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11th Annual SEA Symposium Abstract

Lafayette College

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PauloDiaboli from Lafayette College: Examining Genes 170, Ribonucleotide reductase R2-1 small subunit, and 174 ,Ribonucleotide reductase 2.

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Microbacterium phage, PauloDiaboli, was discovered by utilizing the method of direct isolation. PauloDiaboli was found from a soil sample collected at Lafayette College, Easton PA. The idea for the name arose from the tiny plaques the phage consistently generated, leading to multiple titrations until appropriate-sized plaques were displayed. There was a point in which we thought the phage stock was no longer viable, and due to the phage’s stubbornness, the Latin meaning of “little devil” inspired us to name him PauloDiaboli. With a genome composed of 191968 base pairs and with a GC content of 60.09%, we decided to examine PauloDiaboli’s genes 170 and 174. Uniquely enough, PauloDiaboli was identified as a singleton phage. However, we were able to find similarities among gene function in PauloDiaboli’s genetic makeup. Setting a focus on protein folding led us to place our attention on the influence that alpha helices and beta strands have in the protein sequence that contributes to the genetic makeup of PauloDiaboli. Utilizing UnitProt and HHPred, we studied the specific roles of the active site and metal binding site of both of these structures in PauloDiaboli. While the active site aids in generating GDP, essential for energy supply, the presence of the metal binding site facilitates mineral absorption by the host. How is protein folding such an essential aspect to consider in a singleton phage? Since acquiring and storing energy is facilitated in phages, we concluded that the concentration of both of these protein structures are required to enable phages similar to PauloDiaboli to thrive in diverse environments.