Master of Biomedical Sciences: MBS

The Master of Biomedical Sciences (MBS) is a coursework master's program offered by the Ontario Veterinary College that draws on expertise across three departments: Biomedical Sciences, Clinical Studies, Pathobiology. The MBS program develops graduate training and provides students with hard and soft skills that will prepare them for successful careers.

uoguelph.ca/ovc/master-biomedical-sciences-mbs

PROGRAM

The Master of Biomedical Science (MBS) program is a course-based program completed in approximately 3 semesters (1 year).

COLLABORATIVE SPECIALIZATIONS

Collaborative Specializations allow students to enhance their degrees with multidisciplinary research. The MBS program participates in the following Collaborative Specializations:

- Neuroscience
- Regenerative Medicine
- Toxicology

Additional information on these options can be found in the *Graduate Calendar.*

AREAS OF STUDY

The departments of Biomedical Sciences, Clinical Studies, and Pathobiology offer expertise in a number of areas:

- Neuroscience
- Immunology
- Reproductive biology and development
- Toxicology and pharmacology
- Prevention, diagnosis and treatment of disease
- Translational and comparative models, technologies, and studies

ADMISSION REQUIREMENTS

For the MBS program, the minimum admission requirements are an honours undergraduate degree in a relevant field with a minimum average of 73% (B).

Applicants should consult the Biomedical Sciences website before applying for information on confirming an advisor. Please direct any questions regarding admission requirements to the Graduate and Research Programs team.

APPLICATION DEADLINES:

Domestic applications will be accepted until 2 months prior to the semester. International applications will be accepted until 6 months prior to the semester. See specific dates below.

Entry: Fall / Winter / Summer

See website for deadlines.

Applications can be submitted any time before the deadline and are reviewed on an ongoing basis. Applicants are responsible for ensuring all documents are submitted promptly to receive a timely decision. We recommend having all documents submitted within 15 days of completing the OUAC application.

ARE YOU INTERESTED IN:

- How different body systems work
- How cancer cells grow and spread
- How to develop and apply advanced medical technology
- How to communicate about health and medical issues
- How to improve animal and human health

CAREER OPPORTUNITIES:

- Human medicine
- Veterinary medicine
- Research and development scientist
- Government or regulatory officer
- Embryologist or Andrologist
- Medical writer

CONTACT INFORMATION

OVC Graduate Research and Programs Team:
ovc.biomgrad@uoguelph.ca

Graduate Program Coordinator:
Dr. Laura Favetta
lfavetta@uoguelph.ca

UNIVERSITY OF GUELPH

Biomedical Sciences: 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.

ovc.uoguelph.ca/biomedical-sciences

PROGRAM

The Master of Science (MSc) program is a thesis-based program completed in approximately 6 semesters (2 years). The MSc program requires the successful completion and defence of a research-based thesis.

The PhD program in Biomedical Sciences is a thesis-based program completed in approximately 12 semesters (4 years). The PhD program requires the successful completion of a qualifying exam and the completion and defence of a research-based thesis.

FIELDS

The department of Biomedical Sciences offers expertise in a number of areas:

- Reproductive Biology and Development
- Cardiovascular Physiology
- Cellular and Molecular Basis of Health and Disease
- Cancer Biology
- Toxicology and Pharmacology
- Neuroscience
- Stem Cell Biology and Regenerative Medicine

COLLABORATIVE SPECIALIZATIONS

Collaborative Specializations allow students to enhance their degrees with multidisciplinary research. The MSc and PhD programs in the Department of Biomedical Sciences participate in the following Collaborative Specializations:

- Neuroscience
- One Health
- Regenerative Medicine
- Toxicology

Additional information on these options can be found in the *Graduate Calendar*.

ADMISSION REQUIREMENTS

- MSc: an honours undergraduate degree in a relevant field with a minimum average of 77% (B+)
- PhD: an approved Master's degree with a minimum average of 77% (B+)

Applicants must also confirm a faculty advisor before they apply. Please direct any questions regarding admission requirements to the Graduate and Research Programs team.

APPLICATION DEADLINES:

Domestic applications will be accepted until 2 months prior to the semester. International applications will be accepted until 6 months prior to the semester.

Entry: Fall / Winter / Summer

See website for deadlines.

Applications are reviewed on an ongoing basis. We recommend having all documents submitted within 15 days of completing the OUAC application.

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
- How cancer cells grow and spread

CAREER OPPORTUNITIES:

- Professor
- Research Scientist
- Doctor (Veterinary or Medical)
- Dentist
- Pharmaceutical or Biotech Professional
- Legal Professional (Lawyer or Patent Agent)

CONTACT INFORMATION

OVC Graduate Research and Programs Team:

ovc.biomgrad@uoguelph.ca

Graduate Program Coordinator:

Dr. Craig Bailey
baileyc@uoguelph.ca

UNIVERSITY OF GUELPH

DEPARTMENTAL GRADUATE FACULTY WITH RESEARCH AREAS

CANCER CELL BIOLOGY

Roger Anthony Moorehead - Breast and lung tumor development and progression

Anthony J. Mutsaers - Metronomic chemotherapy and tumour angiogenesis

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

Alicia M. Viloria-Petit - Molecular mechanisms of breast cancer invasion and metastasis

CARDIOVASCULAR HEALTH AND DISEASE

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

W. Glen Pyle - Sex differences in cardiovascular health and disease, molecular mechanisms and therapies for heart failure; ageing

Tarek Saleh - Autonomic control of the heart following stroke

NEUROSCIENCE

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

Giannina Descalzi - Chronic pain-induced dysregulation of brain circuits and gene function in companion and production animals

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

Jibran 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

Neil J. MacLusky - Neurosteroid modulation of hippocampal structure and function

Dr. Melissa Perreault - Neural Oscillations, Sex Differences, Neuropsychiatric Disorders, Molecular and Cellular Biology

PHARMACOLOGY AND TOXICOLOGY

Ronald Johnson - Veterinary clinical pharmacology; pharmacokinetics, clinical trials; human food safety, drug depletion studies

Gordon M. Kirby - Molecular Toxicology and Diagnostics

REPRODUCTIVE BIOLOGY

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

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

W. Allan King - Cytogenetic and morphologic aspects of fertilization and early development

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

Pavneesh Madan - Cellular, molecular and genetic mechanisms regulating preimplantation embryogenesis

STEM CELL AND REGENERATIVE MEDICINE

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

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

OTHER

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

Peter D. Conlon - Communications: Veterinary-client interactions

Jeffrey J. 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:

- Applied Biosystems ViiA7
- multiple BioRad CFX96 Real-Time PCR Detection Systems
- NanoDrop Spectrophotometers
- Accuri C6 System Flow cytometers
- full Proteomics suite consisting of a Typhoon scanner, spot picker and DeCyder analysis Software
- ChemiDoc XRS+ Systems
- Histology core facility
- Fluoview FV1200 Laser Scanning Confocal Microscope
- fluorescent microscopes
- Neuronal Cell Imaging System
- fluorescent plate readers
- Analytical HPLC Facility
- specialized laboratory equipment

UNIVERSITY OF GUELPH