

Biology Special Seminar



Western
UNIVERSITY · CANADA

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Integrating genomics and disease ecology to understand wildlife-pathogen interactions in heterogeneous environments

Emerging infectious diseases have profound impacts on wildlife conservation and frequently affect domestic animal and human populations. The current global increase in emerging infectious diseases – as exemplified by the COVID-19 pandemic – is driven predominantly by human activities that change the dynamics of disease transmission and increase the probability of novel disease emergence. Understanding how wildlife diseases are transmitted and monitoring and predicting their spread across space and time are critical to developing and implementing strategies for their management. However, tracking pathogen transmission in wildlife, and associating transmission networks with the environment, is notoriously difficult. Landscape genetic approaches, which link genetic variation to heterogeneous landscape features, promise to overcome these hurdles. In this talk, I will present recent work on retroviruses in North American felids and transmissible cancer in Tasmanian devils. Using these case studies, I will demonstrate how we can integrate landscape genetics and disease ecology to understand how host ecology and environmental heterogeneity interact to shape patterns of pathogen spread. This work shows how different environmental contexts and host life history traits can result in divergent associations between host and pathogen gene flow and varying effects of environment on pathogen spread.

