

PUBLIC HEALTH WORKER SAFETY

Title: Bacteriophages for the control of *Staphylococcus aureus* on environmental surfaces – **NPB #19-051**

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Date Submitted: November 15, 2020

SCIENTIFIC ABSTRACT

Staphylococcus aureus is a pathogen of significant concern in both humans and livestock. Asymptomatic carriage of *S. aureus* by swine, particularly multidrug-resistant (MDR) strains, poses a potential risk to workers involved with livestock production and to the larger community. Bacteriophages are the most abundant form of life in the biosphere and are major predators of bacteria in natural environments. Recent interest in phages as novel antimicrobials has raised the possibility that phages infecting *S. aureus* may provide an alternative means for modulating this pathogen in the livestock environment and reducing the risk of transmission to humans. A collection of 51 phages was isolated from the environmental samples. These phages were further characterized by transmission electron microscopy and genome sequencing which indicated the presence of three major phage types in the collection: temperate siphophages related to phiETA, virulent phi29-like podophages, and large myophages with “jumbo” genomes. These phages were further characterized by host range and biofilm degradation assays. *S. aureus* strains were found to be generally weak biofilm formers *in vitro*. While liquid host range assays showed that the phages have varied host ranges, phage K specifically, was able to degrade ~37% of preformed *S. aureus* biofilms. However, DNase I treatment resulted in the greatest reduction of biofilm in all tested strains.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

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