



**Faculty of Medicine (Graduate)**  
**Programs, Courses and University Regulations**  
**2011-2012**



This PDF excerpt of *Programs, Courses and University Regulations* is an archived snapshot of the web content on the date that appears in the footer of the PDF.

Archival copies are available at [www.mcgill.ca/study](http://www.mcgill.ca/study).

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

- 1 . McGill University reserves the right to make changes to the information contained in this online publication - including correcting errors, altering fees, schedules of admission, and credit requirements, and revising or cancelling particular courses or programs - without prior notice.
- 2 . In the interpretation of academic regulations, the Senate is the final authority.
- 3 . Students are responsible for informing themselves of the University's procedures, policies and regulations, and the specific requirements associated with the degree, diploma, or certificate sought.
- 4 . All students registered at McGill University are considered to have agreed to act in accordance with the University procedures, policies and regulations.
- 5 . Although advice is readily available on request, the responsibility of selecting the appropriate courses for graduation must ultimately rest with the student.
- 6 . Not all courses are offered every year and changes can be made after publication. Always check the Minerva Class Schedule link at [https://banweb.mcgill.ca/pban1/bwckschd.p\\_disp\\_dyn\\_sched](https://banweb.mcgill.ca/pban1/bwckschd.p_disp_dyn_sched) for the most up-to-date information on whether a course is offered.
- 7 . The academic publication year begins at the start of the Fall semester and extends through to the end of the Winter semester of any given year. Students who begin study at any point within this period are governed by the regulations in the publication which came into effect at the start of the Fall semester.
- 8 . Notwithstanding any other provision of the publication, it is expressly understood by all students that McGill University accepts no responsibility to provide any course of instruction, program or class, residential or other services including the normal range of academic, residential and/or other services in circumstances of utility interruptions, fire, flood, strikes, work stoppages, labour disputes, war, insurrection, the operation of law or acts of God or any other cause (whether similar or dissimilar to those enumerated) which reasonably prevent their provision.

**Note: Throughout this publication, "you" refers to students newly admitted, readmitted or returning to McGill.**

## ***Publication Information***

Published by

### **Enrolment Services**

McGill University  
3415 McTavish Street  
Montreal, Quebec, H3A 1Y1  
Canada

All contents copyright © 2011 by McGill University. All rights reserved, including the right to reproduce this publication, or portions thereof, in any form.

McGill University reserves the right to make changes to the information contained in this publication - including correcting errors, altering fees, schedules of admission and credit requirements, and revising or cancelling particular courses or programs - without prior notification.

Not all courses are offered every year and changes can be made after publication. Always check the Minerva Class Schedule link at [https://banweb.mcgill.ca/pban1/bwckschd.p\\_disp\\_dyn\\_sched](https://banweb.mcgill.ca/pban1/bwckschd.p_disp_dyn_sched) for the most up-to-date information on whether a course is offered.

- 
- 1 Dean's Welcome, page 13
  - 2 Graduate and Postdoctoral Studies, page 13
    - 2.1 Administrative Officers, page 13
    - 2.2 Location, page 13
    - 2.3 General Statement Concerning Higher Degrees, page 14
  - 3 Important Dates 2011-2012, page 14
  - 4 Graduate Studies at a Glance, page 14
    - 4.1 Graduate Diplomas and Certificates, page 16
    - 4.2 Master's Degrees, page 17
    - 4.3 Doctoral Degrees, page 21
    - 4.4 Postdoctoral Research, page 23
  - 5 Program Requirements, page 23
    - 5.1 Master's Degrees, page 23
    - 5.2 Doctoral Degrees, page 24
    - 5.3 Ad Hoc Programs, page 25
    - 5.4 Ad Personam Programs (Thesis Option only), page 25
    - 5.5 Coursework for Graduate Programs, Diplomas, and Certificates, page 25
  - 6 General Admission for Graduate Studies, page 25
    - 6.1 Application for Admission, page 25
    - 6.2 Admission Requirements (minimum requirements to be considered for admission), page 26
    - 6.3 Admission Tests, page 26
    - 6.4 Competency in English, page 26
    - 6.5 Admission to a Qualifying Program, page 27
    - 6.6 Admission to a Second Degree Program, page 27
    - 6.7 Admission to Two Degree Programs, page 27
    - 6.8 Admission to an Ad Personam Joint Program, page 28
    - 6.9 Admission to an Ad Hoc Program (Thesis), page 28
    - 6.10 Reinstatement and Admission of Former Students, page 28
    - 6.11 Deferral of Admission, page 28
  - 7 Fellowships, Awards, and Assistantships, page 28
  - 8 Postdoctoral Research, page 29
    - 8.1 Postdocs, page 29
    - 8.2 Guidelines and Policy for Academic Units on Postdoctoral Education, page 29
    - 8.3 Vacation Policy for Graduate Students and Postdocs, page 31
    - 8.4 Leave of Absence for Health and Parental/Familial Reasons, page 31
    - 8.5 Postdoctoral Research Trainees, page 31
  - 9 Graduate Studies Guidelines and Policies, page 32
    - 9.1 Guidelines and Regulations for Academic Units on Graduate Student Advising and Supervision, page 32
    - 9.2 Policy on Graduate Student Research Progress Tracking, page 34
    - 9.3 Vacation Policy for Graduate Students and Postdocs, page 34

- 
- 9.4 Ph.D. Comprehensives Policy, page 34
  - 9.5 Graduate Studies Reread Policy, page 36
  - 9.6 Health and Parental/Familial Leave of Absence Policy, page 37
  - 9.7 Failure Policy, page 38
  - 9.8 Guideline on Hours of Work, page 38
  - 10 Research Policy and Guidelines, Patents, Postdocs, Associates, Trainees, page 38
    - 10.1 Policy on Research Ethics, page 38
    - 10.2 Regulations on Research Policy, page 38
    - 10.3 Policy on Research Integrity, page 38
    - 10.4 Guidelines for Research Involving Human Subjects, page 38
    - 10.5 Guidelines for Research with Animal Subjects, page 39
    - 10.6 Policy on Intellectual Property, page 39
    - 10.7 Regulations Governing Conflicts of Interest, page 39
    - 10.8 Safety in Field Work, page 39
    - 10.9 Office of Sponsored Research, page 39
    - 10.10 Postdocs, page 39
    - 10.11 Research Associates, page 39
  - 11 Academic Programs, page 39
    - 11.1 Anatomy and Cell Biology, page 39
      - 11.1.1 Location, page 39
      - 11.1.2 About Anatomy and Cell Biology, page 40
      - 11.1.3 Anatomy and Cell Biology Admission Requirements and Application Procedures, page 40
        - 11.1.3.1 Admission Requirements, page 40
        - 11.1.3.2 Application Procedures, page 41
      - 11.1.4 Anatomy and Cell Biology Faculty, page 41
      - 11.1.5 Master of Science (M.Sc.); Cell Biology and Anatomy (Thesis) (48 credits) , page 43
      - 11.1.6 Doctor of Philosophy (Ph.D.); Cell Biology and Anatomy , page 44
    - 11.2 Biochemistry, page 44
      - 11.2.1 Location, page 44
      - 11.2.2 About Biochemistry, page 45
      - 11.2.3 Biochemistry Admission Requirements and Application Procedures, page 46
        - 11.2.3.1 Admission Requirements, page 46
        - 11.2.3.2 Application Procedures, page 47
      - 11.2.4 Biochemistry Faculty, page 47
      - 11.2.5 Master of Science (M.Sc.); Biochemistry (Thesis) (45 credits) , page 49
      - 11.2.6 Master of Science (M.Sc.); Biochemistry (Thesis) — Chemical Biology (47 credits) , page 49
      - 11.2.7 Master of Science (M.Sc.); Biochemistry (Thesis) — Bioinformatics (45 credits) , page 50
      - 11.2.8 Doctor of Philosophy (Ph.D.); Biochemistry , page 51
      - 11.2.9 Doctor of Philosophy (Ph.D.); Biochemistry — Chemical Biology , page 52
      - 11.2.10 Doctor of Philosophy (Ph.D.); Biochemistry — Bioinformatics , page 53

- 
- 11.3 Bioethics, page 54
    - 11.3.1 Location, page 54
    - 11.3.2 About Bioethics, page 54
    - 11.3.3 Bioethics Admission Requirements and Application Procedures, page 55
      - 11.3.3.1 Admission Requirements, page 55
      - 11.3.3.2 Application Procedures, page 55
    - 11.3.4 Bioethics Faculty, page 55
  - 11.4 Biomedical Engineering, page 55
    - 11.4.1 Location, page 55
    - 11.4.2 About Biomedical Engineering, page 56
    - 11.4.3 Biomedical Engineering Admission Requirements and Application Procedures, page 57
      - 11.4.3.1 Admission Requirements, page 57
      - 11.4.3.2 Application Procedures, page 57
    - 11.4.4 Biomedical Engineering Faculty, page 57
    - 11.4.5 Master of Engineering (M.Eng.); Biomedical Engineering (Thesis) (45 credits) , page 58
    - 11.4.6 Master of Engineering (M.Eng.); Biomedical Engineering (Thesis) — Bioinformatics (45 credits) , page 59
    - 11.4.7 Doctor of Philosophy (Ph.D.); Biomedical Engineering , page 60
    - 11.4.8 Doctor of Philosophy (Ph.D.); Biomedical Engineering — Bioinformatics , page 60
  - 11.5 Communication Sciences and Disorders, page 61
    - 11.5.1 Location, page 61
    - 11.5.2 About Communication Sciences and Disorders, page 61
    - 11.5.3 Communication Sciences and Disorders Admission Requirements and Applications Procedures, page 62
      - 11.5.3.1 Admission Requirements, page 62
      - 11.5.3.2 Application Procedures, page 63
    - 11.5.4 Communication Sciences and Disorders Faculty, page 63
    - 11.5.5 Master of Science, Applied (M.Sc.A.); Communication Sciences & Disorders (Non-Thesis) — Speech-Language Pathology (69 credits) , page 64
    - 11.5.6 Master of Science (M.Sc.); Communication Sciences and Disorders (Thesis) (45 credits) , page 65
    - 11.5.7 Doctor of Philosophy (Ph.D.); Communication Sciences and Disorders , page 66
    - 11.5.8 Doctor of Philosophy (Ph.D.); Communication Sciences and Disorders — Language Acquisition , page 66
  - 11.6 Epidemiology and Biostatistics, page 67
    - 11.6.1 Location, page 67
    - 11.6.2 About Epidemiology and Biostatistics, page 68
    - 11.6.3 Epidemiology and Biostatistics Faculty, page 68
    - 11.6.4 Epidemiology, page 70
      - 11.6.4.1 Epidemiology Admission Requirements and Application Procedures, page 71
      - 11.6.4.2 Master of Science (M.Sc.); Epidemiology (Thesis) (48 credits) , page 72
      - 11.6.4.3 Master of Science (M.Sc.); of Public Health (Non-Thesis) (52 credits) , page 72
      - 11.6.4.4 Master of Science (M.Sc.); of Public Health (Non-Thesis) — Environment (52 credits) , page 73
      - 11.6.4.5 Doctor of Philosophy (Ph.D.); Epidemiology , page 74

- 
- 11.6.4.6 Graduate Diploma in Epidemiology (30 credits) , page 74
  - 11.6.5 Biostatistics, page 75
    - 11.6.5.1 Biostatistics Admission Requirements and Application Procedures, page 75
    - 11.6.5.2 Master of Science (M.Sc.); Biostatistics (Thesis) (48 credits) , page 76
    - 11.6.5.3 Master of Science (M.Sc.); Biostatistics (Non-Thesis) (48 credits) , page 76
    - 11.6.5.4 Doctor of Philosophy (Ph.D.); Biostatistics , page 76
  - 11.7 Experimental Medicine, page 77
  - 11.8 Human Genetics, page 77
    - 11.8.1 Location, page 77
    - 11.8.2 About Human Genetics, page 77
    - 11.8.3 Human Genetics Admission Requirements and Application Procedures, page 78
      - 11.8.3.1 Admission Requirements, page 78
      - 11.8.3.2 Application Procedures, page 79
    - 11.8.4 Human Genetics Faculty, page 80
    - 11.8.5 Master of Science (M.Sc.); Human Genetics (Thesis) (45 credits) , page 82
    - 11.8.6 Master of Science (M.Sc.); Human Genetics (Thesis) — Bioinformatics (45 credits) , page 83
    - 11.8.7 Master of Science (M.Sc.); Human Genetics (Thesis) — Bioethics (45 credits) , page 83
    - 11.8.8 Master of Science (M.Sc.); Genetic Counselling (Non-Thesis) (48 credits) , page 84
    - 11.8.9 Doctor of Philosophy (Ph.D.); Human Genetics , page 84
    - 11.8.10 Doctor of Philosophy (Ph.D.); Human Genetics — Bioinformatics , page 85
  - 11.9 Medical Physics, page 86
    - 11.9.1 Location, page 86
    - 11.9.2 About Medical Physics, page 86
    - 11.9.3 Medical Physics Admission Requirements and Application Procedures, page 86
      - 11.9.3.1 Admission Requirements, page 86
      - 11.9.3.2 Application Procedures, page 86
    - 11.9.4 Medical Physics Faculty, page 87
    - 11.9.5 Master of Science (M.Sc.); Medical Radiation Physics (Thesis) (60 credits) , page 87
  - 11.10 Medicine, Experimental, page 88
    - 11.10.1 Location, page 88
    - 11.10.2 About Experimental Medicine, page 88
    - 11.10.3 Medicine, Experimental Admission Requirements and Application Procedures, page 89
      - 11.10.3.1 Admission Requirements, page 89
      - 11.10.3.2 Application Procedures, page 90
    - 11.10.4 Medicine, Experimental Faculty, page 90
    - 11.10.5 Master of Science (M.Sc.); Experimental Medicine (Thesis) (45 credits) , page 94
    - 11.10.6 Master of Science (M.Sc.); Experimental Medicine (Thesis) — Bioethics (45 credits) , page 94
    - 11.10.7 Master of Science (M.Sc.); Experimental Medicine (Thesis) — Environment (45 credits) , page 95
    - 11.10.8 Master of Science (M.Sc.); Experimental Medicine (Thesis) — Family Medicine (45 credits) , page 95
    - 11.10.9 Doctor of Philosophy (Ph.D.); Experimental Medicine , page 96



- 
- 11.10.10 Doctor of Philosophy (Ph.D.); Experimental Medicine — Environment , page 96
  - 11.10.11 Graduate Diploma in Clinical Research (30 credits) , page 97
  - 11.11 Microbiology and Immunology, page 97
    - 11.11.1 Location, page 97
    - 11.11.2 About Microbiology and Immunology, page 97
    - 11.11.3 Microbiology and Immunology Admission Requirements and Application Procedures, page 98
      - 11.11.3.1 Admission Requirements, page 98
      - 11.11.3.2 Application Procedures, page 98
    - 11.11.4 Microbiology and Immunology Faculty, page 99
    - 11.11.5 Master of Science (M.Sc.); Microbiology and Immunology (Thesis) (45 credits) , page 100
    - 11.11.6 Doctor of Philosophy (Ph.D.); Microbiology and Immunology , page 100
  - 11.12 Neuroscience (Integrated Program in), page 101
    - 11.12.1 Location, page 101
    - 11.12.2 About the Integrated Program in Neuroscience, page 101
    - 11.12.3 Neuroscience (Integrated Program in) Admission Requirements and Application Procedures, page 102
      - 11.12.3.1 Admission Requirements, page 102
      - 11.12.3.2 Application Procedures, page 102
    - 11.12.4 Neuroscience (Integrated Program in) Faculty, page 103
    - 11.12.5 Master of Science (M.Sc.); Neuroscience (Thesis) (45 credits) , page 107
    - 11.12.6 Doctor of Philosophy (Ph.D.); Neuroscience , page 108
  - 11.13 Occupational Health, page 108
    - 11.13.1 Location, page 108
    - 11.13.2 About Occupational Health, page 109
    - 11.13.3 Occupational Health Admission Requirements and Application Procedures, page 109
      - 11.13.3.1 Admission Requirements, page 109
      - 11.13.3.2 Application Procedures, page 110
    - 11.13.4 Occupational Health Faculty, page 110
    - 11.13.5 Master of Science, Applied (M.Sc.A.); Occupational Health (Resident) (Non-Thesis) (45 credits) , page 112
    - 11.13.6 Master of Science, Applied (M.Sc.A.); Occupational Health (Distance) (Non-Thesis) (45 credits) , page 113
    - 11.13.7 Doctor of Philosophy (Ph.D.); Occupational Health , page 113
  - 11.14 Otolaryngology – Head and Neck Surgery, page 114
    - 11.14.1 Location, page 114
    - 11.14.2 About Otolaryngology – Head and Neck Surgery, page 114
    - 11.14.3 Otolaryngology Admission Requirements and Application Procedures, page 114
      - 11.14.3.1 Admission Requirements, page 114
      - 11.14.3.2 Application Procedures, page 114
    - 11.14.4 Otolaryngology – Head and Neck Surgery Faculty, page 115
    - 11.14.5 Master of Science (M.Sc.); Otolaryngology (Thesis) (45 credits) , page 116
  - 11.15 Pathology, page 116
    - 11.15.1 Location, page 116

- 
- 11.15.2 About Pathology, page 117
  - 11.15.3 Pathology Admission Requirements and Application Procedures, page 117
    - 11.15.3.1 Admission Requirements, page 117
    - 11.15.3.2 Application Procedures, page 117
  - 11.15.4 Pathology Faculty, page 118
  - 11.15.5 Master of Science (M.Sc.); Pathology (Thesis) (45 credits) , page 119
  - 11.15.6 Doctor of Philosophy (Ph.D.); Pathology , page 120
  - 11.16 Pharmacology and Therapeutics, page 120
    - 11.16.1 Location, page 120
    - 11.16.2 About Pharmacology and Therapeutics, page 120
    - 11.16.3 Pharmacology and Therapeutics Admission Requirements and Application Procedures, page 121
      - 11.16.3.1 Admission Requirements, page 121
      - 11.16.3.2 Application Procedures, page 121
    - 11.16.4 Pharmacology and Therapeutics Faculty, page 122
    - 11.16.5 Master of Science (M.Sc.); Pharmacology (Thesis) (45 credits) , page 123
    - 11.16.6 Master of Science (M.Sc.); Pharmacology (Thesis) — Chemical Biology (47 credits) , page 124
    - 11.16.7 Doctor of Philosophy (Ph.D.); Pharmacology , page 125
    - 11.16.8 Doctor of Philosophy (Ph.D.); Pharmacology — Chemical Biology , page 125
  - 11.17 Physiology, page 126
    - 11.17.1 Location, page 126
    - 11.17.2 About Physiology, page 126
    - 11.17.3 Physiology Admission Requirements and Application Procedures, page 127
      - 11.17.3.1 Admission Requirements, page 127
      - 11.17.3.2 Application Procedures, page 127
    - 11.17.4 Physiology Faculty, page 127
    - 11.17.5 Master of Science (M.Sc.); Physiology (Thesis) (49 credits) , page 129
    - 11.17.6 Master of Science (M.Sc.); Physiology (Thesis) — Bioinformatics (49 credits) , page 129
    - 11.17.7 Doctor of Philosophy (Ph.D.); Physiology , page 130
    - 11.17.8 Doctor of Philosophy (Ph.D.); Physiology — Bioinformatics , page 130
  - 11.18 Psychiatry, page 131
    - 11.18.1 Location, page 131
    - 11.18.2 About Psychiatry, page 131
    - 11.18.3 Psychiatry Admission Requirements and Application Procedures, page 132
      - 11.18.3.1 Admission Requirements, page 132
      - 11.18.3.2 Application Procedures, page 132
    - 11.18.4 Psychiatry Faculty, page 132
    - 11.18.5 Master of Science (M.Sc.); Psychiatry (Thesis) (45 credits) , page 135
  - 11.19 Surgical Research, page 135
    - 11.19.1 Location, page 135
    - 11.19.2 About Surgical Research, page 135

- 
- 11.19.3 Surgical Research Admission Requirements and Application Procedures, page 136
    - 11.19.3.1 Admission Requirements, page 136
    - 11.19.3.2 Application Procedures, page 136
  - 11.19.4 Surgical Research Faculty, page 136
  - 11.19.5 Master of Science (M.Sc.); Experimental Surgery (Thesis) (Surgical Research) (48 credits) , page 138
  - 11.19.6 Doctor of Philosophy (Ph.D.); Experimental Surgery (Surgical Research) , page 139
  - 11.19.7 Graduate Diploma in Surgical Health Care Research (30 credits) , page 139



## 1 Dean's Welcome

To Graduate Students and Postdoctoral Fellows:

I am extremely pleased to welcome you to McGill University. With over 250 doctoral and master's degree programs, McGill is committed to providing world-class graduate education and postdoctoral training in a full range of academic disciplines and professions. Graduate and Postdoctoral Studies (GPS) provides strategic leadership and works in collaboration with the Faculties and other administrative and academic units to deliver the very highest level of teaching and research across the University. GPS is responsible for the admission and registration of graduate students, disbursing graduate fellowships, supporting postdoctoral fellows, and facilitating the graduation process, including the examination of theses.

As a student-centred research institution, McGill places singular importance upon the quality of graduate education and postdoctoral training. As Associate Provost (Graduate Education), as well as Dean of Graduate and Postdoctoral Studies, I work closely with the central administration, Faculties, graduate students, professors, researchers, postdoctoral fellows, and staff to enhance the graduate and postdoctoral experience and provide a supportive, stimulating, and enriching academic environment.

McGill is ranked as one of Canada's most intensive research universities and among the world's top 25. We recognize that these successes come not only from our outstanding faculty members, but also from the quality of our graduate students and postdoctoral fellows - a community into which we are very happy to welcome you.

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

*Martin Kreiswirth, Ph.D.*

*Associate Provost (Graduate Education)*

*Dean, Graduate and Postdoctoral Studies*

## 2 Graduate and Postdoctoral Studies

### 2.1 Administrative Officers

Martin Kreiswirth; B.A.(Hamilton), M.A.(Chic.), Ph.D.(Tor.)	<b>Associate Provost (Graduate Education) and Dean (Graduate and Postdoctoral Studies)</b>
Heather Durham; M.Sc.(W. Ont.), Ph.D.(Alta.)	<b>Associate Dean (Graduate and Postdoctoral Studies) (until Sept. 2011)</b>
Meyer Nahon; B.Sc.(Qu.), M.Sc.(Tor.), Ph.D.(McG.), Eng.	<b>Associate Dean (Graduate and Postdoctoral Studies)</b>
Lisa deMena Travis; B.A.(Yale), Ph.D.(MIT)	<b>Associate Dean (Graduate and Postdoctoral Studies) (as of Sept. 2011)</b>
Shari Baum; B.A.(C'neil), M.Sc.(Vermont), Ph.D.(Brown)	<b>Associate Dean (Graduate and Postdoctoral Studies)</b>
Charlotte E. Légaré; B.Sc.(Montr.), M.Sc.(Sher.), M.B.A.(McG.)	<b>Director (Graduate and Postdoctoral Affairs)</b>
Lissa B. Matyas; B.F.A., M.Sc.(C'dia)	<b>Director (Recruitment and Retention)</b>

### 2.2 Location

James Administration Building, Room 400  
845 Sherbrooke Street West  
Montreal, QC H3A 2T5

Telephone: 514-398-3990

Fax: 514-398-1626

Email: [servicepoint@mcgill.ca](mailto:servicepoint@mcgill.ca)

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



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

### 2.3 General Statement Concerning Higher Degrees

Graduate and Postdoctoral Studies (GPS) administers all programs leading to graduate diplomas, certificates and higher degrees. It is responsible for the admission of candidates, the supervision of their work and for recommending to Senate those who may receive the degrees, diplomas and certificates.

---

### 3 Important Dates 2011-2012

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

---

### 4 Graduate Studies at a Glance

McGill University offers graduate and postdoctoral programs in the following units (organized by their administering home faculty):

#### Agricultural and Environmental Sciences

- : *Agricultural Economics*
- : *Animal Science*
- : *Bioresource Engineering*
- : *Dietetics and Human Nutrition*
- : *Food Science and Agricultural Chemistry*
- : *Natural Resource Sciences*
- : *Parasitology*
- : *Plant Science*

#### Arts

- : *Anthropology*
- : *Art History*
- Classics, see : *History and Classical Studies*
- : *Communication Studies*
- : *East Asian Studies*
- : *Economics*
- : *English*
- : *French Language and Literature*
- : *Geography*
- : *German Studies*
- : *Hispanic Studies*
- : *History and Classical Studies*
- : *Institute for the Study of International Development*
- : *Islamic Studies*
- : *Italian Studies*
- : *Jewish Studies*
- : *Linguistics*
- : *Mathematics and Statistics*
- : *Philosophy*

**Arts**

*: Political Science*  
*: Psychology*  
*: Russian and Slavic Studies*  
*: Social Studies of Medicine*  
*: Social Work*  
*: Sociology*

**Dentistry**

*: Dentistry*

**Desautels Faculty of Management**

*: Desautels Faculty of Management*

**Education**

*: Educational and Counselling Psychology*  
*: Information Studies*  
*: Integrated Studies in Education*  
*: Kinesiology and Physical Education*

**Engineering**

*: Architecture*  
*: Chemical Engineering*  
*: Civil Engineering and Applied Mechanics*  
*: Electrical and Computer Engineering*  
*: Mechanical Engineering*  
*: Mining and Materials Engineering*  
*: Urban Planning*

**Law**

*: Law*

**McGill School of Environment**

*: Environment*

**Medicine**

*section 11.1: Anatomy and Cell Biology*  
*section 11.2: Biochemistry*  
*section 11.3: Bioethics*  
*section 11.4: Biomedical Engineering*  
*section 11.5: Communication Sciences and Disorders*  
*section 11.6: Epidemiology and Biostatistics*  
Experimental Medicine, see *section 11.10: Medicine, Experimental*  
*section 11.8: Human Genetics*  
*section 11.9: Medical Physics*

**Medicine**

- section 11.11: Microbiology and Immunology*
- section 11.12: Neuroscience (Integrated Program in)*
- : Nursing*
- section 11.13: Occupational Health*
- section 11.14: Otolaryngology – Head and Neck Surgery*
- section 11.15: Pathology*
- section 11.16: Pharmacology and Therapeutics*
- : Physical and Occupational Therapy*
- section 11.17: Physiology*
- section 11.18: Psychiatry*
- section 11.19: Surgical Research*

**Religious Studies**

- : Religious Studies*

**Schulich School of Music**

- : Schulich School of Music*

**Science**

- : Atmospheric and Oceanic Sciences*
- : Biology*
- : Chemistry*
- : Computer Science*
- : Earth and Planetary Sciences*
- : Geography*
- : Mathematics and Statistics*
- : Physics*
- : Psychology*

---

**4.1 Graduate Diplomas and Certificates**

Graduate diplomas and graduate certificates are programs of study under the academic supervision of Graduate and Postdoctoral Studies. They have as a prerequisite an undergraduate degree in the same discipline.

McGill University offers other diploma and certificate programs under the supervision of the relevant faculties and their Calendars should be consulted for further details.

**Graduate Diplomas are offered in:**

Clinical Research (Experimental Medicine)	Primary Care Nurse Practitioner
Epidemiology and Biostatistics	Professional Performance
Islamic Studies	Public Accountancy (C.A.)
Library and Information Studies	Registered Dietician Credentialing (R.D.)
Mining Engineering	School and Applied Child Psychology (post-Ph.D.)
Nursing	Surgical Health Care Research

These diploma programs consist of at least two terms of full-time study or the equivalent.



**Graduate Certificates are offered in:**

Assessing Driving Capabilities	Educational Leadership 2
Air and Space Law	Library and Information Studies
Bioresource Engineering (IWRM)	Post-M.B.A.
Biotechnology	Teaching English as a Second Language
Comparative Law	Theory in Primary Care
Educational Leadership 1	Theory in Neonatology

All graduate regulations apply to graduate diploma and certificate candidates.

## 4.2 Master's Degrees

Two categories of programs lead to higher degrees at McGill University, master's programs, and doctoral programs.

**The following master's degrees are offered (see below for more information about sub-specializations):**
**Prerequisites:**

Master of Architecture (M.Arch)	M.Arch. (professional degree) – McGill B.Sc.(Arch.) degree, or equivalent; M.Arch. (post-professional degree) – an M.Arch. (professional degree) or equivalent professional degree.
Master of Arts (M.A.)	Bachelor of Arts in the subject selected for graduate work. See appropriate unit.
Master of Business Administration (M.B.A.)	An undergraduate degree from an approved university. See Management.
Joint program: Master of Business Administration (M.B.A.) with integrated Bachelor of Civil Law (B.C.L.) / Bachelor of Laws (LL.B.)	See Management.
Concurrent Master of Business Administration with Doctor of Medicine / Master of Surgery (M.B.A. with M.D.,C.M.)	See Management.
Master of Manufacturing Management (M.M.M.)	See Management.
Master of Education (M.Ed.)	A bachelor's degree with specialization related to the subject chosen for graduate work, plus a Permanent Quebec Teaching Diploma or its equivalent for some of the above degrees. See appropriate department.
Master of Engineering (M.Eng.)	Bachelor of Engineering or equivalent, with specialization appropriate for the subject selected for graduate study. See appropriate department.
Master of Laws (LL.M.)	An acceptable degree in Law or equivalent qualifications. See Law.
Master of Library and Information Studies (M.L.I.S.)	At least a bachelor's degree from a recognized university. See Library and Information Studies.
Master of Management (M.M.)	See Management.
Master of Music (M.Mus.)	Bachelor of Music or Bachelor of Arts with concentration in the area selected for graduate study. See Music.
Master of Sacred Theology (S.T.M.)	B.A. with specialization in religious studies or theology. See Religious Studies.
Master of Science (M.Sc.)	Bachelor of Science in the subject selected for graduate work. See appropriate unit.
Master of Science, Applied (M.Sc.A.)	A bachelor's degree in the subject selected for graduate work. See appropriate unit.
Master of Science, Applied (OT) (M.Sc.A. (OT))	A bachelor's degree in the subject selected for graduate work. See appropriate unit.
Master of Science, Applied (PT) (M.Sc.A. (PT))	A bachelor's degree in the subject selected for graduate work. See appropriate unit.
Master of Social Work (M.S.W.)	Bachelor's degree in Social Work including courses in statistics and social science research methods. See Social Work.
Joint program: Master of Social Work (M.S.W.) with integrated Bachelor of Civil Law (B.C.L.) / Bachelor of Laws (LL.B.)	See School of Social Work.
Master of Urban Planning (M.U.P.)	Bachelor's degree in any one of the following: Anthropology, Architecture, Economics, Civil Engineering, Geography, Law, Management, Political Science, Social Work, Sociology or Urban Planning, with adequate knowledge of quantitative techniques. See Urban Planning.

### **Master of Architecture Degrees**

M.Arch. programs offered:

- M.Arch. (professional degree) (Non-Thesis) in Design Studio and Design Studio – Directed Research
- M.Arch. (post-professional degree) (Non-Thesis); specializations in Architectural History and Theory, Cultural Mediations and Technology, Urban Design and Housing

### **Master of Arts Degrees**

Programs leading to the degree of Master of Arts are offered in the following areas:

- Anthropology (Thesis and Non-Thesis); options in Development Studies, Environment, Gender and Women's Studies, Medical Anthropology
- Art History (Non-Thesis); option in Gender and Women's Studies (Non-Thesis)
- Classics (Thesis and Non-Thesis)
- Communication Studies (Thesis and Non-Thesis); option in Gender and Women's Studies
- Economics (Thesis and Non-Thesis); options in Development Studies (Non-Thesis) and Social Statistics (Non-Thesis)
- Education (Thesis and Non-Thesis)
- English (Thesis and Non-Thesis)
- French (Thesis and Non-Thesis); option in Gender and Women's Studies
- Geography; options in Development Studies, Environment, Gender and Women's Studies, Neotropical Environment, Social Statistics
- German Studies (Thesis and Non-Thesis)
- Hispanic Studies (Thesis and Non-Thesis)
- History (Thesis and Non-Thesis); options in Development Studies (Thesis and Non-Thesis), European Studies (Thesis and Non-Thesis), Gender and Women's Studies (Thesis and Non-Thesis), History of Medicine (Non-Thesis)
- Islamic Studies; option in Gender and Women's Studies
- Italian Studies (Thesis and Non-Thesis)
- Jewish Studies (Thesis and Non-Thesis)
- Kinesiology and Physical Education (Thesis and Non-Thesis)
- Linguistics (Non-Thesis)
- Mathematics and Statistics (Thesis and Non-Thesis)
- Music (Thesis and Non-Thesis)
- Philosophy; option in Bioethics
- Political Science (Thesis and Non-Thesis); options in Development Studies (Thesis and Non-Thesis), European Studies (Thesis and Non-Thesis), Gender and Women's Studies (Non-Thesis), Social Statistics (Non-Thesis)
- Psychology
- Religious Studies (Thesis and Non-Thesis); options in Bioethics and Gender and Women's Studies
- Russian
- Sociology (Thesis and Non-Thesis); options in Development Studies (Thesis and Non-Thesis), Environment, Gender and Women's Studies (Thesis and Non-Thesis), Medical Sociology (Thesis and Non-Thesis), Social Statistics (Non-Thesis), Neotropical Environment

### **Master of Business Administration Degrees**

A program leading to the degree of Master of Business Administration (M.B.A.) is offered in the following concentrations:

- Finance
- Global Strategy and Leadership
- Marketing
- Technology and Innovation Management

An E.M.B.A. is also offered (joint with HEC).

Special programs:

- M.B.A. with M.D.,C.M.
- M.B.A. with B.C.L. and LL.B.
- Master of Manufacturing Management (see Management and Mechanical Engineering)

### **Master's Degrees in Education**

Three types of master's degrees are offered: M.A. (Thesis and Non-Thesis), M.Ed. (Non-Thesis) and M.Sc. (Thesis and Non-Thesis).

The M.A. may be taken in the following areas:

- Counselling Psychology (Thesis and Non-Thesis): Counselling Psychology – Professional/Internship (Non-Thesis), Counselling Psychology – Project (Non-Thesis)
- Education and Society (Thesis and Non-Thesis); options in Gender and Women's Studies (Thesis and Non-Thesis) and Jewish Studies (Thesis and Non-Thesis)

Educational Psychology (Thesis and Non-Thesis)  
 Educational Leadership (Thesis, Non-Thesis, and Non-Thesis Coursework); option in Gender and Women's Studies (Thesis and Non-Thesis)  
 Kinesiology and Physical Education (Thesis and Non-Thesis)  
 Second Language Education (Thesis and Non-Thesis); option in Gender and Women's Studies (Thesis and Non-Thesis)  
 Teaching and Learning (MATL) (Non-Thesis)

The M.Ed. may be taken in the following area:

Educational Psychology

The M.Sc. may be taken in the following area:

Kinesiology and Physical Education (Thesis and Non-Thesis)

### **Master's Degree in Engineering**

Programs leading to the degree of Master of Engineering are offered in the following areas:

Aerospace Engineering (Project)  
 Biomedical Engineering; option in Bioinformatics  
 Chemical Engineering (Thesis and Project); option in Environmental Engineering (Project)  
 Civil Engineering and Applied Mechanics (Thesis and Project); option in Environmental Engineering (Project)  
 Electrical Engineering (Thesis and Project); option in Computational Science and Engineering  
 Mechanical Engineering (Thesis and Project); option in Computational Science and Engineering  
 Mining and Materials Engineering (Thesis and Non-Thesis); options in Environmental Engineering (Non-Thesis), Mining (Non-Thesis), and Metals and Materials (Non-Thesis)

Other degrees:

Master of Management (M.M.) is offered in Manufacturing Management (see Department of Mechanical Engineering and Faculty of Management).  
 Master of Science (M.Sc.) is offered in Chemical Engineering, Civil Engineering, Mechanical Engineering, and Mining and Materials.

### **Master's Degrees in Law**

The degree of Master of Laws is offered in:

Law (Thesis and Non-Thesis); options in Bioethics, Comparative Law (Thesis and Non-Thesis), Environment (Thesis and Non-Thesis), and European Studies  
 Air and Space Law (Thesis and Non-Thesis)

### **Master of Library and Information Studies Degree**

The Graduate School of Library and Information Studies offers a postgraduate professional program in librarianship. Two years of full-time study or the equivalent are required.

### **Master's Degrees in Music**

Programs leading to the degrees of Master of Arts and Master of Music are offered in the Faculty of Music.

The M.A. may be taken in:

Music Technology  
 Musicology (Thesis and Non-Thesis); option in Gender and Women's Studies  
 Music Education (Thesis and Non-Thesis)  
 Theory (Thesis and Non-Thesis); option in Gender and Women's Studies

The M.Mus. may be taken in:

Composition  
 Performance (various options) (Non-Thesis)  
 Sound Recording (Non-Thesis)

Applicants to the Performance program are required to pass auditions in their speciality.

### **Master's Degrees in Nursing**

Two types of master's degrees are offered: Master of Science (Applied) and Master of Science (with thesis). These two-year programs are designed to prepare clinicians and researchers for the expanding function of nursing within the health care delivery system.

### **Master's Degrees in Religious Studies**

A program leading to the degree of Sanctae Theologiae Magister (S.T.M.) is given in the Faculty of Religious Studies. This degree is primarily for those who intend to enter the ministry of the Christian Church or another religious institution, or to proceed to teaching in schools. A Master of Arts program (thesis and non-thesis) is also available.

### **Master of Science Degrees**

Programs leading to the degree of Master of Science are provided in the following areas:

Agricultural Economics  
Animal Science  
Atmospheric and Oceanic Science; options in Computational Science and Engineering, and Environment  
Biochemistry; options in Bioinformatics, and Chemical Biology  
Biology; options in Bioinformatics, Environment, and Neotropical Environment  
Bioresource Engineering; options in Environment, Integrated Water Resource Management (Non-Thesis), and Neotropical Environment  
Cell Biology and Anatomy  
Chemical Engineering  
Chemistry; option in Chemical Biology  
Civil Engineering and Applied Mechanics  
Communication Sciences and Disorders  
Computer Science (Thesis and Non-Thesis); options in Bioinformatics, and Computational Science and Engineering  
Dental Science (Thesis and Non-Thesis); option in Oral and Maxillofacial Surgery  
Earth and Planetary Sciences; option in Environment  
Entomology; options in Environment, and Neotropical Environment  
Epidemiology and Biostatistics (Thesis and Non-Thesis); option in Environment (Non-Thesis)  
Food Science and Agricultural Chemistry (Thesis and Non-Thesis)  
Geography; options in Environment, and Neotropical Environment  
Genetic Counselling (Non-Thesis)  
Human Genetics; option in Bioinformatics  
Human Nutrition  
Kinesiology and Physical Education (Thesis and Non-Thesis)  
Mathematics and Statistics (Thesis and Non-Thesis); options in Bioinformatics, and Computational Science and Engineering  
Mechanical Engineering  
Medical Radiation Physics  
Medicine, Experimental; options in Bioethics, Environment, and Family Medicine  
Microbiology and Immunology  
Microbiology (Macdonald Campus); option in Environment  
Mining and Materials Engineering  
Neuroscience  
Nursing  
Otolaryngology  
Parasitology; options in Bioinformatics, and Environment  
Pathology  
Pharmacology and Therapeutics; option in Chemical Biology  
Physics  
Physiology; option in Bioinformatics  
Plant Science; options in Bioinformatics, Environment, and Neotropical Environment  
Psychiatry  
Psychology  
Rehabilitation Sciences (Thesis and Non-Thesis)  
Renewable Resources; options in Environment, Environmental Assessment (Non-Thesis), and Neotropical Environment  
Surgery, Experimental

### **Master of Science, Applied, Degrees**

This degree was designed to provide postgraduate training of a professional and vocational character, with less emphasis on theoretical knowledge and research than in Master of Science programs, but with no lower standards either for admission or completion of requirements. Two years of full-time study or equivalent are normally required with an emphasis on coursework.

