

Kerri Kobryn, Assistant Professor
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Recruitment:

Dr. Kobryn is currently accepting applicants for the MSc and Ph.D. programmes, including government-funded students. The potential applicants are encouraged to discuss his/her research interests and the questions about pursuing graduate study at the University of Saskatchewan with Dr. Kobryn at kerri.kobryn@usask.ca.

Areas of Expertise

- 1) Biochemistry and molecular biology of bacterial telomeres, in particular using the model system of *Borrelia burgdorferi* the causative agent of Lyme Disease and the plant pathogen *Agrobacterium tumefaciens*.
- 2) DNA recombination and DNA recombinases

Research Interests

Lyme disease is an important emerging infection in Canada transmitted by ticks infected with *Borrelia burgdorferi*. The Lyme disease spirochetes are unique among human pathogens in having a linear chromosome and plasmids terminated by unusual hairpin telomeres. The lab studies the family of enzymes referred to as telomere resolvases that form hairpin telomeres in *Borrelia*, *Agrobacterium* and several bacteriophages. Telomere resolvases are related to proteins that in other bacterial species control bacteriophage integration/excision, DNA supercoiling levels and chromosome segregation. In addition to possessing the essential activity of making the hairpin telomeres, telomere resolvases promote DNA annealing and ATP-dependent DNA unwinding reactions. The biological role of the annealing and unwinding reactions remains unknown. Projects include biochemical and *in vivo* characterization of the annealing and unwinding activities.

The lab is also interested in homologous recombination in *Borrelia*. Recombination-driven antigenic variation is a key requirement for infection persistence but is independent of the major recombinase, RecA. We are exploring the possibility that *Borrelia* possess an alternative recombinase.