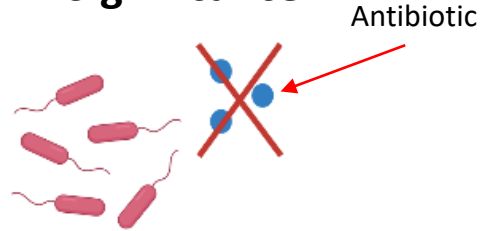


Identification of Carbapenem-Resistant Bioprospects in Puerto Rico's Bodies of Waters

Malavé-Ramos, Darlene¹; Ríos-Velázquez, Carlos¹

¹Biology Department, University of Puerto Rico at Mayagüez

Significance



Carbapenem-resistant bacteria is classified by the CDC as urgent threats. For instance, in 2017, 54,500 cases of infections caused by the Vancomycin-resistant *Enterococcus* in hospitalized patients were reported, and approximately 5,400 deaths were reported. If clones from one or all of the metagenomic libraries studied are found, this will help us have an idea of how human activities can have an impact on the presence of these types of bacteria in these environments.

Innovation



Metagenomic libraries to be studied are Río Grande de Añasco, Embalse de Guajataca and Playa Sucia. These were chosen because in the literature it has been mentioned that carbapenem-resistant bacteria have been found in these types of environments.

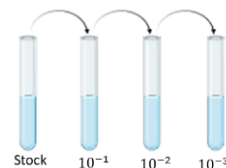
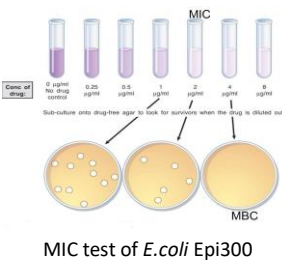
Hypothesis

If multi-drug resistance pathogenic bacteria have increased in different environments due to incorrect management and biomedical practices, then antibiotic resistant bacteria (bioprospects) should be found in bodies of waters impacted by human activities by using culture-independent approaches (metagenomics).

Results

In the summer 2021 I worked with finding clones from a rice pre-harvest metagenomic library in Luria-Bertani plates, ones with the antibiotic chloramphenicol, and others with imipenem, as part of the training to conduct this independent research. No clones were found in either plates. In the fall of 2021, I worked with finding cultivable bioprospects capable of degrading rice and potato starch. This training will facilitate the research that will be undertaken in the Spring 2022 on finding clones resistant to carbapenem antibiotics.

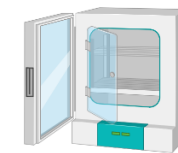
Approach



Serial dilution will be done to determine the concentration with the best microbial load.



One agar plate with vancomycin and another with imipenem at different concentrations.



Incubate at 37°C for 18hrs



Observe results: If clones are present, then the resistance could be due to the DNA insert in the fosmid.

Future Works

To conduct the research, in order to obtain results.