

The Ottawa-Carleton Specialization in Neuroscience

Life Sciences Research
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The Specialization

Coordinator of the Specialization:
J.B. Kelly

Neuroscience is the study of the nervous system and its function. This emerging field cuts across many disciplines and incorporates such areas as anatomy, neurobiology, pharmacology, physiology and psychology. While individual researchers usually specialize in a particular area, neuroscientists today must also be able to appreciate significant research in the other fields and therefore require an understanding of the basics of the other disciplines.

Training in the neurosciences extends past the boundaries of traditional departments. In response to the challenge of providing a comprehensive education for future neuroscientists, the University of Ottawa and Carleton University now offer a multi-disciplinary specialization in neuroscience.

The specialization is intended to augment the research and training which the student receives through one of the "primary" departments which are participating in the neuroscience specialization. The departments are:

- Department of Anatomy, University of Ottawa
 - Department of Biology, Carleton University
 - Department of Biology, University of Ottawa
 - Department of Physiology, University of Ottawa
 - Department of Psychology, Carleton University
 - School of Psychology, University of Ottawa
- Five additional departments from the University of Ottawa Medical School are also affiliated.
- Department of Medicine (Division of Neurology)
 - Department of Neuropathology
 - Department of Pharmacology
 - Department Psychiatry
 - Department of Surgery (Division of Neurosurgery)

The specialization is coordinated by a committee consisting of representatives from each of the participating departments.

Application should be made to the primary department which is most appropriate to the student's research interest. Once accepted by the department, students must be sponsored into the specialization by a member of the neuroscience faculty.

Application forms and further information can be obtained by writing directly to any of the "primary" departments.

Members of the Neuroscience Specialization

Hymie Anisman, *Stress, Coping, Depression, Catecholamines*

Catherine Bielajew, *Brain Stimulation Reward, Feeding Mechanisms and Thermal Regulation*

Roger Broughton, *Biological Rhythms, Sleep Disorder*

Joseph de Koninck, *Sleep Cycles, Biorhythms, Dreams*

Jack de la Torre, *Brain and Spinal Trauma, Central and Peripheral Regeneration, Stroke*

George Fouriez, *Brain Stimulation Reward*

P.A. Fried, *Alcohol, Marijuana, Smoking and Pregnancy*

James Fryer, *Neurohypophyseal Hormones, Neuropeptides, Teleost Endocrine Function, Neuropeptide Gene Expression*

D.R. Gardner, *Patch Clamping, Pesticides, Invertebrate CNS*

Walter Hendelman, *Tissue Culture, Locus Coeruleus, Growth Factors*

Pavel Hrdina, *Antidepressants, Imipramine Binding, Central Neurotransmitters*

J.B. Kelly, *Auditory System Structure and Function*

R.M. Knights, *Head Injury, Cognition Behaviour*

Symon Lemaire, *Neuropeptides, Receptor Modulation, Catecholamines, Phencyclidine Receptors*

Michael McBurney, *Neuronal Cell Differentiation, Molecular Biology, Gene Expression, Teratocarcinomas*

Kenneth Marshall, *Neurotransmitters, Neural Development, Neuronal Regeneration*

Irene Mazurkiewicz-Kwilecki, *Brain Histamine, Aging, Stress, Drug Abuse*

D.C. McIntyre, *Epilepsy, Kindling, Learning, Memory*

Zulfiquar Merali, *Peptides, Catecholamines, Behaviour*

Theris Miliaressis, *Psychobiology, Brain Stimulation Reward, Neuroleptics*

Vital Montpetit, *Pyridoxine Neurotoxicity, Alzheimer's Disease, Leukoencephalopathy*

Catherine Morris, *Single Channel Studies, Acetylcholine Activation*

B.A. Pappas, *Locus Coeruleus, Behavioural Teratology*

David Parry, *Muscular Dystrophy, Neurotrophic Interactions, Myosin Isoenzymes, Muscle Regeneration, Muscle Development*

David Peters, *Brain Development, Stress, Neuropharmacology*
 Terence Picton, *Evoked Potentials, Information Processing, Sensory Pathways*
 R.T. Pivik, *Sleep, Neurophysiology, Psychophysiology, Biological Psychiatry*
 D.C.S. Roberts, *Drug Abuse*
 William Staines, *Neuroanatomical Tracers, Neurotransmitters, Neuronal Tissue Culture and Transplantation*
 B.W. Tansley, *Spatial Vision, Retinitis Pigmentosa, Neurotoxicity, Visual, Auditory Systems*
 T.N. Tombaugh, *Drug Abuse, Neuroleptics*
 Jose-Maria Trifaro, *Neurotransmitter Synthesis, Storage and Secretion*
 R.M. Zacharko, *Intracranial Self-stimulation, Stress, Depression, Dopamine, Anhedonia*