Programs are available in:

Animal Science  
Bioresource Engineering; options in Environment, Environmental Engineering, and Neotropical Environment  
Biotechnology  
Chemistry

Communication Sciences and Disorders  
 Human Nutrition  
 Nursing  
 Occupational Health  
 Occupational Therapy  
 Plant Science  
 Physical Therapy

Other degrees:

Master of Science, Applied (OT)  
 Master of Science, Applied (PT)

#### Master of Social Work Degrees

The M.S.W. degree (Thesis and Non-Thesis options) represents a second level of professional study in which students build competence in a chosen field of practice.

Special program:

M.S.W. with B.C.L. and LL.B.

#### Master of Urban Planning Degree

The program requires a minimum of two years residence and a three-month internship with a member of a recognized planning association.

Options: Transportation Planning and Urban Design.

## 4.3 Doctoral Degrees

Two categories of programs lead to higher degrees at McGill University: master's programs and doctoral programs.

**The following doctoral degrees are offered (see below for more information about sub-specializations):** Prerequisites:

Doctor of Civil Law (D.C.L.)	B.C.L. or LL.B. and usually LL.M. See Law.
Doctor of Music (D.Mus.)	M.A. in Composition (D.Mus. in Composition) or an master's degree in Performance, and professional and teaching experience (D.Mus. in Performance). See Music.
Doctor of Philosophy (Ph.D.)	An undergraduate degree relevant to the subject chosen for graduate work. Some departments require all Ph.D. candidates to hold a master's degree in the same subject. Departments may recommend to Graduate and Postdoctoral Studies that candidates of undoubted promise should be allowed to proceed directly to the Ph.D. degree without being required to submit a master's thesis.

#### Doctor of Civil Law Degrees

Doctoral programs are offered in Air and Space Law and Law (Comparative Law). Both are predominantly research degrees awarded on the basis of a thesis that represents an original contribution to the development of legal science.

#### Doctor of Music Degrees

The Doctor of Music degree is offered in Composition. The Doctoral thesis consists of a musical composition of major dimensions together with a written analysis of the work. The composition is presented by the candidate in concert. The regulations set forth for the Ph.D. generally apply also to the D.Mus.

The Doctor of Music degree is also offered in Performance. It is offered to professional musicians who wish to teach at the university level and to develop a specialization in a particular repertoire, approach, or discipline (musicology, music theory, music education and pedagogy, or music technology).

#### Doctor of Philosophy Degrees

Programs leading to the degree of Doctor of Philosophy are offered in the following areas:

Anatomy and Cell Biology  
 Animal Science; option in Bioinformatics  
 Anthropology; option in Neotropical Environment  
 Architecture  
 Art History; option in Gender and Women's Studies  
 Atmospheric and Oceanic Sciences  
 Biochemistry; options in Bioinformatics, and Chemical Biology

Biology; options in Bioinformatics, Developmental Biology, Environment, and Neotropical Environment  
 Biomedical Engineering; option in Bioinformatics  
 Bioresource Engineering; options in Environment, and Neotropical Environment  
 Chemical Engineering  
 Chemistry; option in Chemical Biology  
 Civil Engineering and Applied Mechanics  
 Classics  
 Communication Studies; option in Gender and Women's Studies  
 Communication Sciences and Disorders; option in Language Acquisition  
 Computer Science; option in Bioinformatics  
 Counselling Psychology  
 Earth and Planetary Sciences; option in Environment  
 Economics  
 Educational Psychology  
 Educational Studies; option in Gender and Women's Studies  
 Electrical Engineering  
 English  
 Entomology; options in Environment, and Neotropical Environment  
 Epidemiology and Biostatistics  
 Food Science and Agricultural Chemistry  
 French; option in Gender and Women's Studies  
 Geography; options in Environment, Gender and Women's Studies, and Neotropical Environment  
 German  
 Hispanic Studies  
 History  
 Human Genetics; option in Bioinformatics  
 Human Nutrition  
 Information Studies  
 Islamic Studies; option in Gender and Women's Studies  
 Linguistics; option in Language Acquisition  
 Management  
 Mathematics and Statistics; option in Bioinformatics  
 Mechanical Engineering  
 Medicine, Experimental; option in Environment  
 Microbiology and Immunology  
 Microbiology (Macdonald Campus); options in Bioinformatics, and Environment  
 Mining and Materials Engineering  
 Music; option in Gender and Women's Studies  
 Neuroscience  
 Nursing; option in Psychosocial Oncology  
 Occupational Health Sciences  
 Parasitology; options in Bioinformatics, and Environment  
 Pathology  
 Pharmacology and Therapeutics; option in Chemical Biology  
 Philosophy; options in Environment, and Gender and Women's Studies  
 Physics  
 Physiology; option in Bioinformatics  
 Plant Science; options in Bioinformatics, Environment, and Neotropical Environment  
 Political Science  
 Psychology; options in Language Acquisition, and Psychosocial Oncology  
 Rehabilitation Science  
 Religious Studies; option in Gender and Women's Studies  
 Renewable Resources; options in Environment, and Neotropical Environment  
 Russian  
 School/Applied Child Psychology  
 Social Work  
 Sociology; options in Environment, and Gender and Women's Studies  
 Surgery, Experimental

The following joint Ph.D. programs are offered:

Nursing (McGill/Université de Montréal)  
 Management (McGill/Concordia/H.E.C./UQAM)  
 Social Work (McGill/Université de Montréal)

#### 4.4 Postdoctoral Research

See [section 8: Postdoctoral Research](#) for information about postdoctoral research at McGill University.

## 5 Program Requirements

### 5.1 Master's Degrees

#### Residence Requirements – Master's Degrees

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

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

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

#### Coursework – Master's Degrees

Program requirements are outlined in the relevant departmental sections of the Graduate and Postdoctoral Studies Calendar available at [www.mcgill.ca/study](http://www.mcgill.ca/study).

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

As a rule, no more than one-third of the McGill program formal coursework (not thesis, project, stage, or internship) can be credited with courses from another university.

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

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

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

If courses were not used for a degree, they could be **credited** toward a McGill degree keeping in mind that a maximum of one-third of the course work (not thesis, project, stage, internship, and practicum) can be credited. If an **exemption** is granted, it must be replaced by another graduate course at McGill toward the degree. No double counting is ever allowed. This regulation also applies to doctoral programs.

#### Research and Thesis – Master's Degrees

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

**Language Requirements – Master's Degrees**

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

---

**5.2 Doctoral Degrees****Residence Requirements – Doctoral**

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

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

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

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

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

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

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

**Comprehensive Examinations – Doctoral**

A comprehensive examination or its equivalent is usually held near the end of Ph.D. 2. The results of this examination determine whether or not students will be permitted to continue in their programs. The methods adopted for examination and evaluation and the areas to be examined are specified by departmental regulations approved by the Dean of Graduate and Postdoctoral Studies. It is the responsibility of students to inform themselves of these details at the commencement of their programs. For more information, see "Ph.D. Comprehensives Policy".

**Language Requirements – Doctoral**

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

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

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

**All** language requirements must be fulfilled and the marks reported to Graduate and Postdoctoral Studies **before** submission of the thesis to GPS (Thesis Section).

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

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

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

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

**Thesis – Doctoral**

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

Seven copies of the thesis must be provided by the candidate. Of these, two copies will be retained by the University and five copies returned to the candidate. Some departments may require one or more additional copies. The final corrected copy is submitted electronically.

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

**Thesis Oral Examination – Doctoral**



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

### 5.3 Ad Hoc Programs

**In exceptional cases**, an applicant who wishes to pursue a master's (Thesis option only) or Ph.D. program in an academic department which is not currently authorized by the *Ministère de l'Éducation, du Loisir et du Sport* (MELS) to offer graduate programs, may be admitted to an *Ad Hoc* program. The application, including a research proposal, is examined by an Admissions Committee in the department which has familiarity with the proposed research area and experience in directing graduate studies.

Once the Admissions Committee makes a favourable recommendation, Graduate and Postdoctoral Studies confirms an Advisory Committee (recommended by the academic unit) to be responsible for program planning and monitoring of research progress. The regulations are fully described in the document "Procedures for Admission in *Ad Hoc* Master's and Doctoral Programs", available from GPS.

### 5.4 Ad Personam Programs (Thesis Option only)

In very rare circumstances, an applicant who wishes to engage in master's (Thesis option only) or Ph.D. studies of an interdisciplinary nature involving joint supervision by two departments, each of which is authorized by the *Ministère de l'Éducation, du Loisir et du Sport* (MELS) to offer its own graduate programs, may be admitted to an *Ad Personam* program. The regulations are fully described in a document available from GPS.

### 5.5 Coursework for Graduate Programs, Diplomas, and Certificates

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

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

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

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

## 6 General Admission for Graduate Studies



**Note:** The following admission requirements and application procedures are the minimum standard for applicants to McGill's Graduate and Postdoctoral Studies programs. Some graduate units may require additional qualifications or a higher minimum CGPA; prospective students are strongly urged to consult the unit concerned regarding specific requirements set for their program of interest.

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

Email: [servicepoint@mcgill.ca](mailto:servicepoint@mcgill.ca)

**Deadline: Admission to graduate studies operates on a rolling basis; complete applications and their supporting documentation must reach departmental offices on or before the date for guaranteed consideration specified by the department. To be considered for entrance fellowships, where available, applicants must verify the deadlines with individual departments. Meeting minimum admission standards does not guarantee admission.**

### 6.1 Application for Admission

Application information and the online application form are available at [www.mcgill.ca/gradapplicants/apply](http://www.mcgill.ca/gradapplicants/apply). Applicants (with some exceptions) are required to ask two instructors familiar with their work to send letters of recommendation. All applicants must themselves send, or ask the appropriate university authorities to send, two official or certified copies of their complete academic record from each university-level institution attended to date. McGill graduates do not need to submit McGill transcripts. Letters of recommendation and official transcripts must be sent **directly** to the department concerned. Please note

that all documents submitted to McGill University in support of an application to be admitted, including, but not limited to transcripts, diplomas, letters of reference and test scores, become the property of McGill University and will not be returned to the applicant or issuing institution under any circumstance.

A **non-refundable** fee of \$100 in Canadian funds **must** accompany each application, otherwise **it cannot be submitted**. This sum must be paid by credit card and is non-refundable when submitting the online application form. Candidates for Special, Visiting Student, and Qualifying status must apply and pay the application fee every year (i.e., every Fall term).

It is recommended that applicants submit a list of the titles of courses taken in the major subject, since transcripts often give code numbers only. **Transcripts written in a language other than English or French must be accompanied by a translation prepared by a licensed translator.** An explanation of the grading system used by the applicant's university is essential. The applicant should also indicate the major subject area in which further study is desired.

Completed applications, with supporting documents, must reach departmental offices according to individual department dates for guaranteed consideration. Applicants should contact the department concerned, or see: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). International students are advised to apply well in advance of the date for guaranteed consideration as immigration procedures may be lengthy. Applications received after the prescribed dates for guaranteed consideration may or may not be considered, at the discretion of the department. Candidates will be notified of acceptance or refusal by Graduate and Postdoctoral Studies as quickly as possible.

Admission to graduate programs at McGill is highly competitive and the final decision rests with Graduate and Postdoctoral Studies. Admission decisions are not subject to appeal or reconsideration.

---

## 6.2 Admission Requirements (minimum requirements to be considered for admission)

Applicants should be graduates of a university of recognized reputation and hold a bachelor's degree equivalent to a McGill degree in a subject closely related to the one selected for graduate work. This implies that about one-third of all undergraduate courses should have been devoted to the subject itself and another third to cognate subjects.

The applicant must present evidence of academic achievement: a minimum standing equivalent to a cumulative grade point average (CGPA) of 3.0 out of a possible 4.0 or a CGPA of 3.2/4.0 for the last two full-time academic years. High grades are expected in courses considered by the department to be preparatory to the graduate program. Some departments impose additional or higher requirements.

See [www.mcgill.ca/gradapplicants/apply/prepare/requirements/international-degree-equivalency](http://www.mcgill.ca/gradapplicants/apply/prepare/requirements/international-degree-equivalency) for information on mark/grade equivalencies and degree requirements from countries in Europe and around the world.

Admission to graduate programs at McGill is highly competitive and the final decision rests with Graduate and Postdoctoral Studies. Admission decisions are not subject to appeal or reconsideration.

---

## 6.3 Admission Tests

### Graduate Record Examination (GRE)

The Graduate Record Examination (GRE) (Educational Testing Service, Princeton, NJ 08540) consists of a relatively advanced test in the candidates' specialty, and a general test of their attainments in several basic fields of knowledge for which no special preparation is required or recommended. It is offered at many centres, including Montreal, several times a year; the entire examination takes about eight hours, and there is a registration fee. Refer to [www.ets.org/gre](http://www.ets.org/gre) for further information. Only some departments require applicants to write the GRE examination, but all applicants who have written either the general aptitude or the advanced test are advised to submit the scores along with their other admission material.

This credential is of special importance in the case of applicants whose education has been interrupted, or has not led directly toward graduate study in the subject selected. In such cases the department has the right to insist on a report from the Graduate Record Examination or some similar test. High standing in this examination will not by itself guarantee admission. The Miller Analogies Test may be used similarly. Some departments of the Faculty of Education also require the taking of various tests.

### Graduate Management Admissions Test (GMAT)

Applicants to graduate programs in Management must submit scores from the Graduate Management Admissions Test (GMAT). The test is a standardized assessment offered by the Graduate Management Admission Council to help business schools assess candidates for admission. For further information see [www.mba.com/mba/thegmat](http://www.mba.com/mba/thegmat).

---

## 6.4 Competency in English

Applicants to graduate studies must demonstrate an adequate level of proficiency in English **prior to admission**, regardless of citizenship status or country of origin.

Normally, applicants meeting any one of the following conditions are NOT required to submit proof of proficiency in English:

1. Mother tongue (language first learned and still used on a daily basis) is English.
2. Has obtained (or is about to obtain) an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction.
3. Has obtained (or is about to obtain) an undergraduate or graduate degree from a recognized institution in Canada or the United States of America (anglophone or francophone).

4. Has lived and attended university, or been employed, for at least four consecutive years, in a country where English is the acknowledged primary language.

Applicants who do not meet any of the above-listed conditions must demonstrate proficiency in English using *one* of the following options:

1. TOEFL (Test of English as a Foreign Language): minimum acceptable scores are

Competency in English		
iBT (Internet-based test)	PBT (paper-based test)	CBT (computer-based test)*
86 overall, (no less than 20 in each of the four component scores)	550	* The CBT is no longer being offered and CBT results are no longer considered valid, or being reported by ETS.
N.B. an institutional version of the TOEFL is not acceptable.		

2. IELTS (International English Language Testing System): a band score of 6.5 or greater.
3. MELAB (Michigan English Language Assessment Battery): a mark of 85% or higher.
4. University of Cambridge ESOL Certificate in Advanced English (CAE): a grade of "B" (Good) or higher.
5. University of Cambridge ESOL Certificate of Proficiency in English (CPE): a grade of "C" (Pass) or higher.
6. Edexcel London Test of English - Level 5 - with an overall grade of at least "Pass".
7. McGill Certificate of Proficiency in English or McGill Certificate of Proficiency - English for Professional Communication: Certificate of Proficiency awarded. McGill Certificate of Proficiency in English or McGill Certificate of Proficiency - English for Professional Communication: Certificate of Proficiency awarded.

In each case, applicants must ensure that official test results are sent to McGill directly by the testing service. Applications cannot be considered if test results are not available. These scores are general minima; some departments may set higher requirements.

*Revised – July 2008*

## 6.5 Admission to a Qualifying Program

Some applicants whose academic degrees and standing entitle them to serious consideration for admission to graduate studies, but who are considered inadequately prepared in the subject selected may be admitted to a Qualifying Program for a Master's. The undergraduate-level courses to be taken in a Qualifying Program will be prescribed by the department concerned.

Qualifying students are registered in graduate studies, **but not as candidates for a degree**. Only one qualifying year (i.e., two full-time terms) is permitted.

In all cases, after the completion of a qualifying year or term, an applicant interested in commencing a degree program must apply for admission by the dates for guaranteed consideration. Successful completion of the work in the Qualifying Program (B- in all courses) does not automatically entitle the student to proceed toward a degree. Qualifying year students must apply for admission to the program for which they seek qualification.

In cases where a department recommends a change of registration from Qualifying Program (Fall) to Master's Degree First Year (Winter), **students must apply to the degree program by the Winter departmental dates for guaranteed consideration**. A Qualifying-Year applicant admitted to a Winter term as a first term of studies must apply for admission for a Fall term as his/her second term of studies.

Students who are ineligible for a Qualifying Program may apply to the appropriate undergraduate faculty for admission as regular or special students, and seek admission to graduate studies at a later date. The normal admission requirements must be met and the usual procedures followed.

## 6.6 Admission to a Second Degree Program

A candidate with a given higher degree may apply for admission to a second degree program at the same level but **in a different subject**. The normal admission requirements must be met and all the usual procedures followed.

## 6.7 Admission to Two Degree Programs

Students may, with special permission granted by Graduate and Postdoctoral Studies, be admitted to two degree programs or to two departments or faculties. Students are **never** permitted to pursue two **full-time** degree programs concurrently.

---

## 6.8 Admission to an Ad Personam Joint Program

*Ad Personam* joint graduate programs are restricted to master's Thesis option and Ph.D. programs. Students shall be admitted and registered by one department, to be known as the "first department". Approval for the joint program must be obtained from Graduate and Postdoctoral Studies. The request shall be signed by the Chairs of both departments involved and shall explicitly list the conditions imposed by the second department. The student shall undertake research under the joint supervision of both departments.

Students shall fulfil the degree requirements of the first department and shall complete all the requirements specified by the second department in the request for admission. This program is described in more detail in a document available from GPS.

---

## 6.9 Admission to an Ad Hoc Program (Thesis)

In exceptional cases, admission to an *Ad Hoc* program (Thesis) may be considered. Before Graduate and Postdoctoral Studies will authorize the admission of a student into an *Ad Hoc* program, it must receive a favourable report from a departmental committee constituted to examine the program in question.

Candidates, through the supervisor designated by the academic department most closely related to their research field, must submit a research proposal, an outline of the coursework needed including a comprehensive examination (for doctoral programs) in the relevant field, and the list of four supervisory committee members.

Once the request has been approved, the candidate may register following all the regular procedures. A fuller description of the admission procedure is available from GPS.

---

## 6.10 Reinstatement and Admission of Former Students

Students who have not been registered for a period of less than two years and who have not officially withdrawn from the University by submitting a signed Withdrawal Form to Graduate and Postdoctoral Studies are eligible to be considered for reinstatement into their program. The student's department must recommend, in writing, that the student be reinstated, stipulating any conditions for reinstatement that it deems appropriate. The final decision rests with GPS. Normally, GPS will approve the departmental recommendation. If the student's department chooses not to recommend reinstatement, the student may appeal to the Associate Dean (Graduate and Postdoctoral Studies). The decision of the Associate Dean (Graduate and Postdoctoral Studies) shall be final and not subject to further appeal.

Reinstatement fees will be charged in addition to the fees due for the academic session into which the student has been reinstated. The amount of the reinstatement fees is the tuition portion of fees owed for all unregistered terms, up to a maximum of two years just prior to the term of reinstatement.

If an individual has not registered for a period of more than two years, their student file will be closed. These individuals and those who have formally withdrawn may be considered for admission. Applicants' admission applications will be considered as part of the current admission cycle, in competition with other people applying during that cycle and in accordance with current graduate admission procedures and policies.

Procedure: Requirements for completion of the program will be evaluated. Some of these requirements may need to be redone or new ones may be added. Applicants must inquire about the fees that will be charged.

*Revised – Council of February 9, 2004.*

---

## 6.11 Deferral of Admission

Under exceptional circumstances, an admission for a particular semester can be considered for a deferral. This can be considered only if the student has not registered. If the student has already registered, no deferral can be granted. The student must withdraw from the University and apply for admission to a later term.

---

## 7 Fellowships, Awards, and Assistantships

Graduate and Postdoctoral Studies  
(Fellowships and Awards Section)  
James Administration Building, Room 400  
845 Sherbrooke Street West  
Montreal, QC H3A 2T5  
Telephone: 514-398-3990  
Fax: 514-398-2626

Email: [graduate.fellowships@mcgill.ca](mailto:graduate.fellowships@mcgill.ca)

Website: [www.mcgill.ca/gps/students](http://www.mcgill.ca/gps/students) (under Fellowships and Awards)

Graduate Fellowships and Awards Calendar: <http://coursecalendar.mcgill.ca/fellowships201112/wwhelp/wwhimpl/js/html/wwhelp.htm>

The Fellowships and Awards Section of Graduate and Postdoctoral Studies provides processing services for many sources of support for Canadian and non-Canadian students, both new to McGill and continuing. Further information on these and other sources of funding can be found in various publications on the Fellowships and Awards web pages. The *Graduate Fellowships and Awards Calendar* lists all internal awards as well as numerous external awards.

Entrance Fellowships are awarded on the basis of the application for admission, upon nomination by academic departments. Most internal fellowships are awarded in this manner – please contact the proposed academic department directly for further information.

Research Assistantships, Teaching Assistantships, and stipends from professors' research grants are handled by individual academic departments at McGill. Fellowships, assistantships, and stipends are used to make funding packages for graduate students. All assistantship and stipend inquiries should be directed to departments.

A small number of citizens from countries whose governments have entered into agreements on tuition fees with Quebec may be exempted from the supplemental tuition fees normally required of international students. All French citizens and a limited number of citizens of a country in the list, which can be found at [www.mels.gouv.qc.ca/ens-sup/ens-univ/droits\\_scolaire-A\\_pays-organisations.pdf](http://www.mels.gouv.qc.ca/ens-sup/ens-univ/droits_scolaire-A_pays-organisations.pdf), are eligible for such exemptions. For more information and the necessary application materials, see this MELS website: [www.mels.gouv.qc.ca/international/index\\_en.asp?page=progExemp](http://www.mels.gouv.qc.ca/international/index_en.asp?page=progExemp). The list of organizations where students should apply can be accessed from this website.

Differential Fee Waivers (DFW's) for international students provide eligible non-Canadian graduate students with waivers of the international tuition fee supplement. There are no application forms for differential fee waivers, since these are awarded on the basis of departmental nominations made to the Fellowships and Awards Section. Eligible students should contact their McGill department.

## 8 Postdoctoral Research

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

### 8.1 Postdocs

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

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

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

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

#### 1. Definition and Status

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

#### 2. Registration

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

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

#### 3. Appointment, Pay, Agreement of Conditions

- i. Appointments may not exceed your registration eligibility status.
- ii. In order to be registered as a Postdoc, you must be assured of financial support other than from personal means during your stay at McGill University, equivalent to the minimal stipend requirement set by the University in accordance with guidelines issued by federal and provincial research granting agencies. There are no provisions for paid parental leave unless this is stipulated in the regulations of a funding agency outside the University.
- iii. At the outset of a postdoctoral appointment, a written Letter of Agreement for Postdoctoral Education should be drawn up and signed by the Postdoc, the supervisor, and the department head or delegate (see template Letter of Agreement on the web at [www.mcgill.ca/gps/postdocs](http://www.mcgill.ca/gps/postdocs) and supporting document – commitments for Postdoctoral Scholars and Supervisors at [www.mcgill.ca/files/gps/Commitments\\_of\\_Postdoctoral\\_Scholars\\_and\\_Supervisors\\_July\\_09.pdf](http://www.mcgill.ca/files/gps/Commitments_of_Postdoctoral_Scholars_and_Supervisors_July_09.pdf)). This should stipulate, for example, the purpose of the postdoctoral appointment (research training and the advancement of knowledge), the duration of the fellowship/financial support, the modality of pay, the work space, travel funds, and expectations and compensation for teaching and student research supervision. Leaves from postdoctoral education must comply with the Graduate and Postdoctoral Studies Policies for Vacation, Parental/Familial, and Health Leave (see Graduate and Postdoctoral Studies General Information [section 8.3: Vacation Policy for Graduate Students and Postdocs](#) and [section 9.6: Health and Parental/Familial Leave of Absence Policy](#)). Any breach of these conditions may result in grievance procedures or the termination of the postdoctoral appointment.
- iv. Postdocs with full responsibility for teaching a course should be compensated over and above their fellowship at the standard rate paid to lecturers by their department.
- v. The amount of research, teaching, or other tasks that Postdocs engage in over and above postdoctoral activities should conform to the regulations for Postdocs specified by the Canadian research council of their discipline. This applies to all Postdocs, including those whose funding does not come from the Canadian research councils.

#### 4. Privileges

- i. Postdocs have the same pertinent rights as the ones granted to McGill students in the *Handbook on Student Rights and Responsibilities* (“Green Book”), available at [www.mcgill.ca/secretariat/policies/students](http://www.mcgill.ca/secretariat/policies/students).
- ii. Postdocs have full graduate student borrowing privileges in McGill libraries through their identity card.
- iii. As a rule, Postdocs who are Canadian citizens or who have Permanent Resident status may take courses for credit. Admission to such courses should be sought by submitting application documents directly to the appropriate program by the Postdoc. They must be admitted by the department offering the courses as Special Students. These Postdocs may only be enrolled as part-time students in non-degree granting programs. They will be charged fees for these courses.
- iv. Postdocs may be listed in the McGill directory. The Computing Centre will grant Postdocs email privileges on the same basis as graduate students upon presentation of a valid identity card.
- v. The Department of Athletics will grant Postdocs access to sports facilities upon presentation of their identity card. A fee will be charged on an annual or term basis.
- vi. Postdocs are mandatory members of the Post-Graduate Students’ Society (PGSS) and an annual association fee is automatically charged. PGSS fees are mandatory. Postdocs are permitted membership in the Faculty Club; an annual fee will be charged for this membership.
- vii. Postdocs are encouraged to participate in Professional Development Workshops provided by Graduate and Postdoctoral Studies and Teaching and Learning services. These sessions are usually free of charge.
- viii. Postdocs have access to the services provided by the Ombudsperson.
- ix. Postdocs may enrol as part-time students in the second language written and spoken English/French courses offered by the School of Continuing Studies/French Language Centre. Postdocs will be charged tuition for these courses. International Postdocs may be required to obtain a CAQ and a Study Permit.
- x. Access to student services and athletic services are available to the Postdoc on an opt-in basis. Fees are applicable.

#### 5. Responsibilities

- i. Postdocs are subject to the responsibilities outlined in the *Handbook on Student Rights and Responsibilities* (“Green Book”), available at [www.mcgill.ca/secretariat/policies/students](http://www.mcgill.ca/secretariat/policies/students).
- ii. Each academic unit hosting Postdocs should clearly identify Postdocs’ needs and the means by which they will be met by the unit.
- iii. Each academic unit should assess the availability of research supervision facilities, office space, and research funding before recruiting Postdocs.
- iv. Some examples of responsibilities of the department are:
  - to verify the Postdoc’s eligibility period for registration;
  - to provide Postdocs with departmental policy and procedures that pertain to them;
  - to oversee the registration and appointment of Postdocs;
  - to assign departmental personnel (e.g., Postdoc coordinator and graduate program director) the responsibility for Postdocs;
  - to oversee and sign off on the Letter of Agreement for Postdoctoral Education;
  - to ensure that each Postdoc has a supervisor, lab and/or office space, access to research operating costs and necessary equipment;
  - to include Postdocs in departmental career and placement opportunities;
  - to refer Postdocs to the appropriate University policies and personnel for the resolution of conflict that may arise between a Postdoc and a supervisor.
- v. Some examples of responsibilities of the supervisor are:

- to uphold and transmit to their Postdocs the highest professional standards of research and/or scholarship;
- to provide research guidance;
- to meet regularly with their Postdocs;
- to provide feedback on research submitted by the Postdocs;
- to clarify expectations regarding intellectual property rights in accordance with the University’s policy;
- to provide mentorship for career development;
- to prepare, sign, and adhere to a Letter of Agreement for Postdoctoral Education.

vi. Some examples of responsibilities of Postdocs are:

- to inform themselves of and adhere to the University’s policies and/or regulations for Postdocs for leaves, for research, and for student conduct as outlined in the *Handbook on Student Rights and Responsibilities* and the *General Information, Regulations and Research Guidelines* Calendar of Graduate and Postdoctoral Studies;
- to submit a complete file for registration to Graduate and Postdoctoral Studies;
- to sign and adhere to their Letter of Agreement for Postdoctoral Education;
- to communicate regularly with their supervisor;
- to inform their supervisor of their absences.

vii. Some examples of the responsibilities of the University are:

- to register Postdocs;
- to provide an appeal mechanism in cases of conflict;
- to provide documented policies and procedures to Postdocs;
- to provide Postdocs with the necessary information on McGill University student services.

*Approved by Senate, April 2000*

---

### 8.3 Vacation Policy for Graduate Students and Postdocs

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

*Council of FGSR April 23, 1999*

---

### 8.4 Leave of Absence for Health and Parental/Familial Reasons

A leave of absence may be granted by Graduate and Postdoctoral Studies for maternity or parental reasons or for health reasons (see [section 9.6: Health and Parental/Familial Leave of Absence Policy](#)).

Such a leave must be requested on a term by term basis and may be granted for a period of up to 52 weeks. Students and Postdocs must make a request for such a leave in writing to their department and submit a medical certificate. The department shall forward the request to GPS. See procedure under [section 9.6: Health and Parental/Familial Leave of Absence Policy](#). Students who have been granted such a leave will have to register for the term(s) in question and their registration will show as “leave of absence” on their record. No tuition fees will be charged for the duration of the authorized leave. Research supervisors are not obligated to remunerate students and Postdocs on leave. GPS has prepared a summary table of various leave policies (paid or unpaid) for students and Postdocs paid from the Federal and Quebec Councils through fellowships or research grants. The document is available at [www.mcgill.ca/gps/postdocs/becoming/leave](http://www.mcgill.ca/gps/postdocs/becoming/leave) under “Information on the Funding Council Leave Policies for Graduate Students and Postdoctoral Fellows”.

---

### 8.5 Postdoctoral Research Trainees

#### Eligibility

If your situation does not conform to the *Quebec Ministère de l’Éducation, du Loisir et du Sport* (MELS) definition of Postdoctoral Fellow, you may be eligible to attend McGill as a Postdoctoral Research Trainee. While at McGill, you can perform research only (you may not register for courses or engage in clinical practice). Medical specialists who will have clinical exposure and require a training card must register through Postgraduate Medical Education of the Faculty of Medicine – not Graduate and Postdoctoral Studies.

The category of Postdoctoral Research Trainee is for:



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

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

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

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



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

### General Conditions

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

---

## 9 Graduate Studies Guidelines and Policies

Students must inform themselves of University rules and regulations and keep abreast of any changes that may occur. The *General Studies Guidelines and Policies* section of this publication contains important details required by students during their studies at McGill and should be periodically consulted, along with other sections and related publications.



**Note:** The University Exam Regulations governed by the : *University Student Assessment Policy* (adopted by Senate in February 2011) are being updated for Fall 2011 and will be available at [www.mcgill.ca/students/exams/regulations](http://www.mcgill.ca/students/exams/regulations). The revised Regulations will be published in the *University Regulations and Resources* section of the 2012-2013 *Programs, Courses and University Regulations* publication. This “Note” applies to all subsections under this topic Graduate Studies Guidelines and Policies.

---

### 9.1 Guidelines and Regulations for Academic Units on Graduate Student Advising and Supervision

The general guidelines suggested below are meant to encourage units to examine their graduate programs and to specify their own policies and procedures. These guidelines are directed primarily toward thesis programs but will, in part, be appropriate for non-thesis programs as well.

Each academic unit should have explicitly stated policies and procedures regarding the advising and supervising of graduate students, as well as established means for informing students of procedures and deadlines (e.g., orientation sessions, handbooks) and mechanisms for addressing complaints. Academic units should ensure that their policies and procedures are consistent with the Charter of Students' Rights. For their part, graduate students are responsible for informing themselves of these policies and procedures.

#### 1. Assignment of Advisers, Supervisors, and Committees

- i. Each unit should designate a member (or members) of the academic staff (usually the graduate program director) to monitor the progress of students throughout the graduate program, to ensure that all conditions of admission and requirements are fulfilled, to provide students with information on their program, their progress through it, sources of and policies on financial support, and to advise them how to resolve problems which may arise during their program.
- ii. As soon as possible, students should have a supervisor who has competence in the student's proposed area of research, and a program or thesis committee. Although procedures and timetables for choosing supervisors and committees may vary across programs, they should be consistent within



a particular program and should be made clear to incoming students. Thesis supervisors must be chosen from academic staff in tenure-track positions. Faculty Lecturers and Research Assistants may not act as supervisors but in exceptional cases, may be co-supervisors. Emeritus Professors and Adjunct Professors may co-supervise. Certain non-tenure track professors appointed in the Faculty of Medicine may be eligible to supervise or co-supervise graduate students with the approval of the unit and Graduate and Postdoctoral Studies. In the case of supervision, the academic unit in question must ensure continuity of appropriate supervision of their graduate students.

## 2. Program

- i. Early in their program, students should be informed of the phases through which they must pass toward the achievement of the graduate degree, the approximate amount of time each phase should take, the criteria for its successful completion, and any deadlines relating to these phases.
- ii. It is important that students are made aware of whatever courses are required to complete their programs, that these courses are available, and that they relate to students' proposed areas of research or to the development of related areas of scholarship.
- iii. Where relevant, students should also be informed early in their program of language requirements or comprehensive examinations. The guidelines, criteria and procedures for comprehensive examinations must be explicit and consistently applied in each program. Academic units should consider the rationale for language and comprehensive examinations and how they relate to the objectives of the graduate program.
- iv. Every effort should be taken to ensure that students choose, as soon as possible, realistic and appropriate areas of research commensurate with degree requirements.
- v. **There must be clear procedures established in every unit by which students receive guidance and constructive criticism on their progress on a regular basis through the program (e.g., regular meetings and/or email communication with supervisors and committees, attendance at research seminars, semester or annual reviews of student progress). In addition to regular meetings between the student and supervisor or advisory/thesis committee, each unit must establish a procedure to provide feedback to thesis students regarding their research progress. At least annually, there must be a meeting between the student, supervisor and advisory/thesis committee or, in the case where there is no such advisory/thesis committee, there must be a meeting between the supervisor and a departmental representative, at which objectives for the upcoming year are established and the prior year's research progress recorded and evaluated. A written record of such meetings must include the signature of the student, supervisor, and the advisory/thesis committee member or a departmental representative, and this record must be retained in the student's departmental file. (The Graduate Student Research Objectives Report Form, the Graduate Student Research Progress Record, and the Graduate Student Research Progress Report Form are to be utilized to keep a record of these meetings.) In the case where the student does not make expected progress, the advisory or thesis committee or, in the case where there is no such advisory or thesis committee, the student, supervisor and a departmental representative must meet at least once per semester for the subsequent twelve months to review progress and if appropriate to set new objectives. On the occasion of a second unsatisfactory progress report, the student may be required to withdraw from the program of study.**
- vi. Students should be made aware of the cost of living in Montreal and of sources of financial support (e.g., teaching or research assistantships, fellowships) and of the facilities available to them (e.g., study space, computers).
- vii. Students should receive guidance and encouragement in areas relating to their growth in scholarship, professional development and career planning. Examples may include, where appropriate, reporting research, writing abstracts, preparing papers for conference presentation or for publication, writing grant and fellowship applications, conducting a job search, and preparing for job interviews.
- viii. Units should be sensitive to special academic needs and concerns that may arise in the case of certain students, such as international students or students who undertake graduate studies after a long absence from university.

## 3. Responsibilities

Each unit should clearly identify the student's supervisory needs at each phase and the means by which these needs will be met. Some functions will be fulfilled by the Chair, some by the graduate program director, some by the supervisor and some by the committee. Each unit should clearly identify the specific responsibilities of each of these, as well as the responsibilities of students themselves.

- i. Each unit should consider the availability of student support, research facilities, space, and availability of potential supervisors in determining the number of students admitted into the program.
- ii. Some examples of the responsibilities of the graduate program director are to be knowledgeable about program requirements, the composition of committees, the procedures for comprehensive and oral defense examinations, and other policies relating to graduate studies; to maintain a dossier on each student's progress; and to be sensitive to graduation deadlines and students' career plans.
- iii. Some examples of the responsibilities of a supervisor are to uphold and to transmit to students the highest professional standards of research and/or scholarship; to provide guidance in all phases of the student's research; to meet with their students regularly; to provide prompt feedback when work is submitted including drafts of the thesis; and to clarify expectations regarding collaborative work, authorship, publication and conference presentations.
- iv. Some examples of the responsibilities of the students are to inform themselves of program requirements and deadlines; to work within these deadlines; to communicate regularly with the supervisor and committee; and to submit progress reports to the supervisor and committee.
- v. The Chair of the unit should ensure that procedures are in place to address serious disagreements that may arise, for example, between a student and a supervisor or between a supervisor and committee members. Such procedures should involve a neutral mediator who will ensure that all sides of a dispute are heard before any decision is made.

## 4. Quality of Supervision and Teaching

- i. Academic units and Graduate and Postdoctoral Studies should consider ways to assess and improve the quality of supervision and to help new supervisors, e.g., through workshops or mentoring models. Procedures for monitoring the quality of graduate student supervision and for providing constructive feedback for supervisors should be developed.
- ii. Graduate supervision should be recognized as an integral part of the academic responsibility of an academic unit and should be considered in the allocation of workload, as should the teaching of graduate courses.

- iii. Academic units should establish criteria of excellence in supervision and graduate teaching appropriate to their disciplines and should suitably reward those who meet these criteria, e.g., in decisions concerning tenure and promotion, or merit pay awards.
- iv. The maximum number of students under the direction of a single supervisor should be consistent with the ability of the supervisor to provide quality supervision, taking into account the workload of the supervisor and norms of the discipline.
- v. Procedures should be established for ensuring continuity in supervision when a student is separated from a supervisor – for example, when the supervisor takes a sabbatical leave, retires from McGill or changes universities or when the student leaves to complete field work or takes a job before submitting a thesis.

*Revised by Council of FGSR, April 23, 1999 and October 6, 2003*

---

## 9.2 Policy on Graduate Student Research Progress Tracking

This is a new mandatory policy and procedure to track the research progress of graduate students. The policy is referred to in the amended [section 9.1: Guidelines and Regulations for Academic Units on Graduate Student Advising and Supervision](#) in bold print. Documents to record progress can be found on the GPS website: [www.mcgill.ca/gps/staff/forms](http://www.mcgill.ca/gps/staff/forms).

