

Interaction of mosquito larvae with *Francisella tularensis* LVS biofilmsU. Mahajan¹, M. W. Turnbull¹, T. L. McNealy¹¹Clemson University, Biological Sciences, Clemson, United States

Aims: *Francisella tularensis* is a highly virulent human pathogen responsible for causing the disease tularemia. *F. tularensis* LVS can form biofilms in aquatic environments which provides them a niche to survive harsh environmental conditions. Arthropods such as mosquitoes, ticks and deer flies are vectors for *F. tularensis*. These arthropods can transmit the infection to various mammalian hosts including humans; however the method and source of acquisition of *F. tularensis* by arthropods is unclear. We hypothesize that aquatic mosquito larvae feed on *F. tularensis* biofilms and play important roles in persistence and dissemination of this bacterium in the environment.

Methods: Persistence of *F. tularensis* LVS in mosquito larvae was measured following oral uptake of suspended cultures and biofilms. Larvae were exposed to either planktonic *F. tularensis* or biofilms grown on glass slides for 24h. Larvae were collected at days 1, 3 and 9 post exposure for analyses by fluorescence microscopy and Real Time PCR.

Results: Real time PCR and fluorescence microscopy confirm the presence of *F. tularensis* LVS within the larval gut for up to nine days post exposure. Real time reverse transcription PCR demonstrates that the mosquito antimicrobial peptides defensin, gambicin and cecropinA are altered suggesting manipulation of the larvae immune response by the bacteria.

Conclusions: Our results show the potential of *F. tularensis* to be acquired by a known vector during larval feeding. Uptake and persistence of *F. tularensis* by mosquito larvae have not previously been shown although the interaction has the potential for significant consequences on transmission of the disease. Future studies will examine the localization of the *F. tularensis* within the larvae gut as well as possible dissemination of the bacteria across the gut epithelium. It is essential to examine the environmental factors and biotic interactions affecting transmission of *F. tularensis* in order to understand and optimize outbreak response and prevention.