INTERACTION OF Francisella noatunensis subsp. orientalis WITH Oreochromis mossambicus BULBUS ARTERIOSUS CELL LINE

Esteban Soto¹**, Susan Yu¹, John Hansen²

¹University of California-Davis, Department of Medicine and Epidemiology, School of Veterinary Medicine, Davis, CA95616

²U.S. Geological Survey, Western Fisheries Research Center, Seattle, WA98115

Francisella noatunensis subsp. orientalis (Fno) (syn. F. asiatica) is an emergent warm water fish pathogen and the causative agent of piscine francisellosis. Although Fno causes septicemia and can live extracellularly in a tilapia (Oreochromis spp.) infection model, the early interaction of Fno with vasculature endothelium is unknown. In the present study, we examined the interaction of wild-type Fno (WT) and two Fno knockout strains, intracellular growth loci C (ΔiglC) and pathogenicity determinant protein A (ΔpdpA), with a previously reported O. mossambicus Bulbus arteriosus endothelial-like cell line (TmB) at 25°C and 30°C. Similar amounts of WT, ΔiglC, and ΔpdpA attached and were detected intracellularly after 5 hours post-infection at both temperatures; however there was an effect of temperature on uptake as significantly greater quantities of Fno (WT, ΔiglC, and ΔpdpA) were detected intracellularly when cells were incubated at 30°C. Only the WT Fno was able to replicate intracellularly, causing cytotoxicity and apoptosis at 24 and 72 h post-infection when incubated at 25°C. WT Fno incubated at 30°C as well as ΔiglC, and ΔpdpA incubated at 25°C and 30°C were defective for survival, replication, and the ability to cause cytotoxicity in TmB. The current findings provide insight into the pathophysiology of francisellosis in tilapia.

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**Corresponding author. Tel.: +001 5307522440; Fax: +001 530-752-0414. E-mail address: sotomartinez@ucdavis.edu