In Pursuit of New Soil-Based Bacteriophages That Infect Gordonia rubripertincta: Discovering Evergreen

Barreto-Massad, Chloe (School: American Heritage School of Boca Delray)

Discovering new antibiotics or identifying alternative therapies to address antibiotic resistance is pivotal. One option is bacteriophage (phage) therapy, which can be used to treat bacterial infections. Bacteriophages are genetically diverse and plentiful globally. Yet, knowledge about its genomic sequence is ruefully low. Thus, the goal of this study was to discover a phage that infects the bacteria Gordonia rubripertincta and then characterize its genomic sequence. G. rubripertincta is routinely found in soil, and is effective in bioremediation. Further, few phages that infect it have been discovered and sequenced, and recent laboratory studies have shown success with identifying pertinent phages using relatively small amounts of samples. G. rubripertincta can be used to eliminate environmental pollutants. Then, a phage can be used to eliminate G. rubripertincta. With the goal of discovering a phage that could lyse G. rubripertincta, soil samples were collected in Loxahatchee and Palm Beach Gardens, FL. Several phages were discovered from the soil sample using a plaque assay and enrichment isolation methods. To ensure that there was only one type of phage per sample, phage purification was conducted, which entailed picking and diluting isolated plaques followed by further plaque assays. To secure uniform plaques, three rounds of purification were performed. Plaque assays were then repeated to ensure a high concentration of the phage by employing a high concentration of the sample. This rendered the phage lysate from which DNA was extracted and used for sequencing and RFLP analysis of the new phage Evergreen.

Awards Won:
Fourth Award of $500