

214-591D Paleography  
 215-381 Topics in Perf. Practice before 1800  
 215-385 Topics in Perf. Practice after 1800  
 216-306 Computer Programming for Musicians I  
 216-307 Computer Programming for Musicians II  
 221-315A Choral Conducting I  
 221-415B Choral Conducting II  
 222-402D Principles and Processes of Music Ed.  
 222-403A,B Selected Topics in Music Ed.  
 222-404A,B Selected Topics in Music Ed.  
 223-315A Instrumental Conducting I  
 223-415A Instrumental Conducting II  
 242-372D Continuo  
 243-494A,B Contemporary Music Ensemble

## 53 Natural Resource Sciences

Department of Natural Resource Sciences  
 Macdonald Campus  
 21,111 Lakeshore Road  
 Sainte-Anne-de-Bellevue, QC  
 Canada H9X 3V9  
 Telephone: (514) 398-7890  
 Fax: (514) 398-7990  
 Email: [info@nrs.mcgill.ca](mailto:info@nrs.mcgill.ca)  
 Website: <http://www.nrs.mcgill.ca>

Chair — W. Hendershot

Graduate Program Director — R.D. Titman

### 53.1 Staff

#### Emeritus Professors

A.C. Blackwood; B.Sc., M.Sc.(Alta.), Ph.D.(Wis.), F.R.S.C.;  
 Microbiology  
 R. Knowles; B.Sc.(Birm.), Ph.D., D.Sc.(Lond.); Microbiology  
 A.F. MacKenzie; B.S.A., M.Sc.(Sask.), Ph.D.(C'nell); Soil Science  
 R.A. MacLeod; B.A., M.A.(Br.Col.), Ph.D.(Wis.), F.R.S.C.;  
 Microbiology

#### Emeritus Curator of the Lyman Museum

V.R. Vickery; B.Sc.(Agr.), M.Sc., Ph.D.(McG.)

#### Curator of the Lyman Museum

C.C. Hsiung; B.Sc.(Taiwan), B.Ed.(Queen's), Ph.D.(McG.)

#### Professors

N.N. Barthakur; B.Sc.(Gauh.), M.Sc.(Alld.), Ph.D.(Sask.);  
 Agricultural Physics  
 D.M. Bird; B.Sc.(Guelph), M.Sc., Ph.D.(McG.); Wildlife Biology  
 W.H. Hendershot; B.Sc.(Tor.), M.Sc.(McG.), Ph.D.(Br.Col.); Soil  
 Science  
 E.S. Idziak; B.Sc.(Agr.), M.Sc.(McG.), D.Sc.(Delft); Microbiology  
 P.H. Schuepp; Dipl.Sc.Nat.(Z[u.r.], Ph.D.(Tor.); Agricultural  
 Physics  
 R.K. Stewart; B.Sc.(Agr.), Ph.D.(Glas.); Entomology

#### Associate Professors

B. Côté; B.Sc., Ph.D.(Laval); Forest Resources  
 M.A. Curtis; B.Sc., M.Sc., Ph.D.(McG.); Wildlife Biology  
 G.B. Dunphy; B.Sc.(U.N.B.), M.Sc., Ph.D.(Mem.); Entomology  
 J.W. Fyles; B.Sc., M.Sc.(Vic., B.C.), Ph.D.(Alta.); Forest  
 Resources  
 D.J. Lewis; B.Sc., M.Sc., Ph.D.(Mem.); Entomology  
 G.R. Mehuy; B.Sc., Ing.Agron.(Gembloux), Ph.D.(Calif.); Soil  
 Science  
 D.F. Niven; B.Sc., Ph.D.(Aber.); Microbiology  
 M.E. Rau; B.Sc.(Purdue), M.Sc., Ph.D.(McG.); Entomology  
 R.D. Titman; B.Sc.(McG.), M.Sc.(Bishop's), Ph.D.(U.N.B.); Wildlife  
 Biology

#### Assistant Professors

D. Berteaux; Bqcc.(Lycée M. Genevoix), Dip.(Nantes),  
 M.Sc.(Rennes), Ph.D.(Sherbrooke); Wildlife Biology

B.T. Driscoll; B.Sc., Ph.D.(McM.); Microbiology  
 C. Hamel; B.Sc., Ph.D.(McG.); Soil Science  
 T.A. Wheeler; B.Sc.(Mem.), M.Sc., Ph.D.(Guelph); Entomology

#### Adjunct Professors

F. Archibald; K. Blanchard; G. Boivin; N. Calero; T. Charles;  
 H. Chiasson; R. Desjardins; W. Fairchild; C. Greer;  
 M. Guillemette; P. Mineau; H. Murkin; M. St-Arnaud; N. Seymour;  
 R. Simard; T.G. Smith; I. Thompson; C. Vincent; F.G. Whoriskey

#### Associate Members

W.D. Marshall (*Food Science and Agricultural Chemistry*);  
 G.J. Matlashewski (*Parasitology*)

#### Cross-Appointed Professors

P. Brown (*Geography and McGill School of Environment*); L. Chan  
 (*Dietetics and Human Nutrition*); D. Smith (*Plant Science*)

### 53.2 Programs Offered

The Department of Natural Resource Sciences offers programs leading to M.Sc. and Ph.D. degrees in Entomology, Microbiology, and Renewable Resources (includes Agrometeorology, Forest Science, Soil Science and Wildlife Biology).

The Department possesses, or has access to, excellent facilities for laboratory research and research in the field. Affiliated with the Department are the Lyman Entomological Museum and Research Laboratory, the Morgan Arboretum, the Avian Science and Conservation Centre, and the Ecomuseum of the St. Lawrence Valley Natural History Society.

### 53.3 Admission Requirements

#### General

Competency in English – Non-Canadian applicants whose mother tongue is not English and who have not completed an undergraduate degree using the English language, are required to 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 equivalent in other tests before registration.

The Graduate Record Exam is not required, however, it is highly recommended.

#### M.Sc.

Candidates are required to have a Bachelor's degree with an equivalent cumulative grade point average of 3.0/4.0 and a sufficient background in the appropriate basic sciences.

#### Ph.D.

Candidates, normally, are required to hold an M.Sc. Degree and will be judged primarily on their ability to conduct an original and independent research study.

### 53.4 Application Procedures

Applications for Admission and all supporting documents must be sent directly to:

Student Affairs Office (Graduate Studies)  
 Macdonald Campus of McGill University  
 21,111 Lakeshore  
 Ste-Anne-de-Bellevue, Québec  
 H9X 3V9 CANADA  
 Telephone: (514) 398-7708  
 Fax: (514) 398-7968  
 Email: [GRAD@macdonald.mcgill.ca](mailto:GRAD@macdonald.mcgill.ca)

Applications will be considered upon receipt of a signed and completed application form, \$60 application fee, all official transcripts, two signed original letters of reference on official letterhead of originating institution, and (if required) proof of competency in oral and written English by appropriate exams.

**Deadlines** – For **international students**, complete applications with supporting documents must reach the Student Affairs Office

(Graduate Studies) at Macdonald Campus at least **eight months** prior to the intended start of program. May 1 for January (winter); September 1 for May (summer); January 1 for September (fall). For **domestic students**, complete applications with supporting documents must reach the office no later than **three months** in advance of intended start of program.

**Application Fee (non-refundable)** – A fee of \$60 Canadian must accompany each application (including McGill students), *otherwise it cannot be considered*. This sum must be remitted using one of the following methods:

1. Certified personal cheque in Cdn.\$ drawn on a Canadian bank;
2. Certified personal cheque in U.S.\$ drawn on a U.S. bank;
3. Canadian Money order in Cdn.\$;
4. U.S. Money Order in U.S.\$;
5. Bank draft in Cdn.\$ drawn on a Canadian bank;
6. Bank draft in U.S.\$ drawn on a U.S. bank;
7. Credit card (by completing the appropriate section of the application form).

**Transcripts** – Two official copies of all transcripts are required for admission. Transcripts written in a language other than English or French must be accompanied by a certified translation. An explanation of the grading system used by the applicant's university is essential. It is the applicant's responsibility to arrange for transcripts to be sent. **DOCUMENTS SUBMITTED WILL NOT BE RETURNED.**

It is desirable to submit a list of the titles of courses taken in the major subject, since transcripts often give code numbers only. Applicants must be graduates of a university of recognized reputation and hold a Bachelor's degree equivalent to a McGill Honours 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 minimum cumulative grade point average (CGPA) is 3.0/4.0 (second-class upper) or 3.2/4.0 during the last two full-time years of university study. High grades are expected in courses considered by the academic unit to be preparatory to the graduate program.

**Letters of Recommendation** – Two letters of recommendation on letterhead and with original signatures from two instructors familiar with the applicant's work, preferably in the applicant's area of specialization, are required. It is the applicant's responsibility to arrange for these letters to be sent.

**Competency in English** – Non-Canadian applicants whose mother tongue is not English and who have not completed an undergraduate degree using the English language are required to submit documented proof of competency in oral and written English, by appropriate exams, e.g. TOEFL (minimum score 550) or IELTS (minimum 6.5). The MCHE is not considered equivalent. Results must be submitted as part of the application. The University code is 0935 (McGill University, Montreal); department code is 31 (graduate schools), Biological Sciences - Agriculture.

**Graduate Record Exam (GRE)** – The GRE is not required, but it is highly recommended.

**Financial aid is very limited and highly competitive. It is suggested that students give serious consideration to their financial planning before submitting an application.**

Acceptance to all programs depends on a staff member agreeing to serve as the student's supervisor and the student obtaining financial support. Normally, a student will not be accepted unless adequate financial support can be provided by the student and/or the student's supervisor. Academic units cannot guarantee financial support via teaching assistantships or other funds.

**Qualifying Students** – 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* if they have met the Faculty of Graduate Studies and Research minimum CGPA of 3.0/4.0. The course(s) to be taken in

a *Qualifying Program* will be prescribed by the academic unit concerned. *Qualifying students* are registered in the Faculty of Graduate Studies and Research, **but not as candidates for a degree**. Only one qualifying year is permitted. **Successful completion of a qualifying program does not guarantee admission to a degree program.**

## 53.5 Program Requirements

### M.Sc.

Candidates must complete a course and research program of a minimum of 45 credits elaborated in consultation with their Supervisory Committee. Course work (6 credits minimum) will include at least two, normally graduate-level, courses and in most research areas, at least one of these courses must be a graduate-level course in statistics. Students are required to register for three 1-credit seminar courses, the last of which will consist of a formal presentation of the student's final thesis research. Candidates must also register in the three M.Sc. Thesis Research courses (373-691, -692, -693; 36 credits) and present a satisfactory thesis based on their research.

### Ph.D.

Course requirements are specified by the staff in the discipline but are flexible and depend largely on the student's background, immediate interests, and ultimate objectives. Students are required to register for four 1-semester seminar courses.

Also required are satisfactory performance in the Ph.D. Comprehensive Examination (373-701) and the presentation, and subsequent defence, of a satisfactory thesis based on the student's research.

## 53.6 Courses for Higher Degrees

- Denotes not offered in 1999-2000.
- ★ Denotes courses offered in alternate years.

The course credit weight is given in parentheses (#) after the course title.

**★338-510B AGRICULTURAL MICROMETEOROLOGY.** (3) (3 lectures) Interaction between plant communities and the atmosphere. The physical processes governing the transfer of heat, mass and momentum as they relate to research and production in agricultural systems. Experimental techniques for measuring fluxes of heat, water-vapour, CO<sub>2</sub> and natural and man-made pollutants.

**Professor Schuepp**

**338-602B ISOTOPIC TRACER TECHNIQUES.** (3) (3 lectures and 1 four-hour lab) (Prerequisite: 338-303A or equivalent.) An advanced practical course to introduce students to laboratory equipment and techniques required for tracer experiments. Theory and use of end-window and windowless G.M. counter, proportional counters, scintillation counters both solid and liquid types.

**Professor Barthakur**

**350-525A INSECT ECOLOGY.** (3) (Normally taken in conjunction with 350-726B)

**Staff**

**350-535B AQUATIC ENTOMOLOGY.** (3)

**Professor Lewis**

**350-600A,B INSECT PATHOLOGY.** (3)

**Professor Dunphy**

**350-610D ADVANCED TAXONOMY AND ZOOGEOGRAPHY.** (6)

**Professor Wheeler**

● **350-726B INSECT POPULATION DYNAMICS.** (3) (Normally taken in conjunction with 350-525A.)

**★360-612B MATHEMATICAL METHODS.** (3) (3 lectures) (Prerequisite: 360-205B or equivalent.) Partial differential equations and boundary-value problems; Fourier and Bessel series expansions; applications; special topics; numerical methods; Laplace transformation.

**Professors Kok and Schuepp**

**362-740D INVITATION LECTURES IN MICROBIOLOGY I.** (1)

(1 seminar) Prominent scientists, actively engaged in research will be invited to present a series of lectures in the field of their

research interest. The speakers and their topics will be chosen to complement the offerings of the permanent staff.

**362-741D INVITATION LECTURES IN MICROBIOLOGY II.** (1) (1 seminar) Description as for course 362-740D.

**362-742D INVITATION LECTURES IN MICROBIOLOGY III.** (1) (1 seminar) Description as for course 362-740D.

**362-764A READING AND CONFERENCE.** (3) (2 hours) Student presentations, taken from current literature, concerned with various aspects of a central topic chosen for the term. Such presentations are designed to be informal and to generate discussions. Topic will change from term to term. **Staff**

**362-765B READING AND CONFERENCE.** (3) (2 hours) Description as for 362-764A. **Staff**

● **★372-610D PEDOLOGY.** (3) (2 lectures per week, one term)

**★372-630D SOIL MINERALOGY.** (3) (2 lectures per week, one term) Structure and identification of minerals, weathering, properties of clay surfaces, adsorption on clays, ion exchange.

