Role of wildlife ecology across scales as the framework to assess pathogen risks in a human dominated planet

Emergent pathogens increasingly threaten the health of human and wildlife populations at local and global scales, with evidence that anthropogenic disturbances may be the cause of this problem. High biological diversity has been hypothesized to protect against zoonotic diseases and reduced the spread of disease. Susceptible host regulation and reduction of intraspecific encounter rates may be the modes by which high diversity reduces pathogen transmission, but exact mechanisms have not been explored. At my lab we are using hantaviruses and their rodent hosts as a model system to address these questions. A global review of hantavirus hosts has evinced the large gaps we have in our knowledge. Also, a large scale field derived study contrasting hantavirus seroprevalence against rodent assemblage patterns between sylvan and human degraded sites has shown that geographical differences are likely more important than local assemblage patterns. Within this system ascertaining the mechanisms of transmission regulation via experimental manipulations will be of high value. Finally, I showcase *Leptospira* prevalence in an insular system as an example of the role of invasive and commensal species to maintain zoonotic pathogens in human dominated systems.