The following is a summary of the main elements of the new **mandatory** policy. The following steps must be followed for each graduate student in a thesis program:

1. Annually, the student must meet with, at minimum, their supervisor(s) and a departmental representative. This meeting can occur in the context of an annual thesis or advisory committee in those departments that have thesis committees
2. At the first such meeting (to be held shortly after thesis students begin their programs), written objectives/expectations for the year must be recorded on the first of the three forms, Form #1 (Graduate Student Research Objectives Report Form). All three people at the meeting must sign this form. A student who does not agree to sign the form must write a statement detailing his/her objections to the expectations recorded on the form.
3. Approximately one year later, and every year thereafter, the student, supervisor(s) and the departmental representative should meet again to review the progress that has been achieved toward the recorded objectives. Prior to the meeting, the student should record his/her accomplishments and progress for the year by completing Form #2 (Graduate Student Research Progress Record). This completed form is then evaluated by the supervisor and the departmental representative on Form #3 (Graduate Student Research Progress Report Form). All parties sign Form #3. A student who does not agree to sign the form must write a statement detailing his/her objections. At this same meeting, objectives for the following year should be recorded on Form #1, as per the procedure described in point 2, above.
4. In the event that recorded research progress is unsatisfactory, a new set of objectives should be developed for the student at the meeting, and recorded on Form #1. These new, or interim, objectives apply only to the next semester. Evaluation of progress should take place after that semester has concluded, following the steps described in point 3, above.
5. In the event that a student has any two unsatisfactory evaluations they may be required to withdraw from their program of study. These two unsatisfactory evaluations need not be successive.
6. All forms are to be kept in departmental files.
7. Departments that already have progress tracking forms may continue to utilize them, but these must conform to the fundamental principles underlying this new policy. Specifically, any departmental procedure or forms to record graduate research progress must:
  - be used **annually**;
  - be used in a meeting with the supervisor and one other departmental representative, and signed by all parties;
  - include a written statement of expectations approximately one year before any evaluation. (Note: This can be one semester in the case of expectations following an unsatisfactory evaluation.);
  - permit the student to submit a minority report and not sign;
  - state clearly that any two unsatisfactory evaluations may be grounds for requiring a student to withdraw.

Please note this new University policy is **MANDATORY**. Students may grieve against a department that fails to adhere to the policy and procedures outlined above.

*Senate, September 2003*

---

## 9.3 Vacation Policy for Graduate Students and Postdocs

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

*Council of FGSR April 23, 1999*

---

## 9.4 Ph.D. Comprehensives Policy

### Preamble

The majority of doctoral programs at McGill require candidates to pass a comprehensive examination or set of examinations or equivalent, such as qualifying examinations, preliminary examinations, candidacy paper, comprehensive evaluation, thesis proposal, etc. The Calendar of Graduate and Postdoctoral Studies (GPS) includes the following statement:

A comprehensive examination or its equivalent is usually held near the end of Ph.D. 2. The results of this examination determine whether or not students will be permitted to continue in their programs. The methods adopted for examination and evaluation and the areas to be examined are specified by departmental regulations and approved by Graduate and Postdoctoral Studies. It is the responsibility of students to inform themselves of these details at the commencement of their programs.

It is recognized that expectations for the Ph.D. comprehensive will vary according to the needs of the discipline. It is important to make it clear to doctoral candidates what the expectations and procedures are for their Ph.D. comprehensive, and to maintain consistency within a given program.

### **1. General Policy**

At the beginning of the relevant academic year, units must provide doctoral students with a written description of the Ph.D. comprehensive, covering the following issues: objectives and content, format, timing, assessment, grading and reporting, failures. (See below for details.)

2. All units that have a Ph.D. comprehensive must adopt an administrative course number for it, usually XXXX 701. One of the following forms of grading must be adopted and used consistently within the program: Pass/Fail or letter grades. ("Mixed" modes of grading are not permitted, i.e., some students within a program reported on a Pass/Fail basis and others by means of letter grades.)

### **Specific Issues**

#### **Objectives and Content**

Units must specify the objectives of the Ph.D. comprehensive. Objectives may include assessing any of the following (or a combination), with a view to determining whether the student demonstrates the necessary research skills and academic achievements to be permitted to continue in the Ph.D. program. (This list is not intended to be exhaustive.)

- knowledge of the discipline (from the point of view of breadth)
- understanding of the proposed field of research
- ability to conduct independent and original research
- a thesis proposal
- professional skills
- ability to present and defend material orally

The content of the comprehensive must be consistent with the objectives and should be appropriately circumscribed. Students must be given an indication of the range of material that may be covered in the examination and suggestions as to how to cover this material (e.g., via reading lists, courses, etc.).

#### **Format**

The format of the comprehensive must be clearly stated and must be consistent across students within a particular program. The following list gives some of the more common formats, which are often combined. (This list is not intended to be exhaustive.)

- written examination of a specific duration
- take-home examination
- extended research paper(s)
- written research proposal
- oral exam (which may include or consist of a defense of a research paper or research proposal)

If the comprehensive consists of several parts, the relationship (if any) between them must be made clear.

#### **Timing**

Timing of the comprehensive must be specified, including the earliest and latest dates by which the comprehensive is to be completed. Students must be informed of the specific dates of the exam in sufficient time for them to prepare for it.

Given the importance of the Ph.D. comprehensive and the consequences of failure, the exam should be held reasonably early in the program, so that students do not spend several years preparing for it.

Prerequisites must be specified. For example, clarify whether all course work must have been completed prior to the comprehensive and whether the comprehensive is the final step before thesis research and writing.

#### **Assessment, Grading and Reporting**

Evaluation parameters must be made clear, including information about who sets the exam questions and who evaluates the student. If performance is assessed by a committee, clarify how the committee is appointed and who sits on it. In the case of written examinations, clarify whether the grading is done by one or more people.

Where there is more than one component to the examination (e.g., an oral exam plus a written exam), it must be made clear how these components are factored into the final grade. For example, make it clear whether each component counts equally, whether the assessment is global, and whether failure on one part of the comprehensive examination (or on one question) results in an overall failure.

#### **Feedback**

The assessment and reasons for the decision must be documented and provided to the student in sufficient detail to allow the student to understand the decision, including identifying strengths and weaknesses. (A number of units have developed short forms specifically for this purpose.) In the case of oral examinations, the student should also be given feedback on presentation, logical exposition, ability to answer questions, etc.

In the case of oral exams, units may wish to consider the following: ensure that there is a reasonably detailed written assessment of the student's performance; tape the oral examination; allow the student to select a faculty member to act as a neutral observer; have one faculty member serve as a neutral chair (equivalent to a Pro-Dean); have an "outside" committee member; have the oral examination open to other students and faculty members.

### **Plagiarism**

McGill University values academic integrity, which is fundamental to achieving our mission of the advancement of learning. Therefore, all students must understand the issues associated with **academic integrity** (see [www.mcgill.ca/students/srr/honest](http://www.mcgill.ca/students/srr/honest) for more information).

Plagiarism in a Ph.D. comprehensive examination contravenes McGill University's academic goals and standards. Consequently, any student found guilty of plagiarism under the Code of Student conduct and Disciplinary Procedures (see the *Handbook on Students Rights and Responsibilities* available at [www.mcgill.ca/secretariat/policies/students](http://www.mcgill.ca/secretariat/policies/students)) in a Ph.D. comprehensive examination may face very serious penalties, even expulsion from the University without the degree.

### **Failures**

#### **i. Repeats**

In the event of a failure, units must allow, without prejudice, one repeat of the comprehensive (in whole or in part). The first time a student fails, the student must be informed in writing by the department that he/she has failed the comprehensive and must be informed of conditions relating to a repeat of the examination. In such circumstances, the grade of HH (continuing) will be used. In the event of a second failure, a grade of F will be reported to Graduate and Postdoctoral Studies and the student will be asked to withdraw from the Ph.D. program.

Conditions for retaking the examination must be clearly stated, including the time frame, potential dates, nature of the re-examination, committee membership, etc.

Units have the right to specify further requirements in the event of failure (e.g., requiring students to take an additional course or courses in areas where they have shown weakness on the comprehensive).

#### **ii. Plagiarism**

If plagiarism is suspected, the case will be referred directly to the committee on Student Discipline in accordance with the code of Student Conduct, Part III (article 15) and Part V (A). If plagiarism is established by due University process, the student is considered to have failed the examination, with no possibility of repeat.

#### **iii. Review and Reassessment**

Rereads. In the case of written comprehensives, the Graduate Studies Reread Policy applies.

A student who fails an oral examination may request a review. In such cases, Graduate and Postdoctoral Studies will conduct a review of the examination process and procedures.

### **Other Relevant Policies/Offices**

- Charter of Student Rights
- Graduate Studies Reread Policy
- Office for Students with Disabilities

*Approved by Executive of Faculty of Graduate Studies and Research (FGSR) February 17, 1997 and Council of FGSR March 7, 1997*

---

## **9.5 Graduate Studies Reread Policy**

**This policy applies only in the case of marks given for written work in 600- and 700-level courses.** For 500-level courses and below, the reread policy of the appropriate undergraduate faculty applies.

### **Consultation**

In accordance with the Charter of Student Rights, and subject to the conditions stated therein, graduate students have the right, subject to reasonable administrative arrangements, "to consult any written submission for which they have received a mark and to discuss this submission with the examiner". Upon request by the student, the instructor of the course is obliged to conduct this consultation with the student.

(Note: Where materials have been graded by a TA and the student wants a reconsideration of the grade, the faculty member responsible for the course is expected to review the materials and the appropriateness of the grade. This is so even if the materials in question have already been discussed by the TA with the student.)

### **Verification**

In a case where a student feels that totalling errors have been made in arriving at the final grade, the student can request the instructor to carry out a detailed check that all questions have been marked and that the final grade has correctly been computed on the basis of the term work, final examination, etc.

### **Rereads**

According to the Charter, students have the right, subject to reasonable administrative arrangements, "to an impartial and competent review of any mark" (hereafter "reread").

At the time the request for a reread is made, the student should have already met with the faculty member responsible for the course to review the mark, or made a reasonable attempt to do so. Rereads can only be requested if a change upwards in the letter grade for the course is possible as a result of the reread. Assignments can only be reread if, together, they account for more than 20% of the course grade.

The reread by a second reader is a review of the mark, not the work assigned. It is the second reader's task to determine whether the original mark is fair and reasonable, not to give the work a totally new assessment.

1. The time limit for requesting a reread is within 30 days after posting of the final marks for the course. However, in the case of work which has been graded during the course and returned to the student, students must indicate in writing to Graduate and Postdoctoral Studies within 5 working days of receiving the graded work their intention to request a reread. This intention must be confirmed within 30 days of the posting of the final marks for the course.

(Note: Material that is returned to a student **cannot be reread** unless arrangements have been made to ensure that the material has not been changed subsequent to the original grading; for example, the student can make a copy for the professor to retain either before handing the material in or immediately upon receiving it back from the instructor or at the point where the professor and student review the work together.)

Instructors are strongly advised to write their corrections in red pen and to write comments which help the student to understand the mark assigned.)

2. The request for a formal reread must be made by the student in writing to Graduate and Postdoctoral Studies and should specify the reasons for the request. It should include a statement indicating that the student has already met with the faculty member responsible for the course to review the mark or indicating why this has not been possible. The reread fee (\$35 for an exam, \$35 for a paper, \$35 for one or more assignments, to a maximum of \$105 per course) will be charged directly to the student's fee account after the result of the reread is received. No fee will be charged if there is a change upwards in the letter grade for the course.
3. Administration of the reread is handled by Graduate and Postdoctoral Studies, not by the department. GPS will contact the department to obtain the work to be reread, a list of potential readers, and details of the marking. The list of potential readers must be approved by the Department Chair or Graduate Program Director. The Chair or Director must, as well, vouch for the impartiality of these readers. All communication with the second reader is conducted by GPS.

The second reader is given the original assignment, with marginalia, corrections, summary comments and mark intact, as well as any notes from the instructor pertinent to the general nature of the course or the assignment and grading schemes, etc.

4. The student's and the instructor's names are blanked out to reduce the possibility of prejudice and to help meet the requirement of the Charter of Students' Rights that the review be impartial. The rereader's name will not be made known to the student or instructor at any time; the student's name will not be made known to the rereader at any time.
5. The second reader should support his or her assessment with a brief memorandum to Graduate and Postdoctoral Studies. As a result of the reread process, the grade may become **higher or lower or remain unchanged**. The grade submitted by the second reader shall replace the original grade. The reread grade cannot be challenged.

In the case of requests for rereads of group work, all members of the group must sign the request, indicating that they agree to the reread. In the event that members of the group are not in agreement, the written request should indicate which students are requesting the reread and which students do not wish for a reread. In such cases, the outcome of the reread (whether positive or negative) will affect only the students in favour of the reread. Neither the reread grade nor the decision to opt in or out of the reread can be challenged.

6. The new grade resulting from the review will be communicated to the student in a letter from Graduate and Postdoctoral Studies, with a copy to the academic unit.

*Prepared by the Committee on Graduate Programs, Supervision and Teaching*

*Approved by Council of the Faculty of Graduate Studies and Research, May 12th 1995*

## 9.6 Health and Parental/Familial Leave of Absence Policy

A leave of absence may be granted by Graduate and Postdoctoral Studies for maternity or parenting (interpreted according to McGill's "Parental Leave Policy" for non-academic staff) reasons or for health reasons.

Such a leave must be requested on a term by term basis and may be granted for a period of up to 52 weeks. Students must make a request for such a leave in writing to their department and submit a medical certificate. The department shall forward the request to GPS.

During a **leave of absence for parental or familial reasons**, a student will not be eligible to take courses but he/she may request and expect guidance on thesis and research work and will have free access to the University's academic facilities. Library services will continue to be available by registering at the Circulation Desk of the Humanities and Social Sciences Library (McLennan-Redpath). In special circumstances, familial leave may be considered by GPS for a student when a close family member is ill.

During a **leave of absence for health reasons**, a student will not be eligible to request guidance on thesis and research work or to take courses. He/she will not have access to the University's academic facilities but Library services will normally continue to be available by registering at the Circulation Desk of the Humanities and Social Sciences Library (McLennan-Redpath).

A medical certificate must accompany such leave requests.

*Council of FGSR, March 1999*

**Please refer to *University Regulations and Resources > Graduate > Regulations > : Leave of Absence Status* for information regarding registration of graduate students and Postdocs on such leaves.**

**Procedure:**

All requests for a leave of absence for health reasons should be accompanied by the following:

- a duly completed *Leave of Absence/Non-Resident Request Form* available from [www.mcgill.ca/gps/staff/registration](http://www.mcgill.ca/gps/staff/registration);
- a written request from the student;
- a Minerva form to drop all courses for all relevant terms;
- a medical certificate.

To be acceptable, the medical certificate must contain at least the following items:

- the student's name, as well as complete contact information for the physician;
- a clear statement by the physician justifying the student's inability to perform his/her academic duties, with start and end dates;
- if the request is submitted during a term for which the leave is requested, a clear explanation as to why the health conditions in question did not prevent the normal performance of academic duties at the beginning of the semester.

No retroactive requests for leave of absence will be considered.

It remains the student's responsibility to verify their administrative situation, in particular, as it pertains to term and course registration.

---

## 9.7 Failure Policy

Please refer to *University Regulations and Resources > Graduate > Regulations > : Failure Policy* for information regarding the policy and procedures to follow in cases of failure.

---

## 9.8 Guideline on Hours of Work

In order to maintain full-time status, a graduate student should not work more than 180 hours per term over 15 weeks with 12 hours per week.

---

# 10 Research Policy and Guidelines, Patents, Postdocs, Associates, Trainees

Students must inform themselves of University rules and regulations and keep abreast of any changes that may occur. The *Research Policy and Guidelines, Patents, Postdocs, Associates, Trainees* section of this publication contains important details required by students during their studies at McGill and should be periodically consulted, along with other sections and related publications.

---

## 10.1 Policy on Research Ethics

Please refer to the Policy on Research Ethics available at [www.mcgill.ca/secretariat/policies/research](http://www.mcgill.ca/secretariat/policies/research).

---

## 10.2 Regulations on Research Policy

Please refer to the Regulations on Research Policy available at [www.mcgill.ca/secretariat/policies/research](http://www.mcgill.ca/secretariat/policies/research).

---

## 10.3 Policy on Research Integrity

Please refer to the Policy on Research Integrity available at: [www.mcgill.ca/research/about/integrity](http://www.mcgill.ca/research/about/integrity).

---

## 10.4 Guidelines for Research Involving Human Subjects

Please refer to the guidelines for research involving human subjects available at: [www.mcgill.ca/research/researchers/compliance/human](http://www.mcgill.ca/research/researchers/compliance/human).

---

**10.5 Guidelines for Research with Animal Subjects**

Please refer to the guidelines for research involving animal subjects available at: [www.mcgill.ca/research/researchers/compliance/animal](http://www.mcgill.ca/research/researchers/compliance/animal).

---

**10.6 Policy on Intellectual Property**

Please refer to the Policy on Intellectual Property available at: [www.mcgill.ca/research/researchers/ip](http://www.mcgill.ca/research/researchers/ip).

---

**10.7 Regulations Governing Conflicts of Interest**

Please refer to the regulations governing conflicts of interest available at [www.mcgill.ca/secretariat/policies/conflictinterest](http://www.mcgill.ca/secretariat/policies/conflictinterest).

---

**10.8 Safety in Field Work**

Please refer to the policies on safety in field work available at [www.mcgill.ca/ehs/fieldworksafety](http://www.mcgill.ca/ehs/fieldworksafety).

---

**10.9 Office of Sponsored Research**

Please refer to the Office of Sponsored Research, available at: [www.mcgill.ca/research/researchers](http://www.mcgill.ca/research/researchers).

---

**10.10 Postdocs**

Please see [www.mcgill.ca/gps/postdocs](http://www.mcgill.ca/gps/postdocs).

---

**10.11 Research Associates**

A Research Associate is a senior career researcher who usually works independently, in most cases has a Ph.D. or equivalent, and is often supported directly by outside granting agencies. ([www.mcgill.ca/apo/classifications/other/research-associate](http://www.mcgill.ca/apo/classifications/other/research-associate))

---

**11 Academic Programs**

The programs and courses in the following sections have been approved for the 2011-2012 session as listed, but the Faculty reserves the right to introduce changes as may be deemed necessary or desirable.

---

**11.1 Anatomy and Cell Biology****11.1.1 Location**

Department of Anatomy and Cell Biology  
Strathcona Anatomy and Dentistry Building  
3640 University Street, Room 1/60  
Montreal, QC H3A 2B2  
Canada

Telephone: 514-398-6335

Fax: 514-398-5047

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

### 11.1.2 About Anatomy and Cell Biology

In addition to laboratory-specific activities, students will attend weekly seminars presented by nationally and internationally recognized researchers ([www.mcgill.ca/anatomy/seminar-series](http://www.mcgill.ca/anatomy/seminar-series)). Students will also present their results approximately twice a year to other students in the program in the Research in Progress seminar series.

Current research projects include: cell biology of secretion; cell biology of endocytosis; signal transduction of cell receptors for growth factors and hormones; synthesis and migration of glycoproteins; subcomponents of the Golgi apparatus and their function; biogenesis and function of lysosomes; cell turnover in various tissues; control of cell growth and proliferation; molecular biology of extracellular matrix; structure, composition, and function of basement membranes and connective tissue microfibrils; cell and microfibrils; cell and molecular biology of spermatogenesis; genetic expression of proteins in the formation of cytoskeletal components of spermatozoa; role of endocytosis and secretion by epididymal cells in sperm maturation; molecular biology of Sertoli cell secretions and their interaction with germ cells; synchronization of sperm production; transferrin, transferrin receptors, and iron in germinal cells; differentiation of B lymphocytes in bone marrow in relation to mechanisms of humoral immunity, immunodeficiency states, and B cell neoplasias; control mechanisms and cytokines in B lymphopoiesis; in situ organization and stromal cell-interactions of B lineage precursor cells in bone marrow; microenvironmental regulation of hemopoiesis; differentiation and regulation of cells mediating natural tumor immunosurveillance; tumor cell biology; cell and molecular biology of the formation of dental enamel, dentin, and bone; structure of organic matrices and inorganic crystals of dental enamel; role of hormones and their binding sites with calcified tissues; secretion and degradation of the proteins of enamel matrix, hypothalamo-pituitary function and gonadotropin patterns in ovarian follicular development; polycystic ovarian disease; computer-assisted modeling of morphometric and kinetic data; cell biology and molecular genetics of aging; senescence and cell cycle-specific genes and their products; cryo-electron microscopy.

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

**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: cell and molecular biology, cellular immunology and hematology, reproductive biology, calcified tissue biology, tumor cell biology, developmental biology, neurobiology, and 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. Techniques used by Department members include labelling with radioisotopes and other tracers, radioautography, immunocytochemistry, histochemistry, cryo-immune microscopy, fluorescence microscopy, high-resolution electron microscopy, scanning electron microscopy, backscattered electron imaging, confocal microscopy, 3D cryo-electron microscopy, microinjection, video-microscopy in living cells, X-ray microanalysis, electron diffraction, freeze-fracture replication, computer reconstruction and quantitation, chromatography, subcellular fractionation, recombinant DNA technology, in situ hybridization, tissue grafting, cell and tissue culture, mutant and transgenic mice, hybridomas, and monoclonal antibodies.

The Department has one of the largest and best-equipped electron microscope facilities in the world. Currently in use are four modern electron microscopes, including 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.

#### *section 11.1.5: Master of Science (M.Sc.); Cell Biology and Anatomy (Thesis) (48 credits)*

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

#### *section 11.1.6: Doctor of Philosophy (Ph.D.); Cell Biology and Anatomy*

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

### 11.1.3 Anatomy and Cell Biology Admission Requirements and Application Procedures

#### 11.1.3.1 Admission Requirements

##### M.Sc. and Ph.D. Programs

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 on 4.0 as is indicated in the general guidelines set up by GPS at McGill.
3. Students must follow the guidelines for English Language Proficiency at [www.mcgill.ca/gradapplicants/apply/prepare/requirements/proficiency](http://www.mcgill.ca/gradapplicants/apply/prepare/requirements/proficiency).
4. M.Sc. and Ph.D. students are supported financially, at a minimum of \$15,000 and \$17,000 respectively, per year.

Graduate students are also expected to apply for the various internal and external fellowships. Detailed information is available at [www.mcgill.ca/anatomy/graduate/fellowships/](http://www.mcgill.ca/anatomy/graduate/fellowships/). Graduate students are responsible for the payment of tuition fees to McGill University. Detailed information about these can be found at [www.mcgill.ca/student-accounts/fees/grad](http://www.mcgill.ca/student-accounts/fees/grad). For international students registered in the M.Sc. and Ph.D. programs, differential fee waivers up to \$5,000 will be allocated to a maximum of eight students through the Department of Anatomy and Cell Biology, for the first year, with a possibility of renewal.

### 11.1.3.2 Application Procedures

Application for admission to graduate studies for the degrees of M.Sc. or Ph.D. in Cell Biology and Anatomy should be made to the Chair of Graduate Studies, Department of Anatomy and Cell Biology.

Application forms are available at [www.mcgill.ca/gradapplicants/apply](http://www.mcgill.ca/gradapplicants/apply) and program guidelines are detailed at [www.mcgill.ca/anatomy/graduate](http://www.mcgill.ca/anatomy/graduate).

**All applicants must first make arrangements with a faculty member of the Department for acceptance into his/her laboratory to carry out the thesis research ([www.mcgill.ca/anatomy/graduate/appproc/](http://www.mcgill.ca/anatomy/graduate/appproc/)).**

#### Dates for Guaranteed Consideration

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program.



**Note:** We are not willing to consider any applications to be admitted for the Summer term.

#### Documents Required

1. Two official copies of complete university-level academic records to date (this also applies to McGill University transcripts). It may be desirable to submit a list of the titles of the courses taken, if transcripts give code numbers only. It is the applicant's responsibility to contact the institution(s) attended and request that the transcripts be forwarded directly to the Department of Anatomy.
2. Two letters of recommendation.  
It is the applicant's responsibility to arrange that these letters are originals, sent directly to the Department of Anatomy from the persons specified by the applicant.
3. Fee of \$100 in Canadian funds for processing the application.
4. TOEFL score (where applicable).

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

## 11.1.4 Anatomy and Cell Biology Faculty

### Acting Chair

Nathalie Lamarche-Vane

### Emeritus Professors

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

Yves Clermont; B.Sc.(Montr.), Ph.D.(McG.), F.R.C.S.

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.)

Philip Barker; B.Sc.(S. Fraser), Ph.D.(Alta.) (*joint appt. with Neurology & Neurosurgery*)

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

Miguel Burnier; M.D., M.Sc., Ph.D.(Brazil) (*joint appt. with Ophthalmology*)

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

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

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

**Professors**

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 & Neurosurgery*)  
 Sandra C. Miller; B.Sc.(Sir G. Wms.), M.Sc., Ph.D.(McG.)  
 Carlos R. Morales; D.V.M.(U.N., Argentina), Ph.D.(McG.)  
 Barry I. Posner; M.D.(Manit.), F.R.C.P.(C) (*joint appt. with Medicine*)  
 Alfredo Ribeiro-da-Silva; M.D., Ph.D.(Oporto) (*joint appt. with Pharmacology and Therapeutics*)  
 Wayne Sossin; S.B.(MIT), Ph.D.(Stan.) (*joint appt. with Neurology & Neurosurgery*)  
 Stefano Stifani; Ph.D.(Rome), Ph.D.(Alta.) (*joint appt. with Neurology & Neurosurgery*)  
 Dominique Walker; B.Sc., Ph.D.(Geneva) (*joint appt. with Psychiatry*)

**Associate Professors**

Orest W. Blaschuk; B.Sc.(Winn.), M.Sc.(Manit.), Ph.D.(Tor.) (*joint appt. with Surgery*)  
 Eugene Daniels; M.Sc., Ph.D.(Manit.)  
 Elaine Davis; B.Sc., M.Sc.(W. Ont.), Ph.D.(McG.)  
 Timothy Kennedy; B.Sc.(McM.), M.Phil., Ph.D.(Col.) (*joint appt. with Neurology & Neurosurgery*)  
 M.F. Lalli; B.Sc., M.Sc.(Bowling Green), Ph.D.(McG.)  
 Craig Mandato; B.Sc., Ph.D.(Wat.)  
 John F. Presley; B.A., Ph.D.(Texas)  
 Dieter Reinhardt; M.S.(Kaiserslautern), Ph.D.(Munich) (*joint appt. with Dentistry*)  
 Hojatollah Vali; B.Sc., M.Sc., Ph.D.(Munich) (*joint appt. with Earth and Planetary Sciences*)

**Assistant Professors**

Fiona Bedford; B.Sc.(Birm.), Ph.D.(Lond.)  
 Isabelle Rouiller; Ph.D.(UK)

**Associate Members**

John J.M. Bergeron; B.Sc.(McG.), D.Phil.(Oxf.)  
 Albert Berghuis (*Biochemistry*)  
 Colin Chalk (*Neurology & Neurosurgery*)  
 Jean-François Cloutier (*Neurology & Neurosurgery*)  
 Claudio Cuello (*Pharmacology & Therapeutics*)  
 Giovanni DiBattista (*Medicine*)  
 Alyson Fournier (*Neurology & Neurosurgery*)  
 Janet Henderson (*Medicine*)  
 Robert Scott Kiss (*Biochemistry*)  
 Bartha Knoppers (*Human Genetics*)  
 Svetlana Komarova (*Dentistry*)  
 Paul Lasko (*Biology*)  
 Andréa Leblanc (*Neurology & Neurosurgery*)  
 Peter Metrakos (*Department of Surgery*)  
 Tommy Nilsson (*Medicine*)  
 Edward S. Ruthazer (*Neurology & Neurosurgery*)  
 Michael Sacher (*Biology*)

**Associate Members**Philippe Seguela (*Neurology & Neurosurgery*)Peter Siegel (*Medicine & Biochemistry*)Thomas Stroh (*Neurology & Neurosurgery*)David Y. Thomas (*Biochemistry*)Jacalyn Vogel (*Biology*)Xiang-Jiao Yang (*Medicine*)**Adjunct Professors**

Michel Cayouette; Ph.D.(Laval)

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

Eric Chevet; Ph.D.(Paris)

Miroslaw Cygler; M.Sc., Ph.D.(Lodz, Poland)

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

Michel Desjardins; M.Sc., Ph.D.(Montr.)

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

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

Marko Horb; Ph.D.(SUNY)

Artur Kania; Ph.D.(Baylor)

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

Alexei Pshezhetsky; Ph.D.(Russia)

Joseph Schrag; M.Sc., Ph.D.(Ill.)

Atilla Sik; M.Sc., Ph.D.(Hungary)

Pierre Thibault; Ph.D.(Montr.)

**Faculty Lecturers**

Ayman Behiery; M.B., Ch.B.(Cairo)

Geoffroy P. Noël; Ph.D.(Br. Col.)

**11.1.5 Master of Science (M.Sc.); Cell Biology and Anatomy (Thesis) (48 credits)****Thesis Course (24 credits)**

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

**Required Course (9 credits)**

ANAT 699 (9) M.Sc. Thesis Research Seminar

**Complementary Courses (15 credits)**

15 credits from one of three streams: Histology Stream, Cell Developmental Biology Stream, or Human Systems Biology Stream

**Histology Stream**

ANAT 541 (3) Cell and Molecular Biology of Aging

ANAT 614D1 (4.5) Human Anatomy and Embryology

ANAT 614D2 (4.5) Human Anatomy and Embryology

ANAT 663D1	(4.5)	Histology
ANAT 663D2	(4.5)	Histology

**Cell Developmental Biology Stream**

ANAT 663D1	(4.5)	Histology
ANAT 663D2	(4.5)	Histology
ANAT 690D1	(3)	Cell and Developmental Biology
ANAT 690D2	(3)	Cell and Developmental Biology

**Human Systems Biology Stream**

6 credits required:

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

9 credits selected from:

BMDE 502	(3)	BME Modelling and Identification
BMDE 519	(3)	Biomedical Signals and Systems
BTEC 501	(3)	Bioinformatics
COMP 564	(3)	Computational Gene Regulation
COMP 680	(4)	Mining Biological Sequences
EXMD 602	(3)	Techniques in Molecular Genetics
MIMM 613	(3)	Current Topics 1
MIMM 614	(3)	Current Topics 2
MIMM 615	(3)	Current Topics 3

**11.1.6 Doctor of Philosophy (Ph.D.); Cell Biology and Anatomy****Thesis****Required Courses**

Note: Students choose between ANAT 663D1 and ANAT 663D2 OR ANAT 690D1 and ANAT 690D2.

ANAT 663D1	(4.5)	Histology
ANAT 663D2	(4.5)	Histology
ANAT 690D1	(3)	Cell and Developmental Biology
ANAT 690D2	(3)	Cell and Developmental Biology
ANAT 701	(0)	Ph.D. Comprehensive Examination

---

**11.2 Biochemistry****11.2.1 Location**

Department of Biochemistry  
McIntyre Medical Sciences Building

3655 Promenade Sir-William-Osler  
Montreal, QC H3G 1Y6  
Canada

Christine Laberge: Student Affairs Administrator  
Telephone: 514-398-2423  
Fax: 514-398-4866  
Email: [admissions.biochemistry@mcgill.ca](mailto:admissions.biochemistry@mcgill.ca)  
Website: [www.mcgill.ca/biochemistry](http://www.mcgill.ca/biochemistry)  
Website: [www.mcgill.ca/biochemistry/chemicalbiology](http://www.mcgill.ca/biochemistry/chemicalbiology)  
Website: [www.mcgill.ca/biochemistry/bioinformatics](http://www.mcgill.ca/biochemistry/bioinformatics)

## 11.2.2 About Biochemistry

The Department of Biochemistry offers M.Sc. and Ph.D. programs, which emphasize laboratory research. Our research interests include molecular and cell biology, the regulation of gene and protein expression, signal transduction, protein structure and function, membrane biology, cell death and differentiation, embryonic development, neurobiology, bioinformatics, and many aspects of cancer. Specialized graduate training programs in Chemical Biology, Human Systems Biology (Bioinformatics), Cancer Research/Oncology (<http://cancercentre.mcgill.ca/research>), and Structural Biology (<http://grasp.mcgill.ca>) are available. Laboratories are located in the new Bellini Life Sciences Building and Goodman Cancer Centre, and the renovated McIntyre Medical Sciences Building, together comprising one of the best-equipped research facilities in Canada. The outstanding quality of our research has been recognized by recent awards including a Gairdner Award, two Killam Prizes, and five Canada Research Chairs.

### Funding

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

### Departmental Seminars

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

#### *section 11.2.5: Master of Science (M.Sc.); Biochemistry (Thesis) (45 credits)*

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

#### *section 11.2.6: Master of Science (M.Sc.); Biochemistry (Thesis) — Chemical Biology (47 credits)*

The Chemical Biology Thematic Group is engaged in a diverse range of research topics which span structural biology, enzymology, nucleic acid research, signalling pathways, single molecule biophysics, and biophysical chemistry of living tissues. Among the themes 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 M.Sc. option provides a foundation in the concepts and approaches of Chemical Biology.

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

#### *section 11.2.7: Master of Science (M.Sc.); Biochemistry (Thesis) — Bioinformatics (45 credits)*

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

**section 11.2.7: Master of Science (M.Sc.); Biochemistry (Thesis) — Bioinformatics (45 credits)**

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

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

**section 11.2.8: Doctor of Philosophy (Ph.D.); Biochemistry**

The Ph.D. in Biochemistry trains students in laboratory-based research at the highest level. The Ph.D. program is streamlined to emphasize independent research, and the many areas of biochemistry studied in our Department offer a wide choice of specialties. Students gain in-depth expertise in biochemistry and the biomedical sciences, with the opportunity to carry out research projects at a world-class level and build collaborations with other leading research groups. Graduates of the Ph.D. program are outstandingly prepared for leadership careers in the basic health sciences in industry, the public sector, or academia.

**section 11.2.9: Doctor of Philosophy (Ph.D.); Biochemistry — 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.

**section 11.2.10: Doctor of Philosophy (Ph.D.); Biochemistry — Bioinformatics**

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

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

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

**11.2.3 Biochemistry Admission Requirements and Application Procedures****11.2.3.1 Admission Requirements**

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

**Master's Program**

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

**Doctoral Program**

Candidates who have completed their M.Sc. degree may be admitted directly to the Ph.D. program. Candidates who are admitted to the M.Sc. program and who are interested in the Ph.D. may transfer directly to 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: Minimum score of 600, or 86 on an Internet-based test with each component score of not less than 20.

or

IELTS: Minimum overall band score of 6.5.

International students who have received their degree outside North America should submit the following:

GRE: Subject Test in Biochemistry, Cell and Molecular Biology with a minimum score of 550. (Not required, but strongly recommended.)

**Admission Requirements – Chemical Biology Option**

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

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

**11.2.3.2 Application Procedures**

Applications will be considered upon receipt of:

1. application form;
2. curriculum vitae;
3. application fee (\$100);
4. two official letters of recommendation from professors on letterhead;
5. two official transcripts;
6. test results (TOEFL/GRE) if applicable.

All information is to be submitted to the Admissions Officer, Department of Biochemistry. All applicants are encouraged to contact potential research supervisors during or before the application process since supervisor acceptance is required. Information about the research interests of faculty members can be found at [www.mcgill.ca/biochemistry/graduates/research-interests](http://www.mcgill.ca/biochemistry/graduates/research-interests) and [www.mcgill.ca/biochemistry/department/faculty-members/](http://www.mcgill.ca/biochemistry/department/faculty-members/).

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

**Dates for Guaranteed Consideration**

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program.

**11.2.4 Biochemistry Faculty****Chair**

David Y. Thomas

**Associate Chair**

Kalle Gehring

**Emeritus Professors**

Rhoda Blostein; B.Sc., M.Sc., Ph.D.(McG.), F.R.S.C.

Peter E. Braun; B.Sc., M.Sc.(Br. Col.), Ph.D.(Calif., Berk.)

Robert E. MacKenzie; B.Sc.(Agr.)(McG.), M.N.S., Ph.D.(C'neil)

Edward A. Meighen; B.Sc.(Alta.), Ph.D.(Calif., Berk.)

Walter E. Mushynski; B.Sc., Ph.D.(McG.)

Theodore L. Sourkes; M.Sc.(McG.), Ph.D.(C'neil), F.R.S.C.

Clifford P. Stanners; B.Sc.(McM.), M.A., Ph.D.(Tor.)

**Professors**

Nicole Beauchemin; B.Sc., M.Sc., Ph.D.(Montr.) (*joint appt. with Oncology and Medicine*)

Albert Berghuis; B.Sc., M.Sc.(Rijks Univ. Groningen, The Netherlands), Ph.D.(Br. Col.) (*Canada Research Chair in Structural Biology*)

Philip E. Branton; B.Sc., M.Sc., Ph.D.(Tor.), F.R.S.C. (*Gilman Cheney Professor of Biochemistry*)

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 & Medicine*)

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

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

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

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

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

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

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

Joseph Shuster; B.Sc.(McG.), Ph.D.(Calif.), M.D.(Alta.)

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

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

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

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

Maria Zannis-Hadjopoulos; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Oncology & Medicine*)

**Associate Professors**

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

Imed Gallouzi; Maitrise, DEA, Ph.D.(Montpellier, France) (*Canada Research Chair in Cellular Information Systems*)

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

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

**Assistant Professors**

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

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

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

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

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

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

**Associate Members**

Karine Auclair (*Chemistry*), Jacques Genest (*Dept. of Medicine*), Matthias Götte (*Micro. & Immunol.*), Michael Hallett (*McGill Centre for Bioinformatics*), Qutayba Hamid (*Meakins-Christie Labs*), Robert S. Kiss (*Dept. of Medicine*), Gregory Miller (*Pharm. & Therapeutics*), Vassilios Papadopoulos (*Dept. of Medicine*), Janusz Rak (*Mtl. Children's Hospital*), Reza Salavati (*Inst. of Parasitology*), Maya Saleh (*Dept. of Medicine*), Erwin Schurr (*Ctr. For Host Resistance, MGH*), Charles Scriver (*Pediatrics, MCH*), Peter Siegel (*Dept. of Medicine*), Youla S. Tsantrizos (*Dept. of Chemistry*), Bernard Turcotte (*Dept. of Medicine, Goodman Cancer Ctr.*), Simon Wing (*Dept. of Medicine*), Xiang-Jiao Yang (*Mol. Oncol., RVH*)

**Adjunct Professors**

Mirek Cygler (*NRC/BRI*), Jacques Drouin (*Clin. Res. Inst.*), Anny Fortin (*Dafra Pharma Res. & Deve. Bvba*), Tarik Möröy (*IRCM*), Donald Nicholson (*Merck Frosst*), Maureen O'Connor (*NRC/BRI*), Enrico Purisima (*NRC/BRI*), René Roy (*PharmaQAM*), Alex Therien (*Merck Frosst Canada*)



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

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

**Required Course (3 credits)**

BIOC 696	(3)	Seminars in Biochemistry
----------	-----	--------------------------

**Complementary Courses\* (6 credits)**

At least 3 credits must be chosen from the following:

BIOC 570	(3)	Biochemistry of Lipoproteins
BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Structural Biology and Proteomics
EXMD 615	(3)	Essentials of Glycobiology
EXMD 635D1	(3)	Experimental/Clinical Oncology
EXMD 635D2	(3)	Experimental/Clinical Oncology

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

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

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

**11.2.6 Master of Science (M.Sc.); Biochemistry (Thesis) — 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 Design and Development 1  
 PHAR 503 (3) Drug Design and Development 1

Note: Students may select either CHEM 503 or PHAR 503.

and at least 3 credits from the following:

BIOC 570 (3) Biochemistry of Lipoproteins  
 BIOC 600 (3) Advanced Strategies in Genetics and Genomics  
 BIOC 603 (3) Genomics and Gene Expression  
 BIOC 604 (3) Macromolecular Structure  
 BIOC 605 (3) Structural Biology and Proteomics  
 EXMD 615 (3) Essentials of Glycobiology  
 EXMD 635D1 (3) Experimental/Clinical Oncology  
 EXMD 635D2 (3) Experimental/Clinical Oncology

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

CHEM 504 (3) Drug Design and Development 2  
 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 Design and Development 2  
 PHAR 562 (3) General Pharmacology 1  
 PHAR 563 (3) General Pharmacology 2  
 PHAR 707 (3) Topics in Pharmacology 6

Note: Students may select either CHEM 504 or PHAR 504.

