



Interfaculty Studies

Pr

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.

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

1 . McGill University reserves the right to mak

Publication Information

Published by

Enrolment Services

McGill University
3415 McTavish Street
Montreal, Quebec, H3A 0C8
Canada

All contents copyright © 2021 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://horizon.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 7
- 2 Graduate and Postdoctoral Studies, page 7
 - 2.1 Administrativ

-
- 12.3 Quantitative Life Sciences, page 26
 - 12.3.1 Location, page 26
 - 12.3.2 About Quantitative Life Sciences, page 26
 - 12.3.3 Quantitative Life Sciences Admission Requirements and Application Procedures, page 26
 - 12.3.3.1 Admission Requirements, page 26
 - 12.3.3.2 Application Procedures, page 26
 - 12.3.3.3 Application Dates and Deadlines, page 26
 - 12.3.4 Quantitative Life Sciences Faculty, page 27
 - 12.3.5 Doctor of Philosophy (Ph.D.) Quantitative Life Sciences , page 29

1 Dean's Welcome

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

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

Josephine Nalbantoglu, Ph.D.

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

2 Graduate and Postdoctoral Studies

2.1 Administrative Officers

Administrative Officers

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

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

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

Associate Dean (Graduate and Postdoctoral Studies)

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

Associate Dean (Graduate and Postdoctoral Studies)

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

Associate Dean (Graduate and Postdoctoral Studies)

2.2 Location

James Administration Building, Room 400

845 Sherbrooke Street West

Montreal QC H3A 0G4

Website: mcgill.ca/gps



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

2.3 Graduate and Postdoctoral Studies' Mission

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

3 Important Dates

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

4 Graduate Studies at a Glance

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

8.2 Guidelines and Policy for Academic Units on Postdoctoral Education

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

1. Definition and Status

- i. Postdoctoral status will be recognized by the University in accordance with Quebec provincial regulations as may be modified from time to time. The eligibility period for postdoctoral status is up to five years from the date when the Ph.D. or equivalent degree was aw

- i. Postdocs are subject to the responsibilities outlined at mcgill.ca/students/srr and must abide by the policies listed at mcgill.ca/secretariat/policies-and-regulations.
- ii. Each academic unit hosting postdocs should clearly identify postdocs' needs and the means by which they will be met by the unit.
- iii. Each academic unit should assess the availability of research supervision facilities, office space, and research funding before recruiting postdocs.
- iv. Some examples of the responsibilities of the academic unit are:
 - to verify the postdoc's eligibility period for registration;
 - to provide postdocs with departmental policy and procedures that pertain to them;
 - to facilitate the registration and appointment of postdocs;
 - to assign departmental personnel the responsibility for postdoctoral affairs in the unit;
 - to oversee and sign off on the Letter of Agreement for Postdoctoral Education;
 - to ensure that each postdoc has a supervisor, lab and/or office space, access to research operating costs and necessary equipment;
 - to include postdocs in departmental career and placement opportunities;
 - to refer postdocs to the appropriate University policies and personnel for the resolution of conflict that may arise between a postdoc and a supervisor.
- v. Some examples of the responsibilities of the supervisor are:
 - to uphold and transmit to their postdocs the highest professional standards of research and/or scholarship;
 - to provide research guidance;
 - to meet regularly with their postdocs;
 - to provide feedback on research submitted by the postdocs;
 - to clarify expectations regarding intellectual property rights in accordance with the University's policy;
 - to provide mentorship for career development;
 - to prepare, sign, and adhere to a Letter of Agreement for Postdoctoral Education.
- vi. Some examples of the responsibilities of postdocs are:
 - to inform themselves of and adhere to the University's policies and/or regulations for postdocs as outlined at mcgill.ca/gps/postdocs, mcgill.ca/students/srr and the Graduate and Postdoctoral Studies *University Regulations and Resources* 2018, 270 1 p22.3e4a3 > ly8.48.4see
 - to submit a complete file for registration to Enrolment Services;
 - to sign and adhere to their Letter of Agreement for Postdoctoral Education;
 - to communicate regularly with their supervisor;
 - to inform their supervisor of their absences.
- vii. Some examples of the responsibilities of the University are:
 - to register postdocs;
 - to provide an appeal mechanism in cases of conflict;
 - to provide documented policies and procedures to postdocs;
 - to provide postdocs with the necessary information on McGill University student services (Postdoctoral Fellows and Scholars) and HR policies and guidelines (Postdoctoral Researchers).

