

ELLIOT COLLINS, Dept of Natural Sciences and Mathematics, West Liberty University, West Liberty, WV, DEANNA SCHMITT, Dept of Natural Sciences and Mathematics, West Liberty University, West Liberty, WV, FRANCISCO LEON, National Center for Natural Products Research, University of Mississippi, University, MS, MELISSA JACOB, National Center for Natural Products Research, University of Mississippi, University, MS, and JOSEPH HORZEMPA, Dept of Natural Sciences and Mathematics, West Liberty University, West Liberty, WV. Compound Isolated from Fennel Dampens Virulence Factor Expression of *Francisella tularensis*

*Francisella tularensis* is a highly infectious bacterium that causes the disease, tularemia. The Centers for Disease Control and Prevention classified *F. tularensis* as a category A bioterror agent due to its virulence and ease of aerosolization. The intentional release of a resistant strain of *F. tularensis* could be devastating. Consequently, there is a need for novel treatments effective against *F. tularensis* infections. We previously tested a cataloged natural compound library for inhibition growth of a fluorescent *F. tularensis* strain (LVS/pTC3D) during infection of THP-1 monocyte cells. From this analysis, we identified nine extracts that only limited bacterial replication in the presence of these host cells. One of the most promising extracts for the inhibition of *F. tularensis* during infection was from Fennel. Using bioassay guided fractionation, the Fennel extract was separated until a pure compound was isolated and identified using NMR and mass spectrometry. We sought to determine whether the compound would be effective at diminishing disease caused by other infectious bacteria, such as the opportunistic pathogen, *Acinetobacter baumannii*. Therefore, wax worms infected with *A. baumannii* were treated with the compound or were mock treated. Wax worm larvae treated with the compound exhibited significant survival compared to the control-treated insects. To investigate the mechanism of action, RNA-seq was conducted on *F. tularensis* incubated in the presence of the compound. These samples compared to bacteria treated with vehicle-alone showed a significant decrease in virulence factor expression – specifically genes under the control of the master virulence regulators MglA and SspA. Currently, we are working to validate this finding with other methods.