**Professor Hendershot**

**372-631B ADVANCED SOIL PHYSICS.** (3) (2 lectures per week, one term) State and fluxes of matter and energy in the soil. Applications to movement of water, salts, nutrients; diffusion of gases; heat transfer. Discussion of significant research in soil physics.

**Professor Mehuys**

**373-520B INSECT PHYSIOLOGY.** (3) (Prerequisite: Permission of instructor.) Organismal approach to insects, emphasizing the physiology and development, and the physiological relations of insects to their environment.

**Professor Dunphy**

**★373-521B SOIL MICROBIOLOGY AND BIOCHEMISTRY.** (3) (Prerequisite: 372-210A) Soil environment, soil microorganisms and their function in the biogeochemical cycles of C, N, P and S. Basics of soil bioremediation.

**Professor Hamel**

**373-550B VETERINARY AND MEDICAL ENTOMOLOGY.** (3) (Prerequisite: Permission of instructor.) Environmental aspects of veterinary and medical entomology. An advanced course dealing with the biology and ecology of insects and acarines as aetiological agents and vectors of disease, and their control. Integrated approaches to problem solving.

**Professors Rau and Lewis**

**373-643A,B GRADUATE SEMINAR I.** (1) Open to students in the M.Sc. Program. Presentation on a selected topic, research proposal, or research results based on progress towards the M.Sc. degree.

*Section 01 Agrometeorology, Forest Science and Soil Science students*

*Section 02 Entomology and Wildlife Biology students*

*Section 03 Microbiology students*

**373-644A,B GRADUATE SEMINAR II.** (1) Open to students in the M.Sc. Program. Presentation on a selected topic, research proposal, or research results based on progress towards the M.Sc. degree.

*Section 01 Agrometeorology, Forest Science and Soil Science students*

*Section 02 Entomology and Wildlife Biology students*

*Section 03 Microbiology students*

**373-651A,B GRADUATE SEMINAR III.** (1) Open to students in the M.Sc. Program. Presentation of an M.Sc. student's final thesis results.

*Section 01 Agrometeorology, Forest Science and Soil Science students*

*Section 02 Entomology and Wildlife Biology students*

*Section 03 Microbiology students*

**373-680A,B,C SPECIAL TOPICS I.** (1) Students pursue topics not otherwise available in formal courses, under staff supervision.

**373-681A,B,C SPECIAL TOPICS II.** (1) Students pursue topics not otherwise available in formal courses, under staff supervision.

**373-682A,B,C SPECIAL TOPICS III.** (2) Students pursue topics not otherwise available in formal courses, under staff supervision.

**373-683A,B,C SPECIAL TOPICS IV.** (2) Students pursue topics not otherwise available in formal courses, under staff supervision.

**373-684A,B,C SPECIAL TOPICS V.** (3) Students pursue topics not otherwise available in formal courses, under staff supervision.

**373-685A,B,C SPECIAL TOPICS VI.** (3) Students pursue topics not otherwise available in formal courses, under staff supervision.

**373-691A,B,C M.Sc. THESIS RESEARCH I.** (12) Independent research under the direction of a supervisor towards the completion of the M.Sc. degree.

**373-692A,B,C M.Sc. THESIS RESEARCH II.** (12) Independent research under the direction of a supervisor towards the completion of the M.Sc. degree.

**373-693A,B,C M.Sc. THESIS RESEARCH III.** (12) Completion of the M.Sc. thesis, its approval by reviewers and acceptance by Graduate Faculty are all required for a pass to be granted.

**373-701D,N PH.D. COMPREHENSIVE EXAMINATION.** (See Faculty Regulations.)

**373-751A,B GRADUATE SEMINAR IV.** (Open to students in the Ph.D. Program.) Presentation on a selected topic, research proposal or research results based on progress in the Ph.D. degree. *Section 01 Agrometeorology, Forest Science and Soil Science students*

*Section 02 Entomology and Wildlife Biology students*

*Section 03 Microbiology students*

**373-752A,B GRADUATE SEMINAR V.** (Open to students in the Ph.D. Program.) Presentation on a selected topic, research proposal or research results based on progress in the Ph.D. degree. *Section 01 Agrometeorology, Forest Science and Soil Science students*

*Section 02 Entomology and Wildlife Biology students*

*Section 03 Microbiology students*

**373-753A,B GRADUATE SEMINAR VI.** (Open to students in the Ph.D. Program.) Presentation on a selected topic, research proposal or research results based on progress in the Ph.D. degree. *Section 01 Agrometeorology, Forest Science and Soil Science students*

*Section 02 Entomology and Wildlife Biology students*

*Section 03 Microbiology students*

**373-754A,B GRADUATE SEMINAR VII.** (Open to students in the Ph.D. Program.) Presentation on a selected topic, research proposal or research results based on progress in the Ph.D. degree. *Section 01 Agrometeorology, Forest Science and Soil Science students*

*Section 02 Entomology and Wildlife Biology students*

*Section 03 Microbiology students*

**373-772A ADVANCED MICROBIAL GENETICS.** (3) (Prerequisite: Minimum of two undergraduate courses in genetics or permission of instructor.) Topics in bacterial, archaeal, eucaryal, and bacteriophage genetics. **Professor Driscoll and Staff**

**373-773B ADVANCED MICROBIAL PHYSIOLOGY.** (3) (Prerequisite: Minimum of an undergraduate course in biochemistry and in genetics or permission of instructor.) Topics in microbial physiology and metabolism, ranging from current to classic, from biochemical to genetic aspects. **Professor Driscoll**

**374-640A,B RECENT ADVANCES IN TREE ECOPHYSIOLOGY.** (3) (3 lectures per week) Discussion of the effects of environmental factors on the physiology of trees. Both anthropogenic and natural factors will be discussed. **Professor Côté**

**374-660A,B RECENT ADVANCES IN FOREST ECOLOGY.** (3) (2 hours seminar) Review and discussion of current literature in forest ecology. Topics covered will depend on the research interests of students and may include population biology of forest plants, forest succession, forest nutrition and nutrient cycling, computer modelling of forest systems. **Professor Fyles**

**375-605B WILDLIFE ECOLOGY.** (3) (2 class hours per week) Discussion of current topics in wildlife ecology with special reference to the research interests of staff and students involved.

**Professor Titman**

**375-610A ADVANCED FISH ECOLOGY.** (3) (3 class hours per week)

A critical examination of current topics in fish ecology; discussion of migration, reproductive strategies, sex determination mechanisms, competition, communication and predator-prey relationships.

**Professor Curtis**

## 54 Neurology and Neurosurgery

Graduate Program in Neurological Sciences  
Department of Neurology and Neurosurgery  
Montreal Neurological Institute  
3801 University Street  
Montreal, QC Canada, H3A 2B4  
Telephone: (514) 398-1905  
Fax: (514) 398-7371  
Email: Monique@MNI.Lan.McGill.ca

*Chair, Department of Neurology and Neurosurgery* — J. Antel

*Chair, Graduate Program in Neurological Sciences* — D. Guitton

*Associate Chair, Graduate Program in Neurological Sciences* — H. Durham

### 54.1 Staff

#### *Emeritus Professors*

D.W. Baxter, G. Bertrand, P. Gloor, T.B. Rasmussen, J.P. Robb, L. Wolfe

#### *Professors*

A. Aguayo; M.D.(Cordoba Natn.), F.R.C.P.(C)  
F. Andermann; B.A.(Paris), B.Sc., (McG.), M.D.(Montr.), F.R.C.P.(C)  
J. Antel; M.D., B.Sc.(Man.), F.R.C.P.(C)  
D. Arnold; B.Sc., M.D.(C'nell), F.R.C.P.(C)  
M. Avoli; M.D.(Rome), Ph.D.(McG.)  
A. Beaudet; B.A., M.D., Ph.D.(Mont.)  
G. Bray; B.Sc.(Bran.), M.D., B.Sc., (Man.), F.R.C.P.(C)  
S. Carbonetto; M.Sc.(Mass.), Ph.D.(N.Carolina)  
M. Diksic; B.Sc., Ph.D.(Zagreb)  
A. Evans; M.Sc.(Sur.), Ph.D.(Leeds)  
W.H. Feindel; O.C., B.A.(Acad.), M.D., C.M.(McG.), M.Sc.(Dal.), D.Sc.(Acad. and McG.), D.Phil.(Oxon.), F.R.C.S.(C), F.A.C.S., F.R.S.C.  
S.G. Gauthier; B.A., M.D.(Montr.), F.R.C.P.(C)  
J. Gotman; M.Eng.(Dart.), Ph.D.(McG.)  
D. Guitton; Dipl. IVK(U. Libre de Brux.), B.Eng., M.Eng., Ph.D.Eng., Ph.D.Physiol.(McG.)  
I. Heller;  
P.C. Holland; B.A.(Lanc.), Ph.D.(N'cle)  
B. Jones; B.A., M.A., Ph.D.(Delaware)  
G. Karpati; M.D.(Dal.), F.R.C.P.(C)  
D. Lawrence; B.Sc.(Bishop's), M.Sc., M.D., C.M.(McG.), F.R.C.P.(C)  
R. Leblanc; M.Sc.(McG.), M.D.(Ott.), F.R.C.S.(C)  
B. Milner; B.A., Sc.D.(Cantab.), Ph.D.(McG.)  
G. Mohr; M.D.(Stras.)  
R.A. Murphy; A.B.(Worch.), M.Sc.(Boston), Ph.D.(Rutgers); Director  
A. Olivier; M.D.(Montr.), Ph.D.(Laval), F.R.C.S.(C)  
H. Pappius;  
Y. Patel; M.B., Ch.B.(Otago), Ph.D.(Monash), F.R.A.C.P., F.R.C.P.(C)  
M. Petrides; B.Sc., M.Sc.(Lond.), Ph.D.(Cantab.)  
M. Rasminsky; B.A.(Tor.), M.D.(Harv.), Ph.D.(Lond.), F.R.C.P.(C)  
J. Richardson; B.Sc., M.D., C.M., Ph.D.(McG.), F.R.C.P.(C)  
P. Richardson; M.D.(Tor.), F.R.C.S.(C)  
A. Sherwin;

J.D. Stewart; B.Sc.(Lond.), M.B., B.S.(W.I.), F.R.C.P.(C)  
J.G. Stratford; M.D., C.M., M.Sc.(McG.), F.R.C.S.(C), F.A.C.S.  
G. Tannenbaum; M.Sc., Ph.D.(McG.)  
C. Thompson; M.Sc., D.Sc.(N.Z.)  
G. Watters; B.A.(Minn.), M.D.(Man.), F.R.C.P.(C)

#### *Associate Professors*

A. Alonso; M.S.(Barcelona), Ph.D.(Madrid)  
E. Andermann; M.D., C.M., M.Sc., Ph.D.(McG.)  
M. Aubé; B.A., M.D.(Montr.), F.R.C.P.(C)  
S. Bekhor; M.B., Ch.B.(Baghdad), F.R.C.P.(C)  
J. Blundell;  
C. Bourque; B.Sc.(Ott.), Ph.D.(McG.)  
J. Carlton; B.S., M.D.(Johns H.), F.R.C.P.(C)  
J.-L. Caron; M.D.(Ott.), F.R.C.S.(C)  
C. Chalk; B.Sc.(Queen's), M.D., C.M.(McG.) F.R.C.P.(C)  
H. Chertkow; M.D.(W. Ont.), F.R.C.P.(C)  
R. Cote; M.D.(Montr.), F.R.C.P.(C)  
S. David; Ph.D.(Man.)  
R. Del Carpio; M.D.(Lima), F.R.C.P.(C)  
P. Drapeau; B.Sc., Ph.D.(McG.)  
F. Dubeau; M..D.(Montr.), F.R.C.P.(C)  
J.R. Dunn; B.Sc., Ph.D.(U.B.C.)  
H. Durham; M.Sc.(W.Ont.), Ph.D.(Alta.)  
J.P. Farmer; M.D., M.Sc.(McG.), F.R.C.P.(C)  
S. Fontaine; M.D.(Montr.), F.R.C.P.(C)  
R. Ford; M.D.(W.Ont.), F.R.S.C.  
E. Hamel; B.Sc.(Sher.), Ph.D.(Montr.)  
K. Hastings; B.Sc., Ph.D.(McG.)  
M. Jones-Gotman; B.A.(Calif), M.A., Ph.D.(McG.)  
J.-P. Julien; B.Sc.,(Que.), Ph.D.(McG.)  
D. Kaplan; B.A.(Clark), Ph.D.(Harv.)  
Y. Lapierre; B.A., M.D.(Montr.), F.R.C.P.(C)  
I. Libman; B.A., M.D., C.M.(McG.), F.R.C.P.(C)  
D. Melançon; B.A., M.D.(Montr.)  
C. Melmed; B.Sc., M.D.(Man.), F.R.C.P.(C)  
F. Miller; B.Sc.(Sask.), Ph.D.(Calg.)  
J. Montes; B.Sc.(Inst.Pot.-Mex.), M.D.(Uoio.Auto.de San Luis Pot.-Mex)  
J. Nalbantoglu; B.Sc., Ph.D.(McG.)  
A. O'Gorman; M.D.(Ireland)  
T. Owens; M.Sc.(McG.), Ph.D.(Ott.)  
A. Peterson; B.Sc.(Vic., B.C.), Ph.D.(U.B.C.)  
R. Pokrupa, R., M.D.(W.Ont.), F.R.C.S.(C)  
L.F. Quesney; B.Sc., M.D.(Chile), Ph.D.(McG.)  
B. Rosenblatt; B.Sc., M.D., C.M.(McG.), F.R.C.P.(C)  
R. Rouleau; M.D.(Ott.), F.R.C.P.(C)  
G. Savard; M.D.(Montr.), F.R.C.P.(C)  
H. Schipper; M.D., Ph.D.(McG.)  
R. Schondorf; M.Sc., Ph.D., M.D.(McG.), F.R.C.P.(C)  
M. Shevell; B.Sc., M.D.(Vanderbilt)  
E. Shoubridge; M.Sc., Ph.D.(U.B.C.)  
D. Tampieri; M.D.(Bologna)  
L. Taylor; B.Sc., B.Ed.(Alta.), M.Sc.(McG.)  
J. Woods; M.B., B.Ch.(Dub.), M.Sc.(McG.), F.R.C.P.(C)  
R.J. Zatorre; A.B.(Boston), M.Sc., Ph.D.(Brown)