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

8.3 Vacation Policy for Graduate Students and Postdocs

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

Council of FGSR April 23, 1999

8.4 Leave of Absence for Health and Parental/Familial Reasons

A leave of absence may be granted for maternity or parental reasons or for health reasons (see

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

12.1.2 About Biological and Biomedical Engineering

Biological and Biomedical Engineering (BBME) is an interfaculty graduate program administered jointly by the Departments of Bioengineering (Faculty of Engineering) and Biomedical Engineering (Faculty of Medicine and Health Sciences) at McGill. Through its interdisciplinary nature, the program is devised to accommodate extensive research areas and training with over 60 world-renowned scientists, as well as to equip students for promising careers in industry, healthcare, academia, and government. As researchers in this field unravel the molecular and physiological mechanisms of biology, develop increasingly advanced technologies to transform healthcare, or attempt to reverse-engineer naturally occurring biological solutions, devices, and procedures, graduates of the BBME program are poised to play a critical role in shaping our global future.

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

Research Domains

Ongoing biological and biomedical engineering research at McGill includes:

- artificial cells and organs
- bioinformatics, computational biology, and biocomputation
- biological materials and mechanics
- biomedical imaging and microscopy
- biomedical modelling
- biomedical sensors, diagnostics, and therapeutics
- biomedical signals and systems
- biomolecular and cellular engineering
- bioprocess engineering
- micro- and nano-bioengineering
- systems and synthetic biology

section 12.1.5: Master of Engineering (M.Eng.) Biological and Biomedical Engineering (Thesis) (45 credits)

The **Biological and Biomedical Engineering Master's program** focuses on the interdisciplinary application of methods, paradigms, technologies, and devices from engineering and the natural sciences to problems in biology, medicine, and the life sciences. With its unique multidisciplinary environment and taking advantage of research collaborations between staff in the Faculties of Medicine and Health Sciences, Science, and Engineering, BBME offers thesis-based graduate degrees (M.Eng.) that span broad themes, including: biomodelling, biosignal processing, medical imaging, nanotechnology, artificial cells and organs, probiotics, bioinformatics, orthopedics, biological materials and mechanobiology, motor proteins and the cytoskeleton, biosensors and

12.1.3.2 Application Procedures

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

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

Please address enquiries directly to

OR

BBME 600N1	(1.5)	Seminars in Biological and Biomedical Engineering
BBME 600N2	(1.5)	Seminars in Biological and Biomedical Engineering

Complementary Courses (12 credits)

3 credits from the following quantitative courses:

BIEN 510	(3)	Engineered Nanomaterials for Biomedical Applications
BIEN 530	(3)	Imaging and Bioanalytical Instrumentation
BIEN 550	(3)	Biomolecular Devices
BIEN 560	(3)	Design of Biosensors
BIEN 570	(3)	Active Mechanics in Biology
BIEN 590	(3)	Cell Culture Engineering
BMDE 502	(3)	BME Modelling and Identification
BMDE 503	(3)	Biomedical Instrumentation
BMDE 512	(3)	Finite-Element Modelling in Biomedical Engineering
BMDE 519	(3)	Biomedical Signals and Systems
BMDE 610	(3)	Functional Neuroimaging Fusion
BMDE 660	(3)	Advanced MR Imaging and Spectroscopy of the Brain
MDPH 607	(3)	Medical Imaging

3 credits from the following:

