DO NOT CONSIDER FOR TALK

2022 SEA Symposium Abstract

University of Maine, Honors College

Orono ME

Corresponding Faculty Member: Sally Molloy (sally.dixon@maine.edu)

Novel Cluster CZ4 phage Oregano

Oyku Goktug, Hannah Lembree, Dorian Royal, Alexander Russell, Annika Savage, Makayla Sisco, Maple Waltner, Veronica Chun

Antibiotic resistance is a growing threat to public health, particularly for immunocompromised patients that are vulnerable to bacterial infections. Bacteriophages (phages) are viruses that infect bacteria. Temperate phages can integrate their genomes into the bacterial genome and their genes have the potential to increase bacterial fitness and drug resistance during this lysogenic infection. Lytic phages replicate and lyse the bacteria to release phage progeny and can serve as an alternative treatment to drug-resistant bacterial infections. To learn more about how phages can play these two opposing roles, we isolated the novel Gordonia phage, Oregano, from a soil sample in Maine. The genome of Oregano is 47,575 bp in length with a GC content of 66% and encodes 82 genes. Oregano is one of 20 members of the CZ4 cluster. Oregano is a temperate phage and encodes two tyrosine integrases and an immunity repressor. Genes 44 and 45 encode a putative VapBC toxin/antitoxin system, with the potential to degrade cellular RNA during cell stress such as superinfection by a phage or exposure to antibiotics. In future research we will identify potential phage attachment sites and test Oregano lysogens for superinfection immunity.