REAGAN GRAY & JOSEPH HORZEMPA. Department of Biomedical Sciences, West Liberty University, West Liberty, WV. The identification of bacteria from human microbiota that inhibit the growth of Methicillin-Resistant *Staphylococcus aureus*

Methicillin-Resistant *Staphylococcus aureus* (MRSA) is an antibiotic-resistant bacterium and a major cause of preventable illness and death. To combat MRSA and other antibiotic-resistant pathogens, alternatives to small molecule therapeutics targeting essential biological pathways of bacteria must be identified. Staphylococci, including MRSA strains, can exist as part of the human microbiota, competing for resources and space with other microorganisms. Here, we sought to identify bacteria from the human microbiota capable of killing or inhibiting the growth of MRSA. Swabs of the nostrils and skin of two individuals were collected, one being a natural MRSA carrier, and bacteria were isolated from these samples. Of these isolates, eight showed to inhibit the growth of a MRSA strain when cross streaking. To identify these bacteria, a portion of the 16s rRNA gene of these bacteria was sequenced and compared to known bacteria in the genbank database using BLAST. Of the eight isolates, three distinct bacterial species were identified: *Acinetobacter baumannii*, *Bacillus aerius*, and *Staphylococcus epidermidis*. Following the identification of these bacteria, we sought to determine the mechanism of inhibition. Cell lysates and extracellular material of these inhibitory bacteria were used in a disk diffusion assay which showed no observable zones of inhibition toward MRSA. This suggests that these bacteria may need to be viable and/or directly contact MRSA to mediate the inhibition of growth. To test this hypothesis, phase-contrast microscopy of co-cultured bacteria was used. While results here suggested that *B. aerius* directly interfered with the ability of MRSA to replicate, future studies using time-lapse microscopy of fluorescent strains of these microbes should produce data that can be more clearly interpreted.