CONSIDER FOR TALK

2021 SEA Symposium Abstract

University of the Sciences (now St. Joseph's Univ)

Philadelphia PA

Corresponding Faculty Member: C. Nicole (Nikki) Sunnen (csunnen@sju.edu)

Investigating the Presence of Promoters and Terminators in Phage Beem

Jessie Jin, Mayra Rosales, Christina Scanlon, Virginia Uyehara, C. Nicole Sunnen

Cluster J actinobacteriophages are of high interest as they have lengthy genomes and temperate life cycles. Cluster J phages, including phage Beem, are known to infect *Mycobacterium smegmatis* mc²1558. While annotating phage Beem, regions of genes coding for functions associated with different processes in temperate phage life cycles were found. This confirmed the presence of different cassettes throughout the genome, with the lysis and integration cassettes being of the highest interest. The variable region between the lysis and integration cassette is reverse and varies across phage genomes, raising questions about its role within the genome. To examine this, the coordinates for the end of the lysis cassette and the start of the integration cassette were calculated through the use of software, which predicts the locations of promoters and terminators. It was expected that there would be promoters in areas switching from forward to reverse frames, beginning the transcription process. Terminators were also expected to be located near the stop site of the last gene of the promoter region. Data results from DNA Master Promoter Prediction indicated that there are two promoters in the region between the frame switch and the integration cassette. The Softberry algorithms determined that there is a terminator after the lysis cassette before the reverse portion. However, it was expected that there would be two terminators in the region. One terminator would indicate the end of the lysis cassette; another would indicate the end of the reverse region. The lack of a second terminator in the region warrants further experimentation to determine whether cassettes can share terminators. By understanding the location of cassettes in this region of Beem, the variability in this region can be compared across other Cluster J phages.