

MACKENZIE HALL, EMILY YOUNG, JORDAN GIBSON, RYLEIGH MORGAN, CAROLINE WOODY, Department of Biomedical Sciences, West Liberty University, West Liberty, WV, KH. TANVIR AHMED, GREGORY B. DUDLEY, C. Eugene Bennett Department of Chemistry, West Virginia University, Morgantown, WV, and DEANNA M. SCHMITT, Department of Biomedical Sciences, West Liberty University, West Liberty, WV. Screening Resorufin Pentyl Ether Analogs for Enhanced Antimicrobial Activity Against *Francisella tularensis* and *Neisseria gonorrhoeae*.

Antibiotic resistance is an urgent public health threat. The CDC estimates there are approximately 2.8 million new cases of antibiotic-resistant infections annually resulting in 35,000 deaths and billions of dollars in health care costs. The development of new drugs is imperative to combat this crisis and prevent the loss of additional lives from once “curable” diseases. Resazomycins, a novel family of antibiotics, have bactericidal activity against *Francisella tularensis* and *Neisseria gonorrhoeae*. One resazomycin, resorufin pentyl ether (RPE), significantly reduces vaginal colonization by *N. gonorrhoeae* in a mouse model of infection. Repeated administration of RPE, however, fails to clear the infection, in contrast to a single dose of ceftriaxone, an antibiotic commonly used to treat gonorrhea, which clears the infection within 24 hours. Further characterization of resazomycins revealed the efficacy of these compounds is limited by interaction with serum albumin and reduced oxygen concentrations found within mammalian tissues. Therefore, we hypothesize that novel resazurin analogs that maintain antimicrobial activity in the presence of serum albumin and low oxygen will have improved therapeutic efficacy in vivo. To date, two different derivatives of RPE have been synthesized and tested for antimicrobial activity against *F. tularensis* and *N. gonorrhoeae* – 1-methyl RPE and 4-methyl RPE. Neither of these compounds inhibited the growth of *F. tularensis* or *N. gonorrhoeae*. Next, we plan to prepare a series of ketone derivatives of resazurin to alter the electrophilicity and reduction potential of these compounds and test their efficacy against *F. tularensis* and *N. gonorrhoeae*.