*Assistant Professors*  
M. Angle; M.D., C.M.(McG.), F.R.C.P.(C)  
P. Barker; Ph.D., (Alta.), B.Sc. (S.Fraser)  
M.A. Castro-Alamancos; B.Sc., M.Sc., Ph.D.(U. Complutense of Madrid)  
A. Dagher; M.Eng.(McG.), M.D.(Tor.), F.R.C.P.(C)  
L. Durcan; M.D.(Man.), F.R.C.P.(C)  
M. Ferns; B.Sc.(Otago), Ph.D.(W. Aust.)  
D. Gendron; M.D.(Laval), F.R.C.P.(C)  
A. Genge; B.Sc.(Dal.), B.Med.Sc., M.D.(Mem.), F.R.C.P.(C)  
W. Gorczyca; M.D., Ph.D.(Poland)  
L. Jacques; B.Sc.(Laval), M.Sc., M.D.(Montr.), F.R.C.P.(C)  
K. Johnston; Ph.D., M.D.(Tor.), F.R.C.S.(C)  
T. Kennedy; B.Sc.(McM.), Ph.D.(Col.)  
A. Leblanc; M.Sc.(Moncton), Ph.D.(Dal.)  
M. Lechter; B.Sc.(McG.), M.D., Ph.D.(Queen's)  
G. Leonard; Ph.D.(McG.)

P. McPherson; M.Sc.(Man.), Ph.D.(Iowa)  
 E. Meyer; M.Sc.(Montr.), Ph.D.(McG.)  
 J. Minuk; M.D.(Man.), F.R.C.P.(C)  
 M. Panisset; M.D.(Montr.)  
 H. Paudel; Ph.D.(Okla.), M.Sc.(Nepal)  
 T. Paus; M.D.(Purkyne U./Czechoslovakia), Ph.D.(Czech. Acad. of Sciences/Prague)  
 B. Pike; B.Eng.(Mem.), M.Eng., Ph.D.(McG.)  
 C. Poulin; M.D.(Laval), F.R.C.P.(C)  
 A. Ptito; Ph.D.(Montr.)  
 D. Ragsdale; B.S.(Ill.), Ph.D.(Calif.)  
 Y. Rao; B.Sc.(China), Ph.D.(Tor.)  
 J.-P. Roy; M.D.(Laval), F.R.C.P.(C)  
 J. Rubin; B.Sc., M.D.(McG.), D.A.M.P.& N.  
 A. Sadikot; M.D.(McG.)  
 F. Salevsky; M.Sc., M.D.(Alta.), F.R.C.P.(C)  
 P. Séguéla; Ph.D.(Bord.), Ph.D.(Montr.)  
 D. Sirhan; M.D.(Montr.), F.R.C.S.(C)  
 J. Snipes; Ph.D., M.D.(Vanderbilt)  
 W. Sossin; S.B.(M.I.T.), Ph.D.(Stan.)  
 S. Stifani; Ph.D.(Rome), Ph.D.(Alta)  
 D. Trojan; M.D.(Conn.)  
 M. Veilleux; M.D.(Sher.), F.R.C.P.(C)

#### Lecturers

B. Brais; M.D.(McG.), M.Phil.(Univ. College London)  
 S. Chouinard; M.D.(Montr.), F.R.C.P.(C)  
 D. Klein; B.A., Ph.D.(U. of Witwatersrand/S. Africa)  
 A.M. Sarrazin; M.D.(Montr.), F.R.C.P.(C)  
 V. Sziklas; Ph.D.(McG.)  
 W. Vanast; M.D.(Tor.), F.R.C.P.(C)

#### Associate Members

C. Baker, C. Benkelfat, P. Blier, P. Boksa, P. Braun, C. Bushnell,  
 B. Collier, G. Debonnel, C. de Montigny, J.P.A. Gratton, R. Hess,  
 S. Kar, P. Lachapelle, A. Majnemer, M. Meaney, K. Mullen,  
 B. Petrof, J. Poirier, R. Quirion, L. Srivastava, C.D. Walker,  
 E. Wang, S. Williams, C. Wolfson, K. Worsley

#### Adjunct Professors

Z. Argov, S. Berkovic, N. Cashman, J. Doyon, G. Duncan,  
 A. Gjedde, J. Hardy, P. Matthews, L. McKerracher, M. Pandolfo,  
 T. Peters, M. Ptito, Y. Robitaille

## 54.2 Programs Offered

M.Sc. and Ph.D. in Neurological Sciences.

## 54.3 Admission Requirements

### General

The applicant should 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 the Faculty of Graduate Studies; however, the program prefers applicants to show a higher academic standing, and requires a minimum GPA of 3.3.

Applicants with degrees from a non-Canadian university must submit results of the GRE exam with their application.

Applicants whose undergraduate studies were carried out in a language other than English must submit results of the TOEFL exam with their application and have a score of 600 or higher.

### M.Sc. Degree

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

### Ph.D. Degree

M.Sc. in a related field or an M.D.

## 54.4 Application Procedures

Applications will be considered upon receipt of:

1. application form;
2. transcripts;
3. letters of reference;
4. \$60 application fee
5. TOEFL test results
6. GRE test results.

All information is to be submitted to above address.

### Deadlines:

September entrance –

May 1 (February 1 for International candidates)

January entrance –

October 15 (September 1 for International candidates).

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 course work necessary to complete the training deemed necessary for the degree sought. These decisions become an integral part of the graduation requirements for the student.

## 54.5 Program Requirements

### 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 to the Graduate Studies Committee (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 also review the written proposal and communicate its recommendations to the student and the Graduate Studies Committee.
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 and members of the Graduate Studies 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 which in turn presents its report to the Graduate Studies Committee.

### M.SC. DEGREE

#### Course requirements:

Student with a B.Sc., B.A. or M.D. degree: A minimum of 45 credits distributed as follows:\*

Principles of Neuroscience I course: 531-630A and either  
 Principles of Neuroscience II: 531-631B or CNS course:  
 531-610B;

6 credits in other graduate level specialty courses relevant to program;

9 credits in Master's project Proposal: 531-697 (first term of studies)

9 credits in Master's Seminar Presentation: 531-698 (second term of studies)

12 credits in Master's Thesis Submission: 531-699 (third term of studies)

Upon recommendation, depending upon their particular background and needs, students may be requested to take additional selected courses.

Any remaining credits needed to complete the minimum 45 credits required may be chosen from the following: Master's Thesis Research I: 531-695 (3 credits); Master's Thesis Research II: 531-696 (6 credits).

\* Please note that all M.Sc. level students must register for a minimum of 12 credits a term during the first three terms of their Master's program.

#### Research requirements:

Presentation of a thesis in a subfield of neuroscience. The thesis must be based upon the research of the student. While not necessarily requiring an exhaustive review of work in a particular field, or a great deal of original scholarship, the thesis must show familiarity with previous work in the field and must demonstrate the ability of the candidate to carry out research and to organize results, all of which must be presented in good literary style. The Graduate Studies Committee expects the student's research should be of sufficient quality for publication in a peer-reviewed journal. A seminar on the thesis topic is given in the second year, and each subsequent year, a report from the student's Advisory Committee is required by the graduate Studies Committee.

#### Residence requirements:

Three terms of full-time study.

### PH.D. DEGREE

#### Course requirements:

**Students with an M.Sc. degree** continuing in this Department have no required courses. 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 531-630 and 531-631 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 531-630 and 531-631. Recently graduating M.D.s should have the equivalent of 631-610, and may be granted equivalence. They will also be required to take 6 credits of graduate level courses.

#### Doctoral Candidacy Examination (531-700A/B)

All students registering directly into the Ph.D. program on or after September 1998, regardless of prior degrees from McGill or any other academic institutions, must complete the Doctoral Candidacy Examination within 18 months of initial registration in the Program. This is a qualifying examination consisting of a formal presentation and oral examination of the thesis proposal. The questioning will pertain to the student's knowledge and understanding of his/her field of specialization in neuroscience as well as the research proposal. Its primary purpose is to evaluate the student's ability to carry out original scholarship.

The Candidacy Examination will be conducted in conjunction with the Transfer seminar for all students currently registered in the M.Sc. program who apply for transfer to the Ph.D.

#### Research requirements:

Presentation of a thesis in a subfield of neuroscience. The thesis must display original scholarship expressed in satisfactory literary style and must be a distinct contribution to knowledge. After the thesis has been submitted to, and approved by the Faculty of Graduate Studies, a final oral exam will be held on the subject of the thesis and subjects immediately related to it.

#### Residence requirements:

Three years of resident study of which one year may be completed in the Master's program.

### 54.6 Graduate Courses

The course credit weight is given in parentheses (#) after the course title.

**531-602A CURRENT TOPICS IN NEUROSCIENCE.** (3) (Prerequisite: Permission of Unit Instructor) This course consists of several units, running concurrently, in which small groups of students (up to 8)

will participate in discussions of present and past literature that has contributed to the present "state of the art" knowledge on various fields of neuroscience. Each unit will be led by a faculty member with expertise in the chosen area. A list of the literature to be covered will be distributed in the first lecture and updated as new articles appear on the topic. The supervising faculty will introduce the topic. The remainder of the course (12-14 weeks) will be devoted to didactic discussion of the literature and/or students presentations in a journal-club format.

**Professors Barker, Leblanc and Staff**

**531-603B FOUNDATIONS OF CELLULAR EXCITABILITY.** (3) This course will focus on the neuronal excitability and synaptic communication in the central nervous system. Discussion of the molecular properties of the voltage-and-ligand-gated ion channels that are the building blocks of cellular excitability. Examination of synaptic transmission and the mechanisms that underlie the changes in synaptic strength that are responsible for learning and memory. Discussion of the properties of neuronal networks that contribute to higher brain functions and pathological conditions like epilepsy. Each week, the class will meet for two 90 minute long sessions dedicated to a particular topic. The first session will be a general presentation by the instructor and the second session will be a student presentation on a specific paper or set of papers.

**Professor Ragsdale and Staff**

**531-604A SEMINAR IN CELL AND MOLECULAR BIOLOGY OF NEUROLOGICAL DISEASE.** (3) (Offered alternate years.) (Prerequisites: 531-630A, 531-631B or 531-610B; and permission of instructor.) (Enrollment limited to 12.) Advanced seminars in neurobiology emphasizing current concepts of the molecular and cellular mechanisms underlying disease of the nervous system and muscle and how the study of disease has contributed to our understanding of cell biology. Topics: genetic mutations responsible for diseases, mechanisms of selective vulnerability of cell populations, and environmental influences.

**Professors Nalbantoglu and Durham**

**531-605B MOLECULAR AND CELLULAR ASPECTS OF NEURONAL DEVELOPMENT.** (3) (Offered alternate years.) This course focuses on neuronal development and maturation from a molecular aspect. We introduce various model organisms and systems that are used to study molecular aspects of development, explore their particular advantages and explore the cellular and molecular events that contribute to the development of the nervous system.

**Professor Stifani and Staff**

**531-610B CENTRAL NERVOUS SYSTEM.** (5) An interdisciplinary course including lectures in neuroanatomy and neurophysiology; laboratories in neuroanatomy, and clinical problems and demonstrations in neurology.

**Professor Chalk**

**531-630A PRINCIPLES OF NEUROSCIENCE I.** (3) (Prerequisites: 177-200A and 177-201B or equivalent; permission of instructor.) An overview of cellular and molecular neuroscience at the graduate level. Topics include: synthesis, processing and intracellular transport of macromolecules; development of the nervous system including neurogenesis, axonal pathfinding, synaptogenesis and myelination; neuronal survival and response to injury; generation and propagation of action potentials; neurotransmitters and synaptic transmission.

**Professor Durham**

**531-631B PRINCIPLES OF NEUROSCIENCE II.** (3) (Prerequisite: Permission of instructor; basic knowledge of mechanisms of neurotransmission and signal transduction.) An overview of the structure, function and interaction of neuronal systems of vertebrates. Topics include basic neuroanatomy, coding and processing of sensory information (somatic sensory, visual and auditory systems), control of posture and voluntary movement, learning and memory, processing of language and speech, cerebral blood flow, the neuroendocrine system and neuroimmunology.

**Professor Walker**

**531-697A,B,C,T,L MASTER'S THESIS PROPOSAL.** (9) (M.Sc. students only) Presentation of a written thesis proposal by the end of the first year in the program. This document stating the hypothesis being tested, relevant literature and methodology will be orally presented to the student's Advisory Committee which will also review

the written proposal and communicate its recommendations to the student and the Graduate Studies Committee.

**531-698A,B,C,T,L MASTER'S SEMINAR PRESENTATION.** (9) Student's presentation of a thesis research seminar. In this seminar, the student shall explain the direction of his/her research and present his/her findings to date. The presentation shall take approximately 30 to 45 minutes and shall be followed by a question period. This seminar will be attended by the Graduate Studies Committee, the student's Advisory Committee, and interested observers.

