

Gram-Positive Bacterial Inhibition by a Potential Antimicrobial Small Molecule

Aaron Sharp *, Science, MSU-Billings MT

Kurt Toenjes, Science, MSU-Billings, MT

*Indicates Presenter

With the advent of antimicrobial molecules in the mid nineteenth century countless people were saved from life threatening infections. With decades of use, antimicrobials put enormous selective pressure on targeted pathogens resulting in resistances forming in many common microbes. These resistant strains of pathogens result in over two million illnesses, 23,000 deaths every year, and billions of dollars in medical expenses. This represents a need to research new molecules that have antimicrobial properties to combat the rise of resistance and prevent undue suffering to those afflicted. A small molecule is under investigation now that displays promising antimicrobial properties in preliminary studies against *Candida* species and many pathogenic gram-positive bacteria. The gram-positive bacteria that are inhibited by this small molecule include *Staphylococcus aureus*, *Streptococcus pneumoniae*, *Listeria monocytogenes*, *Staphylococcus epidermidis*, *Streptococcus pyogenes*, *Bacillus cereus* and *Clostridium difficile*. Research is currently focused on *S. aureus* and *C. difficile* with disk assays performed on both and plate assays performed on *S. aureus* to narrow down the minimum inhibitory concentration. *C. difficile* has a zone of inhibition of 9mm, while *S. aureus* has zone of inhibition at 10mm. The plate assay for *S. aureus* has shown a minimum inhibitory concentration to be between 150-100 uM of the small molecule, though further studies are needed. Plans are being made to find the mechanism of action of the small molecule by using mutant strains of *S. aureus*.