BIEN 510	(3)	Engineered Nanomaterials for Biomedical Applications
BIEN 530	(3)	Imaging and Bioanalytical Instrumentation
BIEN 540	(3)	Information Storage and Processing in Biological Systems
BIEN 550	(3)	Biomolecular Devices
BIEN 560	(3)	Design of Biosensors
BIEN 570	(3)	Active Mechanics in Biology
BIEN 590	(3)	Cell Culture Engineering
BIEN 680	(4)	Bioprocessing of Vaccines
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 508	(3)	Introduction to Micro and Nano-Bioengineering
BMDE 512	(3)	Finite-Element Modelling in Biomedical Engineering
BMDE 519	(3)	Biomedical Signals and Systems
BMDE 525D1	(3)	Design of Assistive Technologies: Principles and Praxis
BMDE 525D2	(3)	Design of Assistive Technologies: Principles and Praxis
BMDE 610	(3)	Functional Neuroimaging Fusion
BMDE 650	(3)	Advanced Medical Imaging

GENERAL

1. Students must select an Advisory Committee, in conjunction with their thesis supervisor. This committee will consist of the thesis supervisor and two (maximum three) other individuals who will participate in discussions with students about their research program.
2. All Ph.D. students are required to complete a candidacy examination before the end of Ph.D. 3. The exam serves to evaluate the students' ability to perform original scholarship and to demonstrate their suitability for a Ph.D. degree. An M.Sc. student may be eligible to transfer to the Ph.D. program without submitting a master's thesis by taking the *Transfer Seminar/Candidacy Exam*. This exam is allowed if the master's CGPA is 3.5 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 3.5 CGPA in their M.Sc. coursework while in the IPN, must submit a master's thesis and apply for the Ph.D. level afterwards.
3. Students are required to submit a written thesis proposal (18 months after the start of the program for M.Sc. students, and at least one month prior to the candidacy exam for Ph.D. students). This document must state the research question, present the hypothesis being tested, review the relevant literature, summarize the methodology used, and present the research data to date. This proposal will then be orally presented to the student's Advisory Committee members, who will review the written proposal and communicate their recommendations to the student.
4. Students will present a formal seminar on their research work prior to writing their thesis. This presentation will be attended by the student's Advisory Committee who will report their impressions and recommendations to the student.
5. Before final thesis submission, Ph.D. students must successfully complete an oral defence, which is a final, in-depth, formal presentation of their research.
6. An annual oral informal presentation of research work accomplished will be presented to the student's Advisory Committee.
7. The Graduate Program Committee has instituted a mentorship program by which each student will be matched with a specific member of the Committee. The Program Mentor ensures that the student, the supervisor(s), and other members of the Advisory Committee are aware of and meet key milestones, in a timely manner, throughout the course of the student's graduate study.
8. All incoming students are required to take the workshops on Responsible Conduct of Research. These will be included as part of the milestones for annual progress reports.

section 12.2.5: Master of Science (M.Sc.) Neuroscience (Thesis) (45 credits)

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

section 12.2.6: Doctor of Philosophy (Ph.D.) Neuroscience

The IPN offers a highly competitive Ph.D. 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.

12.2.3 Neuroscience (Integrated Program) Admission Requirements and Application Procedures**12.2.3.1 Admission Requirements****General**

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

The applicant must present evidence of high academic achievement. A standing equivalent to a cumulative grade point average (CGPA) of 3.0 out of a possible 4.0 is required by Graduate and Postdoctoral Studies; however, the Integrated Program in Neuroscience (IPN) seeks applicants with a higher academic standing, and thus, 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 a *TOEFL* or *IELTS* exam with their application. Consult the Integrated Program in Neuroscience's *website* for details.

M.Sc. Degree

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

Ph.D. Degree

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

Students currently registered in the Master's in Neuroscience may be permitted to transfer to the Ph.D. program without submitting a master's thesis. Applicants are expected to have attained a high scholastic standing equal to, or greater than, the minimum cumulative grade point average of 3.5 out of 4.0 in all levels of study. In exceptional circumstances, a student **may** enter the Ph.D. program directly from their undergraduate degree if a CGPA of 3.7 is attained and if the student already presents extensive research experience.

