

Introduction

Mycobacteriophage GMonster targets host bacterium *Mycobacterium smegmatis* mc²155 and was isolated from this host using an enriched soil sample from in front of Raymond Dining Hall on the Providence College campus. Since GMonster infects *Mycobacterium smegmatis*, it may have the potential to be utilized in phage therapy to treat infections caused by similar, but pathogenic mycobacteria, such as *Mycobacterium tuberculosis*, the causative agent of tuberculosis. Bioinformatic analysis of this phage provides insight into GMonster’s genomic character and features.

Figure 3: Sequencing

Sequencing confirms assignment to the A1 cluster.

Isolation Temperature	37°C
Genome Length (bp)	50575
Overhang Sequence	CGGATGGTAA
GC Content	64%
Sequencing Facility	Rhode Island INBRE Molecular Informatics Core
Shotgun Sequencing Method	Illumina

Figure 1: Purification

Mycobacteriophage GMonster was isolated from an enrichment culture and purified by four rounds of purification on a lawn of *m. smegmatis*. The phage forms small, clear 2 mm plaques.

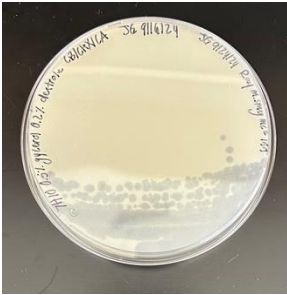


Figure 2: Electron Microscopy

Image of the phage particles show that GMonster is a Siphoviridae with a long contractile tail.

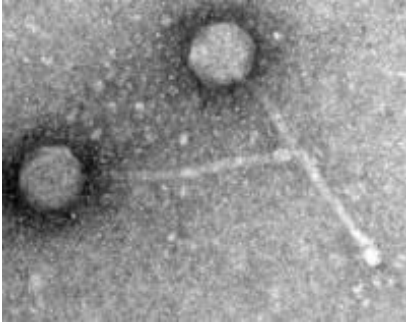


Figure 5: Phamerator Map

This genome map displays the first 15 genes of GMonster and those of the closely related phages Anglerfish and BeesKnees, both part of the A1 cluster.

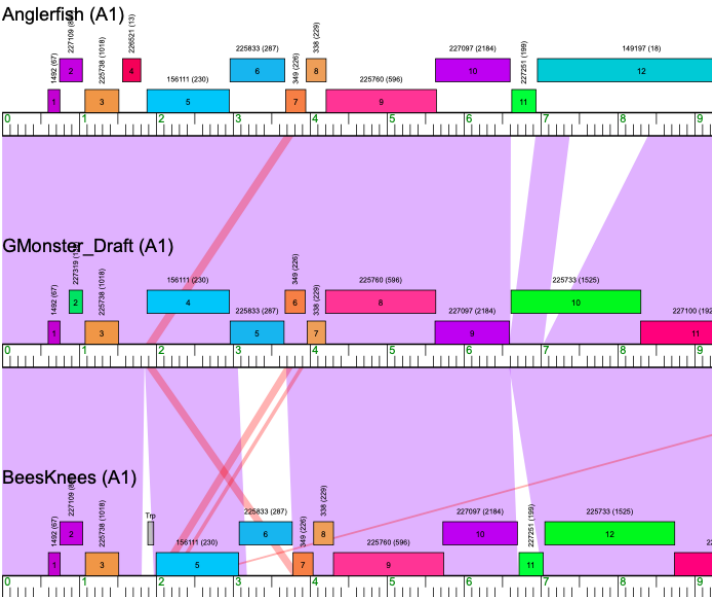


Figure 4: Isolated DNA from Extraction

Analysis of phage DNA, obtained via a phenol-chloroform extraction protocol. Below is a Nanodrop absorbance spectrum. Note the peak at 260 nm, which is the wavelength of light that DNA absorbs, indicating a pure sample of DNA.

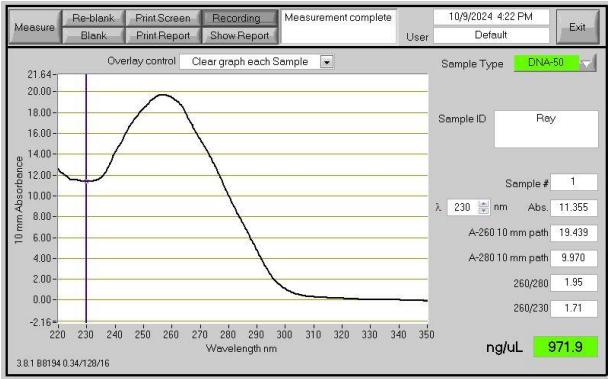


Figure 6: Annotation

Bioinformatics tools DNA Master, HHpred, Starterator, and Phamerator were utilized to complete the genome annotation. Below is an example annotation for gene 22 on DNA Master.

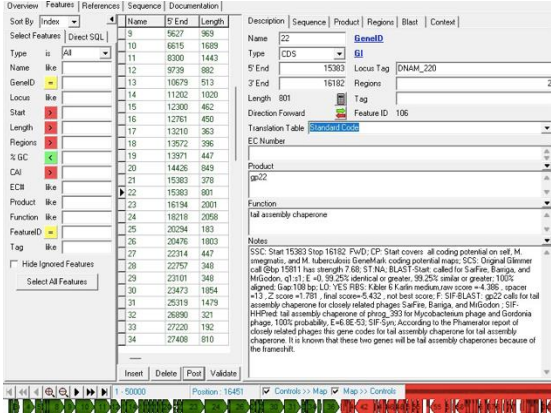
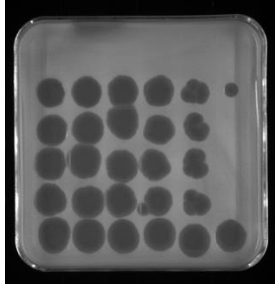


Figure 7: Lysogen Formation

Host bacteria survive in the presence of a high concentration of phage, indicating the adoption of a temperate lifestyle and formation of a lysogen. Phage DNA is incorporated into the host chromosomal DNA, which the host survives.



Acknowledgements

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