

**Required Course (3 credits)**

ENVR 615 (3) Interdisciplinary Approach Environment and Sustainability

**Complementary Courses (15 credits)**

3-6 credits from:

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

0-3 credits from:

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

or 3 credits at the 500 le



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.

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

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 sho

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.

#### **12.11.10 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 cell culture, genetic modification, and differentiation of stem cells into specialized cell types. Exploration of stem cell-based drug development and regenerative medicine applications.

Fax: 514-398-4202

Email: [graduateprograms.fammed@mcgill.ca](mailto:graduateprograms.fammed@mcgill.ca)

Website: [www.mcgill.ca/familymed/education/graduate-programs](http://www.mcgill.ca/familymed/education/graduate-programs)

### **12.12.2 About Family Medicine**

The McGill Department of Family Medicine is home to an exceptional community of primary health care professionals. We are committed to providing a high-quality, patient-centered, and evidence-based education and training for our students and residents.

## 12.12.3 Medicine, Family Admission Requirements and Application Procedures

### 12.12.3.1 Admission Requirements

Our program encourages the following applicants:

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

#### *What do we look for?*

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

**Proof of competency in oral and written English:** TOEFL: International students who have not received their instruction in English, or whose mother tongue is not English, must pass the Test of English as a Foreign Language ([TOEFL](#)) with a minimum score of 86 on the Internet-based test (iBT; 567 on the paper-based test (PBT)), with each component score not less than 20 (internet-based test).



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

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

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

### 12.12.3.2 Application Procedures

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

See [University Regulations & Resources](#)



**Associate Professors**

Eugene Bereza; B.A., M.D.,C.M.(McG.), C.C.F.P.  
 Anne Cockcroft; M.B., B.S., M.D.(Lond.), F.R.C.P., F.F.O.M., D.I.H.(UK)  
 Perle Feldman M.D.,C.M.(McG) C.C.F.P., F.C.F.P., M.H.P.E.  
 Roland Grad; M.D.,C.M.(McG.), M.Sc.(McM.), C.C.F.P.  
 Ellen Rosenberg; B.A.(Smith), M.D.,C.M.(McG.), C.C.F.P.  
 Ian Shrier; M.D.,C.M., Ph.D.(McG.)  
 Pierre-Paul Tellier; M.D.,C.M.(McG.)  
 Isabelle Vedel; M.D.(Paris XI), D.E.A.(Sciences Po), Ph.D.(URCA, France)  
 Mark Ware; B.A.(Qu.), M.B., B.S.(UWI), M.Sc.(Lond.)

**Assistant Professors**

Alayne Adams; M.Sc.(Lond.), Ph.D.(Lond.)  
 Anne Andermann; B.Sc., M.D.,C.M.(McG.), M.Phil.(Camb.), D.Phil.(Oxf.), C.C.F.P., F.R.C.P.(C), F.F.P.H.(UK)  
 Tracie Barnett; Ph.D.(McG.)  
 Yves Bergevin; B.Sc.(Coll. Stanislas, Montreal), M.D.,C.M., M.Sc.(McG.), C.C.F.P., F.R.C.P.(C), F.C.F.P.  
 Alexandra De Pokomandy; M.D.,C.M., M.Sc.(McG.)  
 Bertrand Lebouche; M.D., M.A., Ph.D.(Laval)  
 Peter Nugus; M.A., M.Ed., Ph.D.(New South Wales)  
 Samira Rahimi, Eng.(Tabriz), Ph.D.(Laval), B.Eng.(Cornell)  
 Kathleen Rice, M.A.(C'dia), Ph.D.(Tor.), MA.(C'dia)  
 Tibor Schuster; B.Sc., M.Sc.(LMU Munich), Ph.D.(TU Berlin)  
 Mabelle Wilchesky; B.A., M.A.(Qu.), Ph.D.(McG.)

**Associate Members**

Sara Ahmed (Physical and Occupational Therapy)  
 Olivier Beauchet (Medicine)  
 David Buckeridge (Epidemiology)  
 Robin Cohen (Palliative Care)  
 Carolyn Ells (Bioethics)  
 Jennifer Fishman (Bioethics)  
 Matthias Friedrich (Medicine)  
 Richard Hovey (Dentistry)  
 Matthew Hunt (Physical and Occupational Therapy)  
 Patricia Li (Pediatrics)  
 Francesca Luconi (Continuing Professional Development – Faculty of Medicine)  
 Antonia Maioni (Political Science)  
 Melissa Park (Physical and Occupational Therapy)  
 Erin Strumpf (Epidemiology and Economics )  
 Daniel Weinstock (Institute of Health and Social Policy)  
 Meredith Young (Centre of Medical Education)

**Adjunct Professors**

Antoine Boivin (Montr.)  
 Julie Bruneau (Montr.)







