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2024 SEA Faculty Meeting Abstract

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A Programmed Translational Frameshift in Various Microbacterium Phages and Prophages May Lead to a Holin Isoform With Multiple Transmembrane Helices Instead of One

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It has been well established the PTFs, programmed translational frameshifts, occur when a ribosome encounters “slippery” mRNA sequences, such as those produced by most tail assembly chaperone genes in the Siphoviridae, flexible non-contractile tailed phages. PTFs thus cause a single base frameshift in either direction, changing the reading frame of the mRNA and potentially bypassing the original stop codon, forming a larger isoform of the encoded protein. Additional PTFs have yet to be characterized in these phages. We have used bioinformatics to predict a potential PTF in a putative superfamily VI holin gene in 29 *Microbacterium* phages and 23 prophages found in *Microbacterium* and related genera. This PTF, upon slippage, would create a protein with 3-5 TMSs, transmembrane alpha-helical segments, as opposed to the single one found in the original protein.