**531-695A,B,C,T,L MASTER'S RESEARCH I.** (3) Independent work under the direction of the student's supervisor.

**531-696A,B,C,T,L MASTER'S RESEARCH II.** (6) Independent work under the direction of the student's supervisor.

**531-699A,B,C,T,L MASTER'S THESIS SUBMISSION.** (12) Submission of a Master's thesis.

**531-700A/B DOCTORAL CANDIDACY EXAMINATION.** A qualifying examination consisting of a formal presentation and oral examination of the thesis proposal. The questioning will pertain to the student's knowledge and understanding of his/her field of specialization in neuroscience as well as the research proposal. Its primary purpose is to evaluate the student's ability to carry out original scholarship. (The Candidacy Examination course is also conducted as part of the Transfer seminar for all students currently registered in the M.Sc. program who apply for transfer to the Ph.D.)

## COURSES IN OTHER DEPARTMENTS

### Biology

**177-588A ADVANCES IN MOLECULAR AND CELLULAR NEUROBIOLOGY.** (3) **Professors Carbonetto and Hastings**

**177-532B DEVELOPMENTAL NEUROBIOLOGY SEMINAR.** (3) **Professor Levine**

### Dentistry

**590-654B MECHANISMS AND MANAGEMENT OF PAIN.** (3) **Professor Bushnell**

### Physiology

**552-520B IONIC CHANNELS.** (3) **Professors Drapeau and Bourque**

**552-556B TOPICS IN SYSTEMS NEUROSCIENCE.** (3) **Professors Guitton and Cullen**

### Psychiatry

**555-500B ADVANCES IN THE NEUROBIOLOGY OF MENTAL DISORDERS.** (3) **Professors Boksa and Gratton**

**555-630B STATISTICS FOR NEUROSCIENCES.** (3) **Professor Rochford**

### Psychology

**204-526A PROBLEMS IN VISUAL PERCEPTION.** (3) **Professors Mullen and Kingdom**

**204-710A PHYSIOLOGICAL PSYCHOLOGY GRADUATE SEMINAR COURSE.** (3)

## 55 Nursing

School of Nursing  
Wilson Hall  
3506 University Street  
Montreal, QC Canada H3A 2A7  
Telephone: (514) 398-4151  
Fax: (514) 398-8455  
Website: <http://www.nursing.mcgill.ca>

*Director* — L.N. Gottlieb

*Associate Director of Research* — C.C. Johnston

## 55.1 Staff

### Professor

L.N. Gottlieb; L.N., N., B.N., M.Sc.(A), Ph.D.(McG.)  
(*Flora M. Shaw Professor of Nursing*)

### Associate Professors

H. Ezer; N., B.Sc.(N.), M.Sc.(A)(McG.)  
N. Frasure-Smith; B.A., Ph.D.(Johns H.)  
C.C. Johnston; N., M.S.(Boston), B.N., D.Ed.(McG.)  
O. Mansi; B.Sc.N.,(Queen's), M.Sc..(A)(McG.)  
C.J. Pepler; N., B.N.Sc.(Queen's), M.Sc.N.(Wayne St.),  
Ph.D.(Mich.)

### Assistant Professors

M. Beaulieu; B.Sc., M.Sc.(A)(McG.), Ph.D.(McG.)  
A. Gagnon; N., B.Sc(N), M.P.H., Ph.D.(McG.)  
M. Grossman; N., B.A., B.Sc.(N), M.Sc.(A), Ph.D.(McG.)  
M.N. Purden; B.Sc.(N), Ph.D.(McG.)

### Lecturers

M. Buck; N., B.Sc.(N), M.Sc.(A)(McG.),  
K. Carnaghan-Sherrard; N., B.N., M.Sc.(A)(McG.)

### Sessional Faculty

A. Laizner; N., B.Sc.(N.), M.Sc.(A.)(McG.)  
L. Myers, N., B.A., M.Sc.(A)(McG.)  
B. Poggi; N., B.A., M.Sc.(A)(McG.),  
M. Stewart; N., B.Sc.(N.), M.Sc.(A.)(McG.)

## 55.2 Programs Offered

### Master's Programs

Two types of Master's degrees are offered: Master of Science (Applied) and Master of Science (with thesis) (not offered 1999-2000). These programs are designed to prepare clinicians and researchers for the expanding function of nursing within the health care delivery system.

### Master of Science (Applied)

The objective of this program is to prepare specialists in nursing able to participate in the development, implementation and management of services in all domains of health care. Opportunity is provided for the continued study of nursing, incorporating research and evaluation methods in the investigation of nursing problems.

### Master of Science (with thesis)

(not offered 1999-2000).

### Doctoral Studies in Nursing

The School of Nursing of McGill University and the Faculté des Sciences Infirmières of the Université de Montréal offer a joint doctorate program leading to a Ph.D. in Nursing.

The program is designed to train researchers who will make a contribution to the advancement of knowledge in the field of nursing and assume a leadership role both in the profession and in the health care system.

## 55.3 Admission Requirements

### Master's Programs

Non-Canadian applicants shall normally be required to submit documented proof of competency in oral and written English, e.g. TOEFL (580 minimum) or equivalent.

GRE – General Test required.

### Nurse applicants

Applicants for the Master's degree must have completed a bachelor's degree in nursing with a minimum GPA of 3.0 on a scale of 4.0. This preparation must be comparable to that offered in the bachelor's program at McGill. Accomplishment and development as a nurse are suggested. Applicants for the M.Sc. (with thesis) must have completed an introductory statistics course (3 credits) prior to entrance.

Nurses with a general B.Sc. or B.A. (comparable to the McGill undergraduate degrees) may be considered on an individual basis.

All nurse applicants are expected to hold current registration in the province or country from which they come. Nurses who are not licensed in Québec must obtain a special authorization for graduate nurse students from the Order of Nurses of Québec.

#### Non-nurse applicants (generic master's students)

Non-nurse applicants holding a bachelor's degree comparable to a B.Sc. or B.A. granted at McGill and who have potential for the study of nursing, may be admitted to a Qualifying Year. (Persons prepared in another professional discipline or in nursing are not eligible for this program.) A number of prerequisite courses are required. For entry, applicants must have a GPA of 3.0 or above.

#### Ph.D. Program

To be admitted to McGill University, the candidate must satisfy the following conditions:

1. hold a Master of Science in Nursing or equivalent;
2. GPA of 3.3 or high B standing;
3. demonstrated research ability;
4. be accepted by a faculty member who has agreed to serve as the thesis adviser;
5. submit a letter (not exceeding 5 typewritten pages) that outlines the proposed research to be carried out and the candidate's future career goals;
6. submit two letters of references from two professors who are familiar with the candidate's work and research aptitude;
7. submit a curriculum vitae;
8. submit two official copies of academic transcripts of undergraduate and graduate records,
9. hold nursing registration in Quebec or an authorization to study nursing, if necessary;
10. submit results of the Graduate Record Examination General Test (McGill University only).

### 55.4 Application Procedures

Application for admission to any of these programs is made on application forms available from the Graduate Program Office, School of Nursing. Applications must be completed according to the instructions that accompany the forms.

Deadline for receipt of application is March 1st. All documents required for admission should be submitted by this deadline. Classes are admitted in September.

### 55.5 Program Requirements

#### Master's Programs

The general rules concerning higher degrees apply. (See the Faculty of Graduate Studies General Information and Faculty Regulations.) A minimum of two years of study is required for the Masters' programs.

Nurse applicants to the Master's program may complete their studies on a part-time basis, i.e. minimum of 6 credits per term to a maximum of four years.

Non-nurse applicants who do not have all the prerequisites required for entry may apply for a qualifying year as full-time students. They are recommended for entry to the Master of Science (Applied) program following successful completion of the Qualifying Year of study. They must complete their program of study on a full-time basis.

#### M.SC. (APPLIED)

(48 credits nurse students; 52 credits non-nurse students)

##### First Year

(24 credits nurse students; 28 credits non-nurse students)

- 573-611D (6) Seminar in Nursing I  
 573-612A (3) Research Methods in Nursing I  
 573-614D (6) Clinical Laboratory in Nursing I  
 573-627B (3) Nursing Practicum  
 one 3-credit Statistics course

and

- \* 573-616C (4) Advanced Clinical Skills  
 \* 573-623A (3) Clinical Assessment and Therapeutics  
 \*\* Complementary course (3 credits)  
 \* Generic Students Only  
 \*\* Nurse Students Only

#### Second Year (24 credits)

- 573-615B (3) Health Care Evaluation  
 573-620A (2) Current Theories of Nursing  
 573-621D (6) Seminar in Nursing II  
 573-624A (4) Clinical Laboratory in Nursing II  
 573-625B (6) Clinical Laboratory in Nursing III  
 573-626A (3) Developments in Education & Administration

#### M.SC. (THESIS) (50 credits)

(not offered 1999-2000)

#### QUALIFYING YEAR

##### (non-nurse applicants entering with B.A. or B.Sc.)

- 572-222A (1) The McGill Model of Nursing  
 573-511D (6) Practice and Theory in Nursing – Part I  
 573-514D (10) Clinical Laboratory in Nursing  
 573-512C (8) Practice and Theory in Nursing – Part II

#### Complementary Courses (15 credits)

3 credits from Nursing

12 credits from the physical and social sciences, chosen in consultation with faculty to complement the student's previous academic background.

Students must successfully complete all requirements for entrance and for the Qualifying Year and be recommended by the Standing and Promotions Committee for entry to the Master's of Science (Applied) Program.

#### PH.D. PROGRAM

Each student's program is designed with the research director and thesis supervisor, taking into account the student's previous academic preparation, needs and research interests. The requirements for the doctoral degree are:

1. A minimum of 18 credits beyond the Master's level. Courses and seminars in research design, issues of measurement, advanced nursing, development of theory in nursing and advanced statistics are compulsory. Complementary course(s) in the student's major field of study may be elected. The student's program is decided in consultation with the faculty adviser.
2. Successful completion of the Ph.D. comprehensive examination.
3. Oral defense of the thesis proposal.
4. Dissertation and oral examination.
5. Two years of full-time residence. A student who has obtained a Master's degree at McGill University or at an approved institution elsewhere, and is proceeding in the same subject to a Ph.D. degree, may on the recommendation of the School, be registered in the second year of the Ph.D. program.

### 55.6 Courses

The letters which form part of the course numbers have the following significance:

- A – fall term  
 B – winter term  
 C – summer session courses starting in May  
 D – fall and winter term

- Denotes not offered in 1999-2000.

The course credit weight appears in parentheses (#) after the name.

#### GRADUATE PROGRAM

**573-611D SEMINAR IN NURSING I.** (6) A critical study of selected concepts in nursing and health related to individuals and families.

An introduction to the study of concepts and theories relevant to nursing. **H. Ezer**

**573-612A RESEARCH METHODS IN NURSING I.** (3) Basic knowledge and skills needed to conduct research. The philosophy and principles of scientific inquiry, research design, sampling, techniques of data collection, ethics, and incorporating research into practice are discussed with emphasis for nursing. **P. Purden and N. Frasure-Smith**

**573-614D CLINICAL LABORATORY IN NURSING I.** (6) Field experience in nursing to test and develop concepts critical to the health of individuals and families. The examination of theories relevant to nursing practice in the clinical field. **M Grossman**

**573-615B HEALTH CARE EVALUATION.** (3) An evaluation of educational and health care systems with particular reference to the nursing input in problems of health, health care and health care delivery. Evaluative research includes qualitative and quantitative approaches to assessing health status and quality of care. **A. Gagnon**

**573-616C ADVANCED CLINICAL SKILLS.** (4) Supervised clinical experiences in health care agencies are aimed at developing competence in technical and family nursing skills at an advanced level. Experience is determined on an individual basis according to learning needs and the student's area of interest. **Faculty**

**573-620A CURRENT THEORIES OF NURSING.** (2) (Prerequisites: 573-611D, 573-614D or equivalent). Current theories of nursing e.g. Orem, Roy, King, Rogers are examined along with their implications for practice, curriculum, administration, and research. The internal and external adequacy of these theories will be evaluated using selected schema. Critical analysis of issues and problems of theories in a practice discipline will be undertaken. **L. Gottlieb**

**573-621D SEMINAR IN NURSING II.** (6) An opportunity for investigation of some of the critical problems in nursing as related to the student's area of inquiry. Particular emphasis is placed on theory development in nursing. **TBA**

**573-623A CLINICAL ASSESSMENT AND THERAPEUTICS.** (3) (Prerequisites: 546-300B; 522-201A, 522-202B or equivalent.) Development of skills in the medical-nursing assessment and management of patients and families dealing with chronic and life-threatening illnesses. Includes instruction in history-taking and physical assessment. **M. Buck and N. Daigle**

**573-624A CLINICAL LABORATORY IN NURSING II.** (4) Field experience in nursing, incorporating extensive assessment, experimentation and evaluation of differing nursing approaches. **Faculty**

**573-625B CLINICAL LABORATORY IN NURSING III.** (6) Field experience in nursing, incorporating extensive assessment, experimentation and evaluation of differing nursing approaches. **Faculty**

**573-626A DEVELOPMENTS IN EDUCATION & ADMINISTRATION.** (3) An examination of theories of learning and organizational behaviour as related to the preparation of nurses for the delivery of health care services. Implications of these theories for the assessment, development, and evaluation of nursing programs will be investigated. **C. Pepler**

**573-627B NURSING PRACTICUM.** (3) Research, administrative or teaching projects in nursing are defined by interested faculty and developed with students. The goal is to promote and enhance scholarly activity and productivity. At completion, there should be some final product such as a manuscript, a data collection system set-up, or the synthesis of pilot data **A. Gagnon**

- **573-690B M.Sc. THESIS I.** (4)
- **573-691A M.Sc. THESIS II.** (8)
- **573-692B M.Sc. THESIS III.** (12)

#### QUALIFYING PROGRAM

- **573-507B HISTORY AND DEVELOPMENT OF NURSING.** (3)

**573-511D PRACTICE AND THEORY IN NURSING – PART I.** (6) A study of selected concepts related to the practice of nursing including health, family, normative life transitions and interpersonal interaction. The major focus is on developing an understanding of human behaviour using the process of scientific inquiry. Special emphasis is placed on the observation of people in their physical and social environments and on the analysis of clinical data as the basis for the development of innovative nursing approaches. **Faculty**

**573-512C PRACTICE AND THEORY IN NURSING – PART II.** (8) Learning to nurse adults in acute care settings, who are experiencing a variety of common illness-related problems.

