MEG WARNER, MACKENZIE HALL, Department of Biological Sciences, West Liberty University, WV, KH. TANVIR AHMED, RANDALL A. KOZIEL, VAHID LOTFIKALAJAHI, GREGORY B. DUDLEY, BRIAN V. POPP, KARATAS BRISTOW HACER, Eugene Bennett Department of Chemistry, West Virginia University, Morgantown, WV, AND DEANNA M. SCHMITT, Department of Biological Sciences, West Liberty University, WV. Derivatives of resorufin morpholinoethyl ether exhibit antimicrobial activity against *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 *Neisseria gonorrhoeae.* 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 novel resazurin analogs that maintain antimicrobial activity in the presence of serum albumin and low oxygen will have improved therapeutic efficacy in vivo. We identified one derivative, resorufin morpholinoethyl ether (R-O-mor), that exhibits these desired characteristics and made additional modifications of this compound. These R-O-Mor variants differ structurally by substitution within the morpholine ring: 3a contains a C–C substitution, 3b contains an N–C substitution, and 3c incorporates a S-C substitution. Antimicrobial susceptibility was assessed using broth microdilutions to determine the minimum inhibitory concentration (MIC) of each derivative. Compound 3c exhibited a lower MIC against *N. gonorrhoeae* compared to compounds 3a and 3b. These findings suggest that sulfur incorporation into the ring structure may enhance antimicrobial activity, potentially by altering molecular interactions with bacterial targets. Overall, this study supports continued investigation of the structure-activity relationship of resazomycins for development of novel treatments against *N. gonorrhoeae*.