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

12.2.3.2 Application Procedures

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

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

12.2.3.2.1 Additional Requirements

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

- Curriculum Vitae
- Personal Statement
- Letters of Recommendation (2)

Consult the Integrated Program in Neuroscience's [website](#) for further details

12.2.3.3 Application Dates and Deadlines

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

Application Opening Dates		Application Deadlines		
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
Fall Term:	Sept. 15	Jan. 30	June 1	June 1
Winter Term:	Feb. 15	Sept. 10	Nov. 10	Nov. 10
Summer Term:	N/A	N/A	N/A	N/A

Admission to graduate studies is competitiv

Emeritus Professors

M. Rasminsky; B.A.(Tor.), M.D.(Harv.), Ph.D.(Lond.), F.R.C.P.(C) (*Dept. of Neurology and Neurosurgery*)

G. Tannenbaum; M.Sc., Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)

C. Thompson; D.Sc., F.C.C.P.M. (*Dept. of Neurology and Neurosurgery*)

N. White; B.A.(McG.), Ph.D.(Pitt.) (*Dept. of Psychology*)

Professors

- S.G. Gauthier; B.A., M.D.(Montr.), F.R.C.P.(C) (*Dept. of Neurology and Neurosurgery*)
- B. Giros; M.Sc., Ph.D.(Paris VI) (*Dept. of Psychiatry*)
- I. Gold; B.A.(McG.), Ph.D.(Princ.) (*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.T. Hepple; Ph.D.(Tor.) (*Dept. of Kinesiology and Physical Education*)
- R. Hess; Ph.D.(Melb.), D.Sc.(Aston, UK) (*Dept. of Ophthalmology*)
- R. Joober; M.D.(Tunisia), Ph.D.(McG.) (*Dept. of Psychiatry*)
- D. Juncker; Dipl., Ph.D.(Neuchâtel) (*Dept. of Biomedical Engineering*)
- T. Kennedy; B.Sc.(McM.), Ph.D.(Col.) (*Dept. of Neurology and Neurosurgery*)
- S. King; B.A.(McG.), M.Ed., Ed.S.(James Madison Univ.), Ph.D.(Virginia Tech) (*Dept. of Psychiatry*)
- F. Kingdom; Ph.D.(Reading) (*Dept. of Ophthalmology*)
- P. Lachapelle; Ph.D.(Montr.) (*Dept. of Ophthalmology*)
- N. Lamarche; Ph.D.(Montr.) (*Dept. of Anatomy and Cell Biology*)
- M. Lepage; B.A.(C'

Professors

M. Petrides; B.Sc., M.Sc.(Lond.), Ph.D.(Cant.) (*James McGill Professor*) (*Depts. of Neurology and Neurosurgery, Psychology*)

G. Plourde; M.D.(Laval), M.Sc.(Ott.) (*Dept. of Anesthesia*)

J. Poirier; Ph.D.(Montr.) (*Dept. of Psychiatry and Medicine*)

A. Ptito; Ph.D.(Montr.) (*Dept. of Neurology and Neurosurgery*)

N. Rajah; Ph.D.(Tor.) (*Dept. of Psychiatry*)

Y. Rao; B.Sc.(Sichuan), Ph.D.(Tor.) (*Dept. of Neurology and Neurosurgery*)

A. Ribeiro-da-Silva; M.D., Ph.D.(Porto) (*Dept. of Pharmacology and Therapeutics*)

G. Rouleau; M.D.(Ott.), Ph.D.(Harv.), F.R.C.P.(C), F.R.S.C. (*Dept. of Neurology and Neurosurgery*)

E. Ruthazer; A.B.(Princ.), Ph.D.(Calif.-SF) (*Dept. of Neurology and Neurosurgery*)

A. Sadikot; M.D.,C.M.(McG.), Ph.D.(Laval), F.R.C.S.(C) (*Dept. of Neurology and Neurosurgery*)

H.U. Saragovi; Ph.D.(Miami) (*Dept. of Pharmacology and Therapeutics*)

H. Schipper; M.D., Ph.D.(McG.), F.R.C.P.(C) (*Dept. of Neurology and Neurosurgery*)

G. Sebire; M.D., Ph.D.(Paris VI) (*Dept. of Pediatrics*)

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*)