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

### Elective Courses (8 credits)

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

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

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

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

### Thesis

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

### PhD Comprehensive Exam

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

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

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

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

### Elective Course (3 credits)

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

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## 12.13 Microbiology and Immunology

### 12.13.1 Location

Department of Microbiology and Immunology  
 Duff Medical Building, Room 511  
 3775 University Street  
 Montreal QC H3A 2B4  
 Canada  
 Telephone: 514-398-3061  
 Fax: 514-398-7052

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

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

### 12.13.3.2 Application Procedures

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

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

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

#### 12.13.3.2.1 Additional Requirements

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

- [Supervisor Confirmation Form](#)

### 12.13.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Microbiology and Immunology and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at [www.mcgill.ca/gps/contact/graduate-program](http://www.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)
	April 22Speci 486cep.1 1sA	June 13	June 13

### **Associate Professors**

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

J. Fritz; Ph.D.(Vienna)

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

S. Sagan; B.Sc.(McG.), Ph.D.(Ott.)

### **Assistant Professors**

I. King; B.A.(Ohio), M.Sc.(Pitt.), Ph.D.(Roch.)

C. Maurice; M.S., Ph.D.(Montpellier)

M. Richer; B.Sc.(McG.), M.Sc.(Montr.), Ph.D.(Br. Col.)

### **Associate Members**

*Dentistry*: E. Emami, S. Tran

*Epidemiology and Infectious Diseases*: M. Behr,

MIMM 697	(11)	Master's Research 1
MIMM 698	(11)	Master's Research 2
MIMM 699	(11)	Master's Research 3

**Required Courses (6 credits)**

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

**Complementary Courses (6 credits)**

Minimum 6 credits from:

MIMM 607	(3)	Biochemical Pathology
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.

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

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

**Thesis**

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

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## 12.14 Occupational Health

### 12.14.1 Location

Department of Epidemiology, Biostatistics and Occupational Health  
Purvis Hall  
1020 Pine Avenue West  
Montreal QC H3A 1A2  
Canada  
Telephone: 514-398-6258  
Email: [graduate.eboh@mcgill.ca](mailto:graduate.eboh@mcgill.ca)  
Website: [www.mcgill.ca/epi-biostat-occh](http://www.mcgill.ca/epi-biostat-occh)

### 12.14.2 About Occupational Health

The Department offers two graduate degree programs: a **master's** (M.Sc.A.) and **doctoral** (Ph.D.) in occupational health sciences. The master's program is av



	Application Opening Dates		Application Deadlines		
	All Applicants	Non-Canadian citizens	Canadian citizens/Perm. residents of Canada	Current McGill Students (any citizenship)	Special, Visiting & Exchange Students
<b>Fall Term:</b>	Sept. 15	Dec. 15	Dec. 15	Dec. 15	Apr. 30
<b>Winter Term:</b>	Feb. 15	N/A	N/A	N/A	Sept. 10
<b>Summer Term:</b>	N/A	N/A	N/A	N/A	N/A

Admission to graduate studies is competitive; accordingly



OCCH 602	(3)	Occupational Health Practice
OCCH 603	(3)	Work and Environment Epidemiology 1
OCCH 604	(3)	Monitoring Occupational Environment

Biological Haz51 2678Es 0 0 1 165.864 694.12Tm(Biolo)Tj1 0 0 1 70.52 694.12Tm(Biolo604)Tj8 0 0 1 221.949 678.4

- psychosocial oncology/palliative care
- clinical cancer research
- cancer care services and quality.

### **12.15.3 Oncology Faculty**

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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: Clinical Trials 3
ONCO 615T	(3)	Principles and Practice of Clinical Trials

OR

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

3 credits from:

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

POTH 637	(3)	Cancer Rehabilitation
PPHS 528	(3)	Economic Evaluation of Health Programs
PSYC 507	(3)	Emotions, Stress, and Illness

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## Associate Professors

M. Desrosiers; M.D.(Montr.), F.R.C.S.(C)

N. Fanous; M.B., B.CH.(Cairo), F.R.C.S.(C)

W.R.J. Funnell; B.Eng., M.Eng., Ph.D.(McG.)

M. Hier; M.D.,C.M.(McG.), F.R.C.S.(C)

J. Manoukian; M.B., Ch.B.(Alex.), F.R.C.S.(C)

L. HP. Nguyen; M.D.,C.M.(McG.), M.Sc.(Otol.)(McG.), F.R.C.S.(C)

W.H. Novick; M.D.(Qu.), F.R.C.S.(C)

R. Payne; M.D.,C.M., M.Sc.(Otol.)(McG.), F.R.C.S.(C)

J. Rappaport; M.D.(Dal.), F.R.C.S.(C)

M. Samaha; M.D.(Qu.), M.Sc.(Otol.)(McG.), F.R.C.S.(C)

B. Segal; B.Sc., B.Eng., M.Eng., Ph.D.(McG.)

M. Tewfik; M.D.,C.M., M.Sc.(Otol.)(McG.), F.R.C.S.(C)

A.G. Zeitouni; M.D.(Sher.), M.Sc.(Otol.)(McG.), F.R.C.S.(C)

## Lecturers

A. Finesilver; M.D.,C.M.(McG.), F.R.C.S.(C)

O. Houle; M.D.

V. Iordanescu; M.D.

M. Lalonde; M.D.

L. Monette; M.D.

L. Picard; M.D.(Montr.), F.R.C.S.(C)

J. Rothstein; M.D.,C.M.(McG.), F.R.C.S.(C)

R. Varshney; M.D., C.M., M.Sc., F.R.C.S.(C)

T.V.T. Vu; M.D.

