



COMBINED SEMINAR SERIES

Department of Biochemistry,
Microbiology & Immunology and
PRISM Research Centre

Thursday, March 11
11:30 am – 12:30 pm

(WebEx)



Dr. Scott Samuels

Professor

Division of Biological Sciences
University of Montana

“Regulation of carbohydrate utilization during the enzootic cycle of the Lyme disease spirochete”

Lyme disease is caused by infection with the spirochete *Borrelia burgdorferi*. *B. burgdorferi* is maintained in nature in an enzootic cycle comprising a tick vector and vertebrate host. Several signaling systems regulate passage of the spirochete through the enzootic cycle, including the stringent response and cyclic-dimeric GMP (c-di-GMP). The spirochete shifts its source of carbon and energy from glucose in the vertebrate to glycerol in the tick: utilization of glycerol is a crucial adaptation for the spirochete to persist in the tick and successfully transmit to a vertebrate. We hypothesize that the glycerol-3-phosphate dehydrogenases that interconvert glycerol-3-phosphate and dihydroxyacetone phosphate at the interface of glycerol metabolism and glycolysis serve as a metabolic linchpin for navigating the enzootic cycle. We have taken a genetic approach to dissect the function of *glpD* and *gpsA*, encoding these glycerol-3-phosphate dehydrogenases. *B. burgdorferi* post-transcriptionally regulates expression of the glycerol metabolism (*glp*) operon to utilize glycerol in order to survive in its tick vector. We have probed the molecular mechanisms regulating expression of the *glp* operon, including the specific roles of a novel antisense RNA and the c-di-GMP-binding protein PlzA. The experiments are a work in progress to understand the regulatory mechanisms that allow *B. burgdorferi* to respond and adapt to carbon sources in the tick-to-mammal transmission and in Lyme disease pathogenesis.

WebEx Details:

Meeting link: <https://usask.webex.com/usask/j.php?MTID=m132609b85469698a24c5aca931d88c0b>

Meeting number: 145 049 6878

Password: B3TuRpEiq53

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Everyone Welcome