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2021 SEA Symposium Abstract

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Analysis of unknown gene functions in the bacteriophage NormanBulbieJr

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Antibiotic resistance is an increasing issue in treating infections, and the development of new antibiotics is stagnant. Enter bacteriophages. Phages are found worldwide, in places like soil, sewage, and water and they help to keep bacterial growth in check. A bacteriophage is a virus that infects bacteria, hijacking its replication mechanisms in order to reproduce inside the host bacteria cell. Since bacteriophages are able to attack only bacterial cells, researchers have taken an interest in them as a means to treat infections. While phage therapy may sound like a great alternative for treating multidrug resistant infections, there are still a lot of unknowns. On average 60% of genes within a phage genome have unknown functions. Science Education Alliance - **G**ene-function **E**xploration by a **N**etwork of **E**merging **S**cientists or SEA-GENES is an HHMI undergraduate program, that allows students to uncover the function of genes in previously discovered bacteriophage. Using molecular cloning techniques, we were able to construct our genomic library of individual genes of interest from the bacteriophage NormanBulbieJr. Using the engineered plasmids, we will conduct both cytotoxicity and defense assays to allow us to gain a better understanding of the function of these genes. In collaboration with a network of other GENES schools, we will contribute to a better understanding of phage gene interactions with their host bacteria, *M. smegmatis*. Data collected from NormanBulbieJr will be added to a publicly available database of phage gene functions for broad distribution to the scientific community.