R. Ywakim; M.D., F.R.C.S.(C)

**u; M.D.**

Canada

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documented proof of competency in oral and written English. Before acceptance, appropriate exam results must be submitted directly from the TOEFL (Test of English as a Foreign Language) or IELTS (International English Language Testing Systems) Office. These applicants are usually required to take the *GRE* in order to properly evaluate their suitability.

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

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

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

### 12.17.3.2 Application Procedures

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

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

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

#### 12.17.3.2.1 Additional Requirements

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

### 12.17.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Pathology Department and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at [www.mcgill.ca/gps/contact/graduate-program](http://www.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 Nov. 10	June 21 Nov. 10



### Assistant Professors

S.-M. Jung; M.D.(Chonnam)  
Y. Kanber; M.D.(Marmara)  
J. Lavoie; B.Sc., M.Sc., Ph.D.(Laval)  
H.R. Lopez-Valle; M.D.(UASLP)  
A.T. Marcus; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)  
V.-H. Nguyen; M.D.(Montr.), F.R.C.P.(C)  
A. Omeroglu; M.D.(Istanbul U)  
G. Omeroglu-Altinel; M.D.(Istanbul U)  
F. Razaghi; M.D.(SBUMS)  
S. Sabri; Ph.D.(Paris VII)  
S. Sandhu; M.B.,B.S.(N. Bengal Med.)  
H. Srolovitz; B.Sc.(Pitt), M.D.(Basel)  
J. St. Cyr; M.D.,C.M.(McG.), F.R.C.P.(C)  
T.N. Ton Nu; M.D.(Pham Ngoc Thach), F.R.C.P.(C)  
H. Wang; M.D.(AFMU, China), F.R.C.P.(C)

### Visiting Professors

A.S.M. Noman; B.Sc., M.Sc.(Rajshahi), Ph.D.(Aichi Med.)

### Associate Members

B. S. Abdulkarim; B.Sc.(Aix-Marseille), M.Sc.(Paris V), M.D., Ph.D.(Paris XI), F.R.C.P.(C)  
C.J. Baglole; B.Sc., M.Sc.(PEI), Ph.D.(Calg.)  
N. Braverman, B.Sc.(Cornell), M.S.(Sarah Lawrence), M.D.(Tulane), F.A.C.M.G.  
S. Cellot, M.D., Ph.D.(Montr.)  
P.J. Chauvin; M.Sc.(UWO), D.D.S.(McG.)  
M. Divangahi; Ph.D.(McG.)  
S.N.A. Hussain; M.D.(Baghdad), Ph.D.(McG.)  
G.O.R. Arena; M.D.(Catania), F.R.C.S.(C)  
N. Jabado; M.D.(Paris VI), Ph.D.(INSERM, Paris)  
W. Kassouf; M.D.,C.M.(McG.), F

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.

**12.17.6 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.

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**12.18 Pharmacology and Therapeutics****12.18.1 Location**

Department of Pharmacology and Therapeutics  
McIntyre Medical Sciences Building  
3655 Promenade Sir-William-Osler, Room 1325  
Montreal QC H3G 1Y6  
Canada  
Telephone: 514-398-3623  
Fax: 514-398-2045  
Email: [gradstudies.pharmacology@mcgill.ca](mailto:gradstudies.pharmacology@mcgill.ca)  
Website: [www.mcgill.ca/pharma](http://www.mcgill.ca/pharma)



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.

### 12.18.3.2 Application Procedures

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

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

#### 12.18.3.2.1 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

### 12.18.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Pharmacology and Therapeutics and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at [www.mcgill.ca/gps/contact/graduate-program](http://www.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)
<b>Fall Term:</b>	Sept. 15	March 15	May 15	May 15
<b>Winter Term:</b>	Feb. 15	Sept. 10	Oct. 15	Oct. 15
<b>Summer Term:</b>	N/A	N/A	N/A	N/A

Please refer to our [website](#) for complete deadlines.

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

## 12.18.4 Pharmacology and Therapeutics Faculty

### Chair

G. Multhaup

### Graduate Program Director

B. Robaire

### Emeritus Professors

R. Capek; M.D., Ph.D.(Prague)

H.H. Zingg; M.D., Ph.D.(McG.)

### Professors

D. Bernard; Ph.D.(Johns Hop.)

D. Bowie; B.Sc., Ph.D.(Lond.)

P.B.S. Clarke; M.A.(Camb.), Ph.D.(Lond.)

A.C. Cuello; M.D.(Buenos Aires), M.A., D.Sc.(Oxf.), F.R.S.C.

## Professors

B.F. Hales; Ph.D.(McG.)

