

Biomedical Sciences: MBS, MSc, PhD

The Department of Biomedical Sciences provides unique opportunities for translating fundamental research into practical applications that enhance animal and human health. Our expertise spans several disciplines including biomechanics, cancer biology, endocrinology, neuroscience, pharmacology and toxicology, reproductive biotechnology, cardiovascular biology, and stem cell and regenerative biology.

<https://www.ovc.uoguelph.ca/biomedical-sciences/>

Program

Master's students can choose between a Master of Biomedical Sciences (MBS), a course work program (plus a major research project/paper or an experiential learning/practicum, depending on the research area), approximately three semesters, or the Master of Science (MSc), which is the preparation and defense of a research-based thesis, approximately six semesters.

The PhD program requires the successful completion of a qualifying exam and the completion and defense of a research-based thesis, approximately twelve semesters.

Within the Master of Biomedical Sciences (MBS) program, students can pursue applied training in Reproductive Biotechnologies or Toxicology through practicum placements and in-house training. Graduates who have completed the Applied Repro training have found jobs in repro-related industry positions at a success rate of 90%.

Research Areas

- Reproductive Biology & Development
- Cardiovascular Health & Disease
- Cellular & Molecular Basis of Disease
- Biomedical Toxicology & Pharmacology
- Neuroscience



Admission Requirements

For admission to a Masters program, our department requires an Honours BSc in Biological Sciences or a degree in veterinary medicine or equivalent with a minimum B+ or (77% Ontario equivalent GPA) over the last two years of full-time study.

For admission to the PhD program, our department requires the completion of an approved MSc program by thesis, a minimum B+ average (77% Ontario equivalent GPA) in the prescribed courses taken during the Master's degree program.

A letter of interest and two academic letters of reference are required with the application.

Application Deadline:

Fall: August 1
Winter: December 1
Summer: April 1

ARE YOU INTERESTED IN:

- How the brain works
- How the heart and circulatory system work
- How pregnancy is maintained and regulated
- How drugs and toxins affect the body

CAREER OPPORTUNITIES:

- Professor/Scientist
- Doctor (Veterinary or Medical)
- Dentist/Pharmacist
- Physiotherapist

CONTACT INFORMATION

Graduate Coordinator, MSc & PhD:
Dr. Jon LaMarre
jlararre@ovc.uoguelph.ca

Graduate Coordinator, MBS:
Dr. Glen Pyle
gpyle@uoguelph.ca

Graduate Program Assistant:
Christina Voll
519-824-4120 ext 54780
bmsgrad@uoguelph.ca

Departmental Graduate Faculty with Research Areas

CARDIOVASCULAR HEALTH AND DISEASE

Martino - Circadian regulation of cardiovascular health and disease; chronotherapy, sex differences, cardiac aging, circadian medicine, preclinical translation, “omics” and bioinformatics, heart-brain, microbiome

Pyle - Sex differences in cardiovascular health and disease; heart failing; ageing

Saleh - Autonomic control of the heart following stroke

CANCER CELL BIOLOGY

Moorehead - Breast and lung tumor development and progression

Petrik - Novel therapies for the treatment of advanced stage ovarian cancer

Coomber - Biology of solid tumours

Viloria-Petit - Molecular mechanisms of breast cancer invasion and metastasis

Mutsaers - Metronomic chemotherapy and tumour angiogenesis

STEM CELL AND REGENERATIVE MEDICINE

Vickaryous - Wound healing and tissue regeneration; stem cells; non-mammalian species

Koch - Stem cell isolation, function and application, tissue-engineering, canine and equine studies

PHARMACOLOGY AND TOXICOLOGY

Johnson - veterinary clinical pharmacology, pharmacokinetics, clinical trials, human food safety, drug depletion studies

Kirby - Molecular Toxicology and Diagnostics

REPRODUCTIVE BIOLOGY

LaMarre - Small RNAs in the control of gene expression in gametes and embryos

King - Cytogenetic and morphologic aspects of fertilization and early development

Bartlewski - Hormonal control of ovarian antral follicle development in domestic ruminants

Madan - Cellular, molecular and genetic mechanisms regulating preimplantation embryogenesis

Favetta - Endocrine Disrupting Compounds and their molecular/genetic effects during in vitro early embryonic development

NEUROSCIENCE

Bailey - mechanisms underlying the development and function of the prefrontal cortex and hippocampus, and how these may be altered in developmental brain disorders

MacLusky - Neurosteroid modulation of hippocampal structure and function

Kalisch - Regulation of gene expression in cholinergic neuron function and Alzheimer Disease

Khokhar - Using animal models and advanced imaging techniques to study the neurobiological basis, and consequences, of substance use disorders in patients with serious mental illness

OTHER

Hanna - Assessment of the teaching of critical thinking and scientific literacy in DVM and BSc curricula, and development of new methods

Conlon - Communications: Veterinary - client interactions

Thomason - Biomechanics of the mammalian musculoskeleton



“Within the biomedical sciences major there are so many areas you can specialize in. It really opens up a lot of doors,” says Prof. Tarek Saleh, chair of OVC’s Department of Biomedical Sciences. “Not only are graduates well-prepared for further studies in medical or veterinary medicine or biomedical research, they can also pursue any allied health profession such as dentistry, speech or physical therapy, optometry – anything you can do that is associated with human or animal health.”

Facilities

Facilities include individual labs, multi-investigator labs and common equipment areas that have been renovated with the aid of funding from the Canadian Foundation for Innovation. Research equipment includes an Applied Biosystems ViiA7 and multiple BioRad CFX96 Real-Time PCR Detection Systems, NanoDrop Spectrophotometers, Accuri C6 System Flow cytometers, a full Proteomics suite consisting of a Typhoon scanner, spot picker and DeCyder analysis Software, ChemiDoc XRS+ Systems, a Histology core facility, Fluoview FV1200 Laser Scanning Confocal Microscope, fluorescent microscopes, a Neuronal Cell Imaging System, fluorescent plate readers, an Analytical HPLC Facility and as well as specialized laboratory equipment.