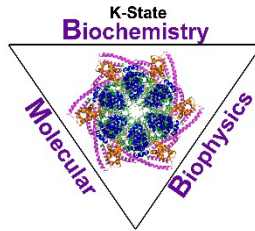


Ackert Hall, Room 120  
Wednesday, February 12, 2025  
4:00 P.M.



Coffee and Cookies  
Chalmers Hall, Room 168  
3:45 P.M.

**Biochemistry**  
&  
**Molecular**  
**Biophysics**

**Seminar**

**DksA is a redox-sensitive, global gene regulatory protein  
required for infectivity of the Lyme disease agent  
*Borrelia burgdorferi***

**Travis Bourret**

Medical Microbiology and Immunology  
Creighton University

Lyme disease is the most prevalent vector-borne illness in the United States with CDC estimates reaching approximately 476,000 cases per year. Lyme disease is caused by the spirochetal bacteria *Borrelia burgdorferi*, which coordinates gene expression as it cycles between its tick vector and mammalian hosts using a small repertoire of gene regulatory proteins. However, there remains key gaps in our knowledge of the mechanisms governing gene expression throughout *B. burgdorferi*'s infectious cycle. We recently reported an essential role for DnaK suppressor protein (DksA) in control of *B. burgdorferi* virulence gene expression required for infectivity. DksA mediates changes in gene transcription through direct interactions with the  $\beta'$  subunit of RNA polymerase, however, the mechanisms governing how changes in the environment contribute to DksA's gene regulatory capacity remain unclear. In this presentation, I will discuss how DksA coordinates transcriptional responses of *B. burgdorferi* to reactive oxygen species (ROS) and reactive nitrogen species (RNS), and how this contributes to its ability to successfully adapt to its tick and mammalian host environments.