T. Hébert; Ph.D.(Tor.)

D. Maysinger; Ph.D.(USC)

A. McKinney; Ph.D.(Ulster)

G. Multhaup; Ph.D.(Cologne)

A. Ribeiro-da-Silva; M.D., Ph.D.(Oporto)

B. Robaire; Ph.D.(McG.)

H. Saragovi; Ph.D.(Miami)

M. Szyf; Ph.D.(Hebre

### Affiliate Members

L. Breton; Ph.D.(Paris)

L. Garolalo; Ph.D.(McG.)

J. Gillard; Ph.D.(Tasmania)

J. Mancini; M.Sc., Ph.D.(McG.)

K. Meerovitch; Ph.D.(McG.)

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

The program leading to a master's degree is designed to provide students the opportunity to acquire knowledge in Pharmacology, to conduct a research project, to analyze data, and to write a thesis. Students will also receive essential training in Research Professionalism and Scientific Communication.

#### Thesis Courses (24 credits)

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

#### Required Cour



**Thesis Courses (24 credits)**

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

**Required Courses (18 credits)**

PHAR 601	(6)	Research Seminar
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

**Complementary Courses (3 credits)**

3 credits from the following courses:

PHAR 503	(3)	Drug Discovery and Development 1
PHAR 505	(3)	Structural Pharmacology
PHAR 562	(3)	Neuropharmacology
PHAR 563	(3)	Endocrine Pharmacology

Or completion of an equivalency exam

Or an exemption granted by the Graduate Training Committee (GTC) on the basis of previous courses.

Students who have taken these courses as part of their undergraduate degree, passed the equivalency exam, or been ex

PHAR 562 (3) Neuropharmacology

PHAR 563 (3) Endocrine Pharmacology

Or completion of an equivalency exam;

Or an exemption granted by the GTC on the basis of previous courses.

**Doctor of Philosophy (Ph.D.) Pharmacology: Environmental Health Science**

## 12.19.2 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 (cardio

## 12.19.3 Physiology Admission Requirements and Application Procedures

### 12.19.3.1 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.

### 12.19.3.2 Application Procedures

McGill's online application form for graduate program candidates is av



**Assistant Professors**

Judith Mandl; B.Sc.(Warw.), Ph.D.(Emory)

Anastasia Nijnik; M.Biochem., Ph.D.(Oxf.)

Masha Prager-Khoutorsky; B.Sc., Ph.D.(Hebrew)

Daniela Quail; B.Sc., Ph.D.(UWO)

Melissa Vollrath; B.Sc.(Wisc.), Ph.D.(BCM)

**Associate Members***Anaesthesia:* Steven Backman*Biomedical Engineering:* Robert Kearney, Satya Prakash*Biomedical Ethics:* Jennifer Fishman*Kinesiology and Physical Education:* Dilson Rassier*Mathematics:* Anthony Humphries*Medicine:* Nicole Bernard, Volker Blank, Mark Blostein, Andrey Cybulsky, Geoffrey Hendy, Louise Larose, Anne-Marie Lauzon, Serge Lemay, James Martin, Barry Posner, Shafaat Rabbani, Simon Rousseau, Mary Stevenson, Tomoko Takano, Elena Torban, Simon Wing*Microbiology and Immunology:* Jörg Fritz*Neurology and Neurosurgery:* Jack Antel, Massimo Avoli, Daniel Guitton, Christopher Pack, David Ragsdale, Ed Ruthazer, Amir Shmuel, Jesper Sjöström*Ophthalmology:* Curtis Baker*Otolaryngology:* Bernard Segal*Pediatrics:* Charles Rohlicek*Pharmacology and Therapeutics:* Daniel Bernard, Terence Hebert*Psychiatry:* Nicolas Cermakian*Research in Neuroscience:* Charles Bourque, Sal. T. Carbonetto**Adjunct Professors**

M. Craig, K. Cullen, P. Haghighi, J. Martinez-Trujillo

**Associate Professor Post-Retirement**

Ann Wechsler; B.A.(Tor.), M.Sc., Ph.D.(McG.)

**12.19.5 Master of Science (M.Sc.) Physiology (Thesis) (45 credits)****Thesis Courses (27 credits)**

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

**Required Courses (12 credits)**

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

**Elective Courses (6 credits)**

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

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

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

**Thesis Courses (27 credits)**

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

**Required Courses (12 credits)**

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar
PHGY 601	(1)	M.Sc. Proposal Seminar
PHGY 602	(2)	Literature Search and Research Proposal
PHGY 604	(0)	Responsible Conduct in Research
PHGY 607	(3)	Laboratory Research 1
PHGY 608	(3)	Laboratory Research 2

**Complementary Courses (6 credits)**

6 credits to be chosen from the following:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics

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

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

The Graduate Option in Chemical Biology is centered on the pursuit of an original research project under the direction of one or more program mentors. This research training is augmented by student participation in lecture and seminar courses and in a series of thematic workshops, all of which are designed to expose students to the diverse approaches and research issues that characterize the current state of the field. Students with training in this interdisciplinary approach will be highly qualified to seek careers in academic research as well as the pharmaceutical and biotechnology industries.