T

Associate Professors

B. Chen; Ph.D.(SUNY) (*Dept. of Neurology and Neurosurgery*)

J.-F. Cloutier; B.Sc.(C'dia), Ph.D.(McG.) (*Depts. of Neurology and Neurosurgery, and Anatomy and Cell Biology*)

E. Cook; B.Sc.(Ariz. St.), M.Sc.(Rice), Ph.D.(Baylor) (*Dept. of Physiology*)

A. Dagher; M.Eng.(McG.), M.D.(Tor.), F.R.C.P.(C) (*Dept. of Neurology and Neurosurgery*)

B. Debruille; M.D.(Paris XI), Ph.D.(Paris VI) (*Dept. of Psychiatry*)

C. Ernst; B.Sc.(McG.), M.Sc.(Br. Col.), Ph.D.(McG.) (*Dept. of Psychiatry*)

B. Frauscher; M.D., Ph.D. (*Dept. of Neurology and Neurosurgery*)

G. Gobbi; M.D., Ph.D. (*Dept. of Psychiatry*)

Associate Professors

P. Wintermark; M.D.(Lausanne) (*Dept. of Pediatrics*)

T.P. Wong; Ph.D.(McG.) (*Dept. of Psychiatry*)

S.C. Woolley; B.Sc.(Duke), Ph.D.(Texas-Austin) (*Dept of Biology*)

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

J. Zhang; M.D.(Shanghai II Medical U.), M.Sc. (Paris XI), Ph.D. (Laval) (*Dept. of Neurology and Neurosurgery*)

Assistant Professors

G. Armstrong; M.Sc., Ph.D.(Qu.) (*Dept. of Neurology and Neurosurgery*)

N. Auclair Oullet; B.A., M.Sc., Ph.D.(Laval) (*School of Communication Sciences and Disorders*)

R. Bagot; Ph.D.(McG.) (*Dept. of Psychology*)

M. Berlim; M.D., M.Sc.(UFRGS) (*Dept. of Psychiatry*)

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

Assistant Professors

- A. Kostikov; Ph.D.(Georgia) (*Dept. of Neurology and Neurosurgery*)
- A. Krishnaswamy; Ph.D.(McG.) (*Dept. of Physiology*)
- G. Leonard; Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- J. Marcoux; M.Sc., M.D.(Montr.) (*Dept. of Neurology and Neurosurgery*)
- M. O. Martel; Ph.D. (*Dept. of Anesthesia*)
- A. Milnerwood; B.Sc (Hertfordshire), Ph.D.(Open, UK) (*Dept. of Neurology and Neurosurgery*)
- B. Mistic; B.Sc., M.A., Ph.D.(Tor.) (*Dept. of Neurology and Neurosurgery*)
- L. Münter; Ph.D.(Berlin) (*Dept. of Pharmacology and Therapeutics*)
- S. Narayanan; B.Sc.(C'dia), M.Sc., Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- J. Near; B.Sc.(Qu.), Ph.D.(Western) (*Dept. of Psychiatry*)
- T. Nguyen; M.D., M.Sc.(McG.), F.R.C.P.(C) (*Dept. of Psychiatry*)
- T. Ohyama; Ph.D.(Baylor) (*Dept. of Biology*)
- C. Paquette; B.Sc., M.Sc.(Laval), Ph.D.(McG.) (*Dept. of Kinesiology and Physical Education*)
- P. Pelufo Silveira; M.D., M.Sc., Ph.D.(UFRGS) (*Dept. of Psychiatry*)
- A. Peyrache; M.Sc.(ESPCI), M.Sc., Ph.D.(Paris VI) (*Dept. of Neurology and Neurosurgery*)
- M. Prager-Khoutorsky; Ph.D.(Hebrew) (*Dept. of Physiology*)
- M. Roig; M.Sc.(Nott.), Ph.D.(Br. Col.) (*Dept. of Physical and Occupational Therapy*)
- M. Roy; Ph.D. (*Dept. of Psychology*)
- D. Rudko; M.Sc.(Vic. BC), PhD(UWO) (*Depts. of Biomedical Engineering, Neurology and Neurosurgery*)
- J. Shah; M.D.(Tor.), F.R.C.P.(C) (*Dept. of Psychiatry*)
- R. Sharif; Ph.D.(McG.) (*Dept. of Physiology*)
- M. Sharp; M.D.(McG.) (*Department of Neurology and Neurosurgery*)
- D. Sinclair; B.Sc., Ph.D.(Dal.) (*Dept. of Neurology and Neurosurgery*)
- M. Srour; M.D.C.M.(McG.), Ph.D.(Montr.), F.R.C.P.(C) (*Depts. of Pediatrics, Neurology and Neurosurgery*)
- J. A. Stratton; Ph.D. (*Dept. of Neurology and Neurosurgery*)
- T. Stroh; Dip.(J. Liebig Univ. Giessen), Ph.D.(Max Planck) (*Dept. of Neurology and Neurosurgery*)
- A. Suvrathan; B.Sc.(Delhi), Ph.D.(Tata Inst.) (*Depts. of Pediatrics, Neurology and Neurosurgery*)
- V. Sziklas; Ph.D.(McG.) (*Dept. of Neurology and Neurosurgery*)
- H. Takahashi; M.D., Ph.D.(Gunma), (*IRCM, Dept. of Experimental Medicine*)
- C. Tardif; B.Sc.(McG.), M.Sc.(Imperial Coll.), Ph.D.(McG.) (*Depts. of Biomedical Engineering, Neurology and Neurosurgery*)
- S. Trenholm; B.Sc.(Vic., BC) M.Sc., Ph.D.(Dal.) (*Dept. of Neurology and Neurosurgery*)
- J. Van Raamsdonk; Ph.D.(Br. Col.) (*Dept. of Neurology and Neurosurg*)