**573-514D CLINICAL LABORATORY IN NURSING.** (10) Learning to nurse through field experiences with individuals and families in the community and in acute care settings. The focus is on the application of knowledge and theory in practice and includes the testing and analysis of nursing approaches. Students work with clients and families experiencing a variety of life events including aging, birth and parenting as well as acute illness and hospitalisation. **Faculty**

#### Ph.D. PROGRAM

**573-701 COMPREHENSIVE EXAMINATION.** (1)

**573-702 RESEARCH DESIGN.** (3) The logic and procedures of both qualitative and quantitative research designs are examined with particular emphasis on their appropriateness for addressing nursing and health problems. Issues specific to the design of nursing and health care studies are explored. Included in the types of designs analyzed are: experimental and quasi-experimental, ethnographic, grounded theory and evaluative. **C. Pepler**

**573-703 ISSUES OF MEASUREMENT.** (3) An examination of the underlying theories of measurement and techniques for assessing the validity and reliability of data collection instruments. Issues related to the development and/or utilization of instruments to measure target variables in nursing and health research are addressed. **C. Johnston**

**573-730 DEVELOPMENT OF THEORY IN NURSING.** (3) (Prerequisite: 573-620A or equivalent) This course surveys the history of nursing theory development with special emphasis placed on the approaches theory development and the factors affecting these approaches. Issues such as the level of theory, where theory derives are examined in light of the needs of a practice discipline. Future directions for theory development in nursing are explored. **F. Carnevale**

**573-780 ADVANCED NURSING.** (3) (3 hours seminar weekly) (Prerequisite: 573-621D, 573-624A, 573-625B or equivalent and permission of instructor). An in-depth analysis of selected issues and developments within nursing and health care. Included will be topics relevant to the areas of research and clinical expertise of the student and faculty. **L. Gottlieb and Faculty**

## 56 Occupational Health

Department of Occupational Health  
Website: <http://www.mcgill.ca/occh>

Chair — G. Thériault

M.Sc. (Resident) and Ph.D. programs:  
Charles Meredith House  
1130 Pine Avenue West  
Montreal, QC Canada H3A 1A3  
Telephone: (514) 398-4229  
Fax: (514) 398-7435  
Email: [occhdept@epid.lan.mcgill.ca](mailto:occhdept@epid.lan.mcgill.ca)

Coordinator (M.Sc. Resident/Ph.D.) — S. Larivière

M.Sc. (Distance Education) program:  
 1140 Pine Avenue West  
 Montreal, QC Canada H3A 1A3  
 Telephone: (514) 398-6989  
 Fax: (514) 398-7153  
 Email: distocch@epid.lan.mcgill.ca  
 Coordinator (M.Sc. Distance Education) — C. Arseneault

## 56.1 Staff

### Emeritus Professor

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

### Professors

J.P. Farant; Ph.D.(Carl.), C.I.H.

C. Infante-Rivard; M.D.(Montr.), M.P.H.(UCLA), Ph.D.(McG.),  
 F.R.C.P.(C)

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

### Associate Professors

A. Dufresne; B.Sc., M.Sc.(Que.), Ph.D.(McG.)

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

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

### Assistant Professor

T. Kosatsky; M.D.(Man.), M.P.H.(Emory)

### Lecturers

J.E. Deadman, P. Dubé, J.P. Gauvin, M. Joncas

### Associate Members

M.R. Becklake, J.F. Boivin, P. Ernst, F. Liddell, A.D. McDonald  
 (Epidemiology and Biostatistics)

P. Burpee (Faculty of Education)

B. Case (RVH-Pathology)

D. Ecobichon

### Adjunct Professors

B. Armstrong (London School of Hygiene); S. Arnold; N. Cherry (Univ. of Manchester); L. DeGuire, L. Drouin, M. Goldberg, F. Labreche, P. Robillard, S. Stock (Direction de la santé publique); A. Dembe (Univ. of Massachusetts); H. Demers (Consultant); D. Gautrin (Hôpital Sacré-Coeur); B. Pant (Concordia); L. Patry; G. Perrault (IRSST); P. Sebastien (St.Gobain); J. Saari (University of Waterloo); G. Shematek (Calgary Regional Hospitals Authority); J. Siemiatycki (Institut Armand Frappier); C. Tremblay (Santé Publique-Montérégie); M. Vézina (Centre de santé Publique de Québec); C. Viau (Université de Montréal); W. Wood (Environmental Safety)

## 56.2 Programs Offered

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.

### M.Sc. Applied Program (Full-time) (Resident) (on campus)

The objective of this program is to train and enable competent health and hygiene professionals to work in occupational health programs by evaluating the work environment and work hazards and by proposing appropriate methods of prevention and control.

### M.Sc. Applied Program (Distance Education)

A three and one-half year program leading to the degree of Master of Science Applied in Occupational Health Sciences – M.Sc.(A). This program is also offered for professional interest, for details please contact the Coordinator.

### Ph.D. Program

The objective of this program is to train independent researchers in the field of work environment and health.

## 56.3 Admission Requirements

Non-Canadian applicants whose mother tongue is not English and who have not completed an undergraduate degree using the English language are required to 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 213 on the computerized test.

### M.Sc. Applied Program (Full-time) (Resident) (on campus)

Candidates should have completed, with high academic standing, a bachelor's degree or its equivalent in a discipline relevant to the proposed field of study such as: chemistry, engineering, environmental sciences, physics; medicine, nursing and other health sciences with a standing equivalent to a minimum Cumulative Grade Point Average (CGPA) of 3.0 out of 4. High grades are expected in courses considered by the Department to be preparatory to the graduate program.

### M.Sc. Applied Program (Distance Education)

Candidates must hold an M.D., a bachelor's degree in nursing, or a B.Sc. (any major). They must have maintained at least a 3.0 on 4.0 grade point average.

Those who hold a B.Sc. must be Industrial Hygienists with at least three years of experience in industrial hygiene and/or safety. In the case of medical doctors and nurses, priority will be given to candidates with two or more years of experience in occupational health.

### Ph.D. Program

Candidates must hold a 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.).

## 56.4 Application Procedures

### M.Sc. Applied Program (Full-time) (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 field of interest (occupational health, occupational hygiene, worker safety, etc.) as well as a \$60(Cdn) application fee.

Eligible candidates may be invited for an interview with members of the Admissions Committee of the Department.

### M.Sc. Applied Program (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 \$60(Cdn) application fee.

### 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 \$60(Cdn) 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, who will guide him/her in the preparation of a definite research protocol.

## 56.5 Program Requirements

### M.SC. APPLIED PROGRAM (FULL-TIME) (RESIDENT) (ON CAMPUS)

Teaching is organized in eight 3-credit courses and one 6-credit course totalling 30 credits. Promotion to the following semester is dependant upon passing grade. A comprehensive examination is held at the end of the course program.

After successfully completing the course requirements and passing the comprehensive examination, students must carry out

an extended project (15 credits). The project requires students to identify an issue in their area of specialization, to review the present state of knowledge relevant to that issue, and either to carry out a survey to assess a particular work situation and make recommendations, or to devise a research protocol to extend knowledge in the area and to carry out a preliminary study to assess the feasibility of the protocol proposed.

Normally, students extend the duration of their project into the Fall term by registering for an additional session.

#### Required Courses (30 credits)

392-602B	(3)	Occupational Health Practice
392-603A	(3)	Work and Environment Epidemiology I
392-604A	(3)	Monitoring Occupational Environment
392-605D	(6)	Physical Health Hazards
392-608B	(3)	Biological and Chemical Hazards
392-612A	(3)	Principles of Toxicology
392-614B	(3)	Topics in Occupational Health
392-615B	(3)	Occupational Safety Practice
392-625B	(3)	Work and Environment Epidemiology II
392-600B		M.Sc.(A) Comprehensive Examination

#### Project Component – Required (15 credits)

392-699T	(15)	Project Occup. Health & Safety
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#### M.SC. APPLIED PROGRAM (DISTANCE EDUCATION)

The Master distance education program takes three and one-half years to complete.

The first part (3 years) consists of 10 three-credit theory courses. Students enrolled in the program must successfully complete ten courses. Equivalencies may be granted upon examination of the application by the professors concerned, and the Faculty of Graduate Studies.

During the first part, there are six work sessions (practicum). These sessions are held in Montréal on the McGill University Campus. Their aim is to offer students direct exposure to various industrial hygiene situations and laboratory activities. Each course has a final examination at the end of the term. Participation in the practica is an essential component of the program.

The second part consists of writing an extended project report. The project report will be carried out under the supervision of a member of the teaching staff. Note that students must pass the comprehensive exam before writing their report. A total of 45 credits is offered, the number required to complete the M.Sc. program.

#### Courses

392-602B-88	(3)	Occupational Health Practice
392-603B-88	(3)	Work & Environment Epidemiology I
392-604A-88	(3)	Monitoring Occupational Environment
392-608B-88	(3)	Biological and Chemical Hazards
392-612A-88	(3)	Principles of Toxicology
392-615B-88	(3)	Occupational Safety Practice
392-616A-88	(3)	Occupational Hygiene
392-617A-88	(3)	Occupational Diseases
392-624B-88	(3)	Social & Behavioural Aspects of Occupational Health
392-625B-88	(3)	Work & Environment Epidemiology II.
392-626B-88	(3)	Basics of Physical Health Hazards
392-627A-88	(3)	Work Physiology and Ergonomics
392-600B-88		M.Sc.(A) Comprehensive Examination

Each course has a final examination at the end of the term. Students must obtain at least 65% (B-) in each course in the program. Students who fail one course will be invited to withdraw from the program. The Department does not make any provision for make-up examinations. Special circumstances can be examined.

#### Practica

Practicum 1: Monitoring the work environment  
to be preceded by 392-616-88

Practicum 2: Clinical approach to occupational diseases  
to be preceded by 392-617A-88

Practicum 3: Epidemiology in occupational health  
to be preceded by 392-603-88

Practicum 4: Ethics and Law / Mental Health /  
Psychoactive substance abuse  
to be preceded by 392-624-88

Practicum 5: Ergonomic evaluation  
to be preceded by 392-627-88

Practicum 6: The multidisciplinary management of occupational  
health problems (student reports)  
to be preceded by 392-625-88 and/or 392-608-88

#### Project Component – Required (15 credits)

392-699T,D-88(15)		Project Occup. Health & Safety
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#### PH.D. PROGRAM

Three years of resident study are required for this program.

Students are required to take course 392-706D Occupational Health and Hygiene Seminars (2 credits) and 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.

All Ph.D. students must take a comprehensive examination within 18 months of registration.

A thesis committee will be established to ensure proper supervision and coverage of the different fields of expertise as required.

#### 56.6 Courses

● Denotes not offered in 1999-2000.

□ Denotes limited enrolment.

The course credit weight is given in parentheses (#) after the course title.

#### M.SC.(A) APPLIED PROGRAM (RESIDENT) COURSES

##### 392-600B M.Sc.(A) COMPREHENSIVE EXAMINATION. (0)

**392-602B OCCUPATIONAL HEALTH PRACTICE.** (3) The course which includes lectures, discussions and practical sessions, analyzes the functions, structure and organization of occupational health programs and services.

**392-603A WORK AND ENVIRONMENT EPIDEMIOLOGY I.** (3) Lectures and practical sessions to provide students with basic knowledge of epidemiology and statistics as applied to occupational health.

**392-604A MONITORING OCCUPATIONAL ENVIRONMENT.** (3) Principles and practices of environmental and biological monitoring of workplace hazards. Familiarization with instrumentation and calibration procedures. Students learn to identify workplace health hazards, develop effective sampling strategies, use industrial hygiene equipment and interpret results of exposure measurements.

**392-605D PHYSICAL HEALTH HAZARDS.** (6) Properties, mechanisms of action and health effects of physical agents in the workplace and in the general environment: electromagnetic risks, noise and vibration, ionizing radiation, ventilation and thermal environment. Administrative, engineering and medical control methods, exposure standards and safety measures for these agents.

**392-608B BIOLOGICAL AND CHEMICAL HAZARDS.** (3) This course will acquaint the student with the physical, chemical, and toxicological properties of common industrial products, important industrial processes and their associated health and safety hazards and the control measures.

**392-612A PRINCIPLES OF TOXICOLOGY.** (3) Lectures and practical sessions on selected topics, including acute, subacute and chronic toxicity assessment, pharmacokinetics and pharmacodynamics, mutagenicity, carcinogenicity and teratogenicity.

**392-614B TOPICS IN OCCUPATIONAL HEALTH.** (3) Using a problem oriented approach, this course aims at integrating all notions seen previously in the program. Advanced learning, lectures, readings, student presentations, written assignments.