**Thesis Courses (27 credits)**

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

**Required Courses (12 credits)**

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

PHGY 608	(3)	Laboratory Research 2
PHGY 620	(3)	Progress in Research

**Complementary Courses (6 credits)**

3 credits from the following Chemical Biology seminars:

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

3 credits from the following:

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

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

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

**Required Courses (8 credits)**

PHGY 604	(0)	Responsible Conduct in Research
PHGY 701	(0)	Ph.D. Comprehensive Examination
PHGY 703	(1)	Ph.D. Progress Seminar 1
PHGY 704	(1)	Ph.D. Progress Seminar 2
PHGY 720	(1)	Ph.D. Seminar Course 1
PHGY 721	(1)	Ph.D. Seminar Course 2
PHGY 722	(1)	Ph.D. Seminar Course 3
PHGY 723	(1)	Ph.D. Seminar Course 4
PHGY 724	(1)	Ph.D. Seminar Course 5
PHGY 725	(1)	Ph.D. Seminar Course 6

**Elective Courses (9 credits)**

9 credits of Physiology or Science at the 500 level or above, in consultation with the GSAAC and the candidate's supervisor.

**12.19.9 Doctor of Philosophy (Ph.D.) Physiology: Bioinformatics**

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

**Thesis**

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



**Required Courses (11 credits)**

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar
PHGY 604	(0)	Responsible Conduct in Research
PHGY 701	(0)	Ph.D. Comprehensive Examination
PHGY 703	(1)	Ph.D. Progress Seminar 1
PHGY 704	(1)	Ph.D. Progress Seminar 2
PHGY 720	(1)	Ph.D. Seminar Course 1
PHGY 721	(1)	Ph.D. Seminar Course 2
PHGY 722	(1)	Ph.D. Seminar Course 3
PHGY 723	(1)	Ph.D. Seminar Course 4
PHGY 724	(1)	Ph.D. Seminar Course 5
PHGY 725	(1)	Ph.D. Seminar Course 6

**Complementary Courses (6 credits)**

6 credits to be chosen from the following courses:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics

**Doctor of Philosophy**

PHGY 722	(1)	Ph.D. Seminar Course 3
PHGY 723	(1)	Ph.D. Seminar Course 4
PHGY 724	(1)	Ph.D. Seminar Course 5

### Complementary Courses (6 credits)

6 credits from the following:

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

## 12.20 Psychiatry

### 12.20.1 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: [www.mcgill.ca/psychiatry](http://www.mcgill.ca/psychiatry)

### 12.20.2 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 12.20.5: Master of Science (M.Sc.) Psychiatry (Thesis) (45 credits)*

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

### 12.20.3 Psychiatry Admission Requirements and Application Procedures

#### 12.20.3.1 Admission Requirements

- A B.Sc., B.A., B.N., or M.D. degree
- A strong background in science and/or social science, as demonstrated by academic achievement equivalent to a GPA of 3.3 (on a 4-point scale) or 3.5 in the last two years
- An outline of the proposed thesis research, to be written by the prospective student in collaboration with an appropriate research supervisor
- Two letters of reference
- Sufficient funding to support their studies
- *TOEFL* or *IELTS* certificate of proficiency in English for non-Canadian applicants whose mother tongue and language of education is not English, with a minimum score of 86 on the TOEFL Internet-based test (iBT; or 550 on the paper-based test [PBT]), with each component score not less than 20, or 6.5 on the IELTS test

### 12.20.3.2 Application Procedures

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

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

#### 12.20.3.2.1 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

### 12.20.3.3 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 [www.mcgill.ca/gps/contact/graduate-program](http://www.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	March 15	March 15
<b>Winter Term:</b>	Feb. 15	Sept. 10	Sept. 10	Sept. 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.

## 12.20.4 Psychiatry Faculty

### Chair

G. Turecki

### Director of Graduate Program

N. Mechawar

### Emeritus Professors

F. Abbott; B.Sc.(McM.), M.Sc., Ph.D.(McG.)

L. Annable; B.Sc.(Liv.), Dipl. in Stat.(Edin.)

M.K. Birmingham; B.A.(Bennington), M.Sc., Ph.D.(McG.)

F. Engelsmann; Ph.D.(Charles)

N. Frasure-Smith; B.A. Ph.D.(Johns Hop.)

A. M. Ghadirian; M.D.(Tabriz), M.Sc.(Ohio St.), Dipl. Psych(McG.)

C. Gianoulakis; B.Sc.(Sir G. Wms.), Ph.D.(Rutgers)

J.C. Negrete; M.D.(Tucuman), Dip.Psych.(McG.)

J. Paris; M.D.(McG.)

G. Pinard; B.A., M.D.(Montr.)

S. Young; B.A.(Oxf.), M.Sc.(Lond.)

### Professors

C. Benkelfat; M.D.(Rabat) (*James McGill Professor*)

## Professors

V. Bohbot; Ph.D.(Ariz.)

D. Boivin; Ph.D.(Montr.)

P. Boksa; B.Sc., Ph.D.(McG.)

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

J. Breitner; B.A.(Harv.), M.P.H.(Johns Hop.), M.D.(Penn.)

A. Brunet; Ph.D.(Montr.)

N. Cermakian; B.Sc.(UQTR), M.Sc., Ph.D.(Montr.)

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

S. El Mestikawy; Ph.D.(Paris VI)

M.-J. Fleury; M.A., Ph.D.(Montr.)