Adjunct Professors

O. Overbury; Ph.D.(C' dia) (*Dept. of Ophthalmology*)

12.2.5 Master of Science (M.Sc.) Neuroscience (Thesis) (45 credits)**Required Courses (36 credits)**

NEUR 696	(6)	Master's Thesis Research
NEUR 697	(9)	Master's Thesis Proposal
NEUR 698	(9)	Master's Seminar Presentation
NEUR 699	(12)	Master's Thesis Submission
NEUR 705	(0)	Responsible Research Conduct

Complementary Courses (9 credits)

3 credits from the following:

NEUR 630	(3)	Principles of Neuroscience 1
NEUR 631	(3)	Principles of Neuroscience 2

And 6 credits in other courses at the 500 level or higher that are relevant to the program.

Upon recommendation, depending upon their particular background and needs, students may be requested to take additional selected courses at the 500 level or higher.

Note: All M.Sc.-level students must register for a minimum of 12 credits per term during the first three terms of their master's program.

12.2.6 Doctor of Philosophy (Ph.D.) Neuroscience

Students with an M.Sc. degree continuing in this Department will receive credit exemptions for graduate coursework accomplished (including NEUR 630 or NEUR 631). It may be recommended that they take specialty courses related to their field of study in neuroscience. Students with an M.Sc. degree from another program will be required to take NEUR 630 and NEUR 631 and/or other courses listed under the M.Sc. degree depending upon their background and field of study.

Students with an M.D. degree proceeding directly into a Ph.D. program will be required to take NEUR 630 and NEUR 631. They will also be required to take 6 credits of graduate-level courses.

Thesis

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

Required Courses (6 credits)

NEUR 630	(3)	Principles of Neuroscience 1
NEUR 631	(3)	Principles of Neuroscience 2
NEUR 700	(0)	Doctoral Candidacy Examination
NEUR 705	(0)	Responsible Research Conduct

Complementary Courses (6 credits)

6 credits at the 500, 600, or 700 level, approved by the graduate program adviser.

12.3 Quantitative Life Sciences

12.3.1 Location

Telephone: 514-398-4826

Email: coordinator.qls@mcgill.ca

Website: mcgill.ca/qls

12.3.2 About Quantitative Life Sciences

Quantitative Life Sciences is the broad application of mathematical, computational, and other quantitative methods to study biological systems at all scales—from single molecules to the environment. It is part of a rapidly expanding field that includes such specializations as systems biology, bioinformatics, biophysics, medical informatics, computational biology, computational pharmacology, computational neuroscience, and mathematical biology.

section 12.3.5: Doctor of Philosophy (Ph.D.) Quantitative Life Sciences

Please refer to the [QLS website](#) for further details.