**392-615B OCCUPATIONAL SAFETY PRACTICE.** (3) Principles of safety and loss prevention; hazards related incident investigations and analyses, occupational safety management tools; loss recognition; safety standards, guidelines and legislation. Selected topics include: fire prevention; workshop, tool and machine safety; fall protection; laboratory safety; confined space entry; safe work permit systems; and materials handling.

**392-616A OCCUPATIONAL HYGIENE.** (3) An introduction to the principles and practices of industrial hygiene designed to provide the students with the knowledge required to identify health and safety hazards in the workplace.

● **392-625B WORK AND ENVIRONMENT EPIDEMIOLOGY II.** (3)

**392-699T PROJECT OCCUP. HEALTH & SAFETY.** (15) Under supervision, the student will identify an issue relevant to occupational health and report on work accomplished (i) to review the present state of knowledge and (ii) to conduct a survey and make recommendations or to devise a study proposal and to carry out a preliminary feasibility study.

**M.SC.(A) DISTANCE EDUCATION PROGRAM COURSES**

**392-600B OR C 88 COMPREHENSIVE EXAMINATION.**

□ **392-602B-88 OCCUPATIONAL HEALTH PRACTICE.** (3)

□ **392-603B-88 WORK & ENVIRONMENT EPIDEMIOLOGY I.** (3)  
**Practicum 3:** Epidemiology in Occupational Health

**392-604A-88 MONITORING OCCUPATIONAL ENVIRONMENT.** (3)  
**Practicum 5-F1** – Laboratory session on monitoring the occupational environment and interpreting results.

□ **392-608B-88 BIOLOGICAL AND CHEMICAL HAZARDS.** (3) (See 392-625B-88)

**Practicum 6:** The Multidisciplinary Management of Occupational Health Problems (Student Reports) (Same as 392-625B-88)

□ **392-612A-88 PRINCIPLES OF TOXICOLOGY.** (3)

□ **392-615B-88 OCCUPATIONAL SAFETY PRACTICE.** (3)

□ **392-616A-88 OCCUPATIONAL HYGIENE.** (3)

**Practicum 1:** Monitoring the Work Environment

□ **392-617A-88 OCCUPATIONAL DISEASES.** (3) Review of occupational health problems structured around target organs: respiratory, musculo-skeletal, skin, cardiovascular, mental disorders and aggressive agents: trauma, physical agents, solvents and metals and infectious agents. Also covered are occupational cancer, conditions associated with hypo- and hyperbaric environments, mutagenicity, teratogenicity and reproduction disorders, pre-employment, period examination and medical activities in the workplace.

**Practicum 2:** Clinical Approach to Occupational Diseases

□ **392-624B-88 SOCIAL & BEHAVIOURAL ASPECTS OF OCCUPATIONAL HEALTH.** (3) This course explores the social science of occupational health practice, and describes influences on that practice of recent political, social and economic changes in the workforce and at the workplace; the theory of health promotion; management skills; and evaluation methods

**Practicum 4:** Selected issues in Ethics and law/Mental health/Psychoactive substance abuse (Same as 392-602B-88)

□ **392-625B-88 WORK & ENVIRONMENT EPIDEMIOLOGY II.** (3)

Combined with 392-608B-88 to prepare students to evaluate the relations between exposure to workplace contaminants and health. The course involves the multidisciplinary analysis of four problems: Work-related cancer; Musculo-skeletal problems; Biological hazards; Chemical intoxication.

**Practicum 6:** The Multidisciplinary Management of Occupational Health Problems (Student Reports) (Same as 392-608A-88)

□ **392-626B-88 BASICS OF PHYSICAL HEALTH HAZARDS.** (3)

Properties, mechanisms of action and health effects of physical agents in the workplace: thermal environment, noise and vibration,

electromagnetism and ionizing radiation. Engineering control methods, exposure standards and safety measures for physical agents. Basics of monitoring workers for health impacts. Control of airborne contaminants using ventilation-based dilution methods.

□ **392-627A-88 WORK PHYSIOLOGY AND ERGONOMICS.** (3) Provide students with basic knowledge of physiological and psychological work requirements, ergonomic approach to work-related health problems and application of this type of approach to preventive and corrective measures.

**Practicum 5:** Ergonomic Evaluation

**392-699T,D-88 PROJECT OCCUP. HEALTH & SAFETY.** (15)

**PH.D. COURSES**

**392-700D PH.D. COMPREHENSIVE EXAMINATION.**

**392-706D OCCUPATIONAL HEALTH AND HYGIENE SEMINARS.** (2)

A critical appraisal of the occupational health sciences literature which addresses issues in hygiene, safety, epidemiology and toxicology. Students will develop a critical sense of the literature and increase their understanding of different research paradigms.

## 57 Otolaryngology

Department of Otolaryngology  
Montreal Children's Hospital  
2300 Tupper Street  
Montreal, QC  
Canada H3H 1P3  
Telephone: (514) 934-4344  
Fax: (514) 934-4342

*Chair* — M.D. Schloss

### 57.1 Staff

*Emeritus Professor*

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

*Professors*

H. L. Galiana; B.Eng., M.Eng., Ph.D.(McG.)  
A. Katsarkas; M.D.(Thess.), F.R.C.S.(C) M.Sc.(Otol.)  
M.D. Schloss; M.D.(Br.Col.), F.R.C.S.(C)

*Associate Professors*

M.J. Black; M.D., C.M.(McG.), F.R.C.S.(C)  
N. Fanous; M.B., BCH.(Cairo), F.R.C.S.(C)  
S. Frenkiel; B.Sc., M.D., C.M.(McG.), F.R.C.S.(C)  
W.R.J. Funnell; B.Eng., M.Eng., Ph.D.(McG.)  
J. Manoukian; M.B., Ch.B.(Alex.), F.R.C.S.(C)  
M. Mendelsohn; B.Sc., M.D., C.M.(McG.), F.R.C.S.(C)  
W.H. Novick; M.D., C.M.(Queen's), 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)  
G.S. Shenouda; M.D.(Cairo), F.R.C.P.(C)  
T.L. Tewfik; M.D.(Alex.), 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)  
M. Hier; M.D.(McG.), F.R.C.S.(C)  
K. Kost; M.D., C.M.(McG.), F.R.C.S.(C)  
R. Lafleur; M.D.(Ott.), F.R.C.S.(C)  
M.-L. Lessard; M.D.(Laval), F.R.C.S.(C)  
J. Rappaport; M.D.(Dalhousie), F.R.C.S.(C)  
H. Remy; M.D.(Montr.), F.R.C.S.(C)  
L. Rochon; M.D., (Sher.), F.R.C.P.(C)  
N. Sadeghi; M.D.(McG.), F.R.C.S.(C) M.Sc.(Otol.)  
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)  
A.G. Zeitouni; M.D.(Sher.), F.R.C.S.(C) M.Sc.(Otol.)

*Lecturers*

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

*Adjunct Professors*

M. Desrosiers; M.D.(Montr.), F.R.C.S.(C)  
J.-J. Dufour; M.D.(Laval), F.R.C.S.(C)

**57.2 Program Offered**

The Master of Science degree in Otolaryngology trains otolaryngologists for clinical or basic-science research in Otolaryngology.

**57.3 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.

All applicants must be otolaryngologists, or they should be currently enrolled in a residency program leading to certification in Otolaryngology.

**57.4 Application Procedures**

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: \$60;
5. Results of Test of English as a Foreign Language (TOEFL) (minimum of 550) if undergraduate and medical training were carried out in a language other than English or French.

Prospective students should contact research supervisors individually.

**57.5 Program Requirements for**

The M.Sc. program comprises a minimum of 45 credits as follows:

**Required Courses** (12 credits)

- 540-602 (3) Physiology, Histopathology and Clinical Otolaryngology 1  
540-612 (3) Physiology, Histopathology and Clinical Otolaryngology 2  
540-603 (3) Advanced Scientific Principles of Otolaryngology 1  
540-613 (3) Advanced Scientific Principles of Otolaryngology 2

**Complementary Course** (3 credits)

- 513-607 (3) Principles of Inferential Statistics in Medicine or equivalent

**Thesis Component – Required** (30 credits)

- 540-690 (3) Thesis 1  
540-691 (3) Thesis 2  
540-692 (6) Thesis 3  
540-693 (6) Thesis 4  
540-694 (12) Thesis 5

When appropriate, courses 540-602, 540-612, 540-603 or 540-613 may be replaced by other basic-science or clinical (500-level or higher) courses of relevance to Otolaryngology, as recommended or approved by the Department.

Students aiming to acquire an interdisciplinary background will be expected to take additional elective courses, at the undergraduate level if necessary.

**57.6 Graduate Courses**

The course credit weight is given in parentheses (#) after the course title.

**540-602A,B,C PHYSIOLOGY, HISTOPATHOLOGY AND CLINICAL OTOLARYNGOLOGY 1.** (3) (6 hours/week) University and hospital rounds and seminars presenting various topics in Clinical Otolaryngology. **Dr. S. Frenkiel and Staff**

**540-603A,B,C ADVANCED SCIENTIFIC PRINCIPLES OF OTOLARYNGOLOGY 1.** (3) (1.5 hours/week) Lectures in advanced basic-science topics of relevance to the otolaryngologist.

**Dr. S. Frenkiel and Staff**

**540-612A,B,C PHYSIOLOGY, HISTOPATHOLOGY AND CLINICAL OTOLARYNGOLOGY 2.** (3) (6 hours/week) University and hospital rounds and seminars presenting various additional topics in Clinical Otolaryngology. **Dr. S. Frenkiel and Staff.**

**540-613A,B,C ADVANCED SCIENTIFIC PRINCIPLES OF OTOLARYNGOLOGY 2.** (3) (1.5 hours/week) Lectures in additional basic-science topics of relevance to the otolaryngologist.

**Dr. S. Frenkiel and Staff**

**540-690 THESIS 1.** (3) A literature search and research proposal under supervision of the research supervisor that leads to a written proposal.

**540-691 THESIS 2.** (3) Supervised training and research in connection with the Master's thesis.

**540-692 THESIS 3.** (3) Independent research in connection with the Master's thesis.

**540-693 THESIS 4.** (6) A seminar and written report to be presented to an ad hoc committee describing appropriate progress at the end of the first year of training.

**540-694 THESIS 5.** (12) Independent study in connection with the Master's thesis. Presentation of results at a departmental seminar, or at a scientific meeting. Completion and final acceptance of the M.Sc. Thesis by the Department and Faculty of Graduate Studies.

**513-607A,C,L PRINCIPLES OF INFERENCE IN STATISTICS IN MEDICINE.** (3) Introduction to basic principles of statistical inference.

**58 Parasitology**

Institute of Parasitology  
Macdonald Campus  
21,111 Lakeshore Road  
Sainte-Anne-de-Bellevue, QC  
Canada H9X 3V9  
Telephone: (514) 398-7722  
Fax: (514) 398-7857  
Email: grad\_sec@parasit.lan.mcgill.ca  
Website: <http://www.parasitology.mcgill.ca/>

*Director* — Marilyn E. Scott

**58.1 Staff***Professors*

G.M. Faubert; B.Sc.(Sher.), M.Sc.(Montr.), Ph.D.(McG.)  
R. Prichard; B.Sc., Ph.D.(N.S.W.) (*CP Professor of Biotechnology*)

*Associate Professors*

K. Chadee; B.Sc.(Winn.), M.Sc.(Man.), Ph.D.(McG.)  
E. Georges; B.Sc., Ph.D.(McG.)  
G.J. Matlashewski; B.Sc.(C' dia), Ph.D.(Ott.)  
M.E. Scott; B.Sc.(U.N.B.), Ph.D.(McG.)

*Assistant Professors*

R.N. Beech; B.Sc.(Nott.), Ph.D.(Edin.)  
P. Ribeiro; B.Sc., Ph.D.(York)

*Adjunct Professors*

M.A. Curtis; B.Sc., M.Sc., Ph.D.(McG.) (*Natural Resource Sciences, Wildlife Biology*)  
M.E. Rau; B.Sc.(Purdue), M.Sc., Ph.D.(McG.) (*Natural Resource Sciences, Entomology*)  
M. Stevenson; B.A.(Hood), M.Sc., Ph.D.(Catholic U. of Amer.), (*Medicine, Experimental Medicine*)  
B. Ward; M.D.(McG.), M.Sc.(Oxon), F.R.C.P.(C) (*Medicine, Experimental Medicine*)

*Lecturer*

J.M. Smith, B.Sc.(N.E. London Polytechnic), Ph.D.(McG.)

## 58.2 Programs Offered

M.Sc. and Ph.D. in Parasitology, and Graduate Certificate in Biotechnology.

The Institute of Parasitology teaches and researches the phenomenon of parasitism of man and livestock. Current research involvement includes the biology, biochemistry, pharmacology, control, ecology, epidemiology, immunology, molecular biology, neurobiology, and population and molecular genetics of parasitic organisms, viruses and cancer cells.

The Institute is housed in its own building adjacent to the Macdonald Campus Library, and has well equipped laboratories. The Institute has its own animal rooms and has access to large animal facilities at Macdonald farm. The Institute is affiliated to the McGill Centre for Tropical Diseases at the Montreal General Hospital.

Staff at the Institute of Parasitology also coordinate a 15-credit Graduate Certificate in Biotechnology.

## 58.3 Admission Requirements

Candidates for either the M.Sc. or the Ph.D. degree should possess a Bachelor's degree in the biological or medical sciences with a cumulative grade point average of 3.2/4.0. Previous experience in parasitology is not essential.

Graduate Certificate in Biotechnology.

