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11th Annual SEA Symposium Abstract

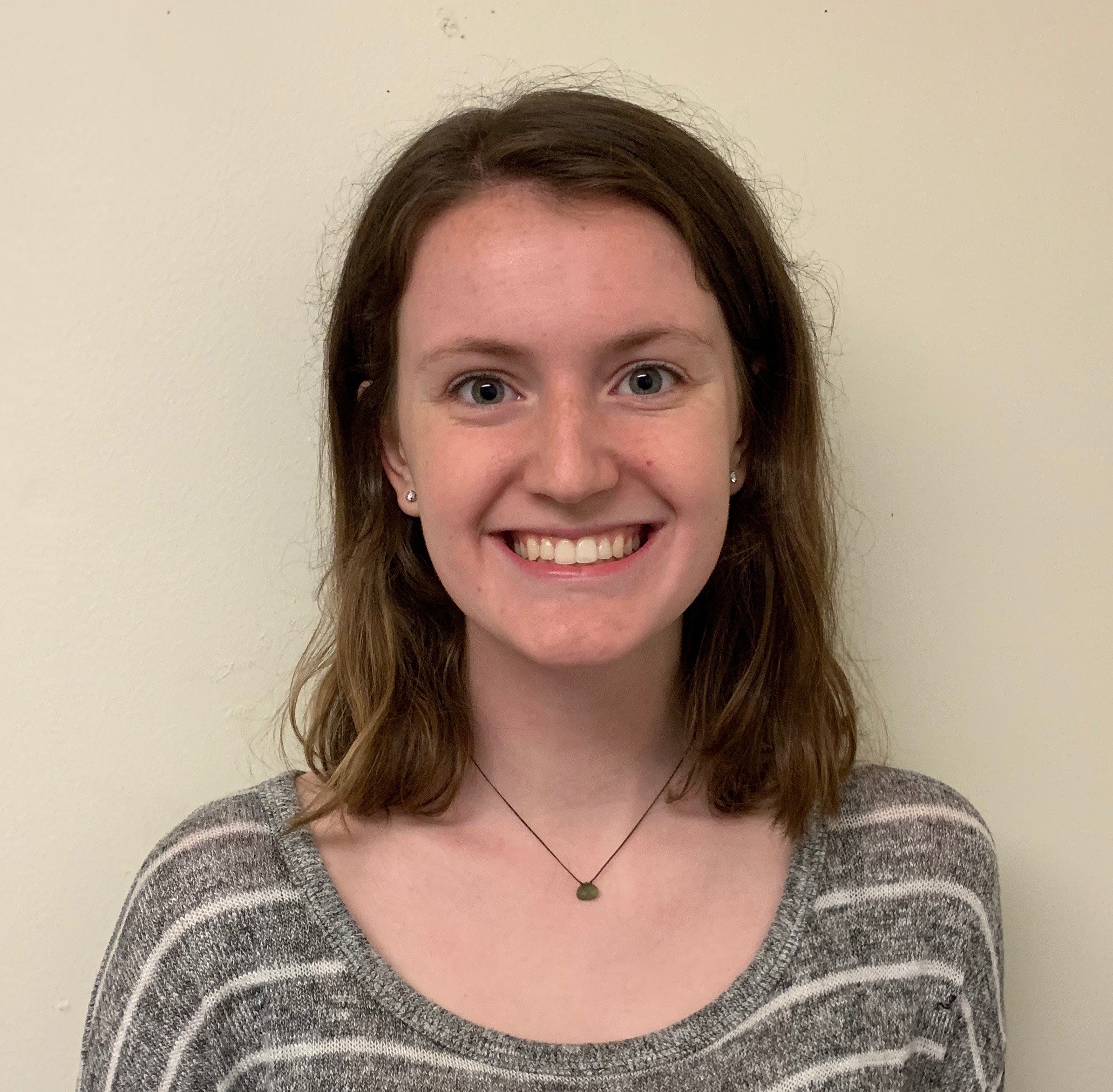
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Novel Bacteriophages Against Environmental Phactors – Phage stability Put to the Test!

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In the Fall of 2018, Drexel University students isolated 36 novel bacteriophages using *Microbacterium foliorum* as a host. All phages were isolated using enriched isolation and 8 of them were sequenced. The Illumina sequencing of these phages demonstrated that all phages have lytic cell cycle, siphoviridae morphology and belong to EA1, EA4 subclusters and EC cluster. These phages were successfully annotated using DNA Master, Phamerator, NCBI Blast and PECAAN and submitted to GenBank. During the Spring quarter, we investigated the effect of varying environmental factors on phage stability by evaluating changes in the plaque forming units (pfu) observed. Phages were exposed to acidic or basic pH, high temperature, different glucose concentrations or UV light. Additionally, the protective effect of whey protein concentrate (WPC) and alpha-lactalbumin on phage stability, when exposed to high-temperature, was also investigated. Full plate plaque assays were conducted in all the experiments. If phage stability was adversely affected, the number of pfu would decrease. Conversely, an increase in pfu would indicate that the tested condition has enhanced the ability of the phages to infect the bacterial cell. Our results demonstrated that exposing phages to acidic or basic conditions or UV light showed a decrease in pfu counts. Another interesting observation was that exposure to glucose also significantly decreased phage stability, probably due to osmotic shock and phage lysis. Other experiments showed that adding whey protein to phage lysates stabilized the phage during high-temperature shock, suggesting that it has a protective effect which enhanced phage infectivity. Surprisingly, alpha-lactalbumin had an opposite effect on phage stability, when exposed to high temperature, because decreased pfu results were observed when compared to the control plates (using phage buffer alone). Based on these observations we conclude that phages can tolerate exposure to a range of environmental factors and are still able to perform bacterial cell infections.