12.3.3 Quantitative Life Sciences Admission Requirements and Application Procedures

12.3.3.1 Admission Requirements

General

Applicants are expected to hold an undergraduate degree in one of the following areas (or equivalent): biology, chemistry, physiology, genetics, engineering, computer science, mathematics, statistics, physics, or chemistry.

Applicants must have a strong quantitative background. Such a background may be obtained by having at least the equivalent of a minor in computer science, mathematics, statistics, physics, chemistry, or engineering.

Applicants who do not have a formal education in life sciences need to have a demonstrated interest for that field, for example in the form of an undergraduate research project or the completion of life-science courses.

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.

Applicants to graduate studies whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction or from a recognized Canadian institution (anglophone or francophone), must submit results of the *TOEFL* exam with their application and have a minimum score of 86 on the Internet-based test (iBT) with each component score not less than 20. Further information on English proficiency requirements is available at mcgill.ca/gradapplicants/international/proficiency.

12.3.3.2 Application Procedures

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

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

12.3.3.2.1 Additional Requirements

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

- Curriculum Vitae
- Personal Statement
- Research Statement
- Two reference letters
- Copy of official transcripts

12.3.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by Quantitativ

Associate Professors

M. Chacron (*Dept. of Physiology*)
E. Cook (*Dept. of Physiology*)
K. Dewar (*Dept. of Human Genetics*)
P. Francois (*Dept. of Physics*)
P. Harrison (*Dept. of Biology*)
R. Hernandez (*Dept. of Human Genetics*)
T. Humphries (*Depts. of Physiology, Mathematics and Statistics*)
A. Khadra (*Dept. of Physiology*)
S. Komarova (*Faculty of Dentistry*)
B. Leung (*Dept. of Biology, School of Environment*)
J. Majewski (*Dept. of Human Genetics*)
N. Moitessier (*Dept. of Chemistry*)
E. Moodie (*Dept. of Epidemiology, Biostatistics and Occupational Health*)
R. Nadon (*Dept. of Human Genetics*)
C. Pack (*Dept. of Neurology and Neurosurgery*)
T. Pastinen (*Dept. of Human Genetics*)
J. Pineau (*Dept. of Computer Science*)
J.B. Poline (*Dept. of Neurology and Neurosurgery*)
B. Richards (*Dept. of Biology*)
A. Schmidt (*Dept. of Epidemiology, Biostatistics and Occupational Health*)
R. Sladek (*Depts. of Experimental Medicine, Human Genetics*)
J. Vogel (*Dept. of Biology*)
J. Waldspühl (*Dept. of Computer Science*)

Assistant Professors

U.D. Akavia (*Biochemistry*)
S. Bhatnagar (*Depts. of Epidemiology, Biostatistics and Occupational Health, Diagnostic Radiology*)
A. Emad (*Dept. of Electrical and Computer Engineering*)
R. Farivar (*Dept. of Ophthalmology*)
S. Gravel (*Dept. of Human Genetics*)
A. Hayer (*Dept. of Biology*)
Y. Iturria Medina (*Dept. of Neurology and Neurosurgery*)
A. Krishnaswamy, (*Dept. of Physiology*)
S. Leslie (*Dept. of Physics*)
Y. Li (*Dept. of Computer Science*)
N. Li-Jessen (*Depts. of Communication Sciences and Disorders, Biomedical Engineering, Otolaryngology*)
J. Mandl (*Dept. of Physiology*)
B. Mistic (*Dept. of Neurology and Neurosurgery*)
H. Najafadabi (*Dept. of Human Genetics*)
T. Ohyama (*Dept. of Biology*)
R. Reyes (*Dept. of Biology*)
P. Saha Chaudhuri (*Dept. of Epidemiology, Biostatistics and Occupational Health*)