C. Flores; B.Sc., M.A., Ph.D.(C'dia)

S. Gauthier; B.A., M.D.(Montr.)

B. Giros; M.Sc., Ph.D.(Paris VI)

I. Gold; B.A.(McG.), Ph.D.(Princ.)

A. Gratton; Ph.D.(C'dia)

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

J. Guzder; B.Sc., M.D., C.M., Dipl.Psych.(McG.)

L.T. Hechtman; B.Sc., M.D.,C.M.(McG.)



**Associate Professors**

S. Renaud; M.D.(La

## Assistant Professors

S. Choudhury; Ph.D.(Univ. Coll. Lond.)

J. Cohen; B.Sc.(Rectorat de Paris), M.Sc., M.D.(Paris V)

P. Cote; B.A.(Laval), M.D.,C.M.(Lav

**Assistant Professors**

M. Laporta; Dip.Psychol., M.D.,C.M.(McG.)

L. Laporte; B.A.(McG.), M.Psychol., Ph.D.(Montr.)

M. Lashley; Ph.D.(McG.)

J.D. Leccia; M.D.(Provence Aix-Marseille)

E. Levy; Gr.Dip.Psychiat.(McG.), M.Ed.(Sher.)

E. Libman; B.A., M.Sc., Ph.D.(McG.)

E. Lizondo; M.D.,C.M.(Nat. Univ. Central Buenos Aires)

N.C.P. Low; M.D., M.Sc.(McG.)

W. Ma; M.D., M.Sc.(Tongji), Ph.D.(McG.)

R. Martins; Ph.D.(Montr.)

N. Masrouha; M.D.(Sher.)

T. Measham; B.Sc., M.D.(McG.)

X. Meng; B.Sc.(Inner Mongolia), M.Sc., Ph.D.(Jilin)

M. Messier; B.A.(Montr.), M.B.A.(HEC)

G. Meterissian; Gr.Dip.Psychiat.(McG.), M.D.,C.M.(Montr.)

T.M. Milroy; B.Sc., M.D.,C.M.(Md.), Gr.Dip.Psychiat.(McG.)

M. Miresco; M.D.,C.M.(McG.)

J.P. Near; Ph.D.(UWO)

M-C. Noel; M.D.(Sher.), F.R.C.P.(C.)

T. V. Nguyen; M.D., M.Sc.(McG.)

K. O'Donnell; Ph.D.(Imp. Coll. Lon.)

J.A. O'Neil; B.A.(C' dia), Dip.Psychol., M.D.,C.M.(McG.)

M. Piat; Ph.D.(Laval)

L. Pinard; M.D.(Montr.), F.R.C.P.(C)

Z. Prelevic; Dip.Psychol.(McG.), M.D.,C.M.(Belgrade)

A. Propst; B.A., M.D.(McG.)

R. Rabin; B.Sc.(McG.), M.Sc., Ph.D.(Tor.)

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

S. Rej; M.D., M.Sc.(McG.)

S.B. Rosenbloom; B.A.(C' dia), M.A.(York)

C. Roy; B.Sc.(McG.), M.D.,C.M.(Dal.)

T. Said; B.Sc.(McG.), M.D.,C.M.(Sher.)

H. Schwartz; M.D.(McG.)

M. Segal; B.A.(C' dia), B.Sc.(O.T.)(McG.), M.D.,C.M.(Ott.)

J. Seguin; B.A., B.Sc., M.D.,C.M.(Ott.)

T. Semeniuk; B.Sc., M.Ed., M.D.,C.M.(Alta.)

J. Shah; M.Sc.(Lond.), M.D.(Tor.)

O. Sidhom; M.D., M.Sc.(Tunis)

P.P. Silveira; M.D., M.Sc., Ph.D.(UFRGS)

I. Spector; B.A.(McG.), M.Sc., Ph.D.(Syrac.)

K.A. Steger; M.D., Ph.D.(Texas, Southwest. Med. Cent.)

A. St-Hilaire; M.Sc.(McG.), Ph.D.(Ohio)



**Assistant Professors**

M. St-Laurent; M.D.(Montr.)  
 N. Szkrumelak; B.Sc., M.D.,C.M.(McG.)  
 K. Tabbane; M.D., Ph.D.(Tunisia)  
 M. Temple; B.Sc., M.D.(Nfld.)  
 L. Thaler; Ph.D.(Nevada)  
 Z. Thomas; M.D.(McG.)  
 L. Tourian; M.D.(McG.)  
 A. Traicu; M.D.(McG.)  
 J. Tremblay; B.A.(Montr.), M.Sc.(McG.), M.D.,C.M.(Montr.)  
 M. R. Tuineag; M.D.(UMFCD), M.Sc.(Montr.)  
 S. Veissière; B.Sc.(Dublin), M.A., Ph.D.(McG.)  
 S. Vida; B.Sc.(Ott.), M.D.,C.M.(McG.)  
 S. Villeneuve; Ph.D.(Montr.)  
 J. Vogel; M.D.,C.M.(Manit.)  
 R. Whitley; B.S., M.S., Ph.D.(Lond.)  
 M.A. Wolf; M.Sc., M.D.,C.M.(Strasbourg)  
 Y. Wolf; M.D.(McG.)  
 G. Zahirney; M.D.(McG.)  
 T.Y. Zhang; Ph.D.(McG.)  
 V. Zicherman; B.Sc., M.D.,C.M.(McG.)  
 D. Zigman; M.D.(McG.)  
 E. Zikos; M.D.(Montr.)

