

Department of Molecular and Cellular Biology
Graduate Seminar MCB*6500

Friday, Sept. 21, 2018 in SSC 1511 @ 12:45 p.m.

presented by:

Victoria Sanderson

(Advisors: C. Khursigara/M. Wills)

**“Exploring the cellular component of blood as a reservoir
of diagnostic targets in Lyme disease”**

Lyme disease is the most common vector-borne illness in North America and Europe, and has been considered endemic in Canada since the 1980s. The causative agent, *Borrelia burgdorferi sensu lato*, is carried in the midgut of infected blacklegged ticks and transmitted to humans through a bite to the skin. Subsequent infection results in Lyme disease, a multi-systemic condition with manifestations in the skin, joints, heart, gastrointestinal tract and nervous system. Lyme disease is severely underdiagnosed with only 30,000 of an estimated 300,000 cases reported each year in the United States alone. The currently available diagnostic methods lack sensitivity and/or specificity, and in some cases, practicality; therefore, research into clinical detection strategies is ongoing. Diagnostic techniques may be improved by better understanding the interactions that occur between the pathogen and host, as there is limited research into the association between *Borrelia* outer membrane vesicles (OMVs) and human cells. Thus, the first objective of this work is to investigate how *Borrelia* OMVs interact with model host cells *in vitro* using immunofluorescent imaging and western blot. This concept will then be applied to improve diagnostic methodologies for Lyme disease by testing a panel of blood components to determine whether there is a particular fraction of blood that concentrates *Borrelia* or its OMVs. The findings of this research will lay the ground work for the development of novel clinical detection methods for Lyme disease.