CONSIDER FOR TALK

11th Annual SEA Symposium Abstract

Florida International University

Miami FL

Corresponding Faculty Member: Patricia Waikel (pwaikel@fiu.edu)



Karina Gonzalez

Phylogenetic and protein structure comparison of minor tail proteins among F cluster phages

Daniel Cambron, Ana Ruas, Karina Gonzalez

The annotation of phage genomes commonly results in the annotation of multiple minor tail proteins per genome, without distinguishing whether there are distinctive differences or functions of these multiple minor tail proteins. While research into the evolution of long-tailed phages has focused on bench work and functional annotation, comparisons of the protein structure of the multiple minor tail proteins harbored by these phages are lacking. We identified 78 minor tail proteins present in ten phages from the F cluster representing subclusters F1, F2, F3, and F4. To visualize the evolutionary relationship among these minor tail proteins, we constructed a maximum likelihood phylogenetic tree using PROMALS3D and IQ-TREE. We then identified distinct clades of minor tail proteins from the phylogenetic tree and predicted the protein structure for one representative of each clade using the program SWISS-MODEL. Similarities in 3D structure between proteins within the same clade and across clades were examined. By examining how these proteins group in the phylogenetic analysis and whether they cluster according to the sub-cluster they belong to or if they cluster across different phages, we will develop a greater understanding of the diversity and conservation of minor tail proteins and their structures. Future research in this area should focus on examining the structural conservation of minor tail proteins across phages of different clusters and, ultimately, different hosts.