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

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

### 11.2.7 Master of Science (M.Sc.); Biochemistry (Thesis) — 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 570	(3)	Biochemistry of Lipoproteins
BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Structural Biology and Proteomics
EXMD 615	(3)	Essentials of Glycobiology
EXMD 635D1	(3)	Experimental/Clinical Oncology
EXMD 635D2	(3)	Experimental/Clinical Oncology

Plus 6 credits from the following courses:

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

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

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

**11.2.8 Doctor of Philosophy (Ph.D.); Biochemistry****Thesis****Required Courses (3 credits)**

BIOC 696*	(3)	Seminars in Biochemistry
BIOC 701**	(0)	Research Seminar 1
BIOC 702**	(0)	Ph.D. Thesis Proposal
BIOC 703**	(0)	Research Seminar 2

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

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

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

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

At least 3 credits selected from:

BIOC 570	(3)	Biochemistry of Lipoproteins
BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Structural Biology and Proteomics
EXMD 615	(3)	Essentials of Glycobiology
EXMD 635D1	(3)	Experimental/Clinical Oncology
EXMD 635D2	(3)	Experimental/Clinical Oncology

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

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

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

## 11.2.9 Doctor of Philosophy (Ph.D.); Biochemistry — Chemical Biology

### Thesis

#### Required Courses (7 credits)

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

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

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

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

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

At least 3 credits from the following:

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

Students can take either CHEM 503 or PHAR 503.

At least 3 credits from the following:

BIOC 570	(3)	Biochemistry of Lipoproteins
BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Structural Biology and Proteomics
EXMD 615	(3)	Essentials of Glycobiology
EXMD 635D1	(3)	Experimental/Clinical Oncology
EXMD 635D2	(3)	Experimental/Clinical Oncology

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

CHEM 504	(3)	Drug Design and Development 2
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 Design and Development 2
PHAR 562	(3)	General Pharmacology 1
PHAR 563	(3)	General Pharmacology 2
PHAR 707	(3)	Topics in Pharmacology 6

Students can take either CHEM 504 or PHAR 504.

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

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

### 11.2.10 Doctor of Philosophy (Ph.D.); Biochemistry — Bioinformatics

#### Thesis

#### Required Courses (6 credits)

BIOC 696*	(3)	Seminars in Biochemistry
BIOC 701**	(0)	Research Seminar 1
BIOC 702**	(0)	Ph.D. Thesis Proposal
BIOC 703**	(0)	Research Seminar 2
COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar

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

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

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

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

3 credits from the following:

BIOC 570	(3)	Biochemistry of Lipoproteins
BIOC 600	(3)	Advanced Strategies in Genetics and Genomics
BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
BIOC 605	(3)	Structural Biology and Proteomics
EXMD 615	(3)	Essentials of Glycobiology
EXMD 635D1	(3)	Experimental/Clinical Oncology
EXMD 635D2	(3)	Experimental/Clinical Oncology

Plus 6 credits from the following:

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

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

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

---

## **11.3 Bioethics**

### **11.3.1 Location**

For information, write to:

Jennifer Fishman, Graduate Program Director  
Biomedical Ethics Unit  
3647 Peel Street  
Montreal, QC H3A 1X1  
Canada

Telephone: 514-398-6980

Fax: 514-398-8349

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

### **11.3.2 About Bioethics**

The Biomedical Ethics Unit was established in 1996 with the aim of supporting scholarly research, clinical services, teaching, and public outreach. Members of the unit have backgrounds in anthropology, history, law, medicine, molecular genetics, philosophy, and sociology. We offer a master's degree specialization

in biomedical ethics for selected master's students in the Division of Experimental Medicine, Genetics Department, Philosophy Department, Faculty of Religious Studies, and Faculty of Law.

### Master's Specialization in Bioethics

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

Faculty of Medicine, Division of Experimental Medicine;  
Faculty of Law;  
Faculty of Religious Studies; and  
Faculty of Arts, Department of Philosophy.

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

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

## 11.3.3 Bioethics Admission Requirements and Application Procedures

### 11.3.3.1 Admission Requirements

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

Enrolment is limited to 12 students.

### 11.3.3.2 Application Procedures

Applications for the Master's Specialization in Bioethics are made initially through the Faculties of Law, Medicine (Division of Experimental Medicine), Religious Studies, and the Department of Philosophy. McGill's online application form for graduate program candidates is available at [www.mcgill.ca/gradapplicants/apply](http://www.mcgill.ca/gradapplicants/apply).

Applicants must satisfy the admission criteria for their chosen discipline and those of the Bioethics Unit, which administers the program and teaches the core courses. [www.mcgill.ca/biomedicalethicsunit/masters/apply/](http://www.mcgill.ca/biomedicalethicsunit/masters/apply/). Please submit all supporting documents to your base department. Once you have completed your online application, send an email to [heike.farber@mcgill.ca](mailto:heike.farber@mcgill.ca) at the Bioethics Unit stating your chosen base discipline.

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

## 11.3.4 Bioethics Faculty

### Faculty

E. Bereza; B.A., M.D.,C.M.(McG.), C.C.FP.(C)  
A. Campbell; B.A., LL.B., B.C.L.(McG.), LL.M.(Harv.)  
C. Ells; R.R.T.(VGH), B.A.(St. Mary's), M.A., Ph.D.(Tenn.)  
J.R. Fishman; B.A.(Calif., Berk.), Ph.D.(Calif., SF)  
K.C. Glass; A.M.(Chic.), LL.B., B.C.L., D.C.L.(McG.)  
J. Kimmelman; B.S.(Duke), Ph.D.(Yale)  
N.B. King; B.A.(Penn.), M.A., Ph.D.(Harv.)

## 11.4 Biomedical Engineering

### 11.4.1 Location

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

Telephone: 514-398-6736

Fax: 514-398-7461

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

### 11.4.2 About Biomedical Engineering

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

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

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

Basic research in the Department concentrates on the application of quantitative engineering analysis methods to basic biomedical research problems. Currently active areas of research include: neuromuscular and postural control, muscle mechanics, the vestibular system, oculomotor control, the auditory system, joint prosthetics, biomaterials, artificial cells and organs, cell and tissue engineering, drug delivery, probiotics, functional food and nutraceuticals, medical imaging, microfluidics, nanotechnology and 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. A new option in bioinformatics is offered jointly with other University departments.

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

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

M.Eng. Progress Meetings: 1) Initial; 2) Progress; and Fast-Track transfer to the Ph.D. program. Details of each meeting can be found at: [www.bmed.mcgill.ca/policies\\_forms.html](http://www.bmed.mcgill.ca/policies_forms.html).

Ph.D. Progress Meetings: 1) Preliminary; 2) Comprehensive Preparation; 3) Thesis Proposal and Comprehensive Exam; 4) Thesis Progress; and 5) Thesis Pre-Submission. Details of each meeting can be found at: [www.bmed.mcgill.ca/policies\\_forms.html](http://www.bmed.mcgill.ca/policies_forms.html).

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

In the first Biomedical Engineering (BME) department in Canada, BME internationally renowned staff provide frequent and stimulating interactions with physicians, scientists in many fields, and with the biomedical industry. McGill BME provides opportunities to receive training in a unique multidisciplinary environment, taking advantage of research collaborations between staff in the Faculties of Medicine, Science, and Engineering. BME offers only thesis-based graduate degrees (M.Eng.) spanning broad themes in biomodelling, biosignal processing, medical imaging, nanotechnology, artificial cells and organs, probiotics, bioinformatics, bioengineering, biomaterials, and orthopaedics. For details, please refer to the BME website: [www.bmed.mcgill.ca](http://www.bmed.mcgill.ca). The best preparation is with a Bachelor's Degree in Engineering, Science, or Medicine with a strong emphasis on mathematics, physics, chemistry, and basic physiology, or cell biology. BME graduates have secured positions in academia, biomedical and other industries, and government or regulatory sectors. To our knowledge, all of our graduates have secured suitable employment either before or within a few months of graduation.

#### *section 11.4.6: Master of Engineering (M.Eng.); Biomedical Engineering (Thesis) — Bioinformatics (45 credits)*

Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. The intention of the Bioinformatics Option is to train M.Eng. 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. Students successfully completing the Bioinformatics Option will be fluent in the concepts, language, approaches, and limitations of the field. The option consists of a number of interdisciplinary courses and a seminar designed to bring students from many backgrounds together and to provide a thorough overview of research in this field.

#### *section 11.4.7: Doctor of Philosophy (Ph.D.); Biomedical Engineering*

In the first Biomedical Engineering (BME) department in Canada, BME internationally renowned staff provide frequent and stimulating interactions with physicians, scientists in many fields and with the biomedical industry. McGill BME provides opportunities to receive training in a unique multidisciplinary environment, taking advantage of research collaborations between staff in the Faculties of Medicine, Science, and Engineering. BME offers only thesis-based graduate degrees (Ph.D.) spanning broad themes in biomodelling, biosignal processing, medical imaging, nanotechnology, artificial cells and organs, probiotics, bioinformatics, bioengineering, biomaterials, and orthopaedics. For details, please refer to the BME website: [www.bmed.mcgill.ca](http://www.bmed.mcgill.ca). The best preparation is with a bachelor's degree in Engineering, Science, or Medicine and a master's degree in Biomedical Engineering, Bioengineering, Biotechnology, Electrical Engineering, Physiology, Chemical Engineering, Biomaterial, System Engineering, Imaging, or other related areas. BME graduates have secured positions in academia, biomedical, and other industries, and government or regulatory sectors. To our knowledge, all of our graduates have secured suitable employment either before or within a few months of graduation.

#### *section 11.4.8: Doctor of Philosophy (Ph.D.); Biomedical Engineering — Bioinformatics*

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



**section 11.4.8: Doctor of Philosophy (Ph.D.); Biomedical Engineering — Bioinformatics**

fluent in the concepts, language, approaches, and limitations of the field and will have the capability of developing an independent Bioinformatics research program. The option consists of a number of interdisciplinary courses and a seminar designed to bring students from many backgrounds together and to provide a thorough overview of research in this field.

**11.4.3 Biomedical Engineering Admission Requirements and Application Procedures****11.4.3.1 Admission Requirements**

See the *Admission Requirements (minimum requirements to be considered for admission)* section in the *Graduate and Postdoctoral Studies Regulations and Resources* publication available at [www.mcgill.ca/study](http://www.mcgill.ca/study). In addition, please see the Department website: [www.bmed.mcgill.ca](http://www.bmed.mcgill.ca).

**11.4.3.2 Application Procedures**

Please address enquiries directly to the Department.

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

**Dates for Guaranteed Consideration**

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program.



**Note:** We are not willing to consider any applications to be admitted for the Summer term.

**11.4.4 Biomedical Engineering Faculty****Chair**

H.L. Galiana

**Emeritus Professor**

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

**Professors**

J.D. Bobyn; B.Sc., M.Sc.(McG.), Ph.D.(Tor.) (*joint appt. with Surgery*)

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

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

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

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

G.B. Pike; B.Eng., M.Eng., Ph.D.(McG.) (*joint appt. with Neurology and Neurosurgery*)

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

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

**Associate Professors**

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

J.L. Nadeau; B.A., Ph.D.(Minn.)

**Assistant Professors**

C. Grova; B.Sc. M.Sc.(UTC-France), Ph.D.(Rennes)

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

**Associate Members**

C. Baker (*Ophthalmology*), F. Barthelat (*Mechanical Engineering*), K. Cullen (*Physiology*), J. Gotman (*Neurology and Neurosurgery*), D. Guitton (*Neurology and Neurosurgery*), E. Jones (*Chemical Engineering*), A. Katsarkas (*Otolaryngology*), A.M. Lauzon (*Medicine*), R. Leask (*Chemical Engineering*), T.

**Associate Members**

Milner (*Kinesiology & Physical Education*), L. Mongeau (*Mechanical Engineering*), R. Mongrain (*Mechanical Engineering*), I. El Naqa (*Oncology*), S.N. Nazhat (*Mining, Metals and Materials Engineering*), A. Reader (*Neurology and Neurosurgery*), A. Shmuel (*Neurology and Neurosurgery*),

**Adjunct Professor**

P.G. Charette (Sher.)

**11.4.5 Master of Engineering (M.Eng.); Biomedical Engineering (Thesis) (45 credits)****Thesis Courses (24 credits)**

BMDE 695	(12)	Thesis Submission
----------	------	-------------------

12 credits selected from the following courses:

BMDE 690	(3)	Thesis Research 1
BMDE 691	(3)	Thesis Research 2
BMDE 692	(3)	Thesis Research 3
BMDE 693	(6)	Thesis Research 4
BMDE 694	(6)	Thesis Research 5

**Complementary Courses (21 credits)**

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

BIOT 505	(3)	Selected Topics in Biotechnology
BMDE 500D1	(1.5)	Seminars in Biomedical Engineering
BMDE 500D2	(1.5)	Seminars in Biomedical Engineering
BMDE 501	(3)	Selected Topics in Biomedical Engineering
BMDE 502	(3)	BME Modelling and Identification
BMDE 503	(3)	Biomedical Instrumentation
BMDE 504	(3)	Biomaterials and Bioperformance
BMDE 505	(3)	Cell and Tissue Engineering
BMDE 506	(3)	Molecular Biology Techniques
BMDE 508	(3)	Introduction to Micro and Nano-Bioengineering
BMDE 519	(3)	Biomedical Signals and Systems
BMDE 650	(3)	Advanced Medical Imaging
BMDE 651	(3)	Orthopaedic Engineering
BMDE 652	(3)	Bioinformatics: Proteomics
COMP 526	(3)	Probabilistic Reasoning and AI
COMP 558	(3)	Fundamentals of Computer Vision
COMP 646	(4)	Computational Perception
COMP 761	(4)	Advanced Topics Theory 2
ECSE 523	(3)	Speech Communications
ECSE 526	(3)	Artificial Intelligence
ECSE 529	(3)	Computer and Biological Vision
ECSE 626	(4)	Statistical Computer Vision

ECSE 681	(4)	Colloquium in Electrical Engineering
EXMD 610	(3)	Biomedical Methods in Medical Research
MDPH 607	(3)	Introduction to Medical Imaging
MDPH 611	(2)	Medical Electronics
MDPH 612	(2)	Computers in Medical Imaging
MECH 500	(3)	Selected Topics in Mechanical Engineering
MECH 561	(3)	Biomechanics of Musculoskeletal Systems
PHGY 517	(3)	Artificial Internal Organs
PHGY 518	(3)	Artificial Cells

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

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

#### 11.4.6 Master of Engineering (M.Eng.); Biomedical Engineering (Thesis) — Bioinformatics (45 credits)

##### Thesis Courses (24 credits)

BMDE 693	(6)	Thesis Research 4
BMDE 694	(6)	Thesis Research 5
BMDE 695	(12)	Thesis Submission

##### Required Courses (3 credits)

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar

##### Complementary Courses (18 credits)

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

BIOT 505	(3)	Selected Topics in Biotechnology
BMDE 500D1	(1.5)	Seminars in Biomedical Engineering
BMDE 500D2	(1.5)	Seminars in Biomedical Engineering
BMDE 501	(3)	Selected Topics in Biomedical Engineering
BMDE 502	(3)	BME Modelling and Identification
BMDE 503	(3)	Biomedical Instrumentation
BMDE 504	(3)	Biomaterials and Bioperformance
BMDE 505	(3)	Cell and Tissue Engineering
BMDE 506	(3)	Molecular Biology Techniques
BMDE 508	(3)	Introduction to Micro and Nano-Bioengineering
BMDE 519	(3)	Biomedical Signals and Systems
BMDE 650	(3)	Advanced Medical Imaging
BMDE 651	(3)	Orthopaedic Engineering
COMP 526	(3)	Probabilistic Reasoning and AI
COMP 558	(3)	Fundamentals of Computer Vision

COMP 646	(4)	Computational Perception
COMP 761	(4)	Advanced Topics Theory 2
ECSE 523	(3)	Speech Communications
ECSE 526	(3)	Artificial Intelligence
ECSE 529	(3)	Computer and Biological Vision
ECSE 626	(4)	Statistical Computer Vision
ECSE 681	(4)	Colloquium in Electrical Engineering
EXMD 610	(3)	Biomedical Methods in Medical Research
MDPH 607	(3)	Introduction to Medical Imaging
MDPH 611	(2)	Medical Electronics
MDPH 612	(2)	Computers in Medical Imaging
MECH 500	(3)	Selected Topics in Mechanical Engineering
MECH 561	(3)	Biomechanics of Musculoskeletal Systems
PHGY 517	(3)	Artificial Internal Organs
PHGY 518	(3)	Artificial Cells

6 credits selected 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

In addition, students are required to present their work as a conference paper or departmental seminar before being granted the M.Eng. (Bioinformatics Option) degree.

#### 11.4.7 Doctor of Philosophy (Ph.D.); Biomedical Engineering

##### Thesis

##### Required Course

BMDE 700	(0)	Ph.D. Comprehensive
----------	-----	---------------------

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

#### 11.4.8 Doctor of Philosophy (Ph.D.); Biomedical Engineering — Bioinformatics

##### Thesis

##### Required Courses (3 credits)

BMDE 700	(0)	Ph.D. Comprehensive
COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar

Any additional coursework required will be determined on an individual basis by the student's adviser and the Graduate Program Director.

**Complementary Courses (6 credits)**

6 credits from the following:

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

**11.5 Communication Sciences and Disorders****11.5.1 Location**

School of Communication Sciences and Disorders  
Beatty Hall  
1266 Pine Avenue West  
Montreal, QC H3G 1A8  
Canada

Telephone: 514-398-4137  
Fax: 514-398-8123  
Email: [scsd@mcgill.ca](mailto:scsd@mcgill.ca)  
Website: [www.mcgill.ca/scsd](http://www.mcgill.ca/scsd)

**11.5.2 About Communication Sciences and Disorders**

The School provides both professional and research training in communication sciences and disorders at the graduate level through its M.Sc. (Applied), M.Sc., and Ph.D. degrees. We were the first department in Canada to provide both clinical and research degrees. Our M.Sc.A. program aims to educate the next generation of well-prepared and innovative speech-language pathology professionals by providing enriched classroom training, clinical laboratory activities that enhance the transition from theory to practice, and outstanding clinical practicum experiences. Our research degrees are designed to develop leading researchers and scholars, who will go on to train future investigators in the field of communication sciences and disorders and who, through their research, will advance our understanding of the processes of human communication and its breakdown. Interdisciplinary interactions are at the core of our research training approach, which includes preparation to conduct both fundamental and clinically applied investigations. Our professors have collaborative ties with many departments and institutes of McGill (psychology, linguistics, neuroscience, otolaryngology, biomedical engineering, Montreal Neurological Institute) and other Montreal universities and maintain national and international collaborations. Students can access this rich collaborative network via the McGill Centre for Research on Language, Mind and Brain, a world-class interdisciplinary research centre established and directed by the School. The multilingual context in which we reside provides a unique environment for language research.

The School offers a professional degree in Communication Sciences and Disorders at the M.Sc. (Applied) level with specialization in Speech Language Pathology and 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, 235 boulevard René Lévesque est, bureau 601, Montreal, Quebec, H2X 1N8. Telephone: 514-282-9123. Website: [www.ooaq.qc.ca](http://www.ooaq.qc.ca).

Quebec law requires that candidates seeking licensure in provincially recognized professions demonstrate a verbal and written working knowledge of the French language. See the Language Requirements for Professions in the General Information and Regulations section of the *Health Sciences Calendar* available at [www.mcgill.ca/study](http://www.mcgill.ca/study).

**Funding**

The IODE Provincial Chapter of Quebec funds two \$1,000 "Silence to Sound" awards for studies in hearing impairment. These in-course awards are based on academic merit, financial need, and potential for excellence, and are awarded by the School.

**Montreal League for the Hard of Hearing Award** – Candidates must be enrolled at the graduate level in the School and working in the area of hearing impairment. Awarded by the School. Value: up to \$1,000.

**section 11.5.5: Master of Science, Applied (M.Sc.A.); Communication Sciences & Disorders (Non-Thesis) — Speech-Language Pathology (69 credits)**

The professional degree leads to a Master of Science (Applied) with a specialization in Speech Language Pathology. The program involves two academic years of full-time study and related practical work followed by a Summer internship. To prepare students as creative professionals, the program emphasizes the understanding of principles and theories, and their present or potential clinical applications, in addition to the teaching of specific techniques for assessment and intervention. Active participation in the learning process is encouraged.

The profession of speech-language pathology concerns assessment and intervention in speech and language disorders. In particular, the speech-language pathologist is concerned with two major parameters of communication sciences and disorders: language and speech. At present, most speech-language pathologists in Canada work in hospitals, public school systems, rehabilitation centres, and in special education facilities.

Students pursuing the M.Sc.A. complete the basic academic content and clinical practica required in preparation for clinical practice as outlined by CASLPA (Canadian Association of Speech Language Pathologist and Audiologists). Our M.Sc.A. program is completed in two years whereas some other programs require three years to complete. The emphasis on bridging theory and clinical practice is very strong in our program. Our admission requirements emphasize basic sciences and do not require completion of a specific undergraduate degree. This flexible entry accommodates students with undergraduate degrees in different fields and promotes diversity within our student body. Our goal is to recruit and train skillful therapists and problem-solvers who can rely on strong foundation in theory to address challenging clinical issues. Our M.Sc.A. graduates typically pursue a professional career working in schools, hospitals, rehabilitation centres, or in private practices. A subset of our graduates will enter a doctoral program (immediately or after a period of clinical employment) to pursue a research career.

**Research Degrees – M.Sc. and Ph.D.****section 11.5.6: Master of Science (M.Sc.); Communication Sciences and Disorders (Thesis) (45 credits)**

Selected candidates may be accepted for the M.Sc. research degree. Each student's thesis supervisor and Thesis Committee design an individualized program of study in collaboration with the student. The program can include graduate courses offered by the School and by other departments at McGill.

This program is designed for students who wish to combine research training with their clinical (M.Sc.A.) program or students from related fields who wish to gain research experience in communication sciences to prepare for doctoral studies. Students are required to take two semesters (6 credits) of statistics and complete a thesis. Admission to the M.Sc. research program requires identification of an SCS D professor(s) with relevant expertise to mentor the student through the thesis process. Graduates of our M.Sc. research program follow diverse career paths working in clinical settings (if they also have a clinical degree) or settings that combine clinical and research activities or continuing their research training at the doctoral level.

**section 11.5.7: Doctor of Philosophy (Ph.D.); Communication Sciences and Disorders**

Selected candidates may be accepted for the Ph.D. research degree. Each student's thesis supervisor and Thesis Committee design an individualized program of study in collaboration with the student. The program can include graduate courses offered by the School and by other departments at McGill.

Students pursuing a Ph.D. in SCS D have varied educational backgrounds, including both clinical and related non-clinical fields. Students who enter the program from a related field (e.g., Psychology, Linguistics) or without a master's thesis complete a qualify year, which includes coursework and a research project. This flexible entry attracts independent scholars with diverse backgrounds and interests, which creates a stimulating and enriched training environment. The main component of the Ph.D. program (beyond the qualifying year) has minimal required coursework and is structured to support students as they develop and pursue an innovative, individualized program of doctoral studies. Admission to the doctoral program requires identification of a SCS D professor(s) with relevant expertise to mentor the student in this process. Ph.D. students have the opportunity to pursue an interdisciplinary specialization in language acquisition through the McGill Language Acquisition Program, which intersects with McGill departments of Linguistics, Psychology, and Education. Our Ph.D. graduates typically pursue academic careers in universities or research institutes, but some work in settings that combine research and professional activities.

**section 11.5.8: Doctor of Philosophy (Ph.D.); Communication Sciences and Disorders — Language Acquisition**

Information about this option is available from the School and at <http://ego.psych.mcgill.ca/lap.html>. This unique interdisciplinary Ph.D. program is available for doctoral students across four departments at McGill including SCS D, Linguistics, Psychology, and Integrated Studies in Education. The program is designed to provide enriched training focused on the scientific exploration of language acquisition by different kinds of learners in diverse contexts. Students in the Language Acquisition Program are introduced to theoretical and methodological issues on language acquisition from the perspectives of cognitive neuroscience, theoretical linguistics, psycholinguistics, education, communication sciences and disorders, and neuropsychology. In addition to the SCS D Ph.D. requirements, students in this program must complete 6 credits of coursework in language acquisition (including at least one course that is not in their home department), and four interdisciplinary seminars (2 credits each) and must include a faculty member in the Language Acquisition Program on their thesis committee.

**11.5.3 Communication Sciences and Disorders Admission Requirements and Applications Procedures****11.5.3.1 Admission Requirements****M.Sc. (Applied)**

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

**M.Sc. in Communication Sciences and Disorders**

The M.Sc. provides research training for:

1. students who are also taking courses for professional qualification;
2. students who have a non-thesis professional degree in Communication Sciences and Disorders; and
3. students with degrees in related fields who wish to do research but not obtain professional qualification in Communication Sciences and Disorders.

**Ph.D. in Communication Sciences and Disorders**

Applicants should normally have a master's degree with thesis or its equivalent in Communication Sciences and Disorders or a related field (e.g., psychology, linguistics).

Students who possess an appropriate bachelor's degree or master's degree without thesis will also be considered for the Ph.D. program, but, if admitted, must first complete a qualifying year of coursework and a research project.

**11.5.3.2 Application Procedures**

Please see the School of Communication Sciences and Disorders website at [www.mcgill.ca/scsd/programs/application](http://www.mcgill.ca/scsd/programs/application) for required application materials.

**Dates for Guaranteed Consideration**

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program.

The School of Communication Sciences and Disorders will only consider applications upon receipt of the following documentation by the dates for guaranteed consideration:

- online application;
- Prerequisite Form;
- two letters of recommendation;
- two official copies of transcripts from all universities attended.

Applicants to graduate studies whose mother tongue is not English and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit documented proof of competency in oral and written English **prior to admission**: the Test of English as a Foreign Language (TOEFL) with a minimum score of 587 (paper-based) or 95 on the Internet-based test with minimum component scores of 24 in both Speaking and Writing and 21 in both Reading and Listening, or the International English Language Testing System (IELTS) with a minimum overall band score of 7.0.

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

All applications received by the dates for guaranteed consideration are automatically considered for any internal funding or awards made available to the Department for recruitment purposes. Students who apply for Fall admission generally have the most options with respect to applying for external funding as well as for being considered for internal support.

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

**11.5.4 Communication Sciences and Disorders Faculty****Interim Director**

Marc Pell

**Research Director**

Linda Polka

**Emeritus Professor**

Donald Doehring; B.A.(Buff.), M.A.(N.M.), Ph.D.(Ind.)

**Professors**

Shari Baum; B.A.(C'neil), M.S.(Vermont), M.A., Ph.D.(Brown)

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

**Associate Professors**

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

**Associate Professors**

Marc Pell; B.A.(Ott.), M.Sc., Ph.D.(McG.)  
 Linda Polka; B.A.(Slippery Rock), M.A.(Minn.), Ph.D.(S. Flor.)  
 Susan Rvachew; B.Sc.(Alta.), M.Sc., Ph.D.(Calg.)  
 Karsten Steinhauer; M.Sc., Ph.D.(Dr.rer.nat)(Free Univ., Berlin)  
 Elin Thordardottir; B.A., M.Sc., Ph.D.(Wisc.-Madison)

**Assistant Professors**

Meghan Clayards; B.Sc.(Vic., BC), M.A., Ph.D.(Roch.)  
 Laura Gonnerman; B.A.(Boston), M.A.(Middlebury), Ph.D.(USC)  
 Aparna Nadig; B.A.(Reed), M.S., Ph.D.(Brown)

**Assistant Professors (Part-Time)**

Christina Lattermann; Staatlich anerkannte Logopaedin(Westfaelische Wilhelms-Universität, Muenster), M.Sc.(McG.), Ph.D.(Kassel)  
 Gabriel Leonard; B.A.(Dublin), D.A.P., M.Sc., Ph.D.(McG.)  
 Rosalee Shenker; B.Sc.(Syrac.), M.A.(Calif. St.), Ph.D.(McG.)

**Faculty Lecturer**

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

**Faculty Lecturers (Part-Time)**

Francois-Xavier Brajot; B.A.(Georgia), M.Sc.(Pitt.)  
 Myrto Brandeker; M.Sc.(Karolinska Inst.)  
 Françoise Brosseau-Lapre; B.A., M.Sc.A.(McG.)  
 Liliane Brunetti; B.Sc.(C'dia), M.Cl.Sc.(W. Ont.)  
 Patricia Coffin; B.A.(PEI), M.Sc.(Dal.)  
 Karen Evans; Licentiate(L.C.S.T.), M.A.(Car.), M.Sc.(McG.)  
 Esther Lando; B.A.(Manit.), M.Sc.A.(McG.)  
 James Lapointe; B.A., M.Sc.A.(McG.)  
 Darla Orchard; B.A., M.Sc.(McG.)  
 Judith Robillard-Shultz; B.A., M.Sc.A.(McG.)  
 Nechama Srebro-Dworkind; B.A.(C'dia), M.Sc.A.(McG.)  
 Colleen Timm; B.A.(C'dia), M.Sc.A.(McG.)

**Associate Members**

Eva Kehayia (*Physical and Occupational Therapy*)  
 Yuriko Oshima-Takane (*Psychology*)

**Adjunct Members**

Howard Chertkow (*Jewish Gen.*), David McFarland (*Montr.*), Lucie Menard (*UQAM*)

**11.5.5 Master of Science, Applied (M.Sc.A.); Communication Sciences & Disorders (Non-Thesis) — Speech-Language Pathology (69 credits)**

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

**Required Courses (63 credits)**



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	(2)	Introductory Clinical Practicum
SCSD 669	(3)	ASD and Neurodevelopmental Disorders
SCSD 679	(2)	Advanced Clinical Practicum
SCSD 680	(3)	Deglutition and Dysphagia
SCSD 681	(1)	Practicum and Seminar 1
SCSD 682	(1)	Practicum and Seminar 2
SCSD 683	(1)	Practicum and Seminar 3
SCSD 684	(1)	Practicum and Seminar 4
SCSD 689	(1)	Management Cranio-Facial Disorders

### Complementary Courses (6 credits)

Two of the following:

SCSD 634	(3)	Research and Measurement Methods 2
SCSD 664	(3)	Communication Sciences and Disorders 1
SCSD 666	(3)	Communication Sciences and Disorders 3
SCSD 667	(3)	Communication Sciences and Disorders 4
SCSD 670	(3)	Communication Sciences and Disorders 2
SCSD 678	(3)	Special Topics 4

### 11.5.6 Master of Science (M.Sc.); Communication Sciences and Disorders (Thesis) (45 credits)

#### Thesis Courses (24 credits)

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

#### Complementary Courses (21 credits)

6-21 credits chosen from:

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

0-15 credits chosen from:

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

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

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

#### Thesis

#### Required Courses (12 credits)

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

#### Complementary Courses (6 credits)

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

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

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

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

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

#### Thesis

#### Required Courses (14 credits)

EDSL 711	(2)	Language Acquisition Issues 3
LING 710	(2)	Language Acquisition Issues 2
PSYC 709	(2)	Language Acquisition Issues 1
SCSD 652	(3)	Advanced Research Seminar 1
SCSD 653	(3)	Advanced Research Seminar 2

SCSD 701	(0)	Doctoral Comprehensive
SCSD 712	(2)	Language Acquisition Issues 4

**Complementary Courses (9 credits)**

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

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

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

At least two courses, selected from the following list.

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

EDSL 620	(3)	Critical Issues in Second Language Education
EDSL 623	(3)	Second Language Learning
EDSL 624	(3)	Educational Sociolinguistics
EDSL 627	(3)	Classroom-Centred Second Language Research
EDSL 629	(3)	Second Language Assessment
EDSL 632	(3)	Second Language Literacy Development
EDSL 664	(3)	Second Language Research Methods
LING 555	(3)	Language Acquisition 2
LING 590	(3)	Language Acquisition and Breakdown
LING 651	(3)	Topics in Acquisition of Phonology
LING 655	(3)	Theory of L2 Acquisition
LING 755	(3)	Advanced Seminar: Language Acquisition
PSYC 561	(3)	Methods: Developmental Psycholinguistics
PSYC 734	(3)	Developmental Psychology and Language
PSYC 735	(3)	Developmental Psychology and Language
PSYC 736	(3)	Developmental Psychology and Language
PSYC 737	(3)	Developmental Psychology and Language
SCSD 619	(3)	Phonological Development
SCSD 632	(3)	Phonological Disorders: Children
SCSD 633	(3)	Language Development
SCSD 637	(3)	Developmental Language Disorders 1
SCSD 643	(3)	Developmental Language Disorders 2

**11.6 Epidemiology and Biostatistics****11.6.1 Location**

Department of Epidemiology, Biostatistics and Occupational Health

1020 Pine Avenue West  
 Montreal, QC H3A 1A2  
 Canada

Telephone: 514-398-6258

Email: [graduate.eboh@mcgill.ca](mailto:graduate.eboh@mcgill.ca)

Website: [www.mcgill.ca/epi-biostat-occh](http://www.mcgill.ca/epi-biostat-occh)

### 11.6.2 About Epidemiology and Biostatistics

The Department offers master's and doctoral programs in epidemiology and biostatistics. Beginning in September 2011, the programs include an M.Sc. in Public Health. The methods learned in these fields are used not only in the study of diseases, but also in health services research, program planning and evaluation, and policy development. Our faculty members are at the forefront of their research domains and include clinician scientists, medical informatics specialists, health economists, medical sociologists, and health geographers. Research in the Department spans all clinical specialties, pharmacoepidemiology, social epidemiology, infectious diseases, population and public health, environmental and occupational health, clinical and public health informatics, biostatistics, health care delivery and organization, and many faculty members 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, and industry.

### 11.6.3 Epidemiology and Biostatistics Faculty

#### Chair

R. Fuhrer

#### Emeritus Professors

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

A. Lippman; B.A.(C'nell), Ph.D.(McG.)

J.C. McDonald; M.B.B.S., M.D.(Lond.), M.Sc.(Harv.), M.R.C.P.(Lond.), F.R.C.P.(C)

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

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

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

#### Professors Post Retirement

A. Lippman; B.A.(C'nell), Ph.D.(McG.)

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

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

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

#### Professors

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

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

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

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

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

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

J.A. Hanley; B.Sc., M.Sc.(N.U.I.), Ph.D.(Wat.) (*on leave Jan. 2012 to June 2012 and Jan. 2013 to June 2013*)

J. Heymann; B.A.(Yale), M.P.H., M.D., Ph.D.(Harv.) (*joint appt. with Political Science*) (*Canada Research Chair*)

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

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

M.S. Kramer; B.A.(Chic.), M.D.(Yale) (*joint appt. with Pediatrics*) (*James McGill Professor*) (*on leave Jan. 2012 to Dec. 2012*)

**Professors**

J. McCusker; M.D.,C.M.(McG.), M.P.H., Ph.D.(Col.)  
 R. Menzies; M.D.,C.M., M.Sc.(McG.) (*joint appt. with Medicine*)  
 O.S. Miettinen; M.D.(Helsinki), M.P.H., M.S., Ph.D.(Minn.)  
 G. Paradis; M.D.(Montr.), M.Sc.(McG.)  
 R.W. Platt; M.Sc.(Manit.), Ph.D.(Wash.) (*joint appt. with Pediatrics*)  
 S.H. Shapiro; B.S.(Bucknell), M.S., Ph.D.(Stan.)  
 S. Suissa; M.Sc.(McG.), Ph.D.(Flor.) (*joint appt. with Medicine*) (*James McGill Professor*)  
 R. Tamblyn; M.Sc.(McM.), Ph.D.(McG.) (*joint appt. with Medicine*) (*James McGill Professor*)  
 C. Wolfson; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Medicine*)

**Associate Professors**

O. Basso; Ph.D.(Milan) (*joint appt. with Obstetrics & Gynecology*)  
 D. Buckeridge; M.D.(Qu.), M.Sc.(Tor.), Ph.D.(Stan.) (*Canada Research Chair*)  
 A. Ciampi; M.Sc., Ph.D.(Qu.), Ph.D.(Rome)  
 N. Dendukuri; M.Sc.(IIT), Ph.D.(McG.) (PT) (*joint appt. with Medicine*)  
 C. Greenwood; B.Sc.(McG.), M.Sc.(Wat.), Ph.D.(Tor.) (*joint appt. with Oncology*)  
 P. Héroux; B.Sc.(Laval), M.Sc., Ph.D.(I.N.R.S.)  
 J. Kaufman; B.A.(Johns Hop.), Ph.D.(Mich.)  
 J. Pickering; B.A.(Tor.), M.D., M.Sc.(McG.) (*joint appt. with Medicine*)  
 A. Manges; B.A.(Col.), M.P.H., Ph.D.(Calif., Berk.)  
 M. Pai; M.B.B.S.(Stanley Med. Coll.), M.D.(Christian Medical Coll.), Ph.D.(Calif., Berk.)  
 A. Quesnel-Vallée; B.A., M.Sc.(Montr.), M.A., Ph.D.(Duke) (*joint appt. with Sociology*)  
 M. Rossignol; B.Sc., M.D.(Sher.), M.Sc.(McG.)  
 P. Tousignant; B.A., M.D.(Laval), M.Sc.(McG.), F.R.C.P.(C) (PT)

**Assistant Professors**

A. Adrien; M.D., M.Sc.(McG.)  
 J. Atherton; M.Sc.(MIT), Ph.D.(McG.)  
 A. Benedetti; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Medicine*)  
 J. Cox; B.Sc., B.A., M.D.(Dal.), M.Sc.(McG.), C.C.F.P., F.R.C.P.(C) (*joint appt. with Family Medicine*)  
 S. Harper; B.A.(Westminster Coll.), M.S.P.H.(S. Carolina), Ph.D.(Mich.)  
 A. Labbe; M.Sc.(Montr.), Ph.D.(Wat.) (*joint appt. with Psychiatry*)  
 S. Martin; M.D.(Tor.), M.Sc.(McG.) (PT)  
 E.E.M. Moodie; B.A.(Winn.), M.Phil.(Camb.), Ph.D.(Wash.)  
 A. Nandi; B.S.(College of New Jersey), M.P.H.(Col.), Ph.D.(Johns Hop.) (*joint appt. with Institute for Health & Social Policy*)  
 L. Patry; B.Sc., M.D.(Laval), F.R.C.P.(C) (PT)  
 E. Strumpf; B.A.(Smith), Ph.D.(Harv.) (*joint appt. with Economics*)  
 G. Tan; D.Phil.(Oxf.) (PT)

**Associate Members**

*Biomedical Ethics Unit:* N. King  
*Dentistry:* P. Allison, J. Feine  
*Dietetics and Human Nutrition:* K. Gray-Donald

**Associate Members**

*Family Medicine:* A. Andermann, J. Haggerty, T. Tannenbaum

*Geography:* N. Ross

*Medicine:* A. Barkun, M. Behr, S. Bernatsky, J. Bourbeau, P. Brassard, T. Brewer, A. Clarke, K. Dasgupta, M. Eisenberg, P. Ernst, M. Goldberg, C. Greenaway, S. Kahn, M. Klein, N. Mayo, N. Pant Pai, L. Pilote, E. Rahme, B. Richards, K. Schwartzman, M. Sewitch, I. Shrier, V. Tagalakis

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

*Pathology:* B. Case

*Pediatrics:* G. Dougherty, B. Foster, C. Quach-Thanh

*Physical & Occupational Therapy:* S. Ahmed

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

**Lecturers**

J.P. Gauvin, W. Wood

**Adjunct Professors**

*Asociación Civil Selva Amazónica Peru:* M. Casapia

*Caro Research:* J. Caro

*Direction régionale de la santé publique:* R. Allard, M. Baillargeon, R. Lessard, E. Robinson

*Harvard Univ.:* J. Brownstein

*Hôpital Sacré-Coeur:* D. Gautrin

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

*INSPQ:* F. Richer, P. Robillard, S. Stock

*Montreal Chest Hospital Centre:* P. Rohan

*Mount Sinai:* M. Baltzan

*Stabilis:* P. Simon

*Univ. de Montréal:* R. Massé, J. Siemiatycki

*Univ. of S. Australia:* J. Lynch

**11.6.4 Epidemiology**

The Department offers master's and doctoral programs in epidemiology and biostatistics. Beginning in September 2011, the programs include an M.Sc. in Public Health. The methods learned in these fields are used not only in the study of diseases, but also in health services research, program planning and evaluation, and policy development. Our faculty members are at the forefront of their research domains and include clinician scientists, medical informatics specialists, health economists, medical sociologists, and health geographers. Research in the Department spans all clinical specialties, pharmacoepidemiology, social epidemiology, infectious diseases, population and public health, environmental and occupational health, clinical and public health informatics, biostatistics, health care delivery and organization, and many faculty members 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, and industry.

