

# PATHOBIOLOGY RESEARCH PROJECTS IN WILDLIFE DISEASE



Knowledge of wildlife disease dynamics contributes to natural resource management and conservation and helps develop strategies to safeguard livestock and human health.



## RESEARCH PROJECTS

Our lab focuses on infectious diseases of free-ranging wildlife, along with the complex interactions at the wildlife – human – domestic animal interface. We have a specific interest in pathogens transmitted by arthropod vectors (e.g., ticks, mosquitoes and biting midges), as well as the dynamics among vertebrate hosts, vectors and pathogens in a constantly changing environment.

### Powassan virus and other tick-borne pathogens in wildlife

Global climate change is enabling the geographic range expansion of some species of wildlife, arthropod vectors, and the pathogens they harbor. We are surveying wildlife in Ontario to characterize tick-host relationships and look for evidence of infections with tick-borne pathogens. For example, Powassan virus is a zoonotic tick-borne pathogen maintained in a sylvatic cycle involving small wild mammals (e.g., groundhogs and skunks) and *Ixodes cookei* ticks that was first identified in Powassan, Ontario. Additional collaborative research includes pathogenesis and serosurveillance for West Nile virus in ruffed grouse in Pennsylvania.

Collaborators: National Microbiology Laboratory/Public Health Agency of Canada, Pennsylvania Game Commission, Colorado State University *Funded by:* NSERC-DG



### Pathogen surveillance in wild turkeys

Wild turkeys in Ontario have become well-established following reintroduction efforts in 1984 and are a popular game bird species. We are assessing hunter-harvested wild turkeys for infectious agents that may cause disease in both wild turkeys and domestic poultry. This work will allow us to assess the overall health of Ontario wild turkeys, establish baselines for future health surveys, and map potential disease “hot spots.”

*Funded by:* Ontario Ministry of Agriculture, Food and Rural Affairs - University of Guelph Partnership, with additional support from the Ontario Federation of Anglers and Hunters



### Additional wildlife disease research

Additional wildlife disease research in our lab includes collaborative efforts with the Canadian Wildlife Health Cooperative, the Toronto Zoo, and others to detect, diagnose, and assess emerging and established diseases in Ontario wildlife.

Examples of these projects include surveillance for the protozoan *Babesia odocoilei* in Ontario cervids, evaluation of the red fox as a sentinel for the fungus *Blastomyces dermatitidis*, retrospective review of mortality causes in raptors, surveillance and pathogenesis of snake fungal disease (caused by *Ophidiomyces ophiodiicola*), and comparison of poxvirus diagnostic methods in wild turkeys.



### Risk assessment for the incursion and establishment of livestock orbiviruses

Epizootic hemorrhagic disease and bluetongue viruses have been expanding northward in latitude in the U.S. and pose a threat to Canadian wildlife and livestock. We are evaluating the risk for the incursion of these viruses and their vectors (i.e., *Culicoides* spp. biting midges) in Ontario through serosurveillance in livestock and free-ranging cervids (e.g., white-tailed deer) and characterization of current vector composition and distribution on farms and natural habitats.

Collaborators: Canadian Food Inspection Agency, Southeastern Cooperative Wildlife Disease Funded by: Ontario Ministry of Agriculture, Food and Rural Affairs - University of Guelph Partnership, with additional support from the Ontario Sheep Marketing Agency