## 58.4 Application Procedures

Applications for Admission and all supporting documents must be sent directly to:

Student Affairs Office (Graduate Studies)  
Macdonald Campus of McGill University  
21,111 Lakeshore  
Ste-Anne-de-Bellevue, Québec  
H9X 3V9 CANADA  
Telephone: (514) 398-7708  
Fax: (514) 398-7968  
Email: GRAD@macdonald.mcgill.ca

Applications will be considered upon receipt of a signed and completed application form, \$60 application fee, all official transcripts, two signed original letters of reference on official letterhead of originating institution, and (if required) proof of competency in oral and written English by appropriate exams.

**Deadlines** – For **international students**, complete applications with supporting documents must reach the Student Affairs Office (Graduate Studies) at Macdonald Campus at least **eight months** prior to the intended start of program. May 1 for January (winter); September 1 for May (summer); January 1 for September (fall). For **domestic students**, complete applications with supporting documents must reach the office no later than **three months** in advance of intended start of program.

**Application Fee (non-refundable)** – A fee of \$60 Canadian must accompany each application (including McGill students), otherwise it cannot be considered. This sum must be remitted using one of the following methods:

1. Certified personal cheque in Cdn.\$ drawn on a Canadian bank;
2. Certified personal cheque in U.S.\$ drawn on a U.S. bank;
3. Canadian Money order in Cdn.\$;
4. U.S. Money Order in U.S.\$;
5. Bank draft in Cdn.\$ drawn on a Canadian bank;
6. Bank draft in U.S.\$ drawn on a U.S. bank;
7. Credit card (by completing the appropriate section of the application form).

**Transcripts** – Two official copies of all transcripts are required for admission. Transcripts written in a language other than English or French must be accompanied by a certified translation. An explanation of the grading system used by the applicant's university is essential. It is the applicant's responsibility to arrange for tran-

scripts to be sent. DOCUMENTS SUBMITTED WILL NOT BE RETURNED.

It is desirable to submit a list of the titles of courses taken in the major subject, since transcripts often give code numbers only. Applicants must be graduates of a university of recognized reputation and hold a Bachelor's degree equivalent to a McGill Honours 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 minimum cumulative grade point average (CGPA) is 3.0/4.0 (second-class upper) or 3.2/4.0 during the last two full-time years of university study. High grades are expected in courses considered by the academic unit to be preparatory to the graduate program.

**Letters of Recommendation** – Two letters of recommendation on letterhead and with original signatures from two instructors familiar with the applicant's work, preferably in the applicant's area of specialization, are required. It is the applicant's responsibility to arrange for these letters to be sent.

**Competency in English** – Non-Canadian applicants whose mother tongue is not English and who have not completed an undergraduate degree using the English language are required to submit documented proof of competency in oral and written English, by appropriate exams, e.g. TOEFL (minimum score 550) or IELTS (minimum 6.5). The MCHE is not considered equivalent. Results must be submitted as part of the application. The University code is 0935 (McGill University, Montreal); department code is 31 (graduate schools), Biological Sciences - Agriculture.

**Graduate Record Exam (GRE)** – The GRE is not required, but it is highly recommended.

**Financial aid is very limited and highly competitive. It is suggested that students give serious consideration to their financial planning before submitting an application.**

Acceptance to all programs depends on a staff member agreeing to serve as the student's supervisor and the student obtaining financial support. Normally, a student will not be accepted unless adequate financial support can be provided by the student and/or the student's supervisor. Academic units cannot guarantee financial support via teaching assistantships or other funds.

**Qualifying Students** – 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* if they have met the Faculty of Graduate Studies and Research minimum CGPA of 3.0/4.0. The course(s) to be taken in a *Qualifying Program* will be prescribed by the academic unit concerned. *Qualifying students* are registered in the Faculty of Graduate Studies and Research, **but not as candidates for a degree**. Only one qualifying year is permitted. **Successful completion of a qualifying program does not guarantee admission to a degree program.**

## 58.5 Program Requirements

### M.Sc. Degree

Candidates are required to write a research proposal in the second term of their registration to fulfill the requirements of 391-600D. While in the Institute, all students are required to register and participate in the seminar courses 391-606 and 391-607. Seminar speakers include students, professors and invited guests. Although emphasis in the graduate program is on research, satisfactory completion of two compulsory 3-credit graduate courses (391-635 and 391-655) is required in the first year of study. Other course work in related subjects may be required, depending upon the candidates' background and research orientation. In total, a minimum of 14 credits of course work is required and a thesis (courses 391-687, 688, 689). The minimum requirement of the M.Sc. degree is 46 credits.

**Ph.D. Degree**

In the first year of the doctoral program, the candidates must successfully complete a written thesis proposal and make an oral presentation on their proposed research to fulfill 391-700D. Satisfactory completion of graduate courses 391-635 and 391-655 is required. While in the Institute, all students are required to participate in the seminar courses (391-606, 391-607).

**Graduate Certificate in Biotechnology**

15-credits. Required courses: 202-505, 391-620, 391-621.

**58.6 Courses**

● Denotes not offered in 1999-2000.

□ Denotes limited enrolment.

The course credit weight is given in parentheses (#) after the course title.

**The following advanced undergraduate courses are available for graduate students in Parasitology.**

● **177-345A PARASITISM AND SYMBIOSIS.** (3) (2 lectures and one lab per week) (Prerequisite: 177-204A or permission of instructor.)

**202-505A,B SELECTED TOPICS IN BIOTECHNOLOGY.** (3) (one 3-hour lecture per week) Current methods used in the biotechnology industry and research, as applied to medical, biological, environmental, agricultural and food sciences aspects of biotechnology, will be described and discussed. This multidisciplinary course will include lectures from outstanding biotechnology researchers from industry and McGill professors, and visits to leading centres of biotechnology in the region.

**Professor Prichard**

**333-211A,B BIOCHEMISTRY I.** (3) (3 lectures per week) (Prerequisite: 333-230A) Biochemistry of carbohydrates, lipids, proteins, nucleic acids, enzymes and coenzymes. Introduction of intermediary metabolism.

**Professors Georges and Ribeiro**

**344-202B CELLULAR BIOLOGY.** (3) (4 lectures per week) Cellular biology in prokaryotic and eukaryotic cells, including their interaction with viruses. Structure, function and replication of theoretical cell types with the emphasis on structure and structurally related function. Some examples of specialized cells are provided to illustrate some of the differences between cell types. Some background in biochemistry is required.

**Professor Beech**

**360-306A MATHEMATICAL METHODS IN ECOLOGY.** (3) (3 lectures per week) An introduction to mathematical and graphical tools for use in ecology. Representation and interpretation of data and associated statistics in graphs and tables; theoretical modelling in plant and animal ecology, including difference and differential equation models. Introduction to stability analysis and probability theory. Emphasis will be placed on graphical techniques.

**Professor Scott**

**375-410B WILDLIFE ECOLOGY.** (3) (3 lectures per week, and assignments) (Prerequisite: 344-205B or equivalent.) Ecological processes and theories in animal populations. Interrelationships among biological processes, biotic and abiotic factors, and life history strategies. Topics include population dynamics, optimization strategies, predation, habitat selection, risks and decision making, and social behavior. Application of problem-solving approach to wildlife ecology through individual and group work.

**Professor Scott**

**391-400B EUKARYOTIC CELLS AND VIRUSES.** (3) (4 lectures per week) (Prerequisite: 356-204A) The basic principles of molecular biology and the underlying molecular basis for various methodologies in molecular biology are covered. The molecular genetic basis for viral infections and tumorigenesis will be covered as examples of the use of molecular genetic approaches to address biological problems.

**Professor Matlashewski**

**391-410B ENVIRONMENT AND INFECTION.** (3) (2 lectures per week) Infectious pathogens of humans and animals and their impact on the global environment are considered. The central tenet is that

infectious pathogens are environmental risk factors. The course considers their impact on the human condition and juxtaposes the impact of control and treatment measures and environmental change.

**Dr. Smith**

**391-438A IMMUNOLOGY.** (3) (3 lectures per week) (Prerequisite: 344-202B or permission of instructor.) An in-depth analysis of the principles of cellular and molecular immunology. The emphasis of the course is on host defense against infection and on diseases caused by abnormal immune responses.

**Professor Chadee**

□ **391-501 BIOINFORMATICS.** (3) (2 lectures and 1 laboratory per week) This course deals with the application of computer software to the fields of molecular biology and biotechnology. Information retrieval from databases available on the internet. Analysis of the primary and secondary structural components of nucleic acids and proteins. Sequence similarity comparisons. Identification of putative function.

**Professor Beech**

**Courses for Higher Degrees**

**391-600D THESIS PROPOSAL FOR M.Sc. CANDIDATES.** (4)

**Supervisor and Staff**

**391-606A,B PARASITOLOGY SEMINAR.** (2) A seminar series in which students present seminars covering topics in parasitology, in areas relevant to their research interests. Students register for the course in their second term of residency. Attendance and participation are compulsory for M.Sc. and Ph.D. students.

**Professor Scott**

**391-607A,B PARASITOLOGY RESEARCH SEMINAR.** (2) This is a required course for M.Sc. and Ph.D. students. A seminar course in which students registered at the Institute of Parasitology present seminars on the results of their thesis research. Students register for the course in the final term prior to thesis submission.

**Professor Scott**

**391-620A,B BIOTECHNOLOGY LABORATORY TECHNIQUES.** (3) (one 6-hour lab per week) Practical training in contemporary methods of molecular and cellular biology. Intended for students with background in molecular biology, biochemistry, or a related area, who are already familiar with theoretical principles of recombinant DNA technologies. Topics include: polymerase chain reaction (PCR), methods for gene cloning and mutagenesis, eukaryotic and prokaryotic gene expression systems, protein purification and methods of eukaryotic cell culture.

**Professors Ribeiro and Matlashewski**

**391-621A,B BIOTECHNOLOGY MANAGEMENT.** (3) (one 3-hour lecture per week) Topics relevant to the management of research in industry are presented by experts working in industry. This course highlights the differences existing between research done in an academic environment and research done within industry.

**Professor Faubert**

**391-635A,B CELL BIOLOGY AND INFECTION.** (3) (Prerequisite: students with some background in molecular biology.) Research articles will be the primary source of information. This course will cover new principles in cell biology. In particular, the mechanisms by which gene expression is regulated through signal transduction pathways initiated at the cell surface will be presented.

**Professor Chadee**

**391-655A,B HOST-PARASITE INTERACTIONS.** (3) Lectures, tutorials and laboratory demonstrations of the principal factors which affect levels of parasite infection and treatment of infections in humans and animals. The integration and management of the host-parasite relationship in terms of transmission, population dynamics, environmental management, behaviour, immune responses, pathology, and pharmacology to decrease parasitic disease.

**Dr. Smith**

**391-665A,B SPECIAL TOPICS IN PARASITOLOGY.** (3) This course designation will be used for special courses that staff, or visiting professors, may wish to provide when student interest warrants. Examples might include a laboratory techniques course, a mathematical modelling course or a special pharmacology seminar series.

**391-675A,B MEMBRANE PROTEINS IN HUMAN DISEASES.** (3) (Prerequisite: 333-211A or equivalent.) The molecular mechanism of membrane proteins and their role in human diseases. Specific examples of how parasites and mammalian cells use these membrane proteins to manipulate their environment will be reviewed in detail.

**Professor Georges**

**391-687A,B THESIS RESEARCH I.** (10) **Staff**

**391-688A,B THESIS RESEARCH II.** (10) **Staff**

**391-689A,B THESIS RESEARCH III.** (12) **Staff**

**391-700D THESIS PROPOSAL FOR PH.D. CANDIDATES.**  
**Supervisor and Staff**

P.J. Chauvin; M.Sc.(W.Ont.), D.D.S.(McG.)  
D. Demschuk; B.Sc., M.Sc., Ph.D.(McG.)  
J. Emond; B.A., M.Sc., M.D.(Montr.)  
F. Halwani; M.D.(Iran), Ph.D.(McG.), F.R.C.P.(C)  
B. Jamison; M.D., C.M.(McG.), F.R.C.P.(C)  
E. Lamoureux; B.Sc., M.D.(Montr.), F.R.C.P.(C)  
C. Logan; M.B.B.S.(W.I.), F.R.C.P.(C)  
E. MacNamara; M.B., Ch.B.(Trinity), F.R.C.P.(C)  
A.R. Mehio; M.D.(Leb.)  
C. Pothel; M.D.(Haiti), F.R.C.P.(C)  
I. Roy; B.Sc., M.D., C.M.(McG.), F.R.C.P.(C)  
G.J. Snipes Jr.; B.Sc.(Emory), M.D., Ph.D.(Vanderbilt) (*joint appt with Neurology & Neurosurgery*)  
H. Srolovitz; B.Sc.(Pitt.), M.D.(Basle)  
J. St. Cyr; M.D., C.M.(McG.), F.R.C.P.(C)

*Adjunct Professors*

T. Seemayer, University of Nebraska Medical Centre  
P.D. Winocour, BioChem Therapeutic Inc.

## 59 Pathology

Department of Pathology  
Duff Medical Building  
3775 University Street  
Montreal, QC H3A 2B4  
Telephone: (514) 398-7192 Ext. 7195 or 7245  
Fax: (514) 398-7446  
Email: hoffmann@pathology.lan.mcgill.ca  
Website: <http://www.mcgill.ca/pathology>

*Chair* — R.P. Michel

*Director of Graduate Program* — E. Zorychta

### 59.1 Staff

*Emeritus Professor*

S. Moore; M.B., Ch.B.(Belf.), F.R.C.P.(C)

*Professors*

M.N. Burnier Jr.; M.D., M.Sc., Ph.D.(Brazil)  
A.C. Cuello; B.Sc., M.D.(Buenos Aires), M.A., D.Sc.(Oxon.) (*joint appt with Pharmacology*)  
W.P. Duguid; M.B., Ch.B.(Glas.)  
A. Ferenczy; B.A., B.Sc., M.D.(Montr.)  
R.D.C. Forbes; M.D.(Queen's), F.R.C.P.(C)  
R. Fraser; B.Sc., M.D., C.M.(McG.), M.Sc.(Glas.), F.R.C.P.(C)  
A. Fuks; B.Sc., M.D., C.M.(McG.)  
Q.A. Hamid; M.D.(Mosul), Ph.D.(Lond.) (*joint appt with Medicine*)  
I. Hüttner; M.D.(Buda.), Ph.D.(McG.), F.R.C.P.(C)  
R.P. Michel; B.Sc., M.D., C.M.(McG.), F.R.C.P.(C) (*Strathcona Professor of Pathology*)  
G. Prud'homme; B.Sc., M.D.(Ott.), F.R.C.P.(C)  
J.B. Richardson; B.Sc., M.D., C.M., Ph.D.(McG.), F.R.C.P.(C)

*Associate Professors*

L. Alpert; M.D., Ph.D.(Tufts)  
J. Arseneau; M.D.(Laval), F.R.C.P.(C)  
L. Bégin; 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)  
A.M.V. Duncan; B.Sc.(Queen's), Ph.D.(Edin.)  
A. Giaid; D.V.M.S.(Baghdad), Ph.D.(Lond.)  
R.H. Latt; D.V.M.(Guelph)  
L.A. Oliva; M.D.(St. Domingue), 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)  
S. Tange; B.A., M.D.(Minn.)  
M. Trudel; B.Sc., M.D.(Ott.), F.R.C.P.(C)  
J. Vilorio; M.D.(Philip.), F.R.C.P.(C)  
K. Watters; B.Sc., M.D., C.M.(McG.), F.R.C.P.(C)  
E.A. Zorychta; B.Sc.(St.F.X.), M.Sc., Ph.D.(McG.)