***section 11.6.4.2: Master of Science (M.Sc.); Epidemiology (Thesis) (48 credits)***

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

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

**section 11.6.4.3: Master of Science (M.Sc.); of Public Health (Non-Thesis) (52 credits)**

The mission of the M.Sc.P.H. is to train outstanding public health professionals and future leaders by offering a rigorous academic program in methods, research, and practice. This program may be of interest for students from the natural and quantitative sciences (e.g., microbiology, computer science, statistics, economics, geography), social sciences (e.g., sociology, psychology, anthropology), or the health professions (e.g., medicine, nursing, social work, nutrition). Students will study the foundations and principles of epidemiology and biostatistics, as applied to public health research and practice, in order to design, conduct, and analyze clinical, population-based, environmental, policy, and methodological public health-related research. Graduates of the program will serve as public health practitioners, research professionals, and educators, and will possess the competencies and professionalism to carry out broad public health functions in local, provincial, national, and international settings. In exceptional circumstances, the admissions committee may take professional experience into account for mid-career or returning/re-entry applicants. The Master's of Public Health program will include a three-month practicum after the first year, which will provide the student with the opportunity to use knowledge and skills acquired in the academic program in a public health practice or research setting.

**section 11.6.4.4: Master of Science (M.Sc.); of Public Health (Non-Thesis) — Environment (52 credits)**

A number of departments and faculties throughout McGill University have joined with the McGill School of Environment (MSE) to provide an Environment Option as part of a variety of existing graduate degrees. The option provides students with an appreciation of the role of science in informed decision-making in the environment sector, and the influence that political, socio-economic, and ethical judgments have. The option also provides a forum whereby graduate students bring their disciplinary perspectives together and enrich each other's learning through structured courses, formal seminars, and informal discussions and networking. Students who have been admitted through their home department or faculty may apply for admission to the option. Option requirements are consistent across academic units. The option is coordinated by the MSE, in partnership with participating academic units.

**section 11.6.4.5: Doctor of Philosophy (Ph.D.); Epidemiology**

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

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

**section 11.6.4.6: Graduate Diploma in Epidemiology (30 credits)**

Applications to the Diploma program will not be accepted for the 2011-2012 academic year.

**11.6.4.1 Epidemiology Admission Requirements and Application Procedures****11.6.4.1.1 Admission Requirements****Graduate Diploma**

*(Applications to the Diploma program will not be accepted for the 2011-2012 academic year.)*

**Master's**

Applicants to the M.Sc. programs must hold a bachelor's degree in a related area, possess a reasonable level of mathematical competency, and have a good knowledge of differential and integral calculus at the level of a CEGEP or first-year undergraduate course.

**Ph.D.**

Applicants to the Ph.D. program who hold a master's in Epidemiology are eligible for admission to the core year. Applicants with other graduate-level degrees or exceptional students without a master's degree are also eligible and will be considered for admission to a preparatory year.

Complete details on the Epidemiology programs are available on our Departmental website at: [www.mcgill.ca/epi-biostat-occh/grad/epidemiology/requirements](http://www.mcgill.ca/epi-biostat-occh/grad/epidemiology/requirements).

**Language Requirement**

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

**11.6.4.1.1 Application Procedures****Dates for Guaranteed Consideration**

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program.

Completed applications, with all supporting documents, must reach the Department by the dates for guaranteed consideration.

Please download required documents from our website: [www.mcgill.ca/epi-biostat-occh](http://www.mcgill.ca/epi-biostat-occh), then select the Graduate Studies tab to link to the appropriate degree program.

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

#### 11.6.4.2 Master of Science (M.Sc.); Epidemiology (Thesis) (48 credits)

Students will study the foundations and principles of epidemiology and applied biostatistics, in order to design, conduct, and analyze clinical, population-based, environmental, policy, and methodological health-related research. Graduates will be prepared to engage in scientific collaboration, and communicate results to other scientists and diverse audiences.

##### Thesis Course (24 credits)

EPIB 690	(24)	M.Sc. Thesis
----------	------	--------------

##### Required Courses (22 credits)

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

EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 602	(3)	Foundations of Population Health
EPIB 603	(4)	Intermediate Epidemiology
EPIB 605	(1)	Critical Appraisal in Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 613	(1)	Introduction to Statistical Software
EPIB 614	(1)	Basics of Measurement in Epidemiology
EPIB 621	(4)	Data Analysis in Health Sciences

##### Complementary Course (2 credits)

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

#### 11.6.4.3 Master of Science (M.Sc.); of Public Health (Non-Thesis) (52 credits)

Students will study the foundations and principles of epidemiology and biostatistics, as applied to public health research and practice, in order to design, conduct, and analyze clinical, population-based, environmental, policy, and methodological public health-related research. The program will include a three-month practicum after the first year.

##### Research Project (10 credits)

EPIB 630	(10)	Public Health Project
----------	------	-----------------------

##### Required Courses (25 credits)

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

EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 602	(3)	Foundations of Population Health
EPIB 603	(4)	Intermediate Epidemiology
EPIB 605	(1)	Critical Appraisal in Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 612	(3)	Principles of Public Health Practice
EPIB 613	(1)	Introduction to Statistical Software
EPIB 614	(1)	Basics of Measurement in Epidemiology
EPIB 621	(4)	Data Analysis in Health Sciences

##### Complementary Courses (17 credits)

9 credits of coursework at the 500 level or higher with a minimum of:



3 credits in environmental health sciences;

3 credits in health services research policy and management;

3 credits in population and public health interventions (social and behavioral science).

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

#### 11.6.4.4 Master of Science (M.Sc.); of Public Health (Non-Thesis) — Environment (52 credits)

Students will study the foundations and principles of epidemiology and biostatistics, as applied to public health research and practice, in order to design, conduct, and analyze clinical, population-based, environmental, policy, and methodological public health-related research.

The program will include a three-month practicum after the first year.

#### Research Project (10 credits)

EPIB 630	(10)	Public Health Project
----------	------	-----------------------

#### Required Courses (31 credits)

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

ENVR 610	(3)	Foundations of Environmental Policy
ENVR 650	(1)	Environmental Seminar 1
ENVR 651	(1)	Environmental Seminar 2
ENVR 652	(1)	Environmental Seminar 3
EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 602	(3)	Foundations of Population Health
EPIB 603	(4)	Intermediate Epidemiology
EPIB 605	(1)	Critical Appraisal in Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 612	(3)	Principles of Public Health Practice
EPIB 613	(1)	Introduction to Statistical Software
EPIB 614	(1)	Basics of Measurement in Epidemiology
EPIB 621	(4)	Data Analysis in Health Sciences

#### Complementary Courses (11 credits)

6 credits of coursework at the 500 level or higher, with a minimum of:

3 credits in health services research policy and management;

3 credits of population and public health interventions (social and behavioural science).

Courses must be chosen and approved in consultation with the student's academic adviser.

3 credits chosen from:

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling
ENVR 580	(3)	Topics in Environment 3
ENVR 611	(3)	The Economy of Nature
ENVR 620	(3)	Environment and Health of Species
ENVR 622	(3)	Sustainable Landscapes
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

or other courses at the 500 level or higher recommended by the advisory committee and approved by the Environmental Option Committee.

AND

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

#### **11.6.4.5 Doctor of Philosophy (Ph.D.); Epidemiology**

##### **Preparatory Year**

Students who are admitted to the Ph.D. degree program without the equivalent of an M.Sc. in epidemiology at McGill will, in their first year, be required to take, as a minimum, the following courses: EPIB 601, EPIB 602, EPIB 603, EPIB 605, EPIB 607, EPIB 613, EPIB 614, EPIB 621 (equivalent to required coursework of the master's program).

This year is called the Preparatory Year. Students then continue, in their second year, into the Core Year.

##### **Core Year**

Students who are admitted to the Ph.D. degree program with the equivalent of the M.Sc. in epidemiology at McGill will, in their first year, be required to take, as a minimum, 15 credits of required Ph.D. courses. This year is called the Core Year.

##### **Thesis**

##### **Required Courses (12 credits)**

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

##### **Complementary Courses (34 credits)**

12-34 credits

0-22 credits\* from the following:

EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 602	(3)	Foundations of Population Health
EPIB 603	(4)	Intermediate Epidemiology
EPIB 605	(1)	Critical Appraisal in Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 613	(1)	Introduction to Statistical Software
EPIB 614	(1)	Basics of Measurement in Epidemiology
EPIB 621	(4)	Data Analysis in Health Sciences

\* Note: If a student has not already successfully completed them or their equivalent.

12 credits of coursework, at the 500 level or higher, of which a minimum of 3 credits in ethics (medical/public health/research), 3 credits in biostatistics, 3 credits in substantive topic, and 3 credits in epidemiology. Courses must be chosen and approved in consultation with the program's academic adviser.

#### **11.6.4.6 Graduate Diploma in Epidemiology (30 credits)**

(Applications to the Diploma program will not be accepted for the 2011-2012 academic year.)

##### **Required Courses (17 credits)**

EPIB 601	(4)	Fundamentals of Epidemiology 1
EPIB 607	(4)	Inferential Statistics
EPIB 650	(9)	Diploma Dissertation

Note: Students exempted from either EPIB 601 and/or EPIB 607 must replace them with additional complementary course credits.

### Complementary Courses

13 credits of coursework, at the 500, 600, or 700 level, chosen in consultation with the student's academic adviser.

## 11.6.5 Biostatistics

Biostatistics involves the development and application of statistical methods to scientific research in areas such as medicine, epidemiology, 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. They also develop new statistical methods for such data. Students will take courses, and may do research, on topics such as mathematical statistics, statistical methods for epidemiology, generalized linear models, survival analysis, longitudinal data, and clinical trials. The Department of Epidemiology, Biostatistics, and Occupational Health has one of the largest concentrations of Ph.D.-level statisticians in any Canadian Faculty of Medicine.

### *section 11.6.5.2: Master of Science (M.Sc.); Biostatistics (Thesis) (48 credits)*

M.Sc. thesis students study a foundational set of courses, and write a thesis on a topic of their choice. Thesis students should have a strong interest in research. These students are well-placed to either continue in a Ph.D. program or to work in academic research in statistics or medicine; they will also have relevant qualifications for the pharmaceutical industry and government.

### *section 11.6.5.3: Master of Science (M.Sc.); Biostatistics (Non-Thesis) (48 credits)*

The M.Sc. non-thesis program is designed to expose students to a wide range of topics including statistical methods for epidemiology, generalized linear models, survival analysis, longitudinal data, and clinical trials. Skills in data analysis, statistical consulting, communication, and report writing are emphasized, and students graduate ready to work in the pharmaceutical and biotechnology industries, in government, or in academic medical research.

### *section 11.6.5.4: Doctor of Philosophy (Ph.D.); Biostatistics*

Applicants should hold a master's degree in mathematics or statistics or its equivalent. Mastery of calculus, linear algebra, real analysis, and mathematical statistics are essential. Exposure to data analysis is an asset. Exceptional students without a master's degree will be considered for admission, starting with a qualifying year. Ph.D. students typically work on development of statistical methods, and can specialize in statistical methods for epidemiology, generalized linear models, Bayesian methods, survival analysis, longitudinal data, causal inference, and clinical trials. Skills in data analysis, statistical consulting, and report writing are emphasized. Ph.D. graduates typically work as faculty in universities, in research institutes, in government, or in the pharmaceutical industry.

## 11.6.5.1 Biostatistics Admission Requirements and Application Procedures

### 11.6.5.1.1 Biostatistics

#### 11.6.5.1.1.1 Admission Requirements

An undergraduate degree in mathematics or statistics or its equivalent (an honours degree is preferred, but not required). At least three semesters of calculus, two semesters of linear algebra, at least one, but preferably two semesters of real analysis, and a full year course/sequence in mathematical statistics preferably at an honours level, e.g., MATH 356/357. Exposure to data analysis is an asset.

M.Sc.: Students admitted into the M.Sc. program will, in general, meet the requirements above.

Ph.D.: Exceptional students without a master's degree but with the above qualifications will be considered for Ph.D. admission starting with a qualifying year.

Complete details on the Biostatistics programs are available on our Departmental website at: [www.mcgill.ca/epi-biostat-occh/grad/biostatistics/requirements](http://www.mcgill.ca/epi-biostat-occh/grad/biostatistics/requirements).

#### Language Requirement

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

#### 11.6.5.1.1.2 Application Procedures

#### Dates for Guaranteed Consideration

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program.

Completed applications, with all supporting documents, must reach the Department by the dates for guaranteed consideration. Please see our website at [www.mcgill.ca/epi-biostat-occh/grad/biostatistics/applying](http://www.mcgill.ca/epi-biostat-occh/grad/biostatistics/applying) for information on required documents as well as the application deadline.

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

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

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

**Thesis Courses (24 credits)**

BIOS 690	(24)	M.Sc. Thesis
----------	------	--------------

**Required Courses (24 credits)**

Students exempted from any of the courses listed below must replace them with complementary course credits, at the 500 level or higher, chosen in consultation with the student's academic adviser or supervisor.

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

**11.6.5.3 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
----------	-----	---

**Required Courses (24 credits)**

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

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

**Complementary Courses (18 credits)**

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

**11.6.5.4 Doctor of Philosophy (Ph.D.); Biostatistics**

Students will study theoretical and applied statistics and related fields; the program will train them to become independent scientists able to develop and apply statistical methods in medicine and biology and make original contributions to the theoretical and scientific foundations of statistics in these disciplines. Graduates will be prepared to develop new statistical methods as needed and apply new and existing methods in a range of collaborative projects. Graduates will be able to communicate methods and results to collaborators and other audiences, and teach biostatistics to biostatistics students, students in related fields, and professionals in academic and other settings.

**Thesis****Required Courses**

BIOS 700	(0)	Ph.D. Comprehensive Examination Part A
BIOS 701	(0)	Ph.D. Comprehensive Examination Part B

BIOS 702 (0) Ph.D. Proposal

### Complementary Courses (28 credits)

0-28 credits from the following list: (if a student has not already successfully completed them or their equivalent)

BIOS 601	(4)	Epidemiology: Introduction and statistical models
BIOS 602	(4)	Epidemiology: Regression Models
BIOS 624	(4)	Data Analysis & Report Writing
MATH 523	(4)	Generalized Linear Models
MATH 533	(4)	Honours Regression and Analysis of Variance
MATH 556	(4)	Mathematical Statistics 1
MATH 557	(4)	Mathematical Statistics 2

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

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

---

## 11.7 Experimental Medicine

Please see "[section 11.10: Medicine, Experimental](#)" for more information.

---

## 11.8 Human Genetics

### 11.8.1 Location

Department of Human Genetics  
Stewart Biological Sciences Building  
1205 Dr. Penfield Avenue, N5/13  
Montreal, QC H3A 1B1  
Canada

Telephone: 514-398-4198

Fax: 514-398-2430

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

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

### 11.8.2 About Human Genetics

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

The Department of Human Genetics offers a clinical Master's program in Genetic Counselling, as well as research training at both the M.Sc. and Ph.D. levels. Both the M.Sc. and Ph.D. research programs require the completion of a thesis, which is the major focus of the student's effort. A minimal amount of coursework is required, but specific course choices are flexible and vary according to the student's previous training and current research interest. The Department also offers a Bioinformatics Option. Information on the Bioinformatics Option can be found at: [www.mcgill.ca/mcb/academic/graduate](http://www.mcgill.ca/mcb/academic/graduate).

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

Faculty have a wide variety of research interests, which embrace: cancer genetics, cytogenetics, reproductive biology, neurogenetics, and genomic and genetic basis of human diseases. Detailed information regarding faculty research interest can be found on the Department web page at [www.mcgill.ca/humangenetics/prospective-students/supervision](http://www.mcgill.ca/humangenetics/prospective-students/supervision).

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

**section 11.8.5: Master of Science (M.Sc.); Human Genetics (Thesis) (45 credits)**

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

**section 11.8.6: Master of Science (M.Sc.); Human Genetics (Thesis) — Bioinformatics (45 credits)**

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

**section 11.8.7: Master of Science (M.Sc.); Human Genetics (Thesis) — Bioethics (45 credits)**

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

**section 11.8.8: Master of Science (M.Sc.); Genetic Counselling (Non-Thesis) (48 credits)**

The M.Sc. in Genetic Counselling program provides the academic foundation and clinical training required for the contemporary practice of genetic counselling. Genetic counsellors are health professionals who provide information and support to families who have members with birth defects or genetic disorders and to families who may be at risk for a variety of inherited conditions. Genetic counsellors investigate the problem present in the family, analyze inheritance patterns and risks of recurrence, and review available options with the family. Some counsellors also work in administrative and academic capacities, and many engage in research activities. The curriculum includes a variety of required courses in Human Genetics and other departments, and 40 weeks of supervised clinical training spread over four semesters. Graduates will be eligible to sit for both the Canadian Association of Genetic Counsellors and the American Board of Genetic Counselling certification examinations. Upon completion of the M.Sc. in Genetic Counselling program, the students will demonstrate competence in or satisfactory knowledge of: principles of human genetics, including cytogenetics, biochemical, molecular, and population genetics; methods of interviewing and counselling, and the dynamics of human behaviour in relation to genetic disease; and social, legal, and ethical issues in genetics. Enrolment will be limited to four students.

**section 11.8.9: Doctor of Philosophy (Ph.D.); Human Genetics**

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

**section 11.8.10: Doctor of Philosophy (Ph.D.); Human Genetics — Bioinformatics**

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

**11.8.3 Human Genetics Admission Requirements and Application Procedures****11.8.3.1 Admission Requirements****M.Sc. in Genetic Counselling**

**Prerequisites:** Bachelor's degree – 3.0/4.0 or 3.2/4.0 for the last two full-time academic years. Recent (five years or less) university-level courses in the Basic Sciences (basic biology, cell and molecular, biochemistry, principles of human genetics or basic genetics with a significant “human” component) and a *minimum* of two Social Sciences (social psychology, abnormal psychology).

**Prerequisites or corequisites:** Recent (five years or less) university-level course in statistics.

Applicants must have obtained some experience (either paid or volunteer) working in a counselling or advisory capacity, ideally in a health care setting.

Applicants to graduate studies whose mother tongue is not English and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit a TOEFL score of 600 on the TOEFL paper-based test (or 100 on the Internet-based test), with each component score no less than 20, as the **minimum** standard for admission.

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

**Prerequisites:** B.Sc. – minimum CGPA 3.0/4.0 or 3.2/4.0 for the last two full-time academic years. Applicants must have a minimum of 6 credits in cellular and molecular biology or biochemistry, 3 credits in mathematics or statistics and 3 credits in genetics. Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit a TOEFL score of 600 on the TOEFL paper-based test (or 100 on the Internet-based test), with each component score no less than 20, or 7 on the IELTS, as the minimum standard for admission.

Admission is based on an evaluation by the Graduate Training Committee and on acceptance by a research director who has agreed to provide adequate funding for the duration of the academic program. Prospective graduate students should complete the online application form, indicate at least three faculty members they are interested in working with, and email copies of their transcripts/letters, etc., to [grad.hg@mcgill.ca](mailto:grad.hg@mcgill.ca).

### **11.8.3.2 Application Procedures**

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

Applications will be considered upon receipt of:

1. online application form, plus fee of \$100;
2. two original transcripts;
3. two original letters of reference;
4. statement of purpose;
5. test results for international students: TOEFL or IELTS.

Documentation and online application must be received by January 15th. Interviews will be arranged during the weeks of March 1 – April 15 for the top 18 candidates. Admission to the program will be based on academic record, reference letters, statement of purpose, and interview.

Application materials should be sent to Thomas Leslie at the departmental address.

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

Applications will be considered upon receipt of:

1. online application form, plus fee of \$100;
2. two original transcripts;
3. two original letters of reference;
4. test results for international students: TOEFL or IELTS.

#### **Dates for Guaranteed Consideration:**

##### ***Canadian Applicants:***

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

**Fall: Jan. 15**

M.Sc. (Thesis) programs:

**Fall: March 31**

**Winter: Sept. 30**

**Summer: no admissions\*\***

Ph.D. programs:

**Fall: March 31**

**Winter: Sept. 30**

**Summer: Jan. 31**

##### ***International Applicants:***

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

**Fall: Jan. 15**

M.Sc. (Thesis) programs:

**Fall: March 31**  
**Winter: Sept. 30**  
**Summer: no admissions\*\***

Ph.D. programs:

**Fall: March 31**  
**Winter: Sept. 30**  
**Summer: Jan. 31**

\* **M.Sc. Genetic Counselling program** accepts applications for the Fall term only.

\*\* The Department of Human Genetics is not willing to consider any applications to the M.Sc. (Thesis) for the Summer term.

For further details regarding dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program.

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

Application materials should be sent to Thomas Leslie at the departmental address.

#### 11.8.4 Human Genetics Faculty

##### Chair

D.S. Rosenblatt

##### Program Directors

J. Fitzpatrick – *M.Sc. in Genetic Counselling*

E. Shoubridge – *M.Sc. and Ph.D. in Human Genetics*

##### Administrative Assistant

K. Springer

##### Graduate Program Coordinator

T. Leslie

##### Assistant Graduate Program Coordinator

A. Cenaiko

##### Emeritus Professors

V. Der Kaloustian; B.A.(Acad.), M.Sc., Ph.D., M.D.,C.M.(McG.), D.Sc.(Acad.), F.R.S.C., F.R.C.P.S.(C)

F.C. Fraser; B.Sc.(Acad.) M.Sc., Ph.D., M.D.,C.M., D.Sc.(McG), O.C., F.R.S.C.

K. Glass; M.A.(Barat), B.C.L., D.C.L.(McG.)

B. Mukherjee; B.Sc.(Calc.), M.S.(Brig. Young), Ph.D.(Utah)

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

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

H. Tenenhouse; M.Sc., Ph.D.(McG.)

##### Professors

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

A. Duncan; B.Sc.(Qu.), Ph.D.(Edin.) (*Pathology and Pediatrics*)

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

F. Glorieux; M.D.(Louvain), Ph.D.(McG.) (*Surgery*)



**Professors**

F. Kaplan; B.A.(Col.), Ph.D.(McG.) (*Pediatrics*)  
 B. Knoppers; Ph.D.(Sorbonne, France), Ad.E., O.C. (*Director, Centre of Genomics and Policy*)  
 M. Lathrop; B.Sc., M.Sc.(Alta.), Ph.D.(Wash.) (*Director, McGill University-Genome Quebec Innovation Centre*)  
 D. Malo; D.U.M., M.Sc.(Montr.), Ph.D.(McG.) (*William Dawson Scholar*) (*Medicine*)  
 R. McInnes; C.M.,M.D., Ph.D., F.R.S.C.(McG.) (*Alva Chair in Human Genetics*) (*Director, Lady Davis Research Institute*)  
 K. Morgan; B.S., M.S., Ph.D.(Mich.) (*Medicine*)  
 R. Palmour; B.A.(Texas W.), Ph.D.(Texas) (*Psychiatry and Biology*)  
 D. Radzioch; M.Sc., Ph.D.(Jagiellonian, Krakow) (*Medicine*)  
 D.S. Rosenblatt; M.D.,C.M.(McG.) (*Medicine, Pediatrics and Biology*)  
 R. Rozen; B.Sc., Ph.D.(McG.) (*Pediatrics and Biology*)  
 E. Schurr; M.Sc., Ph.D.(Albert-Ludwigs, Freiburg) (*Medicine*)  
 E. Shoubridge; B.Sc., M.Sc.(McG.), Ph.D.(Br. Col.) (*Neurogenetics*)  
 R. St-Arnaud; B.Sc.(Montr.), Ph.D.(Laval) (*Surgery*)  
 J. Trasler; M.D.,C.M., Ph.D.(McG.) (*William Dawson Scholar*) (*Pathology and Pediatrics*)

**Associate Professors**

A. Ao; Ph.D.(Lond.) (*OBS/GYN*)  
 D. Avard; Ph.D.(Camb.) (*Centre of Genomics and Policy*)  
 N. Braverman; B.Sc.(C' nell), M.Sc.(Sarah Lawrence), M.D.(Tulane) (*Pediatrics*)  
 T. Costa; M.D.(Ott.) (*Pediatrics*)  
 K. Dewer; Ph.D.(Laval) (*Genome Quebec*)  
 S. Melançon; M.D.(Montr.)  
 R. Nadon; B.A., M.A., Ph.D.(C' dia)  
 L. Russell; B.A., M.D.(Ind.) (*Pediatrics*)  
 P. Tonin; B.Sc., M.Sc., Ph.D.(Tor.) (*Medicine*)  
 S. Vidal; Ph.D.(Genève) (*Medicine*)

**Assistant Professors**

L. Beitel; Ph.D.(McG.) (*Biochemistry*)  
 L. Cartier; B.Sc., M.Sc.(McG.)  
 G. Chong; Ph.D.(Kansas)  
 M. Fujiwara; M.Sc.(Alta.) (*Quantitative Genetics*)  
 Y. Joly; Ph.D.(McG.) (*Centre of Genomics and Policy*)  
 J. Majewski; B.Sc., M.Sc.(Stan.), Ph.D.(Wesl.)  
 P. Moffatt; Ph.D.(Montr.) (*Pharmacology*)  
 T. Pastinen; M.D., Ph.D.(Helsinki)  
 R. Sladek; B.A.Sc., M.D.(Tor.)  
 R. Slim; M.Sc.(Lebanon), M.Sc., Ph.D.(Paris VII)  
 M. Tischkowitz; M.D., Ph.D.(Lond.) (*Cancer Genetics*)  
 S. Wallace; Ph.D.(Sheff.) (*Centre of Genomics and Policy*)  
 Y. Yamanaka; Ph.D.(Osaka) (*Goodman Cancer Research Centre*)

**Lecturers**

N. Bolduc (*Pediatrics*), S.M. Chiu (*Pediatrics*), S. Drury (*Pediatrics*), J. Fitzpatrick (*Pediatrics, Medicine*), S. Fox (*Medicine*), L. Kasprzak (*Medicine*), M. Lalous (*Medicine*), L. Palma (*Medicine*), C. Pouchet (*JGH*), A. Secord (*Pediatrics*), G. Sillon (*Medicine*), R. Vanneste (*Pediatrics*), N. Wong (*Medicine*), S. Zaor (*Medicine*)

**Associate Members**

*Biochemistry*: P. Gros; D. Thomas

*Bioethics*: J. Kimmelman

*Cardiology*: J. Genest

*Endocrinology*: J. Mitchel, C. Polychonakos

*Epidemiology*: A. Lippman

*Law*: R. Gold

*Medical Genetics (MUHC)*: R. Agatep, I. DeBie, S. Levesque

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

*Nephrology*: I. Gupta

*Obs.-Gyn.*: R. Gagnon; A. Naumova

*Pathology*: A. Spatz

*Pediatrics*: P. Goodyer, N. Jabado, L. Majewska, J. Mitchell, A. Ryan

*Psychiatry*: G. Turecki

*Surgery*: P. Roughley

**Assistant Professors**

T. Hudson (OICR)

G. Rouleau (CHUM)

**11.8.5 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 672	(3)	Advances in Human Genetics 3

HGEN 690	(3)	Inherited Cancer Syndromes
HGEN 691	(3)	Host Responses to Pathogens
HGEN 693	(3)	Using Bioinformatics Resources
HGEN 694	(3)	Microarray Statistical Analysis
HGEN 695	(3)	Psychiatric Genetics
HGEN 696	(3)	Advanced Readings in Genetics 1
HGEN 697	(3)	Advanced Readings in Genetics 2
HGEN 698	(3)	Advanced Readings in Genetics 3
HGEN 699	(3)	Advanced Readings in Genetics 4

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

### 11.8.6 Master of Science (M.Sc.); Human Genetics (Thesis) — Bioinformatics (45 credits)

#### Thesis Courses (33 credits)

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

#### Required Courses (6 credits)

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

#### Complementary Courses (6 credits)

6 credits from the following courses:

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

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

### 11.8.7 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 543	(3)	Seminar: Medical Ethics
RELG 571	(3)	Religion and Medicine

**11.8.8 Master of Science (M.Sc.); Genetic Counselling (Non-Thesis) (48 credits)****Required Courses - Phase I (24 credits)**

HGEN 600D1	(3)	Genetic Counselling Practicum
HGEN 600D2	(3)	Genetic Counselling Practicum
HGEN 601	(3)	Genetic Counselling Principles
HGEN 620D1	(4.5)	Introductory Field Work Rotations
HGEN 620D2	(4.5)	Introductory Field Work Rotations
HGEN 660	(3)	Genetics and Bioethics
PATH 653	(3)	Reading and Conference

**Required Courses - Phase II (24 credits)**

HGEN 610	(3)	Genetic Counselling: Independent Studies 1
HGEN 611	(3)	Genetic Counselling: Independent Studies 2
HGEN 630D1	(6)	Advanced Field Work Rotations
HGEN 630D2	(6)	Advanced Field Work Rotations
HGEN 640	(3)	Clinical Genetics 1
HGEN 641	(3)	Clinical Genetics 2

**11.8.9 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****Required Courses (3 credits)**

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

**Complementary Courses (15 credits)**

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

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

HGEN 660	(3)	Genetics and Bioethics
HGEN 661	(3)	Population Genetics
HGEN 663	(3)	Beyond the Human Genome
HGEN 690	(3)	Inherited Cancer Syndromes
HGEN 691	(3)	Host Responses to Pathogens
HGEN 693	(3)	Using Bioinformatics Resources
HGEN 694	(3)	Microarray Statistical Analysis
HGEN 695	(3)	Psychiatric Genetics
HGEN 696	(3)	Advanced Readings in Genetics 1
HGEN 697	(3)	Advanced Readings in Genetics 2
HGEN 698	(3)	Advanced Readings in Genetics 3
HGEN 699	(3)	Advanced Readings in Genetics 4

Students are restricted to taking any two of the following courses:

HGEN 670	(3)	Advances in Human Genetics 1
HGEN 671	(3)	Advances in Human Genetics 2
HGEN 672	(3)	Advances in Human Genetics 3

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

#### 11.8.10 Doctor of Philosophy (Ph.D.); Human Genetics — Bioinformatics

##### Thesis

##### Required Courses (6 credits)

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

##### Complementary Courses (6 credits)

\* Two courses from the following:

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

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

## 11.9 Medical Physics

### 11.9.1 Location

Medical Physics Unit  
Montreal General Hospital  
Livingston Hall, Room L5-113  
1650 Cedar Avenue  
Montreal, QC H3G 1A4  
Canada

Telephone: 514-934-1934 ext. 44158

Fax: 514-934-8229

Email: [mak@medphys.mcgill.ca](mailto:mak@medphys.mcgill.ca)

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

### 11.9.2 About Medical Physics

The Medical Physics Unit offers an M.Sc. in Medical Radiation Physics. Facilities are available for students to undertake a Ph.D. in Medical Physics through the Department of Physics.

The Unit is a teaching and research unit concerned with the application of physics and related sciences in medicine, especially (but not exclusively) in radiation medicine; i.e., radiation oncology, medical imaging, and nuclear medicine.

The research interests of members of the Unit include various aspects of medical imaging, including 3D imaging, the development of new imaging modalities, and applications of imaging in radiation therapy; radiation dosimetry, solid state, electret, and NMR systems; nuclear cardiology; and applications of radiation biology to therapy.

The M.Sc. and Ph.D. programs in Medical Physics are accredited by the Commission on Accreditation of Medical Physics Education Programs, Inc., sponsored by the American Association of Physicists in Medicine (AAPM), the American College of Medical Physics (ACMP), the American College of Radiology (ACR), and the Canadian College of Physicists in Medicine (CCPM).

#### *section 11.9.5: Master of Science (M.Sc.); Medical Radiation Physics (Thesis) (60 credits)*

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

The program comprises:

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

### 11.9.3 Medical Physics Admission Requirements and Application Procedures

#### 11.9.3.1 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 overall GPA of 3.0/4.0 (minimum of 70%).

#### 11.9.3.2 Application Procedures

##### Dates for Guaranteed Consideration

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program.

Students are admitted to the M.Sc. program only to start in the Fall term (in September) of a given academic year. Applications for consideration for the Fall term of 2012 must be completed by January 15, 2012.

Applications being made to McGill University graduate programs for September 2012 can only be made online via McGill's website. For information regarding the application procedure and to access the application form, please go to [www.mcgill.ca/gradapplicants/apply](http://www.mcgill.ca/gradapplicants/apply) or go directly to the Medical Physics Unit admissions website at [www.medphys.mcgill.ca](http://www.medphys.mcgill.ca) and click on **Academic** and then **Admissions Information**.

Only complete applications will be considered. Interested candidates should (a) ask their university(ies) to send two originals of each transcript, and (b) request that original confidential letters of recommendation be sent by professors familiar with their work. Letters must be originals, must be dated within the last two years, and must be written on official university letterhead, otherwise they will not be accepted. The application fee of \$100 may be remitted in either Canadian or U.S. funds. When preparing the online application form, the application fee is remitted via a valid credit card. Applicants must either complete the "Applicant Statement" portion of the online application, or alternatively may submit a one-page "Statement of Interest" as part of their supporting documentation.

Applicants to graduate studies whose mother tongue is not English and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone) must submit documented proof of competency in English by a TOEFL, iBT, or IELTS. The original test report must be sent by the testing centre, i.e., a photocopy sent by the applicant is not acceptable. The test must have been taken within the two years prior to date of application review, i.e., not prior to April 2009. Applicants from some countries are exempt from providing evidence of English language proficiency. For more information, see [www.mcgill.ca/gradapplicants/apply/prepare/requirements/proficiency](http://www.mcgill.ca/gradapplicants/apply/prepare/requirements/proficiency).

**All supporting application materials should be sent directly to the Administrative Coordinator, Medical Physics Unit, and should reach the Department by January 15, 2012.**

#### 11.9.4 Medical Physics Faculty

##### Director

J.P.F. Seuntjens

##### Emeritus Professor

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

##### Professors

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

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

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

##### Associate Professor

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

##### Assistant Professor

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

##### Lecturers

F. DeBlois, S. Devic, A. Gauvin, G. Hegyi, C. Janicki, J. Kildea, P. Léger, W.A. Parker, H.J. Patrocinio, R. Ruo, G. Stroian

##### Associate Members

A. Reader, R.B. Richardson, E. Soisson, N. Tomic, W. Wierzbicki

#### 11.9.5 Master of Science (M.Sc.); Medical Radiation Physics (Thesis) (60 credits)

##### Thesis Courses (32 credits)

MDPH 625 (32) M.Sc. Thesis Research

##### Required Courses (28 credits)

MDPH 601 (3) Radiation Physics

MDPH 602	(3)	Applied Dosimetry
MDPH 603	(2)	Laboratory Practicum 1
MDPH 607	(3)	Introduction to Medical Imaging
MDPH 608	(2)	Laboratory - Diagnostic Radiology and Nuclear Medicine
MDPH 609	(2)	Radiation Biology
MDPH 611	(2)	Medical Electronics
MDPH 612	(2)	Computers in Medical Imaging
MDPH 613	(2)	Health Physics
MDPH 614	(3)	Physics of Diagnostic Radiology
MDPH 615	(3)	Physics of Nuclear Medicine
MDPH 616	(1)	Selected Topics in Medical Physics

---

## 11.10 Medicine, Experimental

### 11.10.1 Location

Division of Experimental Medicine  
Department of Medicine  
Lady Meredith House, Room 101  
1110 Pine Avenue West  
Montreal, QC H3A 1A3  
Canada

Telephone: 514-398-3466

Fax: 514-398-3425

Email: [experimental.medicine@mcgill.ca](mailto:experimental.medicine@mcgill.ca)

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

### 11.10.2 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 certain other centres to supervise graduate students. The Division offers various programs, each of which has different training objectives (see below). The international recognition of the high-quality training accorded our graduates is in essence what distinguishes graduates of our programs from the graduates of comparable programs in peer institutions.

#### *section 11.10.5: Master of Science (M.Sc.); Experimental Medicine (Thesis) (45 credits)*

Applicants for the M.Sc. in Experimental Medicine must hold a B.Sc. degree or its 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, and infectious diseases. This is a thesis program that may lead to careers in industry or serve as a stepping stone to further graduate studies.

#### *section 11.10.6: Master of Science (M.Sc.); Experimental Medicine (Thesis) — Bioethics (45 credits)*

Applicants for the M.Sc. (Bioethics Option) program must hold an M.D., Nursing, Physical and Occupational Therapy, and/or any other professional health training degree. Students who do not fit these criteria may be considered for admission on an individual basis. The objectives of this research-stream program are to allow students to conduct innovative research in relation to a bioethical issue pertinent to health care and to acquire a working knowledge of bioethical issues from the current viewpoint of other relevant disciplines such as law, philosophy, and religious studies. The curriculum is composed of required courses (6 credits) offered in the Biomedical Ethics Unit, bioethics courses (6 credit minimum) offered by the base faculty or department and any graduate course required or accepted by a base faculty for the granting of a Master's degree, for a total of 21 credits. A minimum of 45 credits is required including the thesis. The research culminates in the preparation of a thesis.

#### *section 11.10.7: Master of Science (M.Sc.); Experimental Medicine (Thesis) — Environment (45 credits)*

Applicants for the M.Sc. (Environment Option) must meet the requirements for the M.Sc. in Experimental Medicine as well as those set out by the McGill School of Environment (MSE) for their graduate option. Acceptability into the option will be based on a student's academic experience and performance, availability of an MSE accredited supervisor or co-supervisor, the proposed research, and plans for funding as articulated by the supervisor(s). The



**section 11.10.7: Master of Science (M.Sc.); Experimental Medicine (Thesis) — Environment (45 credits)**

Environment option is aimed at students who wish to use interdisciplinary approaches in their graduate research on environmental issues and who wish to benefit from interactions that will occur as they are brought into contact with students from a wide range of disciplines through structured courses, formal seminars, and informal discussions and networking. The option in Environment provides students with an appreciation of the role of science in informing decision-making in the environment sector, and the influence that political, socio-economic, and ethical judgments have.

**section 11.10.8: Master of Science (M.Sc.); Experimental Medicine (Thesis) — Family Medicine (45 credits)**

Applicants for the M.Sc. (Family Medicine Option) must be practising family physicians interested in conducting research in family medicine. Exceptionally, candidates from different backgrounds may be considered. This program is the first of its kind in Canada because it teaches rigorous research skills to be successful researchers in the discipline of family medicine. It differs from the other programs in that it focuses on improving primary care delivery. All students are expected to complete a thesis to graduate. Graduates of this program may lead to careers in clinical or primary care research, government, or academia.

