

## Pathobiology: GDip, MSc, PhD, DVSc

Research in the Department of Pathobiology addresses such diverse areas as pathogens of animals and how they interact with their hosts, emerging and zoonotic pathogens, antimicrobial resistance, immunologic and genetic bases of resistance to infectious disease, development and progression of cancer, and immune-mediated and inflammatory diseases. We work on diseases of farm animals, laboratory animals, fish, wildlife, zoo and companion animals, from the molecular level to that of the population.

*ovc.uoguelph.ca/pathobiology*

### Program

Research-based MSc (2 years) or PhD (4 years) degrees are offered to non-veterinarians and veterinarians in all fields of study in the department. Veterinary specialty training is offered through DVSc (3 years) and Graduate Diploma (1 year) programs for applicants with a DVM degree.

### Research Fields

- Comparative Pathology
- Immunology
- Veterinary Infectious Diseases
- Veterinary Pathology

### Admission Requirements

- Applicants should have at least a 'B' average (for MSc applicants) or 'B+' average (for PhD applicants). A DVM degree is not required for MSc or PhD programs.
- Prior to applying, students should identify a faculty member who is willing to serve as advisor and who will provide funding for the research and a stipend for the student.
- Numerous scholarships and awards are available on a competitive basis.

### Application Deadline:

Ongoing

**Entry:** Fall, Winter, Spring



### Faculty and Facilities

Pathobiology includes 23 faculty members, 66 graduate students, and 28 technicians, postdocs and research associates.

Graduate Students work in a new building that is well-equipped with shared laboratories and state-of-the-art equipment for quantitative RT-PCR, liquid-handling robotics instrumentation for preparing large numbers of samples, flow cytometry, fluorescent and optical microscopy, 2D protein gel electrophoresis, multiplex ELISA, next generation sequencing, and tissue microarray. As well, our investigators have close interactions with other departments and other universities, and with the Animal Health Laboratory, Center for Public Health and Zoonoses, and the Public Health Agency of Canada.

### ARE YOU INTERESTED IN:

- Infectious diseases of animals
- Immunology
- Cancer development and treatment
- Veterinary pathology diagnostics and research
- Zoo medicine and wildlife
- One Health

### CAREER OPPORTUNITIES:

- Biomedical research
- Animal health research and development
- Diagnostic activities in private and public sector laboratories

### CONTACT INFORMATION

#### Graduate Program Coordinator:

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#### Graduate Program Assistant:

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## Departmental Graduate Faculty with Research Areas

### John Barta:

Parasitology: Protozoan parasites of the phylum Apicomplexa

### Janet Beeler-Marfisi:

Clinical Pathology; pathogenesis of equine lower airway disease relating to air pollution; canine leukemias.

### Dorothee Bienzle:

Clinical Pathology; Mechanisms of Airway Inflammation; Diseases of the Hematopoietic System

### Patrick Boerlin:

Bacteriology: Molecular epidemiology of infectious diseases and antimicrobial resistance

### Byram Bridle:

Viral immunology, cancer immunotherapy, oncolytic viruses, vaccines for infectious diseases

### Jeff Caswell:

Anatomic Pathology: Respiratory & cardiovascular pathology, Bacterial pneumonia of cattle, Innate immunity in the lung

### Robert A. Foster:

Anatomic Pathology: Reproductive pathology, surgical pathology

### Claire Jardine:

Wildlife and ecosystem health; ecology of diseases in wild animal populations; Rodent and vector-borne zoonotic diseases

### Brandon Lillie:

Anatomic Pathology: Lectins and innate immunity; mechanism of resistance to infectious diseases, genetics of disease

### John S. Lumsden:

Comparative Pathology: Aquatic animal health, innate immunity of teleosts and corals

### Grazieli Maboni:

Clinical microbiology, antimicrobial resistance of bacterial and fungal pathogens, development of genomic tools, host-pathogen interactions

### Bonnie Mallard:

Immunology: Immunogenetics of antibody and cellular mechanisms of host defense, livestock breeding for disease resistance, genetic regulation of the immune system

### Heather Murphy:

One Health, environmental health, microbial water quality, infectious diseases, antimicrobial resistance, epidemiology of waterborne diseases

### Nicole Ricker:

Bacteriology: Comparative genomics and metagenomics; Antimicrobial resistance; Plasmid dynamics; Role of microbiome in disease resilience/development

### Andrew S. Peregrine:

Parasitology: Epidemiology, impact and control of parasitic infections

**Mauricio Seguel:** Anatomic pathology; ecology, immunology and pathology of wildlife infectious diseases

### Shayan Sharif:

Immunology: Immunology and genetics of host disease resistance



### Leonardo Susta:

Avian virology, poultry diseases and pathology, pathogenesis of high-consequence poultry viral diseases

### Scott Weese:

Bacteriology: Emerging infectious diseases, infection control, MRSA, Clostridium difficile, antimicrobial resistance, microbiome

### R. Darren Wood:

Clinical Pathology; canine hematologic and hemostatic disease, microRNA in canine lymphoma

### Geoffrey A. Wood:

Anatomic Pathology: Pathology of neoplasia; Cross-species cancer genomics; microRNA in cancer; Mouse models of cancer

### Sarah Wootton:

Virology: Molecular virology; AAV gene therapy; Oncolytic viral therapy; Recombinant viral vaccines

**Sam Workenhe:** Programmed cell death and immunity; cancer immunology and immunotherapy; innate and adaptive immunity of viruses.