**Lecturers**

F. Amdiss, T. Bedrossian, J.F. Belair, F. Bensaada, I. Blais, M. Boisvert, O. Boureanu, V. Brazzini-Poisson, C.M.J. Brebion, Mioara Bunea Cotfas, A. Cadivy, E. Casimir, E. Cauchois, P. Chan, C. Chen, C. Chenaud-Soucy, M. Cicalo, M. Coward, T.-V. Dao, M.H.N. Dinh, H.C. Dube, J.A. Farquhar, H. Goldhaar, P. Harden, J. Harvey, M. Heyman, H.G. Jean-Francois, D. Kunin, N. Kuperstok, L. LaChance, S. Mauger, D. Michaud, D.F.S. Monti, K. Myron, R. Orenman, C. Paquin-Hodge, R. Payeur, L. Peters, M. Pickles, M. Quintal, K. Richter, D.T. Rochon, A. Schiavetto, V. Tagalakakis, F.C. Toma, O. Triffault, E. Veljanova, S. Wisebord

**Associate Members**

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

**Adjunct Professors**

M. Alda, E. Amirali, P. Blier, L. Booi, B. Chaumette, A. Daigneault, A. Duffy, D. Fikretoglu, A. Gagnon, J.-M. Guile, F. Jollant, B. Kieffer, V. Kovess, R. Labonte, A. Lesage, S.J. Lloyd, A. Maccordick, T. Ngo-Minh, J. Pruessner, M. Pruessner, S. Richard-Devantoy, A. Ryder, C. Tranulis

**Post-Retirement**

D.P. Dastoor, J.P. Ellman

**12.20.5 Master of Science (M.Sc.) Psychiatry (Thesis) (45 credits)**

The M.Sc. in Psychiatry is administered by the Graduate Training Committee. Each student selects a Supervisory Committee composed of the research supervisor plus two to four other faculty who are knowledgeable about the student's research area and who can advise both on appropriate coursework and on the thesis research project. The student will meet with this Supervisory Committee at least once during each year of matriculation for the purpose of evaluating academic and research progress of the student. The Supervisory Committee will also act as a resource body for the student, both with respect to academic and administrative matters.

**Thesis Courses (36 credits)**

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

**Complementary Courses (9 credits)**

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

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

**12.20.6 Doctor of Philosophy (Ph.D.) Mental Health**

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

**Thesis**

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

**Required Courses (6 credits)**

PSYT 605	(3)	History and Philosophy of Psychiatry
864 440.503 Ty983 h 0 15t((3))Tj1 0 ah Tm8e7i10		Research in Clinical Psychiatry

**Complementary Courses (3 credits)**

3 credits from the following or 3 credits of 500 lev

Canada  
Graduate Program Coordinator: Sharon Turner  
Telephone: 514-934-1934, ext. 42837  
Email: [gradstudies.surgery@mcgill.ca](mailto:gradstudies.surgery@mcgill.ca)  
Website: [www.mcgill.ca/experimentalsurgery](http://www.mcgill.ca/experimentalsurgery)

## 12.21.2 About Experimental Surgery

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

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

### *section 12.21.5: Master of Science (M.Sc.) Experimental Surgery (Thesis) (45 credits)*

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

### *section 12.21.6: Master of Science (M.Sc.) Experimental Surgery (Thesis): Global Surgery (45 credits)*

This concentration emphasizes healthcare needs specifically within the surgical field in resource-limited settings. It comprises three main pillars: research, education, and mentorship. Through extensive research work, students will participate in the design and implementation of innovative approaches in surgical care and injury surveillance, advancing the surgical capacities in lo

***section 12.21.11: Graduate Certificate (Gr. Cert.) Surgical Innovation (15 credits)***

clinical activity in their focus themes. The trainees learn basic prototyping skills, start-up organization, and project management. This is supplemented by a basic statistics course and an introduction to the current status of biomedical research innovation. This certificate then gives a solid non-thesis-based foundation in the innovation process.

***section 12.21.12: Graduate Diploma (Gr. Dip.) Surgical Innovation (30 credits)***

The cores of this program are two-fold. Firstly, two innovation courses are offered by the McGill Department of Surgery, Experimental Surgery (EXSU 620 Surgical Innovation 1 and EXSU 621 Surgical Innovation 2) and supporting courses are delivered by the McGill Department of Surgery with some sessions in those courses provided by external partners, Local Industry (Rev

### **12.21.3.3 Application Dates and Deadlines**

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

**Professors**

A. Philip; M.Sc., Ph.D.(McG.)  
 L. Rosenberg; M.Sc., M.D., Ph.D.(McG.)  
 D. Shum-Tim; M.Sc., M.D.,C.M.(McG.)  
 R. St. Arnaud; Ph.D.(Laval)  
 T. Taketo-Hosotani; B.Sc., M.Sc., Ph.D.(Kyoto)  
 M. Tanzer; M.D.,C.M.(McG.), F.R.C.S.(C)  
 C.I. Tchervenkov; B.Sc., M.D.,C.M.(McG.), F.R.C.S.(C)  
 J.I. Tchervenkov; M.D.,C.M.(McG.), F.R.C.S.(C)  
 R. Turcotte; M.D.(Montr.)