**section 11.10.9: Doctor of Philosophy (Ph.D.); Experimental Medicine**

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

**section 11.10.10: Doctor of Philosophy (Ph.D.); Experimental Medicine — Environment**

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

**section 11.10.11: Graduate Diploma in Clinical Research (30 credits)**

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

**11.10.3 Medicine, Experimental Admission Requirements and Application Procedures****11.10.3.1 Admission Requirements**

For all four programs, candidates educated outside of Canada and the United States must submit GRE (General Examination) scores.

**M.Sc. or Ph.D. in Experimental Medicine**

Admission to graduate studies and research in Experimental Medicine is no longer solely restricted to students who wish to register for the Ph.D. degree. Candidates who hold only a major or honours B.Sc. degree, or an M.D. degree, must apply to the M.Sc. program, unless they have an undergraduate CGPA of 3.5 or more out of a possible 4.0, in which case they may apply for direct entry into the Ph.D. if they so desire. Candidates who already hold an M.Sc. apply directly to the Ph.D. program.

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

In addition to the documentation currently required by Graduate and Postdoctoral Studies, a letter from the candidate's research director outlining the M.Sc. or Ph.D. project is necessary.

**M.Sc. (Bioethics Option)**

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

For those who apply to the M.Sc. (Bioethics Option), the requirements, as well as the application dates for guaranteed consideration are different. For further information regarding this program, please refer to the Bioethics entry or visit their website at [www.mcgill.ca/biomedicalethicsunit/masters](http://www.mcgill.ca/biomedicalethicsunit/masters).

**M.Sc. (Environment Option)**

For those applicants wishing to apply to the Master's program (Environment Option), it should be noted that, although the requirements and application dates for guaranteed consideration remain the same, the student must remit additional documents which constitute their application to NOT ONLY the Division of Experimental Medicine but ALSO to the McGill School of Environment. All the relevant information can be found on the School of Environment website at [www.mcgill.ca/mse/programs/envroption](http://www.mcgill.ca/mse/programs/envroption).

The option of in-course addition of the Environment Option is also available to students in Experimental Medicine. For further information, students should refer to the departmental website or contact the student affairs office.

### **M.Sc. (Family Medicine Option)**

The M.Sc. in Experimental Medicine (Thesis) – Family Medicine option is designed to provide research training to family physicians practising in Quebec interested in conducting research in family medicine. Exceptionally, students who do not fit these criteria may be considered for admission on an individual basis.

For those who apply to the M.Sc. (Family Medicine Option), the requirements, as well as the application deadline are different. For further information regarding this program, please visit their website at: [www.mcgill.ca/familymed/mastersprogram](http://www.mcgill.ca/familymed/mastersprogram).

### **Graduate Diploma in Clinical Research**

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

## **11.10.3.2 Application Procedures**

### **Dates for Guaranteed Consideration**

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program.

Applications will be considered upon receipt of:

1. application form;
2. letter of intent;
3. curriculum vitae;
4. two copies of official university transcripts;
5. letters of reference (2);
6. \$100 application fee;
7. test results (TOEFL and GRE);
8. additional documents (in the case of both the M.Sc. (Bioethics Option) and the M.Sc. (Environment Option)).

All information is to be submitted to the Departmental Office.

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

## **11.10.4 Medicine, Experimental Faculty**

### **Chair, Department of Medicine**

D. Eidelman

### **Director, Division of Experimental Medicine**

H. Bennett

### **Emeritus Professors**

T.M.S. Chang; B.Sc., M.D.,C.M., Ph.D.(McG.), F.R.C.P.(C)

B.E.P. Murphy; B.A., M.D.(Tor.), M.Sc., Ph.D.(McG.), F.A.C.P.(C)

### **Professors**

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

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

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

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

N. Beauchemin; B.A., B.Sc., M.Sc., Ph.D.(Montr.)

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

R. Blostein; M.Sc., Ph.D.(McG.)

A.E. Clarke; M.D.(Nfld.), M.S.(Stan.), F.R.C.P.(C)

M. Cosio; B.Sc.(Oviedo), M.D.(Madrid)

**Professors**

A. Cybulsky; M.D.(Tor.), F.R.C.P.(C)  
 D. Eidelman; M.D.,C.M.(McG.), F.R.C.P.(C)  
 A. Fuks; B.Sc., M.D.,C.M.(McG.)  
 J. Genest Jr.; M.D.,C.M.(McG.), F.R.C.P.(C)  
 A. Giaid; D.V.M.(Baghdad), M.D., Ph.D.(Lond.)  
 V. Giguere; B.Sc., Ph.D.(Laval)  
 M. Goldberg; B.Sc., M.Sc., Ph.D.(McG.)  
 D. Goltzman; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)  
 S.A. Grover; B.A.(Roch.), M.D.,C.M.(McG.), M.P.A.(Harv.), F.R.C.P.(C)  
 Q.A. Hamid; M.D.(Mosul, Iraq.), Ph.D.(Lond.)  
 G. Hendy; B.Sc.(Sheff.), Ph.D.(Lond.)  
 J. Hiscott; B.Sc., M.Sc.(W. Ont.), Ph.D.(NYU)  
 L.J. Hoffer; B.Sc., M.D.,C.M.(McG.), Ph.D.(MIT)  
 S. Hussain; M.D.(Baghdad), Ph.D.(McG.)  
 A.C. Karaplis; B.Sc., M.D., Ph.D.(McG.)  
 L. Kleiman; B.Sc.(Ill.), Ph.D.(Johns Hop.)  
 R. Kremer; M.D., Ph.D.(Paris)  
 S. Lehnert; B.Sc.(Nottingham), M.Sc., Ph.D.(Lond.)  
 M. Levy; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)  
 M.S. Ludwig; M.D.(Manit.), F.R.C.P.(C)  
 S. Magder; M.D.(Tor.), F.R.C.P.(C)  
 D. Malo; D.V.M., M.Sc.(Montr.), Ph.D.(McG.)  
 O.A. Mamer; B.Sc., Ph.D.(Windsor)  
 E. Marliss; M.D.(Alta.), F.R.C.P.(C)  
 J. Martin; B.Sc., M.B., B.Ch., M.D.(Cork), F.R.C.P.(C)  
 J. Milic-Emili; M.D.(Milan), F.R.S.C.  
 W.H. Miller; A.B.(Princ.), Ph.D.(Rock.), M.D.(C'nell)  
 W.J. Muller; B.Sc., Ph.D.(McG.)  
 A. Nepveu; B.Sc., M.Sc.(Montr.), Ph.D.(Sher.)  
 T. Nilsson; B.Sc., Ph.D.(Sweden)  
 L. Panasci; B.Sc., M.D.(G'town)  
 K. Pantopoulos; B.Sc., Ph.D.(Aristotelian, Greece)  
 V. Papadopoulos; D.Pharm.(Athens), Ph.D.(Paris)  
 M. Park; B.Sc., Ph.D.(Glas.)  
 A.C. Peterson; B.Sc.(Vic., BC), Ph.D.(Br. Col.)  
 B.J. Petrof; M.D.(Laval)  
 M.N. Pollak; M.D.,C.M.(McG.), F.R.C.P.(C)  
 P. Ponka; M.D., Ph.D.(Prague)  
 B. Posner; M.D.(Manit.), F.R.C.P.(C)  
 W.S. Powell; B.A.(Sask.), Ph.D.(Dal.)  
 S. Prakash; M.Sc., M.Tech., M.Phil.(India), Ph.D.(McG.)  
 S. Rabbani; M.B.B.S.(King Edward Med. Coll., Lahore)

**Professors**

D. Radzioch; M.Sc., Ph.D.(Jagiellonian, Cracow)  
 M. Rasminsky; B.A.(Tor.), M.D.(Harv.), Ph.D.(Lond.)  
 S. Richard; B.Sc., Ph.D.(McG.)  
 E. Schiffrin; M.D.(Argentina), Ph.D.(McG.)  
 E. Schurr; Diplom., Ph.D.(Al. Ludwigs U., Freiburg)  
 E. Skamene; M.D.(Charles U., Czech.), Ph.D.(Czech. Acad. of Sci.), F.R.C.P.(C), F.A.C.P.  
 A.D. Sniderman; M.D.(Tor.)  
 C. Srikant; M.Sc., Ph.D.(Madr.)  
 M.M. Stevenson; B.A.(Hood), M.Sc., Ph.D.(Catholic U. of Amer.)  
 D.M.P. Thomson; M.D.(W. Ont.), Ph.D.(Lond.), F.R.C.P.(C)  
 M. Trifiro; B.Sc., M.D.,C.M.(McG.)  
 C. Tsoukas; B.Sc.(McG.), M.Sc.(Hawaii), M.D.(Athens), F.R.C.P.(C)  
 M. Wainberg; B.Sc.(McG.), Ph.D.(Col.)  
 J. White; B.Sc., M.Sc.(Car.), Ph.D.(Harv.)  
 S. Wing; B.Sc., M.Sc.(McG.)  
 X.-J. Yang; B.Sc.(Zhejiang), Ph.D.(Shanghai)  
 M. Zannis-Hadjopoulos; B.Sc., M.Sc., Ph.D.(McG.)  
 H. Zingg; M.D.(Basel), Ph.D.(McG.)

**Associate Professors**

S. Ali; B.Sc.(C' dia), Ph.D.(McG.)  
 D. Baran; M.D.,C.M.(McG.), F.R.C.P.(C)  
 M. Behr; B.Sc.(Tor.), M.D.(Qu.), M.Sc.(McG.)  
 N. Bernard; B.Sc.(McG.), Ph.D.(Duke)  
 V. Blank; B.Sc., M.Sc.(Konstanz, Germany), Ph.D.(Inst. Pasteur)  
 M. Blostein; M.D.,C.M.(McG.)  
 L. Chalifour; B.Sc., Ph.D.(Manit.), M.A.(Harv.)  
 S.R. Cohen; B.Sc., M.Sc., Ph.D.(McG.)  
 D. Cournoyer; M.D.(Sher.), F.R.C.P.(C)  
 M. Culty; B.Sc., M.Sc.(Lyon), Ph.D.(Grenoble)  
 G. Di Battista; B.Sc.(C' dia), M.Sc., Ph.D.(Montr.)  
 F. Doualla-Bell; B.Sc., M.S., Ph.D.(Paris XI)  
 J.C. Engert; B.A.(Colby), Ph.D.(Boston)  
 E. Fixman; B.Sc.(Col.), Ph.D.(Johns Hop.)  
 R. Gagnon; B.Sc.(Montr.), M.D.(Laval), D.Phil.(Oxf.)  
 A. Gatignol; M.Sc., Ph.D.(Paul Sabatier)  
 S.B. Gottfried; M.D.(Penn.)  
 J. Henderson; B.Sc., Ph.D.(McG.)  
 B. Jean-Claude; B.Sc., M.Sc.(Moncton), Ph.D.(McG.)  
 P. Laneuville; B.Sc.(McM.), M.D.(Ott.), F.R.C.P.(C)  
 S. Laporte; B.Sc., M.Sc., Ph.D.(Sher.)  
 L. Larose; B.Sc., Ph.D.(Montr.)

**Associate Professors**

M. Laughrea; B.Sc.(Laval), M.Sc., M.Phil., Ph.D.(Yale)  
 A.-M. Lauzon; B.Sc., M.Sc., Ph.D.(McG.)  
 J.-J. Lebrun; B.Sc., M.Sc., Ph.D.(Rennes, France)  
 L. Lecanu; M.Sc., Ph.D.(Paris)  
 S. Lemay; M.D.(Montr.), F.R.C.P.(C)  
 R. Lin; B.Sc., M.Sc.(PRC), Ph.D.(C' dia)  
 M. Lipman; M.D.,C.M.(McG.), F.R.C.P.(C)  
 J.-L. Liu; B.Sc., M.Sc.(Beijing), Ph.D.(McG.)  
 J.A. Morais; M.D.(Montr.), F.R.C.P.(C)  
 A. Mouland; B.A., B.Sc., Ph.D.(McG.)  
 M. Newkirk; B.Sc., M.Sc.(Qu.), Ph.D.(Tor.)  
 S. Qureshi; B.Sc., M.D.(Alta.), F.R.C.P.(C)  
 J. Rauch; B.Sc., Ph.D.(McG.)  
 J.-P. Routy; B.Sc., M.D., Ph.D.(France)  
 G. Spurl; B.Sc.(Med.), M.D.(Manit.)  
 T. Takano; M.D., Ph.D.(Tokyo)  
 P. Tonin; B.Sc., M.Sc., Ph.D.(Tor.)  
 B. Turcotte; B.Sc., Ph.D.(Laval)  
 B.J. Ward; M.D.,C.M.(McG.), M.Sc.(Oxf.), F.R.C.P.(C)

**Assistant Professors**

R. Aloyz; B.A., M.Sc., Ph.D.(Argentina)  
 C. Baglolle; B.Sc., M.Sc.(PEI), Ph.D.(Calg.)  
 M. Chevrette; B.Sc., M.Sc., Ph.D.(Laval)  
 S. Daskalopoulou; M.D.(Athens)  
 M. Divangahi; B.Sc.(McM.), Ph.D.(McG.)  
 B. Gilfix; B.Sc.(Manit.), Ph.D.(W. Ont.), M.D.,C.M.(McG.), F.R.C.P.(C)  
 C. Haston; B.Sc.(W. Ont.), M.Sc.(Tor.), Ph.D.(Texas)  
 N. Johnson; B.Sc.(C' dia), M.D.(Ott.), Ph.D.(Br. Col.), F.R.C.P.(C)  
 M. Kokoeva; B.Sc., Ph.D.(Russia)  
 L. Koski; B.Sc.(Tor.), Ph.D.(McG.)  
 A. Kristof; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)  
 S. Lehoux; B.Sc.(Bishop's), Ph.D.(Sher.)  
 C. Liang; B.Sc., Ph.D.(Nankai)  
 B. Mazer; B.Sc.(Col.), M.D.,C.M.(McG.), F.R.C.P.(C)  
 M. Murshed; M.Sc.(Brussels), Ph.D.(Cologne)  
 D. Nguyen; M.D.,C.M.(McG.), F.R.C.P.(C)  
 R. Rajan; B.Sc., M.D.(Manit.), M.Sc.(McM.)  
 C. Rocheleau; B.A.(Assumption Coll.), Ph.D.(Mass.)  
 S. Rousseau; B.Sc., M.Sc., Ph.D.(Laval)  
 M. Saleh; B.Sc., M.Sc.(Beirut), Ph.D.(McG.)  
 M. Sebag; B.Sc., Ph.D.(McG.), M.D.(Tor.), F.R.C.P.(C)

**Assistant Professors**

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

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

E. Torban; B.Sc., M.Sc.(Russia), Ph.D.(McG.)

**Associate Members, McGill**

G. Bartlett, M. Basik, E. Bereza, J.D. Bobyn, D. Boivin, M. Bouchard, J. Bourbeau, P. Brodt, K. Brown, D.H. Burns, S. Chevalier, R.-C. Chian, H. Clarke, T. Duchaine, D. Dufort, C. Ells, R. Farookhi, K. Glass, C. Goodyer, P. Goodyer, W. Gottlieb, M. Götte, I. Gupta, J. Haggerty, M. Hunt, N. Jabado, M. Kaartinen, N. Kabani, J. Kimmelman, A. Koromilas, L. Lands, J. Lapointe, C. Mandato, A. Macaulay, K. Mann, L. McCaffrey, C. McCusker, M. Meaney, T. Muanza, M. Nagano, J. Nalbantoglu, M. Ndao, F. Ni, C. O'Flaherty, A. Pause, H. Perrault, C. Piccirillo, P. Pluye, C. Polychronakos, J. Rak, C. Rodriguez, E. Rosenberg, A. Ryan, G. Sant'Anna, R. Schirrmacher, R. Slim, N. Sonenberg, M. Sullivan, S.L. Tan, G. Tannenbaum, M. Tremblay, J. Ursini-Siegel, M. Ware, M. Witcher, C. Wu, M. Yaffe, J. Zwaagstra

**Associate Members, Université de Montréal**

J. Archambault, R. Butterworth, M. Cayouette, F. Charron, E. Cohen, J.-F. Côté, V. Dave, J. Davignon, C. Deal, A. Deng, C.F. Deschepper, C. Desrosiers, J.M. Di Noia, J. Drouin, H. Gu, J. Gutkowska, P. Hamet, Z. Hanna, P. Jolicoeur, A. Kania, M. Kmita, C. Lazure, E. Lecuyer, S. Mader, T. Moroy, M. Oeffinger, K. Podypanina, R. Rabasa-Lhoret, E. Racine, M. Raymond, T. Reudelhuber, M. Sairam, N. Seidah, R.-P. Sekaly, W.-K. Suh, J. Tremblay, M. Trudel, W.Y. Tsang, J. Vacher, A. Veillette

**Associate Member, Pharmaceutical Companies**

B. Gibbs

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

24-36 credits selected from the following:

EXMD 690	(3)	Master's Thesis Research 1
EXMD 691	(6)	Master's Thesis Research 2
EXMD 692	(9)	Master's Thesis Research 3
EXMD 693	(12)	Master's Thesis Research 4
EXMD 694	(12)	Master's Thesis Research 5

**Complementary Courses (21 credits)**

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

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

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

**Required Courses (6 credits)**

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

**Complementary Courses (15 credits)**

3 credits, one of the following:

BIOE 682	(3)	Medical Basis of Bioethics
CMPL 642	(3)	Law and Health Care
PHIL 543	(3)	Seminar: Medical Ethics
RELG 571	(3)	Religion and Medicine

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

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

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

**Required Courses (6 credits)**

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

**Complementary Courses (15 credits)**

3 credits from one of the following courses\*:

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling
ENVR 580	(3)	Topics in Environment 3
ENVR 611	(3)	The Economy of Nature
ENVR 620	(3)	Environment and Health of Species
ENVR 622	(3)	Sustainable Landscapes
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

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

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

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

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

**Required Courses (17 credits)**

DENT 672	(3)	Applied Mixed Methods in Health Research
EPIB 507	(3)	Biostatistics for Health Professionals
EPIB 600	(3)	Clinical Epidemiology
FMED 500	(1)	Introduction to Research
FMED 600	(1)	Mixed Studies Reviews
FMED 601	(3)	Advanced Topics in Family Medicine Research
PSYT 625	(3)	Qualitative Research in Health Care

**Elective Courses (4 credits)**

Up to 4 credits, at the 500 level or higher, of coursework may be chosen from outside the Department, in consultation with the student's academic adviser or supervisor.

**11.10.9 Doctor of Philosophy (Ph.D.); Experimental Medicine**

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

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

**Thesis****Required Courses**

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

**Complementary Courses (18 credits)**

(12-18 credits)

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

**11.10.10 Doctor of Philosophy (Ph.D.); Experimental Medicine — Environment****Thesis****Required Courses (6 credits)**

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

**Complementary Courses (12 credits)**

(6-12 credits)

One of the following courses:\*

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling



ENVR 580	(3)	Topics in Environment 3
ENVR 611	(3)	The Economy of Nature
ENVR 620	(3)	Environment and Health of Species
ENVR 622	(3)	Sustainable Landscapes
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

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

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

### 11.10.11 Graduate Diploma in Clinical Research (30 credits)

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

#### Required Courses (6 credits)

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

#### Complementary Courses (6 credits)

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

#### Required Practicum (18 credits)

EXMD 627	(18)	Practicum in Clinical Research
----------	------	--------------------------------

---

## 11.11 Microbiology and Immunology

### 11.11.1 Location

Department of Microbiology and Immunology  
3775 University Street  
Montreal, QC H3A 2B4  
Canada

Telephone: 514-398-3061

Fax: 514-398-7052

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

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

### 11.11.2 About Microbiology and Immunology

The Department offers graduate programs leading to the degrees of M.Sc. and Ph.D. Each program is tailored to fit the needs and backgrounds of individual students. The graduate program is designed to offer students state-of-the-art training, concentrating on four key areas of research: cellular and molecular immunology, microbial physiology and genetics, molecular biology of viruses, and medical microbiology. Basic research discoveries in microbiology may lead to improved drug design and vaccine development to treat and prevent diseases. The Department has many notable facilities and resources, including

a Cell sorter, ultra centrifuges, confocal microscope, real-time PCR facilities, cryostat for Immunocytochemistry, and facilities for radio-isotope studies and infectious diseases. We foster close ties with McGill's teaching hospitals and research centres to promote multidisciplinary research.

#### ***section 11.11.5: Master of Science (M.Sc.); Microbiology and Immunology (Thesis) (45 credits)***

The primary goal of this program is to provide students with unique opportunities to learn experimental designs and fundamental research techniques, and objectively synthesize information from scientific literature. These tools enable the students to focus on major research topics offered by the Department: molecular microbiology, mycology, microbial physiology, virology, genetics, immunology, drug design, and aspects of host-parasite relationships. Each M.Sc. student chooses their preferred major research area and research supervisor. Following an interview, the student is presented with a research topic and offered a studentship (amounts vary). Each student then must register for our graduate courses (two seminars, two reading and conference courses, and three current topics). If pertinent to the student's research program, the research adviser may advise the student to take additional courses. Most of our students, after one year, are proficient researchers, and some first author of a research publication. About 70% of the M.Sc. students elect to enter into our Ph.D. program. The remaining students advance their microbiology background by opting to enter into medicine, epidemiology, biotechnology, or pharmaceutical disciplines.

#### ***section 11.11.6: Doctor of Philosophy (Ph.D.); Microbiology and Immunology***

The primary goal of the Ph.D. program is to create a self-propelled researcher, proficient in experimental designs and advanced methodologies applicable to the varied and rapidly changing disciplines in microbiology and immunology. Close research supervision and bi-weekly laboratory sessions impart the requisite research discipline and objective assessment of acquired or published research data. A Ph.D. student, if promoted from our M.Sc. program, without submitting the thesis, is required to register for one graduate seminar and one reading and conference course, but the bulk of his/her time is devoted to research. Other requirements include a yearly presentation of the accumulated research data to the Ph.D. supervisory committee, successfully clearing the Ph.D. comprehensive examination, two years after registration into the Ph.D. program, and finally submission of a thesis. The research theme must be original, and the acquired data and hypothesis must be defended orally by the student. Each student receives a stipend for the entire duration and a minimum six-semester residency is required for the completion of the program.

### **11.11.3 Microbiology and Immunology Admission Requirements and Application Procedures**

#### **11.11.3.1 Admission Requirements**

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

Candidates are required to hold a B.Sc. degree in microbiology and immunology, biology, biochemistry, or another related discipline; those with the M.D., D.D.S., or D.V.M. degrees are also eligible to apply. The minimum grade point average for acceptance into the program is 3.2 (out of 4.0). Applicants to graduate studies whose mother tongue is not English and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit documented proof of competency in oral and written English. Before acceptance, appropriate exam results must be submitted directly from the TOEFL (Test of English as a Foreign Language) or IELTS (International English Language Testing Systems) Office. An institutional version of the TOEFL is not acceptable. Applications will not be considered if a TOEFL or IELTS test result is not available.

The Test of English as a Foreign Language (TOEFL):

- Paper-Based Test (PBT): a minimum score of 575
- Internet-Based Test (iBT): a minimum overall score of 95
- The International English Language Testing System (IELTS): a minimum overall band score of 7.0

The TOEFL Institution Code for McGill University is 0935.

##### **Ph.D.**

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

#### **11.11.3.2 Application Procedures**

Applications will be considered upon receipt of:

1. online application;
2. two official transcripts;
3. two letters of reference;
4. letter from a prospective supervisor;
5. \$100 application fee;
6. TOEFL test (GRE not required but recommended).

All information is to be submitted directly to the Student Affairs Officer in the Department of Microbiology and Immunology.

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

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

#### Dates for Guaranteed Consideration

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program. All applications and documents must be submitted by the dates for guaranteed consideration.

### 11.11.4 Microbiology and Immunology Faculty

#### Chair

M.G. Baines (retiring May 31, 2011) (*Interim Chair*)

#### Emeritus Professors

G. Faubert

R.A. MacLeod

#### Professors

A. Berghuis; M.Sc.(The Netherl.), Ph.D.(Br. Col.)

J.W. Coulton; B.Sc.(Tor.), M.Sc.(Calg.), Ph.D.(W. Ont.)

J. Hiscott; B.Sc., M.Sc., Ph.D.(W. Ont.)

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

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

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

#### Associate Professors

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

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

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

M. Gotte; Ph.D.(Max Planck)

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

G. T. Marczyński; B.Sc., Ph.D.(Ill.)

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

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

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

S. Vidal; Ph.D.(Geneva)

#### Assistant Professors

J. Fritz; Ph.D.(Vienna)

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

C. Krawczyk; Ph.D.(Tor.)

#### Associate Members

*Human Genetics*: P. Gros

*Institute of Parasitology*: F. Dziarsinski, A. Jardim, M. Ndao, P. Ribeiro, P. Rohrbach

*Medicine*: M. Behr, S. Hussain, A. Kristof, C. Liang, V. Loo, A. Manges, M.A. Miller, J. Nadeau, M. Newkirk, K. Pantopoulos, J.E. Rauch, M. Reed, M. Saleh, C. Tsoukas, B. Turcotte, B.J. Ward

*Microbiology and Immunology*: L. Kleiman

*Neuroimmunology*: A. Bar-Or

**Associate Members***Neurology and Neurosurgery:* J. Antel*Oncology:* A. Gagnol, A.E. Koromilas, A. Mouland, S. Richard*Ophthalmology:* M. Burnier*Surgery:* N.V. Christou**Adjunct Professors**

J. Archambault, A. Descoteaux, P. Lau, B. Lee, S-L. Liu, A. Makrigiannis, Y. Mamane, R.-P. Sekaly, W.-K. Suh, D. Ziberstein

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

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

**Required Courses (15 credits)**

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

**Complementary Courses (6 credits)**

6 credits, two of the following courses:

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

Other courses may be required to strengthen the student's background.

**11.11.6 Doctor of Philosophy (Ph.D.); Microbiology and Immunology****Thesis****Required Courses (18 credits)**

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

**Complementary Courses (12 credits)**

(minimum of 12 credits)

Three courses from List A and a minimum of three consecutive courses from List B

**List A:**

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

**List B:**

MIMM 721	(1)	Ph.D. Research Progress Report 1
MIMM 722	(1)	Ph.D. Research Progress Report 2
MIMM 723	(1)	Ph.D. Research Progress Report 3
MIMM 724	(1)	Ph.D. Research Progress Report 4

Other courses may be required to strengthen the student's background.

**11.12 Neuroscience (Integrated Program in)****11.12.1 Location**

Montreal Neurological Institute, Room 141  
3801 University Street  
Montreal, QC H3A 2B4  
Canada

Telephone: 514-398-1229 / 398-6243 / 398-1905

Fax: 514-398-4621

Email: [ipn@mcgill.ca](mailto:ipn@mcgill.ca) or [ipn.admissions@mcgill.ca](mailto:ipn.admissions@mcgill.ca)Website: [www.mcgill.ca/ipn](http://www.mcgill.ca/ipn)**11.12.2 About the Integrated Program in Neuroscience**

Montreal is home to the largest concentration of neuroscientists in North America. Neuroscience research at McGill University is internationally renowned, and its Integrated Program in Neuroscience (IPN) provides graduate training in this outstanding research environment. With approximately 300 M.Sc. and Ph.D. students and more than 160 supervisors, the IPN is the largest graduate program in the Faculty of Medicine and one of the largest neuroscience graduate programs in North America. Neuroscience training within the IPN spans the full spectrum of research fields, from cellular and molecular neuroscience to behavioural and cognitive neuroscience. In addition to laboratory research, the IPN offers an extensive range of courses, hosts an annual Neuroscience Retreat, and maintains a seminar program to facilitate communication between students in different neuroscience disciplines. Neuroscience trainees from McGill have gone on to successful careers in academia and industry.

A prospective graduate student may identify a supervisor from one of several research streams, spanning the full spectrum of neuroscience research. A student with a bachelor's degree may apply to the M.Sc. program; it is common to transfer to the Ph.D. program if suitable progress is made. Students with M.Sc. degrees may apply directly to the Ph.D. program. From 2010, IPN also offers a Ph.D. Rotation program each September.

**GENERAL**

1. Students must select an Advisory Committee, in conjunction with their thesis supervisor. This committee will consist of the thesis supervisor and two other individuals who will participate in discussions with students about their research program.
2. Students are required to submit a written thesis proposal (at the end of their first year for M.Sc. students, and at least one month prior to the Candidacy Examination for Ph.D. students). This document must state the hypothesis being tested, the relevant literature, and a summary of the methods that will be used to address the research question. This proposal will then be orally presented to the student's Advisory Committee, which will review the written proposal and communicate its recommendations to the student.

3. Students will present a formal seminar on their research work prior to writing their thesis. This presentation will be attended by the student's Advisory Committee who will report their impressions and recommendations to the student.
4. An annual oral informal presentation of research work accomplished will be presented to the student's Advisory Committee.
5. The Graduate Program Committee has instituted a mentorship program by which each student will be matched with a specific member of the Committee. The Program Mentor ensures that the student, the supervisor(s) and other members of the Advisory Committee are aware of and meet key milestones, in a timely manner, throughout the course of the student's graduate study.
6. An M.Sc. student may be eligible to transfer to the Ph.D. program without submitting a master's thesis by taking the Transfer Seminar/Candidacy Exam. This exam is allowable if the master's CGPA is 3.3 or higher and if the student's Advisory Committee recommends the student as an appropriate candidate for Ph.D. studies. M.Sc. students who wish to pursue a Ph.D. degree, but who have not obtained the minimum 3.3 CGPA in their M.Sc. coursework while in the IPN, must submit a master's thesis and apply for the Ph.D. level afterwards.
7. All incoming students are required to take the workshops on Responsible Conduct of Research. These will be included as part of the milestones for annual progress reports.

#### *section 11.12.5: Master of Science (M.Sc.); Neuroscience (Thesis) (45 credits)*

The M.Sc. program offers opportunities to a wide diversity of individual interests and backgrounds, and prepares our students for scientific careers in the neuroscience and related fields. Programs leading to an M.Sc. degree require the completion of 45 credits of academic and research training. Applicants must hold an undergraduate degree, or its equivalent, from a recognized institution and must display an adequate background in basic sciences. Applicants are expected to have attained a high scholastic standing equal to, or greater than, the minimum cumulative grade point average (CGPA) of 3.3 (out of 4.0 at McGill University) in all levels of study.

#### *section 11.12.6: Doctor of Philosophy (Ph.D.); Neuroscience*

The IPN offers a highly competitive Ph.D. degree program that prepares students for successful, scientific careers in the field of neuroscience. Over half of the students registered in the neuroscience graduate program at McGill University are in the doctoral stream. Applicants must hold a graduate-level degree in a field related to neuroscience or have an M.D. degree, preferably with postgraduate training. Applicants will also be considered for admission if enrolled in the M.D.-Ph.D. program through the Faculty of Medicine at McGill University. Students currently registered in the Master's program in neuroscience may be permitted to transfer to the Ph.D. program without submitting a master's thesis. Applicants are expected to have attained a high scholastic standing equal to, or greater than, the minimum cumulative grade point average of 3.3 (out of 4.0 at McGill University) in all levels of study. In exceptional circumstances, students MAY enter the Ph.D. program directly from their undergraduate degree if a CGPA of 3.7 is attained and if the student already presents extensive research experience.

## **11.12.3 Neuroscience (Integrated Program in) Admission Requirements and Application Procedures**

### **11.12.3.1 Admission Requirements**

#### **General**

The applicant must be a university graduate and hold a bachelor's degree in a field related to the subject selected for graduate work.

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

Applicants to graduate studies whose mother tongue is not English and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit results of the TOEFL exam with their application and have a minimum score of 600 on the paper-based test (96 on the Internet-based test with each component score not less than 20).

#### **M.Sc. Degree**

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

#### **Ph.D. Degree**

Applicants must hold a master's degree in a field related to neuroscience, or an M.D. degree with postgraduate training.

Students currently registered in the master's program in neuroscience may be permitted to transfer to the Ph.D. program.

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

### **11.12.3.2 Application Procedures**

Applications will be considered upon receipt of:

1. application form;
2. official transcripts;
3. two letters of reference;
4. CV and personal statement;
5. \$100 application fee;

**6.** TOEFL test results.

All information is to be submitted to the address listed in [section 11.12: Neuroscience \(Integrated Program in\)](#).

**Dates for Guaranteed Consideration**

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program.

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

**11.12.4 Neuroscience (Integrated Program in) Faculty****Director**

J. Nalbantoglu

**Associate Director**

D. Ragsdale

**Administrator**

J. Makkerh

**Emeritus Professors**

B. Collier; Ph.D., Dept. of Pharmacology

M. Diksic; Ph.D., Dept. of Neurology and Neurosurgery

C. Thompson; D.Sc., F.C.C.P.M., Dept. of Neurology and Neurosurgery

**Professors**

A. Aguayo; M.D.(Cordoba Natn.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery

G. Almazan; B.Sc.(N'eastern), Ph.D.(McG.), Dept. of Pharmacology and Therapeutics

E. Andermann; M.D.,C.M., M.Sc., Ph.D.(McG.), F.C.C.M.G., Dept. of Neurology and Neurosurgery

F. Andermann; B.A.(Paris), B.Sc.(McG.), M.D.(Montr.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery

J. Antel; M.D., B.Sc.(Manit.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery

D. Arnold; B.Sc., M.D.(C'nell), F.R.C.P.(C) (*James McGill Professor*), Dept. of Neurology and Neurosurgery

M. Avoli; M.D.(Rome), Ph.D.(McG.), Dept. of Neurology and Neurosurgery

C. Baker; Ph.D.(Calif.), Dept. of Ophthalmology

P. Barker; Ph.D.(Alta.), B.Sc.(S. Fraser), Dept. of Neurology and Neurosurgery

S. Baum; Ph.D.(Brown), School of Communication Sciences and Disorders

C. Benkelfat; M.D., C.S.P.Q., D.E.R.B.H., Dept. of Psychiatry

G. Bennett; Ph.D.(Virg. Commonwealth), Dept. of Anaesthesia

P. Boksa; Ph.D.(McG.), Dept. of Psychiatry

C. Bourque; B.Sc.(Ott.), Ph.D.(McG.), Dept. of Neurology and Neurosurgery

P. Braun; Ph.D.(Calif., Berk.), Dept. of Biochemistry

C. Bushnell; Ph.D.(Amer.), Dept. of Anaesthesia

S. Carbonetto; M.Sc.(Mass.), Ph.D.(N. Carolina), Dept. of Neurology and Neurosurgery

F. Cervero; M.D., Ph.D.(Madrid), D.Sc.(Edin.), Dept. of Anaesthesia

H. Chertkow; M.D.(W. Ont.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery

P. Clarke; Ph.D.(Lond.), Dept. of Pharmacology and Therapeutics

**Professors**

D. Colman; Ph.D.(SUNY), Dept. of Neurology and Neurosurgery

C. Cuello; M.D., M.A., D.Sc.(Oxf.), Dept. of Pharmacology and Therapeutics

K. Cullen; Ph.D.(Chic.), Dept. of Physiology

S. David; Ph.D.(Manit.), Dept. of Neurology and Neurosurgery

R. Del Maestro; M.D.(W. Ont.), Ph.D.(Uppsala), F.R.C.S.(C), D.A.B.N.S., F.A.C.S., Dept. of Neurology and Neurosurgery

R.J. Dunn; B.Sc., Ph.D.(Br. Col.), Dept. of Neurology and Neurosurgery

H. Durham; M.Sc.(W. Ont.), Ph.D.(Alta.), Dept. of Neurology and Neurosurgery

S. El Mestikawy; Ph.D.(Univ. Pierre et Marie Curie), Dept. of Psychiatry

A. Evans; M.Sc.(Sur.), Ph.D.(Leeds), Dept. of Neurology and Neurosurgery

C. Flores; Ph.D.(C' dia), Dept. of Psychiatry

E. Frombonne; M.D.(Paris V), M.Sc.(Paris), Dept. of Psychiatry

S.G. Gauthier; B.A., M.D.(Montr.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery

B. Giros; Ph.D.(Paris), Dept. of Psychiatry

J. Gotman; M.Eng.(Dart.), Ph.D.(McG.), Dept. of Neurology and Neurosurgery

A. Gratton; Ph.D.(C' dia), Dept. of Psychiatry

J. Grodzinsky; Ph.D.(Brandeis), Dept. of Linguistics

D. Guitton; Dipl. IVK(Univ. Libre de Brux.), B.Eng., M.Eng., Ph.D.(Eng.), Ph.D.(Physiol.)(McG.), Dept. of Neurology and Neurosurgery

D. Haegert; M.D.(Br. Col.), F.R.C.P.(C), Dept. of Pathology

E. Hamel; B.Sc.(Sher.), Ph.D.(Montr.), Dept. of Neurology and Neurosurgery

K. Hastings; B.Sc., Ph.D.(McG.), Dept. of Neurology and Neurosurgery

R. Hess; Ph.D.(Melb.), D.Sc.(Aston, UK), Dept. of Ophthalmology

P.C. Holland; B.A.(Lanc.), Ph.D.(Newcastle, UK), Dept. of Neurology and Neurosurgery

B. Jones; B.A., M.A., Ph.D.(Delaware), Dept. of Neurology and Neurosurgery

M. Jones-Gotman; B.A.(Calif.), M.A., Ph.D.(McG.), Dept. of Neurology and Neurosurgery

F. Kingdom; Ph.D.(Reading), Dept. of Ophthalmology

P. Lachapelle; Ph.D.(Montr.), Dept. of Ophthalmology

N. Lamarche; Ph.D.(Montr.), Dept. of Anatomy and Cell Biology

A. LeBlanc; M.Sc.(Moncton), Ph.D.(Dal.), Dept. of Neurology and Neurosurgery

M. Levine; Ph.D.(P.T.)(McG.), School of Physical and Occupational Therapy

D. Maysinger; M.Sc.(Calif.-LA), Ph.D.(Calif.-LA), Dept. of Pharmacology and Therapeutics

P. McPherson; M.Sc.(Manit.), Ph.D.(Iowa) (*William Dawson Scholar*), Dept. of Neurology and Neurosurgery

M.J. Meaney; B.A.(Loyola), M.A., Ph.D.(C' dia), Dept. of Psychiatry

B. Milner; B.A., Sc.D.(Cant.), Ph.D.(McG.), Dept. of Neurology and Neurosurgery

T.E. Milner; B.Sc., Ph.D.(Alta.), Dept. of Kinesiology and Physical Education

J. Mogil; Ph.D.(Calif.-LA), Dept. of Psychology

K. Mullen; Ph.D.(Camb.), Dept. of Ophthalmology

A. Olivier; M.D.(Montr.), Ph.D.(Laval), F.R.C.S.(C), Dept. of Neurology and Neurosurgery

D.J. Ostry; B.A.Sc., M.A.Sc., Ph.D.(Tor.), Dept. of Psychology

O. Overbury; Ph.D.(C' dia), Dept. of Ophthalmology

M. Petrides; B.Sc., M.Sc.(Lond.), Ph.D.(Cant.) (*James McGill Professor*), Dept. of Neurology and Neurosurgery

B. Pike; B.Eng.(Memp.), M.Eng., Ph.D.(McG.) (*William Dawson Scholar*), Dept. of Neurology and Neurosurgery

G. Plourdes; M.D.(Laval), M.Sc.(Ott.), Dept. of Anaesthesia



**Professors**

J. Poirier; Ph.D.(Montr.), Dept. of Psychiatry and Medicine  
 A. Ptito; Ph.D.(Montr.), Dept. of Neurology and Neurosurgery  
 R. Quirion; B.Sc., M.Sc., Ph.D.(Sher.), Dept. of Psychiatry  
 M. Rasminsky; B.A.(Tor.), M.D.(Harv.), Ph.D.(Lond.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery  
 A. Ribeiro-da-Silva; M.D.(Porto), Ph.D.(Porto), Dept. of Pharmacology and Therapeutics  
 R.J. Riopelle; M.D.(Ott.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery  
 A. Sadikot; M.D., C.M.(McG.), Ph.D.(Laval), F.R.C.S.(C), Dept. of Neurology and Neurosurgery  
 H.U. Saragovi; Ph.D.(Miami), Dept. of Pharmacology and Therapeutics  
 H. Schipper; M.D., Ph.D.(McG.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery  
 P. Seguela; Doct. 3e Cycle(Bord.), Ph.D.(Montr.), Dept. of Neurology and Neurosurgery  
 M. Shevell; B.Sc., M.D.(Vanderbilt), Dept. of Neurology and Neurosurgery  
 E. Shoubridge; M.Sc., Ph.D.(Br. Col.), Dept. of Neurology and Neurosurgery  
 W. Sossin; B.S.(MIT), Ph.D.(Stan.), Dept. of Neurology and Neurosurgery  
 L. Srivastava; Ph.D.(New Delhi), Dept. of Psychiatry  
 S. Stifani; Ph.D.(Rome), Ph.D.(Alta.), Dept. of Neurology and Neurosurgery  
 M. Sullivan; B.A.(McG.), M.A., Ph.D.(C' dia), Dept. of Psychology  
 G. Tannenbaum; M.Sc., Ph.D.(McG.), Dept. of Neurology and Neurosurgery  
 G. Turecki; M.D.(Brazil), Ph.D.(McG.), Dept. of Psychiatry  
 C.-D. Walker; Ph.D.(Geneva), Dept. of Psychiatry  
 C. Wolfson; Ph.D.(McG.), Dept. of Epidemiology and Biostatistics  
 R.J. Zatorre; A.B.(Boston), M.Sc., Ph.D.(Brown), Dept. of Neurology and Neurosurgery

