Hailey Dyce
University of Wisconsin La-Crosse Department of Microbiology
Assessing the global transcriptional regulation effect of BrpR in *Staphylococcus aureus*

Staphylococcus aureus (*S. aureus*) causes a wide range of diseases, including bloodstream and skin infections. Drug resistant *S. aureus* strains have become very common. A novel antimicrobial drug, SK-03-92, developed at the University of Wisconsin-La Crosse may help combat the antimicrobial resistance issue. SK-03-92 treatment affects transcription levels of two genes in *S. aureus*: *brpR* (biofilm regulating protein regulator) and *brpS* (biofilm regulating protein sensor). In this study, the involvement of BrpR in regulating other genes will be assessed by comparing transcriptional changes in a *brpR* mutant strain to the *S. aureus* unmutated parent strain. Previously, RNA sequencing analysis has been done that compared transcript abundance in a *brpR* mutant to the unmutated parent. Bioinformatic analyses will be performed on the data generated by the RNA sequencing results. From this, 5-10 genes will be chosen for quantitative reverse transcription polymerase chain reaction analysis to confirm transcriptional differences between the *brpR* mutant and parent strain. Further, three enzymatic assays will be performed to confirm RNA sequencing and bioinformatic analysis results. Overall, a better understanding of how BrpR regulates biofilm formation and late-stage competency will result from this study.