Master's Program

Admission Requirements

The requirements for admission to the master's neuroscience specialization are as follows:

- Prior admission to the master's program of the primary department which participates in the specialization
- A letter of recommendation from a participating faculty member of the neuroscience specialization, which both recommends admission and indicates the willingness of the faculty member to supervise the candidate's research program

Students with less than a high honours average in their undergraduate and graduate courses will not normally be recommended for admission.

Program Requirements

In addition to fulfilling the requirements for the master's program of the department in which they are enrolled, the specialization requires that the students successfully complete one of the two courses: Basics of Neuroscience or Neuroanatomy and Neurophysiology. The thesis research must concern a neuroscience topic and must be supervised by a member of the neuroscience faculty. The student is expected to join the Ottawa Neurosciences Society and attend its scientific meetings.

Doctor of Philosophy

Admission Requirements

Admission requirements to the Ph.D. neuroscience specialization are as follows:

- Prior admission to the Ph.D. program of the primary department which participates in the specialization

- A letter of recommendation from a participating faculty member of the neuroscience specialization, which both recommends admission and which indicates the willingness of the faculty member to supervise the candidate's research program
- Two additional letters of recommendation from University faculty who are familiar with the candidate's academic and research career
- Students with less than a high honours standing in their undergraduate and graduate courses will not normally be recommended for admission

Selection of master's and doctoral students is carried out by the neuroscience specialization coordinating committee which will select and rank the admissible candidates. Admission is determined by priority of ranking and the number of admissions depends upon the available positions in the specialization.

Program Requirements

Students must fulfil the Ph.D. program requirements of the department in which they are enrolled. The requirements for the specialization also include the following, some of which may satisfy the Ph.D. requirements of the participating departments:

- The student is expected to join the Ottawa Neurosciences Society and attend its scientific meetings
- Successful completion of the following neuroscience courses: Advanced Seminar in Neuroscience (49.621), Neuroscience Techniques I and II (61.623F1 and 61.624W1) and one of Basics of Neuroscience (49.520) *or* Neuroanatomy and Neurophysiology (49.623)
- A thesis in the area of neuroscience, which must be defended at an oral examination

Graduate Courses*

A variety of neuroscience courses are available through the primary departments. These currently include behavioural neuroscience, neuroendocrinology, clinical neuropsychology, neurophysiology, synaptic transmission and behavioural medicine. Course offerings vary slightly from year to year and a complete listing can be obtained from the specialization coordinator.

The following are the five core courses of the curriculum.

- Psychology 49.520T2 (PSY6201)
 Basics of Neuroscience
 A comprehensive neuroscience course from the membrane and the cellular levels through to the

* F,W,S indicates term of offering. Courses offered in the fall *and* winter will be followed by T.

The number following the letter indicates the credit weight of the course: 1 denotes a half-course credit, 2 denotes a full-course credit, etc.

behavioural aspects of invertebrates and vertebrates. Lectures and tutorials will cover such aspects of neuroscience as neuroanatomy, neurophysiology, behavioural neuroscience and neuropharmacology. (Also offered as Biology 61.534)

- Biology 61.623F1 (ANA7400 Fall Term)
Neuroscience Techniques I
Completion of a research project carried out under the supervision of a neuroscience faculty member from a department other than the student's enrolling department.
(Also offered as Psychology 49.624)

- Biology 61.624W1 (ANA7400 Winter Term)
Neuroscience Techniques II
Completion of a research project carried out under the supervision of a neuroscience faculty member from a department other than the student's enrolling department. The supervisor must be different from that of Biology 61.623.
(Also offered as Psychology 49.625)

- Psychology 49.620T2
Advanced Seminar in Neuroscience
An advanced seminar course integrating various aspects of neuroscience.
Prerequisite: Psychology 49.520 or 49.623
(Also offered as Biology 61.623)

- Psychology 49.623T2 (ANA5470, PHS 5470)
Neuroanatomy and Neurophysiology
An integrated course on the central nervous system given by the departments of Anatomy and Physiology of the University of Ottawa and their invited lecturers.