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2024 SEA Symposium Abstract

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Isolation and Characterization of Mycobacterium smegmatis Phage Landor

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A bacteriophage is a virus that specifically infects, replicates in, and kills bacteria. There is a growing concern that antibiotic resistant bacteria are becoming untreatable. This makes the discovery of new bacteriophages important because these viruses can kill the bacteria without affecting human cells, making them a viable treatment for multi-drug resistant bacteria. In our experiments, we collected a sample of dirt from a hay field in Concord, North Carolina. We used Mycobacterium smegmatis mc2155 as our host bacterium to discover novel phages against this bacterium. We followed standardized protocols from the SEA-PHAGES program to isolate and analyze bacteriophages including sample enrichment, standard plaque assay, and purification. Plaques were picked for purification six times until only one phage, named Landor, was left in the sample. Plaques vary in size but tend to be bullseyes, indicating that the phage may be temperate. Characterization will be done to determine optimal growth conditions including temperature, pH, and media types. Similar tests will be performed on lysate to determine phage stability. Preliminary tests show that Landor propagates best at 37˚ C like its bacterial host and has a two-layer plaquing system. Preliminary DNA annotation confirmed Landor is a temperate phage with the presence of an integrase gene,gp35. Future directions include further optimal growth conditions testing and completion of the genome annotation.