*Assistant Professors*

S. Albrecht; M.D.(Sher.), F.R.C.P.(C)  
M. Auger; M.D., C.M.(McG.), F.R.C.P.(C)  
Y. Ayroud; M.D.(Montr.), F.R.C.P.(C)  
C. Bernard; M.D.(Sherb.)

### 59.2 Programs Offered

M.Sc. and Ph.D. degrees in Pathology.

The Pathology Department offers research training in a wide variety of areas such as atherosclerosis, immunology and transplantation, neoplasia, 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), cell culture, advanced immunological, pharmacological, biochemical and physiological techniques, as well as morphometry and computers.

### 59.3 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 at McGill is required for at least the two final full-time years of undergraduate training with a minimum CGPA of 3.0 overall.

Non-Canadian students may be required to take the GRE and TOEFL examinations in order to properly evaluate their suitability. Students are normally accepted into the M.Sc. program, and those candidates showing exceptional ability may be permitted to transfer into the Ph.D. program after one year of training.

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

Prospective students are encouraged to contact the Teaching Office, Department of Pathology, for application forms and a departmental brochure containing the research interests of the academic staff.

### 59.4 Application Procedures

Applications will be considered upon receipt of:

1. application;
2. transcripts;
3. letters of reference;
4. \$60 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.

## 59.5 Program Requirements

All students must take Pathology 546-300B 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 which are relevant to the student's area of research will be chosen in consultation with the research director and Graduate Students Committee.

### M.Sc. Program Requirements

The program consists of 45 credits, 30 credits obtained by laboratory work and submission of a thesis (546-690, 546-691, 546-692), with the remaining 15 course credits to be distributed as follows: 546-613 or 546-614, 546-620, 546-622, plus 2 courses from the following: 546-607, 546-650, 546-651, 546-652. A graduate course in another department may be substituted for one of the Pathology graduate courses upon approval by the research director and Graduate Students Committee.

### Ph.D. Program Requirements

Ph.D. candidates are required to complete courses 546-613, 546-614, 546-620, 546-622, 546-701, plus 3 of the following: 546-607, 546-650, 546-651, 546-652 and any additional courses considered necessary by the research director or the Graduate Students Committee.

Candidates will be evaluated primarily on their ability to conduct independent research and submit a thesis, which must be defended orally.

## 59.6 Courses

The course credit weight is given in parentheses (#) after the course title.

### Advanced Undergraduate

**546-300B HUMAN DISEASE.** (3) Integrated study of human disease, with emphasis on the major disorders prevalent in North America. Cell injury, inflammation, healing, infection, immune responses, lifestyle and aging, neoplasia, disorders of organ systems. **Professor Zorychta**

### Graduate Courses

The following courses are given in a variable sequence depending on the interests and requirements of graduate students enrolled in the Department.

**546-607B CYTOKINES IN HEALTH AND DISEASE.** (3) Lectures and seminars covering a range of topics in the field of cytokine biology, the role of cytokines in disease pathogenesis and advanced molecular techniques in the expression and regulation of cytokines. **Professor Hamid**

**546-613A,B; -614A,B RESEARCH TOPICS IN PATHOLOGY.** (3) **Professor Zorychta**

**546-620A,B RESEARCH SEMINAR I.** (3) **Professor Zorychta and Staff**

**546-622A,B RESEARCH SEMINAR 2.** (3) **Professor Zorychta and Staff**

● **546-650A,B IMMUNOPATHOLOGY.** (3)

● **546-651A PATHOBIOLOGY OF THE ARTERIAL WALL.** (3)

● **546-652A,B MOLECULAR BIOLOGY OF DISEASE.** (3)

**546-690A,B,C M.Sc. RESEARCH PROJECT I.** (9)

**546-691A,B,C M.Sc. RESEARCH PROJECT II.** (9)

**546-692A,B,C M.Sc. RESEARCH PROJECT III.** (12)

**546-701D COMPREHENSIVE EXAMINATION FOR PH.D. CANDIDATES.**

## 60 Pharmacology and Therapeutics

Department of Pharmacology and Therapeutics  
McIntyre Medical Sciences Building  
3655 Drummond Street, Room 1325  
Montreal, QC  
Canada, H3G 1Y6  
Telephone: (514) 398-3623  
Fax: (514) 398-6690  
Email: PMOORE@PHARMA.MCGILL.CA  
Website: <http://WWW.PHARMA.MCGILL.CA>

*Chair* — A.C. Cuello

*Vice-Chair* — R. Capek

*Chair, Graduate Committee* — B. Collier

### 60.1 Staff

#### Professors

J. Aranda; M.D.(Manila Central), Ph.D.(McG.)

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

B. Collier; Ph.D.(Leeds)

A.C. Cuello; M.D.(Buenos Aires), D.Sc.(Oxon)

C. de Montigny; M.D., Ph.D.(Montr.), F.R.C.P.(C)

B. Hales; M.Sc.(Phila. Coll. Pharm.), Ph.D.(McG.)

P.J. McLeod; M.D.(Man.), F.R.C.P.(C)

J.B. Richardson; M.D., C.M., Ph.D.(McG.)

B. Robaire; B.A.(UCLA), Ph.D.(McG.)

T.L. Sourkes; M.Sc.(McG.), Ph.D.(C'nell)

A. Tenenhouse; M.D., C.M., Ph.D.(McG.)

D.R. Varma; M.D.(L'now), Ph.D.(McG.)

#### Associate Professors

G. Almazan; Ph.D.(McG.)

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

B. Esplin; M.D.(Warsaw)

H.S. Katz; M.Sc., Ph.D., D.D.S.(McG.)

D. Maysinger; M.Sc.(Zagreb), M.Sc.(Radiop), Ph.D.(S. Calif.)

S. Nattel; M.D. C.M.(McG.)

A.L. Padjen; M.D., Ph.D.(Zagreb)

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

H. Saragovi; Ph.D.(Miami)

B.I. Sasyniuk; Ph.D.(Man.)

M. Szyf; M.Sc., Ph.D.(Hebrew Univ.)

J. Trasler; M.D., C.M., Ph.D.(McG.)

E. Zorychta; Ph.D.(McG.)

#### Assistant Professor

Y. de Koninck; Ph.D.(McG.)

#### Associate Members

G. Batist; M.D., C.M.(McG.)

S. Gauthier; M.D.(Montr.)

Y. Patel; M.D.(Otago) Ph.D.(Monash) F.R.A.C.P., F.R.C.P.(C)

R. Prichard; B.Sc., Ph.D.(N.S.W.)

R. Quirion; M.Sc., Ph.D.(Sher.)

#### Adjunct Professors

P. Albert; Ph.D.(Harv.)

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

Sr. A. Ford-Hutchinson; M.Sc.(Warw.), Ph.D.(Lond.)

### 60.2 Programs Offered

The Department of Pharmacology and Therapeutics offers training leading to M.Sc. (thesis), M.Sc. Applied (non-thesis) and Ph.D. degrees.

Pharmacology is a multi-disciplinary science which 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 areas of specialty ranging from neuropharma-

ology, reproductive, endocrine, receptor, cardiovascular, cancer, developmental, autonomic, clinical and biochemical pharmacology, molecular biology, to toxicology.

The present 34 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 Center, Allan Memorial Institute, Montreal Children's Hospital, Montreal General Hospital, Montreal Heart Institute, Lady Davis Research Institute 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.

### 60.3 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. Non-Canadian students are required to take the Graduate Record Examination Aptitude Test (GRE) and the Test of English as a Foreign Language (TOEFL) or the equivalents.

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.

### 60.4 Application Procedures

Applications will be considered upon receipt of:

1. Completed preliminary or official McGill University application form.
2. Curriculum vitae including a statement of research interests.
3. Two copies of official 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).
5. Application fee (\$60 Canadian or U.S. Funds, in money order, certified personal cheque, bank draft, or credit cards) to be enclosed with the official application form.
6. Official GRE and TOEFL scores (not required of applicants from Canada).

All information is to be submitted directly to the Graduate Coordinator, Mrs. Pam Moore, in the Department of Pharmacology. There is no fixed deadline for submission of applications.

### 60.5 Program Requirements

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

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.

Students enrolled in the M.Sc. (Thesis) degree program must successfully complete 549-601D, Comprehensive Examination; plus 549-712B, Statistics for Pharmacologists and two 700 level graduate courses in Pharmacology, in addition to an M.Sc. Thesis. 549-562A and 549-563B, General Pharmacology I and II, or their equivalents, are the prerequisites for 700 level courses in Pharmacology. The M.Sc. program consists of 45 credits, a minimum of 18 credits are required in addition to Thesis Preparation courses 549-696, 549-697, 549-698, and 549-699 (3, 6, 9 and 12 credits respectively).

Students enrolled in the Ph.D. Program must successfully complete or be exempted from the same courses as for the M.Sc. Degree, plus one additional 700 level graduate course, (total of 3) in addition to a Ph.D. thesis.

#### M.Sc. (Applied) degree (pending the availability of resources)

The objective of the M.Sc. Applied program is to provide a broad exposure and training in Pharmacology, with two terms of courses and two of research, one of which may be completed during the summer. The course requirements (45 credits) are as follows: 549-562A and 549-563B, General Pharmacology I and II, or their equivalents; 549-712B, Statistics for Pharmacologists; 549-603A, Drug discovery and development; one 700 level Pharmacology graduate course; 549-604, Advanced independent research project in pharmacology; 549-605, Advanced independent research project in applied pharmacology, plus three complementary courses to be chosen from options in Epidemiology, Experimental Medicine, Biotechnology, Bioethics, Biochemistry, Physiology, Microbiology and Immunology, Pathology, and Economics.

### 60.6 Courses for Higher Degrees

The following courses are designed primarily for graduate students in the Department, but may be attended by others under special circumstances. These courses are given in a rotational sequence and students may register according to their specific requirements and interests.

- Denotes not offered in 1999-2000.

The course credit weight is given in parentheses (#) after the course title.

**549-601D COMPREHENSIVE EXAM.** (9) Registration for this is required for all students in the M.Sc. (Thesis) and Ph.D. degree programs.

- **549-603A DRUG DISCOVERY AND DEVELOPMENT.** (6)

- **549-604A,B ADVANCED INDEPENDENT RESEARCH PROJECT IN PHARMACOLOGY.** (9)

- **549-605A,B ADVANCED INDEPENDENT RESEARCH PROJECT IN APPLIED PHARMACOLOGY.** (9)

**549-696A,B,C THESIS PREPARATION.** (3)

**549-697A,B,C THESIS PREPARATION I.** (6)

**549-698A,B,C THESIS PREPARATION II.** (9)

**549-699A,B,C THESIS PREPARATION III.** (12)

- **549-702A,B BIOCHEMICAL PHARMACOLOGY.** (3)

**549-703A,B NEUROPHARMACOLOGY.** (3) The basic actions of drugs affecting axonal conduction and synaptic transmission, with particular emphasis on the central nervous system and its functions.

- **549-704A,B DRUG DISTRIBUTION, METABOLISM AND EXCRETION.** (3)

- **549-705A,B CARDIOVASCULAR REGULATION AND DRUG ACTION.** (3)

- **549-706A,B CHEMICAL MEDIATORS AND AUTONOMIC DRUGS.** (3)

- **549-707A,B MOLECULAR PHARMACOLOGY.** (3)

- **549-712B STATISTICS FOR PHARMACOLOGISTS.** (3)

- **549-713A,B DEVELOPMENTAL PHARMACOLOGY.** (3)

**549-714A,B ENDOCRINE PHARMACOLOGY.** (3) Mechanisms by which drugs interact with and modulate the endocrine system. Examples of drugs for discussion include oral contraceptives, drugs used to treat infertility and for the management of menopause, vitamin D, insulin, adrenal steroids and thyroid hormone.