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2023 SEA Symposium Abstract

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Isolation and Characterization of Mycobacteriophage Milcery

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Milcery is a mycobacteriophage infecting M. smegmatis mc2155 that was isolated in September 2022 at Merrimack College. Milcery was isolated via the enriched isolation technique from soil collected in North Andover, MA. Infection of M. smegmatis mc2155 with Milcery yields large plaques with a clear center and turbid edge. Milcery is a cluster A5 phage with a genome length of 50,985 bp. Its closest homologs are Tarynearal, LittleCherry, Bonamassa, and George. Milcery has a typical A5 cluster genome organization with 85 predicted protein-coding genes and 1 predicted tRNA gene. The proximal half of the genome is mainly comprised of genes in the forward orientation encoding structural and assembly proteins. Genes located on the distal half of the genome are mainly in reverse orientation include genes associated DNA replication and lytic growth. Like all A5 genomes, Milcery contains a serine integrase at its center. Analysis of the Milcery genome with Aragorn identified a single tRNA-Trp gene in forward orientation at 4309-4382, upstream of lysins A and B. We identified a Cas4 exonuclease and immunity repressor on the basis of homology and synteny with other A5 phage. Future work will include identification of operator/stoperator sequences within the Milcery genome that may be subject to regulation via the repressor.