**Associate Professors**

J. Armony; Ph.D.(NYU), Dept. of Psychiatry  
 A. Bar-Or; M.D., C.M.(McG.), F.R.C.P.(C), D.A.B.N.P., Dept. of Neurology and Neurosurgery  
 S. Beaulieu; M.D., Ph.D., F.R.C.P.(C), Dept. of Psychiatry  
 D. Bernard; Ph.D.(Johns Hop.), Dept. of Pharmacology  
 A. Bernasconi; M.D.(Basel), Dept. of Neurology and Neurosurgery  
 V. Bohbot; Ph.D.(Ariz.), Dept. of Psychiatry  
 D. Boivin; M.D.(Laval), Ph.D.(Montr.), Dept. of Psychiatry  
 D. Bowie; Ph.D.(Lond.), Dept. of Pharmacology and Therapeutics  
 A. Brunet; Ph.D.(Montr.), Dept. of Psychiatry  
 M. Cayouette; M.Sc.(Laval), Ph.D.(Laval), Depts. of Anatomy and Cell Biology, Biology, and Experimental Medicine  
 N. Cermakian; Ph.D.(Montr.), Dept. of Psychiatry  
 J.-F. Cloutier; B.Sc.(C' dia), Ph.D.(Montr.), Dept. of Neurology and Neurosurgery  
 T. Coderre; Ph.D.(McG.), Dept. of Anaesthesia  
 L. Collins; M.Eng., Ph.D.(McG.), Dept. of Neurology and Neurosurgery  
 A. Dagher; M.Eng.(McG.), M.D.(Tor.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery  
 S. Daniel; M.D., C.M., M.Sc.(McG.), Dept. of Otolaryngology  
 B. Debruille; M.D.(Paris XI), Ph.D.(Univ. Pierre et Marie Curie, Paris), Dept. of Psychiatry  
 L. Fellows; B.Sc.(McG.), D.Phil.(Oxf.), M.D., C.M.(McG.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery  
 E. Fon; M.D.(Montr.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery

**Associate Professors**

A. Fournier; B.Sc., Ph.D.(McG.), Dept. of Neurology and Neurosurgery  
 G. Gobbi; M.D.(Rome), Ph.D.(Calg.), Dept. of Psychiatry  
 I. Gold; Ph.D.(Princ.), Dept. of Psychiatry  
 V. Gracco; Ph.D.(Wisc.), School of Communication Sciences and Disorders  
 R. Joober; M.D.(Tunisia), Ph.D.(McG.), Dept. of Psychiatry  
 A. Kania; Ph.D.(Baylor), Depts. of Biology, Anatomy and Cell Biology, and Experimental Medicine  
 T. Kennedy; B.Sc.(McM.), Ph.D.(Col.), Dept. of Neurology and Neurosurgery  
 A. Lamontagne; Ph.D.(Laval), School of Physical and Occupational Therapy  
 M. Leyton; M.A., Ph.D.(C' dia), Dept. of Psychiatry  
 G. Luheshi; Ph.D.(Newcastle, UK), Dept. of Psychiatry  
 A. McKinney; Ph.D.(Ulster), Dept. of Pharmacology and Therapeutics  
 K. Murai; Ph.D.(Calif.), Dept. of Neurology and Neurosurgery  
 K. Nader; B.Sc., Ph.D.(Tor.), Dept. of Psychology  
 J. Nalbantoglu; B.Sc., Ph.D.(McG.), Dept. of Neurology and Neurosurgery  
 H. Paudel; Ph.D.(Okla.), M.Sc.(Nepal), Dept. of Neurology and Neurosurgery  
 M. Pell; B.A.(Ott.), M.Sc., Ph.D.(McG.), School of Communication Sciences and Disorders  
 A. Peterson; B.Sc.(Vic., BC), Ph.D.(Br. Col.), Dept. of Neurology and Neurosurgery  
 J.C. Pruessner; Ph.D.(Trier), Depts. of Psychiatry, Psychology, Neurology, and Neurosurgery  
 D. Ragsdale; B.S.(Ill.), Ph.D.(Calif.), Dept. of Neurology and Neurosurgery  
 N. Rajah; Ph.D.(Tor.), Dept. of Psychiatry  
 Y. Rao; B.Sc.(China), Ph.D.(Tor.), Dept. of Neurology and Neurosurgery  
 A. Raz; M.Sc., Ph.D.(Hebrew), Dept. of Psychiatry  
 J. Rochford; Ph.D.(C' dia), Dept. of Psychiatry  
 B. Rosenblatt; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C), Dept. of Neurology and Neurosurgery  
 R. Schirmacher; Ph.D.(Mainz), Dept. of Neurology and Neurosurgery  
 A. Thiel; Ph.D.(Cologne), M.D.(Bonn), Dept. of Neurology and Neurosurgery  
 D. Van Meyel; Ph.D.(W. Ont.), Dept. of Neurology and Neurosurgery  
 S. Williams; Ph.D.(Montr.), Dept. of Psychiatry

**Assistant Professors**

A. Adamantidis; M.Sc., Ph.D.(Liege), Dept. of Psychiatry  
 B. Bedell; B.S.(Leigh), M.D.,C.M.(McG.), Ph.D.(Texas), Dept. of Neurology and Neurosurgery  
 F. Bedford; Ph.D.(Lond.), Dept. of Anatomy and Cell Biology  
 M. Brodeur; Ph.D.(McM.), Dept. of Psychiatry  
 B. Chen; Ph.D.(SUNY), Dept. of Neurology and Neurosurgery  
 C. Flores; Ph.D.(C' dia), Dept. of Psychiatry  
 Y. Goto; Ph.D.(Albany Med. Coll.), Dept. of Psychiatry  
 R. Gruber; Ph.D.(Tel Aviv), Dept. of Psychiatry  
 P. Haghighi; Ph.D.(McG.), Dept. of Physiology  
 F. Jollant; M.D., M.Sc., Ph.D.(France), Dept. of Psychiatry  
 D. Juncker; Dipl., Ph.D.(Neuchâtel), Dept. of Biomedical Engineering  
 D. Klein; B.A., Ph.D.(Witw./S. Af.), Dept. of Neurology and Neurosurgery

**Assistant Professors**

E. Kobayashi; M.D., Ph.D.(Campinas State), Dept. of Neurology and Neurosurgery  
 L. Koski; B.Sc.(Tor.), Ph.D.(McG.), Dept. of Neurology and Neurosurgery  
 N. Ladbou-Bernasconi; M.D.(Lausanne), Ph.D.(McG.), Dept. of Neurology and Neurosurgery  
 A. Lamontagne; Ph.D.(Laval), School of Physical and Occupational Therapy  
 G. Leonard; Ph.D.(McG.), Dept. of Neurology and Neurosurgery  
 C. Limperopoulos; B.Sc., M.Sc., Ph.D.(McG.), Dept. of Neurology and Neurosurgery  
 W. Ma; M.D.(Tongji), M.Sc., Ph.D.(McG.), Dept. of Psychiatry  
 N. Mechawar, Ph.D.(Montr.), Dept. of Psychiatry  
 C. Pack; B.Sc.(Tufts), Ph.D.(Boston), Dept. of Neurology and Neurosurgery  
 K. Petrecca; B.Sc., M.D., Ph.D.(McG.), Dept. of Neurology and Neurosurgery  
 J. Pruessner; Ph.D.(Trier), Dept. of Psychiatry  
 E. Ruthazer; A.B.(Princ.), Ph.D.(Calif.-San Francisco), Dept. of Neurology and Neurosurgery  
 P. Schweinhardt; M.D.(Heidelberg), Ph.D.(Oxf.), Depts. of Dentistry, Neurology and Neurosurgery  
 A. Shmuel; B.Med., M.Sc.(Hebrew), Ph.D.(Weizmann Institute of Science), Dept. of Neurology and Neurosurgery  
 K. Steinhauer; M.Sc., Ph.D.(Dr.rer.nat)(Free Univ., Berlin), School of Communication Sciences and Disorders  
 D. Stellwagen; B.Sc.(Brown), Ph.D.(Calif.), Dept. of Neurology and Neurosurgery  
 L. Stone; Ph.D.(Minn.), Dept. of Dentistry  
 K.-F. Storch; Ph.D.(Max Planck), Dept. of Psychiatry  
 T. Stroh; Dip.(J. Liebig U.), Ph.D.(Max Planck), Dept. of Neurology and Neurosurgery  
 V. Sziklas; Ph.D.(McG.), Dept. of Neurology and Neurosurgery  
 T. Taivassalo; B.Sc., Ph.D.(McG.), Dept. of Kinesiology and Physical Education  
 D. Van Meyel; Ph.D.(W. Ont.), Dept. of Neurology and Neurosurgery  
 M. Vollrath; Ph.D.(Baylor), Dept. of Neurology and Neurosurgery  
 P. Wintermark; M.D.(McG.), Dept. of Pediatrics  
 T.P. Wong; Ph.D.(McG.), Dept. of Psychiatry  
 J. Zhang; M.D.(Shanghai II Medical U.), M.Sc.(Paris XI), Ph.D.(Laval), Dept. of Neurology and Neurosurgery

**Lecturer**

S. Antel

**Adjunct Professors**

L. Descarries, G. Duncan, M. Ptito, E. Racine

**11.12.5 Master of Science (M.Sc.); Neuroscience (Thesis) (45 credits)****Thesis Courses**

Any remaining credits needed to complete the minimum of 45 may be chosen from the following:

NEUR 695	(3)	Master's Thesis Research 1
NEUR 696	(6)	Master's Thesis Research 2

**Required Courses (33 credits)**

NEUR 697	(9)	Master's Project Proposal
----------	-----	---------------------------

NEUR 698	(9)	Master's Seminar Presentation
NEUR 699	(12)	Master's Thesis Submission

and one of the following:

NEUR 610	(5)	Central Nervous System
NEUR 630	(3)	Principles of Neuroscience 1
NEUR 631	(3)	Principles of Neuroscience 2

**Complementary Courses (6 credits)**

6 credits in other graduate-level specialty courses relevant to the program.

Upon recommendation, depending upon their particular background and needs, students may be requested to take additional selected courses.

Note: All M.Sc.-level students must register for a minimum of 12 credits per term during the first three terms of their master's program.

**11.12.6 Doctor of Philosophy (Ph.D.); Neuroscience**

Students with an M.Sc. degree continuing in this Department will receive credit exemptions for graduate coursework accomplished (including NEUR 630, and either NEUR 631 or NEUR 610). It may be recommended that they take specialty courses related to their field of study in neuroscience. Students with an M.Sc. degree from another program will be required to take NEUR 630 and NEUR 631 and/or other courses listed under the M.Sc. degree depending upon their background and field of study.

Students with an M.D. degree proceeding directly into a Ph.D. program will be required to take NEUR 630 and NEUR 631. Recently graduated M.D.s should have the equivalent of NEUR 610, and may be granted equivalence. They will also be required to take 6 credits of graduate-level courses.

**Thesis**

**Required Courses (3 credits)**

Note: A student may receive an exemption if the student can display equivalency for NEUR 630.

NEUR 630	(3)	Principles of Neuroscience 1
NEUR 700	(0)	Doctoral Candidacy Examination

**Complementary Courses (11 credits)**

(9-11 credits)

Note: A student may receive exemptions if the student can display equivalencies for NEUR 631 and NEUR 610.

Must take one of the following courses:

NEUR 610	(5)	Central Nervous System
NEUR 631	(3)	Principles of Neuroscience 2

Two courses at the 500, 600, or 700 level, approved by the graduate program adviser.

---

**11.13 Occupational Health**

**11.13.1 Location**

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

Canada

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

M.Sc.(A.) (Resident) and Ph.D. programs:

Telephone: 514-398-6258

Email: [graduate.eboh@mcgill.ca](mailto:graduate.eboh@mcgill.ca)

M.Sc.(A.) (Distance Education) program:

Telephone: 514-398-6989

Email: [distance.occh@mcgill.ca](mailto:distance.occh@mcgill.ca)

Website: [www.mcgill.ca/occh/programs/distance](http://www.mcgill.ca/occh/programs/distance)

### 11.13.2 About Occupational Health

The Department of Occupational Health offers two graduate degree programs: a doctorate (Ph.D.) and master (M.Sc.(A.)) in occupational health sciences. The master's program is available on campus or in distance education format. Special student status may be granted to students who wish to take only specific courses from our M.Sc. program. There is a maximum of 12 credits overall, with a maximum of 6 credits per semester.

Students are required to have access to a computer and the Internet as some of the course material is most readily available by accessing the web.

#### *section 11.13.5: Master of Science, Applied (M.Sc.A.); Occupational Health (Resident) (Non-Thesis) (45 credits)*

A one-year program in health and hygiene appropriate for physicians, nurses, graduates from engineering, and basic sciences. Occupational health training allows candidates to evaluate work environments and attenuate work hazards using prevention and control.

#### *section 11.13.6: Master of Science, Applied (M.Sc.A.); Occupational Health (Distance) (Non-Thesis) (45 credits)*

A three-and-a-half-year program completed mostly over the Internet. This program is not accepting applicants for 2011-2012.

#### *section 11.13.7: Doctor of Philosophy (Ph.D.); Occupational Health*

The objective of this program is to train independent researchers in the field of work environment and health.

### 11.13.3 Occupational Health Admission Requirements and Application Procedures

#### 11.13.3.1 Admission Requirements

Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit documented proof of competency in oral and written English by appropriate exams, e.g., TOEFL (Test of English as a Foreign Language) with a minimum score of 550, or 86 on the Internet-based test with each component score not less than 20.

#### **M.Sc. Applied Program (Resident) (on campus)**

Candidates should have completed, with a standing equivalent to a minimum cumulative grade point average (CGPA) of 3.0 out of 4.0, one of the requisites below:

- a bachelor of science degree or its equivalent, in a discipline relevant to occupational health or hygiene such as: chemistry, engineering, environmental sciences, physics;
- an M.D. (medicine);
- a B.Sc. in health sciences or nursing.

#### **Distance Education**

Candidates should have completed, with a standing equivalent to a minimum cumulative grade point average (CGPA) of 3.0 out of 4.0, one of the requisites below:

- an M.D. (medicine);
- a B.Sc. in health sciences or nursing;
- a bachelor of science degree, or its equivalent, in a discipline relevant to occupational health or hygiene such as: chemistry, engineering, environmental sciences, physics.

Candidates should have at least three years of experience in industrial hygiene and/or in safety.

For medical doctors and nurses, priority will be given to candidates with at least three years of experience in occupational health.

**Ph.D. Program**

Candidates must hold an M.Sc. degree or its equivalent in occupational health sciences, or in a relevant discipline, such as: community health, environmental health, epidemiology, chemistry, engineering, physics, or health sciences (medicine, nursing, etc.).

**11.13.3.2 Application Procedures****Dates for Guaranteed Consideration**

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program.



**Note:** We are not willing to consider any applications to be admitted for the Winter/Summer term.

Application forms are available online at [www.mcgill.ca/gradapplicants/apply](http://www.mcgill.ca/gradapplicants/apply).

**Resident (on campus)**

Candidates must submit with their application: two official copies of their university transcripts, two letters of reference, a copy of their curriculum vitae and a letter describing their background (occupational health, occupational hygiene, worker safety, etc.) as well as a CAD\$100 application fee.

Eligible candidates may be invited for an interview with members of the Admissions Committee of the Department.

Applications are considered for Fall term only. We are not willing to consider any applications to be admitted for the Winter/Summer term.

**Distance Education**

Candidates must submit with their application: two official transcripts from their university of graduation, two letters of recommendation, a copy of their résumé, a letter describing their career plan, the reasons for their enrolment, and how they plan to accommodate their study time within their work schedule as well as a CAD\$100 application fee.

Students are required to have access to a computer and the Internet as the course material is available through the web.

**Ph.D. Program**

Candidates must submit with their application: two official copies of their university transcripts (undergraduate and graduate), two letters of reference (or completed special forms), a copy of their curriculum vitae and a letter describing their field of interest as well as a CAD\$100 application fee.

Candidates must also submit with their application an outline of their scientific interests, indicating the field and the topic of their proposed research. Each student will be assigned to one academic staff member of the Department, who will act as his/her supervisor, and who will guide him/her in the preparation of a definite research protocol.

**11.13.4 Occupational Health Faculty****Chair**

R. Fuhrer

**Emeritus Professors**

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

A. Lippman; B.A.(C'nell), Ph.D.(McG.)

J.C. McDonald; M.D., B.S.(Lond.), M.Sc.(Harv.), F.R.C.P.(C)

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

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

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

**Professors Post-Retirement**

A. Lippman; B.A.(C'nell), Ph.D.(McG.)

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

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

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

**Professors**

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

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

**Professors**

J. Brophy; B.Eng.(McG.), M.Eng., M.D.(McM.), Ph.D.(McG.) (*joint appt. with Medicine*)  
 E.L.F. Franco; M.P.H., Dr.P.H.(Chapel Hill) (*joint appt. with Oncology*) (*James McGill Professor*)  
 R. Fuhrer; B.A.(CUNY (Brooklyn College)), M.Sc., Ph.D.(Calif.-San Francisco)  
 T.W. Gyorkos; B.Sc.(McG.), M.Sc.(Bishop's), Ph.D.(McG.)  
 J.A. Hanley; B.Sc., M.Sc.(NUI), Ph.D.(Wat.) (*on leave Winter 2012 and Winter 2013*)  
 J. Heymann; B.A.(Yale), M.P.H., M.D., Ph.D.(Harv.) (*joint appt. with Political Science*) (*Canada Research Chair*)  
 C. Infante-Rivard; M.D.(Montr.), M.P.H.(Calif.-LA), Ph.D.(McG.), F.R.C.P.(C) (*James McGill Professor*)  
 L. Joseph; M.Sc., Ph.D.(McG.)  
 M.S. Kramer; B.A.(Chic.), M.D.(Yale) (*joint appt. with Pediatrics*) (*James McGill Professor*) (*on leave Jan. 2012 to Dec. 2012*)  
 J. McCusker; M.D.,C.M.(McG.), M.P.H., Ph.D.(Col.)  
 R. Menzies; M.D.,C.M., M.Sc.(McG.) (*joint appt. with Medicine*)  
 O.S. Miettinen; M.D.(Helsinki), M.P.H., M.S., Ph.D.(Minn.)  
 G. Paradis; M.D.(Montr.), M.Sc.(McG.)  
 R.W. Platt; M.Sc.(Man.), Ph.D.(Wash.) (*joint appt. with Pediatrics*)  
 S.H. Shapiro; B.S.(Bucknell), M.S., Ph.D.(Stan.)  
 S. Suissa; M.Sc.(McG.), Ph.D.(Flor.) (*joint appt. with Medicine*) (*James McGill Professor*)  
 R. Tamblin; M.Sc.(McM.), Ph.D.(McG.) (*joint appt. with Medicine*) (*James McGill Professor*)  
 C. Wolfson; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Medicine*)

**Associate Professors**

O. Basso; Ph.D.(Milan) (*joint appt. with Obstetrics & Gynecology*)  
 D. Buckeridge; M.D.(Qu.), M.Sc.(Tor.), Ph.D.(Stan.) (*Canada Research Chair*)  
 A. Ciampi; M.Sc., Ph.D.(Qu.), Ph.D.(Rome)  
 N. Dendukuri; M.Sc.(Indian I.T.), Ph.D.(McG.) (PT) (*joint appt. with Medicine*)  
 C. Greenwood; B.Sc.(McG.), M.Sc.(Wat.), Ph.D.(Tor.) (*joint appt. with Oncology*)  
 P. Héroux; B.Sc.(Laval), M.Sc., Ph.D.(I.N.R.S.)  
 J. Kaufman; B.A.(Johns Hop.), Ph.D.(Mich.)  
 A. Manges; B.A.(Col.), M.P.H., Ph.D.(Calif., Berk.)  
 M. Pai; M.B.B.S.(Stanley Medical College), M.D.(Christian Medical College), Ph.D.(Calif., Berk.)  
 J. Pickering; B.A.(Tor.), M.D., M.Sc.(McG.) (*joint appt. with Medicine*)  
 A. Quesnel-Vallee; B.A., M.Sc.(Montr.), M.A., Ph.D.(Duke) (*joint appt. with Sociology*)  
 M. Rossignol; B.Sc., M.D.(Sher.), M.Sc.(McG.), F.R.C.P.(C)  
 P. Tousignant; B.A., M.D.(Laval), M.Sc.(McG.), F.R.C.P.(C) (PT)

**Assistant Professors**

A. Adrien; M.D., M.Sc.(McG.)  
 J. Atherton; M.Sc.(MIT), Ph.D.(McG.)  
 A. Benedetti; B.Sc., M.Sc., Ph.D.(McG.) (*joint appt. with Medicine*)  
 J. Cox; B.Sc., B.A., M.D.(Dal.), M.Sc.(McG.), C.C.F.P., F.R.C.P.(C) (*joint appt. with Family Medicine*)  
 S. Harper; B.A.(Westminister), M.S.P.H.(S. Carolina), Ph.D.(Mich.)  
 A. Labbe; M.Sc.(Montr.), Ph.D.(Wat.) (*joint appt. with Psychiatry*)  
 S. Martin; M.D.(Tor.), M.Sc.(McG.) (PT)

**Assistant Professors**

E.E.M. Moodie; B.A.(Winn.), Ph.D.(Wash.)

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

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

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

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

**Associate Members**

*Biomedical Ethics Unit:* N. King

*Dietetics and Human Nutrition:* K. Gray-Donald

*Dentistry:* P. Allison, J. Feine

*Family Medicine:* A. Andermann, J. Haggerty, T. Tannenbaum

*Geography:* N. Ross

*Medicine:* A. Barkun, M. Behr, S. Bernatsky, T. Brewer, J. Bourbeau, P. Brassard, A. Clarke, K. Dasgupta, M. Eisenberg, P. Ernst, M. Goldberg, C. Greenaway, S. Kahn, M. Klein, N. Mayo, N. Pant Pai, L. Pilote, E. Rahme, B. Richards, K. Schwartzman, M. Sewitch, I. Shrier, V. Tagalakis

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

*Pathology:* B. Case

*Pediatrics:* G. Dougherty, B. Foster, C. Quach-Thanh

*Physical & Occupational Therapy:* S. Ahmed

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

**Lecturers**

J.P. Gauvin, W. Wood

**Adjunct Professors**

*Asociación Civil Selva Amazónica Peru:* M. Casapia

*Caro Research:* J. Caro

*Direction régionale de la santé publique:* R. Allard, M. Baillargeon, R. Lessard, E. Robinson

*Harvard Univ.:* J. Brownstein

*Hôpital Sacré-Cœur:* D. Gautrin

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

*INSPQ:* F. Richer, P. Robillard, S. Stock

*Montreal Chest Hospital Centre:* P. Rohan

*Mount Sinai:* M. Baltzan

*Stabilis:* P. Simon

*Univ. de Montréal:* R. Massé, J. Siemiatycki

*Univ. of S. Australia:* J. Lynch

**11.13.5 Master of Science, Applied (M.Sc.A.); Occupational Health (Resident) (Non-Thesis) (45 credits)****Research Project (15 credits)**

OCCH 699 (15) Project Occupational Health and Safety

**Required Courses (30 credits)**



Note: Students must pass the Master's Integrative Examination (OCCH 600) before writing their Project.

OCCH 600	(0)	Master's Integrative Exam
OCCH 602	(3)	Occupational Health Practice
OCCH 603	(3)	Work and Environment Epidemiology 1
OCCH 604	(3)	Monitoring Occupational Environment
OCCH 605	(6)	Physical Health Hazards
OCCH 608	(3)	Biological Hazards
OCCH 612	(3)	Principles of Toxicology
OCCH 614	(3)	Topics in Occupational Health
OCCH 615	(3)	Occupational Safety Practice
OCCH 616	(3)	Occupational Hygiene

### 11.13.6 Master of Science, Applied (M.Sc.A.); Occupational Health (Distance) (Non-Thesis) (45 credits)

This program is not accepting applicants for 2011-2012.

#### Research Project (15 credits)

OCCH 699	(15)	Project Occupational Health and Safety
----------	------	--

#### Required Courses (30 credits)

Note: Students must pass the Master's Integrative Examination (OCCH 600) before writing their Project.

Each course has a final (proctored) examination at the end of the term.

OCCH 600	(0)	Master's Integrative Exam
OCCH 602	(3)	Occupational Health Practice
OCCH 603	(3)	Work and Environment Epidemiology 1
OCCH 604	(3)	Monitoring Occupational Environment
OCCH 608	(3)	Biological Hazards
OCCH 612	(3)	Principles of Toxicology
OCCH 615	(3)	Occupational Safety Practice
OCCH 616	(3)	Occupational Hygiene
OCCH 617	(3)	Occupational Diseases
OCCH 624	(3)	Social and Behavioural Aspects - Occupational Health
OCCH 625	(3)	Work and Environment Epidemiology 2
OCCH 626	(3)	Basics: Physical Health Hazards
OCCH 627	(3)	Work Physiology and Ergonomics
OCCH 630	(3)	Occupational Diseases for OHNS
OCCH 635	(3)	Environmental Risks to Health

On-campus practicum may be held at the discretion of each professor. These sessions are held in Montreal on the McGill University campus. Their aim is to offer students additional specific learning activities. Participation in the practicum is an essential component of the program.

### 11.13.7 Doctor of Philosophy (Ph.D.); Occupational Health

#### Thesis

**Required Courses (2 credits)**

OCCH 700	(0)	Ph.D. Comprehensive Examination
OCCH 706	(2)	Ph.D. Seminar on Occupational Health and Hygiene

Students are encouraged to take up to 12 credits in areas pertinent to their specialty or in areas necessary to complete their knowledge of occupational health.

---

**11.14 Otolaryngology – Head and Neck Surgery****11.14.1 Location**

Department of Otolaryngology – Head and Neck Surgery  
Royal Victoria Hospital  
687 Pine Avenue West, Room E3-37  
Montreal, QC H3A 1A1  
Canada

Telephone: 514-843-2820

Fax: 514-843-1403

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

**11.14.2 About Otolaryngology – Head and Neck Surgery**

The Master of Science degree in Otolaryngology trains otolaryngologists and physicians for clinical or basic science research in Otolaryngology – Head and Neck Surgery. Master's programs can include research on normal function and disease of head and neck structures: otology, neuro-otology, laryngology, rhinology, oncology, surgery, auditory-vestibular sciences, middle-ear modeling, oto-toxicity, genomics, infection, thyroid disease, or genetics.

***section 11.14.5: Master of Science (M.Sc.); Otolaryngology (Thesis) (45 credits)***

The master's program is intended for otolaryngologists or for physicians with a strong interest in otolaryngology research. Under exceptional circumstances, others (Ph.D.s, dentists, veterinarians, medical professionals, etc.) may be considered. The program addresses research questions using an interdisciplinary approach, combining methodologies of both the clinical sciences and the basic sciences. The Master's program is unique in Canada and rare elsewhere.

Medical professionals graduating from the program can better treat ear-nose-throat diseases; they are better positioned to do, and to evaluate, research in otolaryngology. They typically obtain the most highly sought positions in their fields.

**11.14.3 Otolaryngology Admission Requirements and Application Procedures****11.14.3.1 Admission Requirements**

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

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

**11.14.3.2 Application Procedures****Dates for Guaranteed Consideration**

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program.

Applications require the following documentation:

1. completed application form and personal statement form;
2. letters of reference from two professors;
3. two official copies of academic transcripts;
4. application fee: \$100;

5. results of Test of English as a Foreign Language (TOEFL) (minimum of 550 on the paper-based test or 86 on the Internet-based test with each component score not less than 20) for applicants to graduate studies whose mother tongue is not English and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone).

Prospective students should contact research supervisors individually.

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

#### 11.14.4 Otolaryngology – Head and Neck Surgery Faculty

##### Chair

S. Frenkiel

##### Emeritus Professor

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

##### Professors

S. Frenkiel; B.Sc., M.D.,C.M.(McG.), F.R.C.S.(C)

A. Katsarkas; M.D.(Thess.), M.Sc.(Otol.)(McG.), F.R.C.S.(C)

M.D. Schloss; M.D.(Br. Col.), F.R.C.S.(C)

T.L. Tewfik; M.D.(Alex.), F.R.C.S.(C)

##### Associate Professors

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

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

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

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

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

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

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

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

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

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

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

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

##### Assistant Professors

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

I. Fried; M.D.(Dal.), F.R.C.S.(C)

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

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

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

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

G. Sejean; M.D.(Beirut), F.R.C.S.(C)

R. Sweet; M.D.,C.M.(McG.)

L. Tarantino; M.D.(Naples), F.R.C.S.(C)

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

**Associate Members**

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

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

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

L. Mongeau; B.Sc., M.Sc.(Montr.), Ph.D.(Penn. St.)

**Lecturers**

A. Finesilver, J. Rothstein, J. Young

**Adjunct Professor**

J.-J. Dufour

**11.14.5 Master of Science (M.Sc.); Otolaryngology (Thesis) (45 credits)****Thesis Courses (30 credits)**

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

**Required Courses (12 credits)**

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

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

**Complementary Course**

(3-4 credits)

EPIB 607	(4)	Inferential Statistics
----------	-----	------------------------

or equivalent

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

---

**11.15 Pathology****11.15.1 Location**

Department of Pathology  
Duff Medical Building  
3775 University Street  
Montreal, QC H3A 2B4  
Canada

Telephone: 514-398-7192 ext. 00481 or 00494  
 Fax: 514-398-7446  
 Email: [pathologyteaching.med@mcgill.ca](mailto:pathologyteaching.med@mcgill.ca)  
 Website: [www.mcgill.ca/pathology](http://www.mcgill.ca/pathology)

### 11.15.2 About Pathology

Pathology is the science of disease, and research in Pathology is focused on understanding the cellular and molecular changes that cause disease – generating knowledge that is essential in the development of new methods for prevention and treatment. Pathology is a multidisciplinary science, and laboratory techniques overlap those used in all current fields of biomedical investigation. We offer unique opportunities for graduate students to conduct fundamental biomedical research that is directly linked to patient care, working with teams of highly experienced investigators and clinicians. Our laboratories are located on the main campus and throughout the McGill network of hospitals and research institutes. Our investigators collaborate with basic scientists from a variety of other departments, and we also undertake collaborative studies with colleagues in academic institutions around the world. Graduate students take part in joint clinical-experimental presentations involving our 48 faculty members, gaining a broad exposure to current issues in diagnosis and treatment of disease. This opportunity to combine basic research and potential applications offers very exciting possibilities for a highly rewarding career.

The Pathology Department offers research training in a wide variety of areas such as immunology and transplantation, neoplasia, ophthalmic pathology, cell biology, pulmonary vascular and airways disease, pulmonary edema, neurodegenerative disorders, and smooth muscle pathophysiology.

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

#### *section 11.15.5: Master of Science (M.Sc.); Pathology (Thesis) (45 credits)*

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

#### *section 11.15.6: Doctor of Philosophy (Ph.D.); Pathology*

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

### 11.15.3 Pathology Admission Requirements and Application Procedures

#### 11.15.3.1 Admission Requirements

Applicants must have a B.Sc. or the equivalent degree with an extensive background in the physical and biological sciences. An academic record equivalent to or better than a CGPA of 3.2 out of 4.0 at McGill is required for at least the two final full-time years of undergraduate training, with a minimum CGPA of 3.0 overall.

Applicants to graduate studies whose mother tongue is not English and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit the GRE and TOEFL examinations in order to be properly evaluated as to their suitability. Students are normally accepted into the M.Sc. program, and those candidates showing exceptional ability may be permitted to transfer into the Ph.D. program after one year of training.

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

Prospective students apply online at [www.mcgill.ca/gradapplicants/apply](http://www.mcgill.ca/gradapplicants/apply).

For further information, applicants may contact the Teaching Office, Department of Pathology.

#### 11.15.3.2 Application Procedures

##### Dates for Guaranteed Consideration

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program.

Applications will be considered upon receipt of:

1. application;
2. transcripts;
3. two letters of reference;
4. \$100 application fee;
5. test results (GRE, TOEFL).

All information is to be submitted directly to the Pathology Teaching Office.

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

#### 11.15.4 Pathology Faculty

##### Chair

D. Haegert

##### Director of Graduate Program

E. Zorychta

##### Professors

M.N. Burnier Jr.; M.D., M.Sc., Ph.D.(Brazil)

A.M.V. Duncan; B.Sc.(Qu.), Ph.D.(Edin.)

A. Ferenczy; B.A., B.Sc., M.D.(Montr.)

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

D. Haegert; M.D.(Br. Col.), F.R.C.P.(C)

Q.A. Hamid; M.D.(Mosul), Ph.D.(Lond.) (*James McGill Professor*) (*joint appt. with Medicine*)

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

J.B. Richardson; B.Sc., M.D.,C.M., Ph.D.(McG.), F.R.C.P.(C)

A. Spatz; M.Sc., M.D.(Paris)

##### Associate Professors

L. Alpert; M.D., Ph.D.(Tufts)

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

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

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

M.L. Brisson; B.A.(Paris), B.Sc., M.D.(Montr.)

B. Case; B.Sc., M.D.,C.M., M.Sc.(McG.), Dipl. Occ. Hyg., F.R.C.P.(C)

M.F. Chen; M.B., B.S.(Monash), F.R.C.P.(C)

T. Haliotis; M.D.(Greece), Ph.D.(Qu.), F.R.C.P.(C)

E. Lamoureux; B.Sc., M.D.(Montr.), F.R.C.P.(C)

R. Onerheim; M.D.(Alta.), F.R.C.P.(C)

L. Rochon; M.D.(Sher.), F.R.C.P.(C)

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

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

E. Zorychta; B.Sc.(St. FX), M.Sc., Ph.D.(McG.)

##### Assistant Professors

S. Albrecht; M.D.(Sher.), F.R.C.P.(C)

O. Aleynikova; M.D.(Dal.), F.R.C.P.(C)

R.D. Amre; M.B.B.S.(India), F.R.C.P.(C)

K. Bakdounes; M.D.(Damascus), F.R.C.P.(C)

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

G.A. Brandao; M.D.(Brazil)

F. Brimo; M.D.(Damascus), F.R.C.P.(C)

**Assistant Professors**

D. Caglar; M.D.(Turkey)  
 P.J. Chauvin; M.Sc.(W. Ont.), D.D.S.(McG.)  
 A. Gologan; M.D.(Romania)  
 B.F. Fernandes; M.D., Ph.D.(Brazil)  
 M.-C. Guiot; B.Sc., M.D.(Bordeaux)  
 S.-M. Jung; M.D.(Korea)  
 Y. Kanber; M.D.(Turkey)  
 J. Lavoie; B.Sc., M.Sc., Ph.D.(Laval)  
 H.R. Lopez-Valle; M.D.(Mexico)  
 A.T. Marcus; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C)  
 V.A. Marcus; M.D.,C.M.(McG.), F.R.C.P.(C)  
 A. Nahal; M.D.(Aleppo)  
 V.-H. Nguyen; M.D.(Montr.), F.R.C.P.(C)  
 A. Omeroglu; M.D.(Istanbul)  
 G. Omeroglu-Altinel; M.D.(Istanbul)  
 D. Pilavdzic; M.D.(Zagreb), F.R.C.P.(C)  
 S. Sandhu; M.B., B.S.(India)  
 H. Srolovitz; B.Sc.(Pitt.), M.D.(Basel)  
 J. St. Cyr; M.D.,C.M.(McG.), F.R.C.P.(C)

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

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

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

**Thesis Courses (30 credits)**

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

**Required Courses (6 credits)**

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

**Complementary Courses (9 credits)**

3 credits, one of the following courses:

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

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

### 11.15.6 Doctor of Philosophy (Ph.D.); Pathology

#### Thesis

Candidates will be evaluated primarily on their ability to conduct independent research and submit a thesis, which must be defended orally. They must also complete the courses listed below and any additional courses considered necessary by their research director or the Graduate Students Committee.

#### Required Courses (12 credits)

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

#### Complementary Courses (9 credits)

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

---

### 11.16 Pharmacology and Therapeutics

#### 11.16.1 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.medicine.mcgill.ca/pharma](http://www.medicine.mcgill.ca/pharma)

#### 11.16.2 About Pharmacology and Therapeutics

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

The Department also offers the Chemical Biology Interdisciplinary Graduate Option, together with the Departments of Biochemistry and Chemistry. Students interested in training in this option must first be accepted for graduate studies by one of the participating departments. Information on this option can be found at: [www.mcgill.ca/biochemistry/chemicalbiology](http://www.mcgill.ca/biochemistry/chemicalbiology).

Pharmacology is a multidisciplinary science that deals with all aspects of drugs and their interactions with living organisms. Thus, pharmacologists study the physical and chemical properties of drugs, their biochemical and physiological effects, mechanisms of action, pharmacokinetics, and therapeutic and other uses. The Department offers broad exposure and training in both basic and clinical research in a range of areas of specialty, including neuropharmacology, reproductive, endocrine, receptor, cardiovascular, cancer, developmental, autonomic, clinical, and biochemical pharmacology, molecular biology, and toxicology.

The present 52 full and affiliate members of the Department have research laboratories located in the McIntyre Medical Sciences Building and in a variety of hospitals, institutes, and industry including the Douglas Hospital Research Centre, Allan Memorial Institute, Montreal Children's Hospital, Montreal General Hospital, Royal Victoria Hospital, Montreal Heart Institute, Lady Davis Research Institute, Pfizer Canada, and Merck Frosst Canada Inc. The participation of researchers from both industry and government ensures the relevance of the Department's applications-oriented training programs.

