Isolation of Multidrug Resistant Bacteria from the Lane College Soil

Jayla Wright, LaDaja Allen, Melanie Van Stry
First published: 13 May 2022

https://doi.org/10.1096/fasebj.2022.36.S1.R5473
NSF HRD 2011938 and Department of Education MSEIP P120A180072

Abstract

Antibiotics are substances that eliminate or slow down the growth of bacteria. Beta-lactam antibiotics, such as penicillin, are antibiotics that contain a beta-lactam ring that inhibits bacterial cell wall biosynthesis. Bacteria are becoming resistant to antibiotics being that antibiotics are highly prescribed when people seek health care. My goal for this project is to isolate and characterize soil bacteria that are resistant to beta-lactams. I hypothesize that the bacteria present in the soil on Lane College campus is resistant to beta-lactams. Furthermore, I hypothesize that these bacteria have a beta-lactamase gene, which is an enzyme that inactivates the bacteria by cleaving the beta-lactam ring. I collected soil samples from Lane College campus and cultured the bacteria on two nutrient agar plates with ampicillin and cultured over night at room temperature. For further characterization, I then chose 3 different colonies from the plates (S1A, S1B, and S2A) and streaked them on to new nutrient agar plates with ampicillin. The strains were tested for drug resistance using the Kirby-Bauer method. They were incubated overnight at room temperature. I then streaked separate LB agar plates from all 3 colonies and added antibiotic disks to each plate (ampicillin, penicillin, amoxicillin, and streptomycin) with *E. coli as a* control group. Strains S1A, S1B, and S2A were resistant to ampicillin, penicillin, and amoxicillin, but were sensitive to streptomycin. We then further characterized by Gram staining and morphological observation. All samples were Gram negative, and the cells were a coccus shape. I am planning to use the 16S rDNA gene to identify the bacteria using Nanopore next generation sequencing, and to look for the presence of beta-lactamase genes by PCR.