**Associate Professors**

M. Basik; M.D.,C.M., M.Sc.(McG.)  
 S. Bergman; M.Sc., M.D.,C.M.(McG.), F.R.C.S.(C)  
 O. Blaschuk; B.Sc.(Winn.), M.Sc.(Manit.), Ph.D.(Tor.)  
 R. Cecere; M.D.,C.M., B.Sc.(McG.), F.R.C.S.(C), A.B.S., F.A.C.S.  
 D. Fleischer; B.Sc., M.D.,C.M.(McG.)  
 S. Fraser; B.Sc., M.D.(Tor.), M.Sc.(McG.), F.R.C.S.(C)  
 M. Gilardino; M.D.,C.M., M.Sc.(McG.), F.R.C.S.(C), F.A.C.S.  
 L. Haglund; B.Sc., Ph.D.(Lunds)  
 K.J. Lachapelle; M.Sc., M.D.,C.M.(McG.)  
 J. Lapointe; M.D., Ph.D.(Laval)  
 L. Lessard; B.Sc., M.D.(Laval), F.R.C.S.(C)  
 A. Meguerditchian; M.D., M.Sc.(Montr.), F.R.C.S., F.A.C.S.  
 C. O'Flaherty; D.V.M., Ph.D.(Buenos Aires)  
 S. Paraskevas; M.D., Ph.D.(Laval)  
 P. Puligandla; M.D., M.Sc.(UWO), F.R.C.S.(C)  
 J. Sampalis; M.Sc., Ph.D.(McG.)  
 T. Steffen; M.D.(Switz.), Ph.D.(McG.)  
 A. Thomson; Ph.D.(Lond.)  
 D. Zukor; B.Sc., M.D.,C.M.(McG.)

**Assistant Professors**

A. Dragomir; M.Sc., Ph.D.(Montr.)  
 J. Faria; M.D.,C.M., M.Sc.(McG.), F.R.C.S.(C)  
 J. Fiore; M.Sc.(Fed. U. Sao Paulo), Ph.D.(Melb.)  
 O. Huk; B.Sc., M.D.,C.M.(McG.), M.Sc.(Montr.)  
 P. Jarzem; B.Sc., M.D.(Qu.)  
 E. Lee; B.A.(Boston), M.Sc., Ph.D.(McG.)  
 K. Mackenzie; B.Sc.(Br. Col.), M.D.,C.M.(McG.), F.R.C.S.(C)  
 E. Mitmaker; M.D.(TJU), M.Sc.(McG.), F.R.C.S.(C)  
 M. Petropavlovskaja; M.Sc., Ph.D.(Moscow)  
 N. Saran; M.D., B.Sc.(Br. Col.)  
 K. Shaw; M.D.,C.M., M.Sc.(McG.)

**Associate Members**

M.N. Burnier  
 M. Cantarovich  
 J.C. Chen  
 F. Cury  
 C.E. Ferland-Legault  
 P. Goldberg  
 A. Gursahaney  
 J. Henderson  
 D. Juncker  
 S. Komarova  
 J.J. Lebrun  
 N.M. Makhoul  
 S. Mayrand  
 M. Murshed  
 P.H.N. Nguyen  
 S. Prakash  
 L.A. Stein  
 M. Tabrizian  
 B.M. Willie

**Professor of Practice**

S. Arless; B.Sc.(McG.)

**12.21.5 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 (9 credits)**

EXSU 601	(3)	Knowledge Management 1
EXSU 602	(3)	Knowledge Management 2

And:

3 credits from the following:

EDPE 575	(3)	Statistics for Practitioners
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EPIB 681	(3)	Global Health: Epidemiological Research
EXMD 609	(3)	Cellular Methods in Medical Research
EXMD 610	(3)	Molecular Methods in Medical Research
EXSU 605	(3)	Biomedical Research Innovation
EXSU 620	(3)	Surgical Innovation 1
EXSU 621	(3)	Surgical Innovation 2
EXSU 623	(6)	Surgery Research Project 2
EXSU 684	(3)	Signal Transduction
FMED 619	(3)	Program Management in Global Health & Primary Health Care
	(3)	Artificial Internal Organs

**Required Courses (12 credits)**

9 credits in:

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

And:

3 credits from the following:

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

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

**Elective Course (3 credits)**

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

**12.21.12 Graduate Diploma (Gr. Dip.) Surgical Innovation (30 credits)**

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

**Required Courses (15 credits)**

12 credits in:

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

And:

3 credits from the following:

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

**Complementary Courses (9 credits)**

9 credits from the following:

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

Or:

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

**Elective Courses (6 credits)**

6 credits at the 500 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.