#### *section 11.16.5: Master of Science (M.Sc.); Pharmacology (Thesis) (45 credits)*

The objective of the M.Sc. (Thesis) and Ph.D. degree training programs is to provide in-depth independent research experience in a specific area of pharmacology.



**section 11.16.6: Master of Science (M.Sc.); Pharmacology (Thesis) — Chemical Biology (47 credits)**

The Chemical Biology Thematic Group is engaged in a diverse range of research topics that span structural biology, enzymology, nucleic acid research, signalling pathways, single molecule biophysics, and biophysical chemistry of living tissues. Among the themes that unite the research being performed in this group is trying to learn new chemistry and physics from biological systems.

We have projects relating to pharmaceutically relevant enzymes such as those involved in drug metabolism and antibiotic resistance; development of therapeutic agents in the control of inflammation, cancer, and viral infections; the chemical biology of NO; quantification of bioenergetic markers of metabolism; self-assembly mechanisms of the HIV-1 virion capsid; liposome microarray systems to address membrane protein dynamics and recognition; studies on reactive oxygen species translocation across the aqueous/lipid membrane interface; RNAi/antisense technologies; dynamic combinatorial chemistry; protein dynamics and function; mechanistic aspects involved in cellular adhesion and transport in membrane and zeolite channels; and cutting-edge microscopes used to examine transport, motility, and reactivity in cells.

**section 11.16.7: Doctor of Philosophy (Ph.D.); Pharmacology**

The objective of the M.Sc. (Thesis) and Ph.D. degree training programs is to provide in-depth independent research experience in a specific area of pharmacology.

**section 11.16.8: Doctor of Philosophy (Ph.D.); Pharmacology — 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.

**11.16.3 Pharmacology and Therapeutics Admission Requirements and Application Procedures****11.16.3.1 Admission Requirements**

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

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

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

**Admissions Requirements – Chemical Biology Option**

As for the regular graduate programs of the participating departments, acceptance into the Chemical Biology option consists of two steps:

1. Preliminary approval by the Department's Graduate Committee based on the student's transcript, references, and other documents submitted with the application. The criteria for assessment at this level are the same as for the regular graduate programs of the participating departments.
2. Acceptance by an individual research director. For students wishing to participate in the Chemical Biology option, the director must propose a research project for the student that provides training in the methods and philosophy of chemical biology. Project proposals are assessed by the Chemical Biology Program Committee.

**11.16.3.2 Application Procedures**

Applications will be considered upon receipt of:

1. completed official McGill University application form, available online at [www.mcgill.ca/gradapplicants/apply](http://www.mcgill.ca/gradapplicants/apply);
2. curriculum vitae including a statement of research interests;
3. two original transcripts sent directly from all universities attended;
4. two confidential letters of recommendation from professors or research-related employers (at least one should be from an academic known to the international scientific community). There is no "Standard Form". The letter must be printed on letterhead;

5. official GRE ([www.ets.org/gre](http://www.ets.org/gre)) and TOEFL ([www.ets.org/toefl](http://www.ets.org/toefl)) scores (not required of applicants from Canada).

Applications and all documents should be submitted directly to the Graduate Program Coordinator, Ms. Tina Tremblay, in the Department of Pharmacology.

#### Dates for Guaranteed Consideration

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program.

Please refer to our website ([www.medicine.mcgill.ca/pharma](http://www.medicine.mcgill.ca/pharma)) for complete deadlines.

### 11.16.4 Pharmacology and Therapeutics Faculty

#### Chair

H.H. Zingg

#### Graduate Program Director

G. Almazan

#### Emeritus Professors

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

B. Collier; Ph.D.(Leeds)

T. Sourkes; Ph.D.(C'neil)

#### Professors

G. Almazan; Ph.D.(McG.)

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

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

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

D. Maysinger; Ph.D.(USC)

P.J. McLeod; M.D.(Manit.), F.R.C.P.(C)

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

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

H. Saragovi; Ph.D.(Miami)

M. Szyf; Ph.D.(Hebrew)

J. Trasler; M.D.,C.M., Ph.D.(McG.)

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

#### Associate Professors

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

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

T. Hébert; Ph.D.(Tor.)

A. McKinney; Ph.D.(Ulster)

S. Nattel; M.D.,C.M.(McG.)

A.L. Padjen; M.D., Ph.D.(Zagreb)

E. Zorychta; Ph.D.(McG.)

#### Assistant Professors

G. Miller; Ph.D.(W. Ont.)

J. Tanny; Ph.D.(Harv.)

**Associate Members**

M. Alaoui-Jamali; Ph.D.(Sorbonne)

G. Batist; M.D.,C.M.(McG.)

M. Culty; Ph.D.(Fr.)

G. Di Battista; B.Sc., Ph.D.(Montr.)

L. Fellows; M.D., C.M.(McG.) Ph.D.(Oxf.)

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

S. Gauthier; M.D.(Montr.)

T. Geary; Ph.D.(Mich.)

B. Jean-Claude; Ph.D.(McG.)

S. Kimmins; Ph.D.(Dal.)

S. Laporte; Ph.D.(Sher.)

C. O'Flaherty; Ph.D.(Buenos Aires)

V. Pappadopoulis; Ph.D.(Univ. Pierre &amp; Marie Curie)

R. Prichard; Ph.D.(NSW)

R. Quirion; Ph.D.(Sher.)

S. Rousseau; Ph.D.(Laval)

Y. Shir; M.D.(Israel), Ph.D.(Johns Hop.)

L. Stone; Ph.D.(Minn.)

M. Ware; MBBS(West Indies)

T. P. Wong; Ph.D.(McG.)

**Adjunct Professors**

B. Allen, M. Bruno, S. Chemtob, J. Coull, Y. De Koninck, L. Garofalo, J.M.A. Laird, J. Mancini, K. Meerovitch, T. Sanderson

**11.16.5 Master of Science (M.Sc.); Pharmacology (Thesis) (45 credits)****Thesis Courses (24 credits)**

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

**Required Courses (9 credits)**

PHAR 601	(6)	Comprehensive
PHAR 712	(3)	Statistics for Pharmacologists

**Complementary Courses (12 credits)**

6 credits, from the following courses:

PHAR 562	(3)	General Pharmacology 1
PHAR 563	(3)	General Pharmacology 2

or, for students who have taken PHAR 562 and PHAR 563 as part of their undergraduate degree, they will register for the following course:

PHAR 697	(6)	Thesis Preparation 1
----------	-----	----------------------

6 credits, two 700-level PHAR courses.

### 11.16.6 Master of Science (M.Sc.); Pharmacology (Thesis) — Chemical Biology (47 credits)

#### Thesis Courses (24 credits)

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

#### Required Courses (9 credits)

PHAR 601	(6)	Comprehensive
PHAR 712	(3)	Statistics for Pharmacologists

#### Complementary Courses (14 credits)

2 credits, two of the following courses:

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

6 credits, from the following courses:

PHAR 562	(3)	General Pharmacology 1
PHAR 563	(3)	General Pharmacology 2

or, for students who have taken PHAR 562 and PHAR 563 as part of their undergraduate degree, they can be replaced with two of the following courses:

BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
CHEM 504	(3)	Drug Design and Development 2
CHEM 522	(3)	Stereochemistry
CHEM 591	(3)	Bioinorganic Chemistry
CHEM 621	(5)	Reaction Mechanisms in Organic Chemistry
CHEM 629	(5)	Organic Synthesis
CHEM 655	(4)	Advanced NMR Spectroscopy
PHAR 504	(3)	Drug Design and Development 2
PHAR 707	(3)	Topics in Pharmacology 6

3 credits, one of the following courses:

PHAR 702	(3)	Topics in Pharmacology 1
PHAR 703	(3)	Topics in Pharmacology 2

PHAR 704	(3)	Topics in Pharmacology 3
PHAR 705	(3)	Topics in Pharmacology 4
PHAR 706	(3)	Topics in Pharmacology 5
PHAR 707	(3)	Topics in Pharmacology 6

3 credits, one of the following courses:

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

### 11.16.7 Doctor of Philosophy (Ph.D.); Pharmacology

#### Thesis

Students must successfully complete, or be exempted from, the same courses as for the equivalent M.Sc. in Pharmacology, plus one additional 700-level graduate course (for a total of three).

### 11.16.8 Doctor of Philosophy (Ph.D.); Pharmacology — Chemical Biology

#### Thesis

#### Required Courses (13 credits)

BIOC 610	(1)	Seminars in Chemical Biology 1
BIOC 611	(1)	Seminars in Chemical Biology 3
BIOC 689	(1)	Seminars in Chemical Biology 2
BIOC 690	(1)	Seminars in Chemical Biology 4
PHAR 601	(6)	Comprehensive
PHAR 712	(3)	Statistics for Pharmacologists

#### Complementary Courses (14 credits)

6 credits, from the following courses:

PHAR 562	(3)	General Pharmacology 1
PHAR 563	(3)	General Pharmacology 2

or, for students who have taken PHAR 562 and PHAR 563 as part of their undergraduate degree, they can replace them with two of the following courses:

BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
CHEM 504	(3)	Drug Design and Development 2
CHEM 522	(3)	Stereochemistry
CHEM 591	(3)	Bioinorganic Chemistry
CHEM 621	(5)	Reaction Mechanisms in Organic Chemistry
CHEM 629	(5)	Organic Synthesis
CHEM 655	(4)	Advanced NMR Spectroscopy
PHAR 504	(3)	Drug Design and Development 2
PHAR 707	(3)	Topics in Pharmacology 6

two of the following courses:

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

one of the following courses:

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

---

## 11.17 Physiology

### 11.17.1 Location

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

Telephone: 514-398-4343  
Fax: 514-398-7452  
Website: [www.medicine.mcgill.ca/physio](http://www.medicine.mcgill.ca/physio)

### 11.17.2 About Physiology

The Physiology Department offers training leading to M.Sc. and Ph.D. degrees. The scope of the ongoing research, and close connections with the McGill teaching hospitals, offer excellent opportunities for collaborations with hospital-based scientists. Research in the Department covers a broad range of topics from systems neuroscience to molecular and cellular biology. Interests include studies of nuclear and membrane receptors, transporters, channels, and signal transduction pathways, to the broader integration of physiological systems (cardiovascular, respiratory, renal, endocrine, immune and central nervous systems) using an array of molecular and cellular approaches as well as quantitative techniques in data collection, analysis, and mathematical modeling by computational means. All graduate students in Physiology receive financial support. Any faculty member who agrees to supervise a student who does not hold a fellowship is obliged to provide financial support.

#### *section 11.17.5: Master of Science (M.Sc.); Physiology (Thesis) (49 credits)*

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

#### *section 11.17.6: Master of Science (M.Sc.); Physiology (Thesis) — Bioinformatics (49 credits)*

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

**section 11.17.7: Doctor of Philosophy (Ph.D.); Physiology**

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

**section 11.17.8: Doctor of Philosophy (Ph.D.); Physiology — Bioinformatics**

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

**11.17.3 Physiology Admission Requirements and Application Procedures****11.17.3.1 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 Graduate and Postdoctoral Studies, 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 transfer to the Ph.D. program after 12-18 months, following successful completion of all transfer requirements. 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.

The GRE General Test is required for anyone who does not have a degree from a North American University. TOEFL: 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.

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

**11.17.3.2 Application Procedures**

The GSAAC will only consider applications upon receipt of all of the following documentation:

1. online application form;
2. \$100 application fee;
3. personal statement;
4. CV;
5. two letters of reference, not more than six months old, from two professors printed on official letterhead;
6. two official copies of all university transcripts;
7. results of the GRE (Graduate Record Exam) General Test, for applicants whose undergraduate degree is not from a North American university;
8. results of the Test of English as a Foreign Language (TOEFL), minimum score of 600 on paper-based test (or 100 on the Internet-based test with each component score not less than 20); only those whose mother tongue is English, who graduated from a North American institution (anglophone or francophone), or who completed an undergraduate or graduate degree at a foreign institution where English is the language of instruction will be exempt from providing proof of competency in English.

Applications should be submitted to the Graduate Student Affairs Coordinator as early as possible in order to facilitate processing. However, no applications will be considered after the dates for guaranteed consideration.

**Dates for Guaranteed Consideration**

Interested candidates should refer to the Department's website [www.medicine.mcgill.ca/physio](http://www.medicine.mcgill.ca/physio) for dates for guaranteed consideration and other important information.

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

**11.17.4 Physiology Faculty****Chair**

John Orłowski

**Graduate Program Director**

Kathleen Cullen

**Emeritus Professors**

Thomas M.S. Chang; B.Sc., M.D.,C.M., Ph.D.(McG.), F.R.C.P.(C)

Kresmir Krnjevic; O.C., B.Sc., Ph.D., M.B., Ch.B.(Edin.), F.R.S.C.

Wayne S. Lapp; M.S.A.(Tor.), Ph.D.(McG.)

Mortimer Levy; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C) (*joint appt with Medicine*)

George Mandl; B.Sc.(C'dia); Ph.D.(McG.)

Geoffrey Melvill Jones; B.A., M.A., M.B., B.Ch., M.D.(Cant.)

Joseph Milic-Emili; M.D.(Milan)

**Professors**

Monroe W. Cohen; B.Sc., Ph.D.(McG.)

Ellis J. Cooper; B.Eng.(Sir G. Wms.), M.Sc.(Surr.), Ph.D.(McM.)

Kathleen Cullen; B.Sc.(Brown), Ph.D.(Chic.) (*William Dawson Scholar*)

Leon Glass; B.S.(Brooklyn), Ph.D.(Chic.) (*Rosenfield Professor of Medicine*)

Phil Gold; M.Sc., Ph.D., M.D.,C.M.(McG.), F.R.C.P.(C.) (*Douglas G. Cameron Professor of Medicine*)

David Goltzman; B.Sc., M.D.,C.M.(McG.), F.R.C.P.(C) (*Antoine G. Massabki Professor of Medicine*) (*joint appt. with Medicine*)

John Hanrahan; Ph.D.(Br. Col.)

Gergely Lukacs; M.D., Ph.D.(Budapest)

Michael Mackey; B.A., Ph.D.(Wash.) (*Drake Professor of Medicine*)

Jacapo P. Mortola; M.D.(Milan)

John Orłowski; B.Sc.(McG.), M.Sc., Ph.D.(Qu.) (*James McGill Professor*)

Premysl Ponka; M.D., Ph.D.(Prague)

Alvin Shrier; B.Sc.(C'dia), Ph.D.(Dal.) (*Hosmer Professor of Physiology*)

Douglas G.D. Watt; M.D., Ph.D.(McG.)

John White; B.Sc., M.Sc.(Car.), Ph.D.(Harv.), Sheldon Magder; M.D.(Tor) (*joint appt. with Medicine*)

**Associate Professors**

Erik Cook; Ph.D.(Baylor Coll., Tx)

Riaz Farookhi; B.Sc., M.Sc.(MIT), Ph.D.(Tufts)

Mladen Glavinovic; B.Sc.(Zagreb), M.Sc.(Tor.), Ph.D.(McG.)

Michael Guevara; Ph.D.(McG.)

Pejmun Haghighi; Ph.D.(McG.)

Sheldon Magder; M.D.(Tor.) (*joint appt. with Medicine*)

Julio Martinez-Trujillo; Ph.D.(Tubingen)

Ursula Stochaj; Ph.D.(Cologne)

Teresa Trippenbach; M.D., Ph.D.(Warsaw)

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

**Associate Professor - Part-Time**

Nicole Bernard; B.Sc.(McG.), Ph.D.(Duke)



**Assistant Professors**

Maurice Chacron; Ph.D.(Ott.)

Russell Jones; Ph.D.(Tor.)

**Associate Members***Anaesthesia:* Steven Backman, Fernando Cervero*Biochemistry:* Imed Gallouzi*Biomedical Engineering:* Robert Kearney, Satya Prakash*Electrical and Computer Engineering:* Sam Musallam*Kinesiology and Physical Education:* Dilson Rassier*Medicine:* Albert Aguauo, Volker Blank, Mark Blostein, Andrey Cybulsky, Abraham Fuks, Claude Gagnon, Raymond Gagnon, Harry L. Goldsmith, Geoffrey Hendy, Louise Larose, Anne-Marie Lauzon, James Martin, Shree Mulay, Mariana Newkirk, Barry Posner, Shafaat Rabbani, Mary Stevenson, Simon Wing, Hans Zingg*Nephrology:* Serge Lemay, Tomoko Takano*Neurology:* David Ragsdale*Neurology and Neurosurgery:* Jack Antel, Massimo Avoli, Charles Bourque, Sal Carbonetto, Daniel Guitton, Christopher Pack, Melissa Vollrath*Ophthalmology:* Curtis Baker*Otolaryngology:* Bernard Segal*Pediatrics:* Charles Rohlicek*Pharmacology:* Terence Hebert*Psychiatry:* Nicolas Cermakian, Bernardo Dubrovsky, Christina Gianoulakis**Adjunct Professors**

Roy Caplan, Pierre Drapeau, John Milton, Malmur Sairam, Peter Swain

**11.17.5 Master of Science (M.Sc.); Physiology (Thesis) (49 credits)****Thesis Courses (30 credits)**

PHGY 621	(12)	Thesis 1
PHGY 622	(15)	Thesis 2
PHGY 623	(3)	M.Sc. Seminar

**Required Courses (13 credits)**

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

**Elective Courses (6 credits)**

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

**11.17.6 Master of Science (M.Sc.); Physiology (Thesis) — Bioinformatics (49 credits)****Thesis Courses (30 credits)**

PHGY 621	(12)	Thesis 1
PHGY 622	(15)	Thesis 2
PHGY 623	(3)	M.Sc. Seminar

**Required Courses (16 credits)**

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar
PHGY 601	(1)	M.Sc. Proposal Seminar
PHGY 602	(3)	Literature Search and Research Proposal
PHGY 603	(3)	Systems Biology and Biophysics
PHGY 607	(3)	Laboratory Research 1
PHGY 608	(3)	Laboratory Research 2

**Complementary Courses (3 credits)**

3 credits to be chosen from the following:

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

**11.17.7 Doctor of Philosophy (Ph.D.); Physiology****Thesis****Required Courses (9 credits)**

PHGY 701	(0)	Ph.D. Comprehensive Examination
PHGY 702	(1)	Ph.D. Proposal
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)**

Students are required to take an additional three courses of Physiology or Science at the 500 level or above, in consultation with the GSAAC and the candidate's supervisor.

**11.17.8 Doctor of Philosophy (Ph.D.); Physiology — Bioinformatics****Thesis****Required Courses (15 credits)**

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar
PHGY 603	(3)	Systems Biology and Biophysics
PHGY 701	(0)	Ph.D. Comprehensive Examination
PHGY 702	(1)	Ph.D. Proposal
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 Course (3 credits)

One course to be chosen from the following courses:

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

## 11.18 Psychiatry

### 11.18.1 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.med.mcgill.ca/psychiatry](http://www.med.mcgill.ca/psychiatry)

### 11.18.2 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 plus 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 plus animal models, and benefits from expertise ranging from neuroimaging and epigenetics to mental health services and public policy, remaining at the cutting edge of research on health, disease, and recovery.

**Master of Science (M.Sc.), *ad hoc* Ph.D.**

#### *section 11.18.5: 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. The graduate program does not provide clinical training.

### 11.18.3 Psychiatry Admission Requirements and Application Procedures

#### 11.18.3.1 Admission Requirements

- A B.Sc., B.A., B.N., or M.D. degree.
- A strong background in science and/or social science, as demonstrated by academic achievement equivalent to a GPA of 3.3 (on a 4 point scale) or 3.5 in the last two years.
- A written agreement from the proposed research supervisor, and student's statement of purpose for seeking an M.Sc.
- An outline of the proposed thesis research, to be written by the prospective student in collaboration with an appropriate research supervisor.
- Two letters of reference.
- Certified proficiency in written English or French.

#### 11.18.3.2 Application Procedures

Applications will be considered upon delivery of the following to the Graduate Program Coordinator:

1. a completed application form;
2. CAD\$100 application fee;
3. two official transcripts of all university studies;
4. a written Confirmation of Supervision form (see Department website) from the proposed research supervisor;
5. a written statement of purpose, describing the specific reasons for seeking a Master of Science degree in Psychiatry;
6. an outline of the proposed thesis research, to be written by the prospective student in collaboration with an appropriate research supervisor;
7. two letters of reference with Applicant Evaluation checklist forms (see Department website);
8. 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 550 on the written TOEFL test, or 86 on the Internet-based test, with each component score not less than 20, or 6.5 on the IELTS test.

#### Dates for Guaranteed Consideration

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program. McGill's online application form for graduate program candidates is available at [www.mcgill.ca/gradapplicants/apply](http://www.mcgill.ca/gradapplicants/apply).

### 11.18.4 Psychiatry Faculty

#### Chair

M. Israël

#### Vice Chairs

G. Turecki – *Research*

D. Charney – *Education*

#### Chair of Graduate Program

M. Leyton

#### Emeritus Professors

B.E. Murphy; M.D.(Tor.), Ph.D.(McG.)

L. Sourkes; M.Sc.(McG.), Ph.D.(C'nell)

#### Professors

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

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

A. Bechara; Ph.D.(Tor.)

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

**Professors**

P. Boksa; B.Sc., Ph.D.(Montr.)  
 E. Fombonne; M.D.(Paris)  
 N. Frasure-Smith; B.A., Ph.D.(Johns Hop.)  
 S. Gauthier; B.A., M.D.(Montr.)  
 A. Gratton; Ph.D.(C'dia)  
 L.T. Hechtman; B.Sc., M.D.,C.M.(McG.)  
 L.J. Kirmayer; B.Sc., M.D.,C.M., Dipl.Psych.(McG.) (*James McGill Professor*)  
 M.J. Meaney; B.A.(Loyola), M.A., Ph.D.(C'dia) (*James McGill Professor*)  
 V.N.P. Nair; M.B., B.S.(Kerala), D.P.M.(Mys.)  
 R. Palmour; B.A., Ph.D.(Texas)  
 J. Paris; M.D.,C.M.(McG.)  
 J.C. Perry; M.D.(Duke)  
 J. Poirier; Ph.D.(Montr.)  
 R. Quirion; B.Sc., M.Sc., Ph.D.(Sher.)  
 H. Steiger; Ph.D.(McG.)  
 C.-D. Walker; B.Sc., Ph.D.(Geneva)  
 A. Young; B.A., M.A., Ph.D.(Penn.)  
 S.N. Young; B.A.(Oxf.), M.Sc., Ph.D.(Lond.)

**Associate Professors**

S. Beaulieu; M.D./Ph.D.(Laval)  
 D. Boivin; Ph.D.(Montr.)  
 A. Brunet; Ph.D.(Montr.)  
 N. Cermakian; B.Sc.(UQTR), M.Sc., Ph.D.(Montr.)  
 D. Charney; M.D.,C.M.(McG.)  
 A. Crocker; Ph.D.(Montr.) (*William Dawson Scholar*)  
 J.B. Debruille; M.D.(Paris), Ph.D.(Univ. Pierre et Marie Curie)  
 B.O. Dubrovsky; M.D.(Buenos Aires)  
 M.-J. Fleury; M.A., Ph.D.(Montr.)  
 G. Galbaud du Fort; M.D., Ph.D.(Paris) (*joint appt. with Epidemiology and Biostatistics*)  
 K.G. Gill; B.Sc.(Br. Col.), M.A., Ph.D.(C'dia)  
 G. Gobbi; M.D.(Rome), Ph.D.(Cagliari, Italy)  
 I. Gold; Ph.D.(Princ.)  
 B. Greenfield; M.D.(Wash.)  
 D. Groleau; B.Sc., M.Sc., Ph.D.(Montr.)  
 J. Guzder; M.D.,C.M.(McG.)  
 R. Joobar; M.D.(France), Ph.D.(Tunisia)  
 S. King; M.Ed., Ed.S.(James Madison Univ.), Ph.D.(Virginia Poly. Inst.)  
 E. Latimer; B.A.Sc.(Wat.), M.S., Ph.D.(Carn. Mell)  
 M. Lepage; B.A.(C'dia), Ph.D.(UQAM)  
 M. Leyton; Ph.D.(C'dia) (*William Dawson Scholar*)  
 K. Looper; B.Sc., M.D.(Ott.), M.Sc.(McG.)

**Associate Professors**

G. Luheshi; Ph.D.(Newcastle, U.K.) (*William Dawson Scholar*)  
 G. Myhr; M.D.,C.M., M.Sc.(McG.)  
 D. Pedersen; M.D.(Buenos Aires)  
 M. Perreault; Ph.D.(Montr.)  
 J. Pruessner; Ph.D.(Univ. Trier)  
 M.N. Rajah; B.Sc., M.A., Ph.D.(Tor.)  
 A. Raz; M.Sc., Ph.D.(Hebrew)  
 J. Renaud; M.Sc., M.D.(Montr.)  
 J. Rochford; M.A.(Qu.), Ph.D.(C'dia)  
 C. Rousseau; M.D.(Sher.), M.Sc.(McG.)  
 L.K. Srivastava; B.Sc., M.Sc.(Alld.), Ph.D.(New Delhi)  
 G. Turecki; M.D.(Brazil), Ph.D.(McG.) (*William Dawson Scholar*)  
 S. Williams; Ph.D.(Montr.)  
 P. Zelkowitz; Ph.D.(McG.)  
 M. Zoccolillo; B.Sc.(New Orleans), M.D.(Norfolk)

**Assistant Professors**

J. Armony; Ph.D.(NYU)  
 L. Beauclair; B.Sc., M.D.(Laval)  
 P. Beaudry; M.D.(Sher.), Dipl.Psych.(McG.)  
 D. Bloom; B.Sc.(Regina), M.D.(Qu.)  
 V. Bohbot; Ph.D.(Ariz.)  
 T.G. Brown; Ph.D.(C'dia)  
 D.M. Dunkley; B.Sc.(Tor.), Ph.D.(McG.)  
 C. Flores; Ph.D.(C'dia)  
 Y. Goto; B.S.(Tokyo), M.Sc., Ph.D.(Albany)  
 R. Gruber; B.A., M.S., Ph.D.(Tel Aviv)  
 G.E. Jarvis; B.M.S., M.D.(Alta.)  
 F. Jollant; M.D.(Paris), M.Sc., Ph.D.(Montpellier)  
 E. Loucks; B.Sc., Ph.D.(Br. Col.)  
 N.C.P. Low; M.D., M.Sc.(McG.)  
 A. Malla; Ph.D.(W. Ont.)  
 T. Measham; B.Sc., M.D.(McG.)  
 N. Mechawar; B.Sc., M.Sc., Ph.D.(Montr.)  
 L. Nadeau; M.D.(Montr.)  
 M. Piat; Ph.D.(Laval)  
 R. Rodriguez; M.D., MPH(Spain), Ph.D.(Montr.)  
 N. Schmitz; Ph.D.(Univ. Dortmund)  
 B. Thombs; B.S.(N'western), M.A.(Ariz.), Ph.D.(NYU)  
 A. Wazana; B.A.(McM.), M.Sc.(Col.), M.Sc.(McG.), M.D.(McM.)  
 R. Whitley; B.S., M.S., Ph.D.(Lond)  
 T.P. Wong; B.Sc.(HK), Ph.D.(McG.)

**Associate Member**R.O. Pihl (*Psychology*)**Adjunct Professors**

P. Blier, L. Gaston, C. Mercier, S. Welner

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

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

**Thesis Courses (36 credits)**

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

**Complementary Courses (9 credits)**

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

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

**11.19 Surgical Research****11.19.1 Location**

Division of Surgical Research, Department of Surgery  
 Montreal General Hospital, Room C9-160  
 1650 Cedar Avenue  
 Montreal, QC H3G 1A4  
 Canada

Telephone: 514-934-1934 ext. 42837

Fax: 514-934-8289

Email: [gradstudies.surgery@mcgill.ca](mailto:gradstudies.surgery@mcgill.ca)

Website: [www.surgery-research.mcgill.ca](http://www.surgery-research.mcgill.ca)

**11.19.2 About Surgical Research**

The Department of Surgery offers graduate programs leading to M.Sc. and Ph.D. degrees, and a Graduate Diploma in Surgical Health Care Research. The Division of Surgical Research is responsible for the administration of the graduate programs and allows excellent opportunities for training under the supervision of professors located in the Research Institutes of the different McGill teaching hospitals. The scope of the research and close connections with other centres and departments of McGill provide ample opportunities for collaboration. The research in the Department covers a broad range of topics from repair and regeneration to cancer cell biology and sexual dysfunction. Research interests include studies of wound healing, scarring and skin tissue engineering, receptors and signal transduction pathways, cartilage repair and osteoarthritis, islet cell differentiation and islet transplantation, tissue engineering of cardiac muscle, immunopathogenesis of liver xenograft rejection; osteoinduction and biomechanics; sepsis and multi-organ failure; biology of cancer; sexual dysfunction and prostate cancer; and surgical health outcomes.

A list of research directors and a description of their research topics, as well as application forms may be obtained from our website ([www.surgery-research.mcgill.ca](http://www.surgery-research.mcgill.ca)).

**section 11.19.5: Master of Science (M.Sc.); Experimental Surgery (Thesis) (Surgical Research) (48 credits)**

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

**section 11.19.6: Doctor of Philosophy (Ph.D.); Experimental Surgery (Surgical Research)**

The doctoral program is intended for students with excellent academic standing who wish to pursue research-focused careers in academia, medical field, or industry. Thesis projects available in the various laboratories of the Department are multidisciplinary and provide in-depth training ensuring that students are exposed to a broad spectrum of research projects and experimental approaches.

**section 11.19.7: Graduate Diploma in Surgical Health Care Research (30 credits)**

The graduate diploma program is open to all graduate students in the Division of Surgical Research, but is specifically designed for surgical residents who have allotted time during their residency training. The intention of the program is to train students to become researchers in the interdisciplinary field of surgical health outcome. The students will receive training strategies for experimental design, analysis of data sets, modeling techniques, and use of algorithms and statistics. Upon completion of this program, students are expected to be proficient in the concepts, language, approaches, and limitations of the field.

**11.19.3 Surgical Research Admission Requirements and Application Procedures****11.19.3.1 Admission Requirements****M.Sc. Program**

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

**Ph.D. Program**

Admission is usually from the M.Sc. program either upon completion of the M.Sc. degree, or by transfer from the first year of M.Sc. to the second year of Ph.D. studies. Request for such transfer is to be made in writing by the thesis supervisor during the candidate's first year of M.Sc. studies, not later than March 30 for students enrolled in September, or October 15 for those registered in January. The student must then apply for admission to the Ph.D. program in order to effect the transfer. **Transfer is granted on the basis of an examination administered by the student's Research Supervisory Committee.** Exceptional students with a minimum 3.5/4.0 CGPA may apply directly to the Ph.D. program. Students must apply for admission to transfer to the Ph.D. by the date for guaranteed consideration.

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

**Graduate Diploma in Surgical Health Care Research**

The program is open to all graduate students in the Division of Surgical Research, but is specifically designed for surgical residents who have allotted time during their residency training. To be accepted into the Graduate Diploma program, students must be accepted into the Division of Surgical Research; fulfil the minimum requirements for admission to Graduate and Postdoctoral Studies; identify an acceptable and feasible research project; and identify an accredited faculty member willing to support the research and supervise the student.

**11.19.3.2 Application Procedures**

Applicants must apply online to Graduate and Postdoctoral Studies at [www.mcgill.ca/gradapplicants/apply](http://www.mcgill.ca/gradapplicants/apply). Furthermore, they are to submit the required supporting documents including a brief curriculum vitae and a short description of the proposed thesis research (prepared by the student and/or the prospective research director). A letter of intent and a memorandum of agreement are also required from the prospective supervisor. Two copies of all academic transcripts and two letters of recommendation must be mailed directly to the Department. When applicable, official proof of English language proficiency (e.g., TOEFL scores) must be submitted.

**Dates for Guaranteed Consideration**

For dates for guaranteed consideration, please consult the following website: [www.mcgill.ca/gradapplicants/programs](http://www.mcgill.ca/gradapplicants/programs). Then select the appropriate program.

**11.19.4 Surgical Research Faculty****Director**

L. Rosenberg



**Associate Director**

A. Philip

**Administrative & Student Affairs Coordinator**

514-934-1934 ext. 42837

**Professors**

J.D. Bobyn; B.Sc., M.Sc.(McG.), Ph.D.(Tor.)  
 P. Brodt; B.Sc.(Bar-Ilan), M.Sc.(Ott.), Ph.D.(McG.)  
 R.C.-J. Chiu; M.B.(Taiwan), Ph.D.(McG.)  
 N.V. Christou; B.Sc., M.Sc., Ph.D., M.D.,C.M.(McG.)  
 M.M. Elhilali; M.B., B.Ch., D.S., DU, M.Ch.(Cairo), Ph.D.(McG.)  
 G.M. Fried; B.Sc., M.D.,C.M.(McG.)  
 C. Gagnon; B.Sc., M.Sc., Ph.D.(Montr.)  
 F. Glorieux; M.D.(Louvain), M.Sc.(Montr.), Ph.D.(McG.)  
 P.H. Gordon; M.D.(Sask.)  
 J.E. Henderson; Ph.D.(McG.)  
 J.M. Laberge; M.D.(Laval)  
 D.S. Mulder; M.D.(Sask.), M.Sc.(McG.)  
 L. Rosenberg; M.Sc., M.D., Ph.D.(McG.)  
 P.J. Roughley; B.Sc., Ph.D.(Nott.)  
 R. St. Arnaud; Ph.D.(Laval)  
 M. Tanzer; M.D.,C.M.(McG.), F.R.C.S.(C)  
 C.I. Tchervenkov; B.Sc., M.D.,C.M.(McG.), F.R.C.S.(C)  
 H.B. Williams; B.A.(Acad.), M.D.,C.M.(McG.)

**Associate Professors**

J. Antoniou; M.D.,C.M., Ph.D.(McG.), F.R.C.S.(C)  
 J. Barkun; M.D., M.Sc.(McG.)  
 O. Blaschuk; B.Sc.(Winn.), M.Sc.(Manit.), Ph.D.(Tor.)  
 S. Chevalier; B.Sc., M.Sc., Ph.D.(Montr.)  
 S. Emil; M.D.,C.M.(McG.), F.R.C.S.(C)  
 L. Feldman; M.D.,C.M., M.Sc.(McG.)  
 D. Fleiszer; B.Sc., M.D.,C.M.(McG.)  
 R.C. Hamdy; M.Sc, M.D.(Egypt), F.R.C.S.(C)  
 E. Harvey; B.Sc.(Ont.) M.D.,C.M., M.Sc.(McG.)  
 K.J. Lachapelle; M.Sc., M.D.,C.M.(McG.)  
 L. Lessard; B.Sc., M.D.(Laval), F.R.C.S.(C)  
 S. Meterissian; M.D.,C.M., M.Sc.(McG.)  
 P. Metrakos; B.Sc., M.D.(McG.), F.R.C.S.(C)  
 J.S. Mort; B.Sc.(McG.), Ph.D.(McM.)  
 A. Philip; M.Sc., Ph.D.(McG.)  
 P. Puligandla; M.D., M.Sc.(W. Ont.), F.R.C.S.(C)  
 J. Sampalis; M.Sc., Ph.D.(McG.)

**Associate Professors**

D. Shum-Tim; M.Sc., M.D.,C.M.(McG.)  
 T. Steffen; M.D.(Switz.), Ph.D.(McG.)  
 T. Taketo-Hosotani; B.Sc., M.Sc., Ph.D.(Kyoto)  
 J.I. Tchervenkov; M.D.,C.M.(McG.), F.R.C.S.(C)  
 R. Turcotte; M.D.(Montr.)  
 D. Zukor; B.Sc., M.D.,C.M.(McG.)

**Assistant Professors**

M. Basik; M.D.,C.M.(McG.)  
 S. Bergman; M.Sc., M.D.,C.M.(McG.), F.R.C.S.(C)  
 J. Chen; B.Sc.(Chin. Acad. Sci.), Ph.D.(Guelph)  
 M. Chevrette; B.Sc., M.Sc., Ph.D.(Laval)  
 N. Eliopoulos; B.Sc.(McG.), M.Sc., Ph.D.(Montr.)  
 J. Faria; M.D.,C.M., M.Sc.(McG.), F.R.C.S.(C)  
 L. Ferri; M.D.,C.M., M.Sc.(McG.)  
 S. Fraser; B.Sc., M.D.(Tor.), M.Sc.(McG.), F.R.C.S.(C)  
 O. Huk; B.Sc., M.D.,C.M.(McG.), M.Sc.(Montr.)  
 P. Jarzem; B.Sc., M.D.(Qu.)  
 J. Lapointe; M.D., Ph.D.(Laval)  
 E. Lee; B.A.(Boston), M.Sc., Ph.D.(McG.)  
 S. Paraskevas; M.D., Ph.D.(McG.)  
 M. Petropavlovskaja; M.Sc., Ph.D.(Moscow)  
 A.D. Recklies; B.Sc.(McG.), Ph.D.(McM.)  
 K. Shaw; M.D.,C.M., M.Sc.(McG.)

**11.19.5 Master of Science (M.Sc.); Experimental Surgery (Thesis) (Surgical Research) (48 credits)****Thesis Courses (33 credits)**

EXSU 690	(4)	M.Sc. Research 1
EXSU 691	(4)	M.Sc. Research 2
EXSU 692	(4)	M.Sc. Research 3
EXSU 693	(21)	M.Sc. Thesis

**Required Courses (12 credits)**

EXSU 601	(6)	Knowledge Management
EXSU 605	(3)	Biomedical Research Innovation
EXSU 606	(3)	Statistics for Surgical Research

**Complementary Courses (3 credits)**

3 credits, one graduate-level course in the student's specialty, selected in consultation with the Research Supervisory Committee.

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

**11.19.6 Doctor of Philosophy (Ph.D.); Experimental Surgery (Surgical Research)****Thesis****Required Courses (12 credits)**

EXSU 601	(6)	Knowledge Management
EXSU 605	(3)	Biomedical Research Innovation
EXSU 606	(3)	Statistics for Surgical Research
EXSU 700	(0)	Comprehensive Examination

**Complementary Course (3 credits)**

One graduate-level course in the student's specialty, selected in consultation with the Research Supervisory Committee.

**11.19.7 Graduate Diploma in Surgical Health Care Research (30 credits)****Project (9 credits)**

EXSU 637	(9)	Research Project
----------	-----	------------------

**Required Courses (9 credits)**

EXSU 601	(6)	Knowledge Management
EXSU 606	(3)	Statistics for Surgical Research

**Complementary Courses (12 credits)**

At least 3 credits from the following courses:

EPIB 631*	(2)	Pharmacoepidemiology 2
EPIB 633*	(2)	Pharmacoepidemiology 1
EPIB 656	(3)	Health Care Technology Assessment
EPIB 679	(3)	Special Topics 10
EXMD 631	(3)	Topics in Economic Evaluation

Note: EPIB 631 and EPIB 633 must be taken in tandem for a total of four credits.

At least 9 credits from the following courses:

EPIB 601	(4)	Fundamentals of Epidemiology
EPIB 607	(4)	Inferential Statistics
EPIB 610	(3)	Advanced Methods: Causal Inference
EPIB 631*	(2)	Pharmacoepidemiology 2
EPIB 633*	(2)	Pharmacoepidemiology 1
EPIB 643	(1)	Substantive Epidemiology 3
EPIB 655	(3)	Epidemiology in Public Health
EPIB 668	(2)	Special Topics 1
EXMD 631	(3)	Topics in Economic Evaluation
POTH 630	(3)	Measurement: Rehabilitation 2

Note: EPIB 631 and 633 must be taken in tandem for a total of four credits.