Assistant ProfessorsJ. Vargas (*Dept. of Anatomy and Cell Biology*)I. Watson (*Dept. of Biochemistry*)S. Weber (*Dept. of Biology*)J. Xia (*Dept. of Animal Science, Inst. of Parasitology*)**12.3.5 Doctor of Philosophy (Ph.D.) Quantitative Life Sciences****Required Courses (6 credits)**

QLSC 600D1	(3)	Foundations of Quantitative Life Sciences
QLSC 600D2	(3)	Foundations of Quantitative Life Sciences
QLSC 601D1	(0)	Quantitative Life Sciences Seminars 1
QLSC 601D2	(0)	Quantitative Life Sciences Seminars 1
QLSC 602D1	(0)	Quantitative Life Sciences Seminars 2
QLSC 602D2	(0)	Quantitative Life Sciences Seminars 2
QLSC 603D1	(0)	Quantitative Life Sciences Seminars 3
QLSC 603D2	(0)	Quantitative Life Sciences Seminars 3
QLSC 701	(0)	Ph.D. Comprehensive Exam

Complementary Courses

9-11 credits

Students will be required to take one or two courses from each of the Quantitative and Life Science Blocks for a total of three, stream-specific courses.

Biophysics Stream

Quantitative

BIEN 530	(3)	Imaging and Bioanalytical Instrumentation
BMDE 512	(3)	Finite-Element Modelling in Biomedical Engineering
BMDE 519	(3)	Biomedical Signals and Systems
CHEM 514	(3)	Biophysical Chemistry
CHEM 520	(3)	Methods in Chemical Biology
COMP 551	(4)	Applied Machine Learning
MATH 682	(4)	Statistical Inference
PHYS 519	(3)	Advanced Biophysics
PHYS 559	(3)	Advanced Statistical Mechanics
QLSC 611	(3)	Directed Readings

Life Sciences

BIOC 605	(3)	Protein Biology and Proteomics
BIOL 551	(3)	Principles of Cellular Control
PHGY 518	(3)	Artificial Cells
PHGY 520	(3)	Ion Channels
QLSC 611	(3)	Directed Readings

Computational and Statistical Molecular Biology Stream

Quantitative

BIOS 601	(4)	Epidemiology: Introduction and Statistical Models
BMDE 502	(3)	BME Modelling and Identification
COMP 551	(4)	Applied Machine Learning
COMP 561	(4)	Computational Biology Methods and Research
COMP 598	(3)	Topics in Computer Science 1
HGEN 677	(3)	Statistical Concepts in Genetic and Genomic Analysis
MATH 523	(4)	Generalized Linear Models
MATH 533	(4)	Regression and Analysis of Variance
MATH 680	(4)	Computation Intensive Statistics
MATH 682	(4)	Statistical Inference
QLSC 611	(3)	Directed Readings

Life Sciences

BIOC 603	(3)	Genomics and Gene Expression
BIOL 551	(3)	Principles of Cellular Control
EXMD 602	(3)	Techniques in Molecular Genetics
HGEN 661	(3)	Population Genetics
HGEN 692	(3)	Human Genetics
PHAR 503	(3)	Drug Discovery and Development 1
PHAR 505	(3)	Structural Pharmacology
QLSC 611	(3)	Directed Readings

Ecosystems Stream

Quantitative

ENVB 506	(3)	Quantitative Methods: Ecology
MATH 523	(4)	Generalized Linear Models
MATH 525	(4)	Sampling Theory and Applications
MATH 533	(4)	Regression and Analysis of Variance
MATH 537	(4)	Honours Mathematical Models in Biology
MATH 547	(4)	Stochastic Processes
MATH 556	(4)	Mathematical Statistics 1
MATH 682	(4)	Statistical Inference
QLSC 611	(3)	Directed Readings

Life Sciences

BIOL 509	(3)	Methods in Molecular Ecology
BIOL 510	(3)	Advances in Community Ecology
BIOL 540*	(3)	Ecology of Species Invasions
BIOL 594	(3)	Advanced Evolutionary Ecology

ENVR 540*	(3)	Ecology of Species Invasions
QLSC 611	(3)	Directed Readings

* Students either choose BIOL 540 or ENVR 540 but not both.

