EFFECT OF ENVIRONMENTAL RADIATION ON THE INCIDENCE OF ANTIBIOTIC RESISTANCE IN BACTERIA ISOLATED FROM FROGS

Demarcus Rainey[1,2], Nathaniel Fox[1,3], Courtney Burckhalter[1], and J Vaun McArthur[1]

[1]UGA Savannah River Ecology Laboratory, Aiken, SC

[2]South Carolina State University, Orangeburg, SC

[3]Kenyon College, Gambier, OH

Mentor: J Vaun McArthur

Antibiotic resistance has been called one of the world's most pressing public health problems. Antibiotic resistance is the ability of microbes to resist the effects of antimicrobial drugs. Every time a person takes antibiotics, sensitive bacteria are killed, but resistant ones may be left to grow and multiply. Resistant bacteria are frequently found in settings where antibiotics are repeatedly used such as communities, food and animal production, and healthcare settings. Previous work in our laboratory has determined a link between the concentration of heavy metals from industrial activities and levels of antibiotic resistance in estuaries and freshwater environments. The objective of this study was to determine if bacteria isolated from the surface of frogs exposed to radionuclides have higher levels of antibiotic resistance than frogs from uncontaminated locations. Twenty four frogs (bull frogs –*Lithobates catesbeianus* and green frogs –*Lithobates clamitans*) were captured from low and high contaminated ponds on the Savannah River Site. Bacteria where then swabbed off the backs of the frogs and spread on nutrient broth plates from which up to eight colonies were isolated.

These colonies were purified, placed in liquid culture and subsequently screened against five different types of antibiotics using replica plating techniques. Over 200 isolates were screened. Resistant patterns towards the five antibiotics were individually unique. Bacteria from green frog samples have higher resistance than bull frog samples for the Chloramphenicol, Imipenem, and Streptomycin antibiotics. Resistance to Ceftazidine was the only one to demonstrate a pattern of increasing resistance with increasing levels of environmental radiation exposure. Sixty isolates were randomly selected from the 200 to be screened against 23 antibiotics in 26 different combinations.

Demarcus in the lab.