ABSTRACT

TITLE:	Implications of Chronic Hantavirus Infection on the Immune System Function of Wild Deer Mice (Peromyscus maniculatus)
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PRESENTED AT:	2014 Undergraduate Research and Creative Activities Symposium, Fort Lewis College

ABSTRACT: The objective of our research was to determine the role that immunocompetence plays in the susceptibility of wild mammals to simultaneous infection with multiple pathogens. As part of this research, we determined 1) the extent to which maintaining a chronic infection with Sin Nombre virus (SNV) affected immune system function of wild deer mice and 2) the extent to which immunocompetence influenced the susceptibility of deer mice to co-infection with the bacterial pathogen, Bartonella. We conducted a field and lab-based study in which we compared the innate, inflammatory and virus-specific immunity of SNV-infected deer mice to their uninfected counterparts. Likewise, the immunity of deer mice who were co-infected with both Bartonella and SNV were compared to individuals who were either uninfected or infected with only 1 of these pathogens. Our results show that deer mice chronically infected with SNV have a long-term increase in the inflammatory immune response, and this reduction in innate immunity is most pronounced during the acute stage of infection. Collectively, these results indicate that costs to innate immunity may differ over the course of SNV infection. In addition, we found that SNV infected deer mice are more susceptible to secondary infection with Bartonella during the acute phase of SNV infection, as this represents a period when their innate immunity is greatly reduced. Our results provide much needed information regarding the regulation of both bacterial and viral pathogenesis in wild animals, ultimately improving our ability to predict patterns of zoonotic disease transmission among animals and from animals to humans.