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2022 SEA Symposium Abstract

Virginia Commonwealth University

Richmond VA

Corresponding Faculty Member: Allison Johnson (aajohnson@vcu.edu)

The Phage of Enlightenment: Mycobacteriophage Discoveries of Fall 2021

Tejal Bhor, Nikitha Manikonda, Riya Pulla, Ayesha Safeer, Allison Johnson

Bacteriophages are viruses that infect bacterial hosts. Bacteriophages are known as a natural predator of bacteria which cause no negative effects to animal or human cells. For this reason, bacteriophages can be used as an alternative to antibiotics and in phage therapy. It is important to continue hunting for bacteriophages because they may be able to target bacteria which are resistant to antibiotics. The Mycobacterium host used for our phage discovery was Mycobacterium smegmatis (MC2155). M. smegmatis is considered a close, non-pathogenic, relative of M. tuberculosis. During the fall semester, the goal was to characterize the phage samples isolated though purification with the host bacteria, M. smegmatis. Standard methods were used to find and isolate these phages including enrichment plating, filtration, spot testing, several rounds of purification, webbed plating, DNA purification, restriction enzyme digest, and transmission electron microscopy. Within the same enrichment and spot test processes, some phages had different plaque morphologies, indicating more than one phage could potentially be present. In total, the Fall 2021 wet lab section identified and characterized 5 mycobacteriophages: BaBullseye, Aubs, CheetoDust, FAN, and SUDAT. Plaque morphology, phage particle morphology and DNA characterization results will be shared. It was inferred that the phages found were Siphoviridae due to the double stranded DNA that was found during DNA purification and the long non-contractile tail. Further research will be done to determine protein position and function within each phage.