Discovery, Isolation, Purification, Amplification, and Characterization of Mycobacteriophage HSavage

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The discovery and characterization of tiny viruses that target bacteria - called bacteriophages - is an ongoing study around the globe. Within the United States, Phage Hunters Integrating Research and Education (PHIRE), Howard Hughes Medical Institute Science Education Alliance Phage Hunters Advancing Genomics, and NIH-SEPA's Bringing Research Into the Classroom (BRIC) are the current umbrella projects encompassing phage discovery research. This research has the potential for application in the medical field as an alternative to antibiotic treatments for bacterial infections (known as phage therapy). Mycobacteriophage HSavage, a virus that targets Mycobacterium smegmatis, was discovered on June 27, 2017, after being isolated from a compost sample collected during the winter. It was purified, amplified, and later viewed using electron microscopy. These processes revealed a plaque morphology that is small and circular while the phage morphology consists of an average tail length of 240.5 nm and head width of approximately 51.7 nm. The DNA was then extracted and sent to the Pittsburgh Bacteriophage Institute for sequencing. Additionally, a nanodrop test was performed to tell the concentration and purity of the DNA. The sequenced genome was then annotated and genes were given putative functions using BLAST, Phamerator, and DNA Master programs. All of the data collected on HSavage has been submitted to phagesdb.org, a database of phages which will provide valuable information to future research in areas such as phage therapy.

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