

Thesis Defense Announcement
To: The George Mason University Community

Candidate: Navolle Amiri
Program: MS in Biology

Date: November 29, 2022

Time: 9:00 AM Eastern Time

Zoom Link: <https://gmu.zoom.us/j/94229845726?pwd=VTNodGZVdINJUGhPazV4NDc4UGFVdz09>

Title: *Vibrio vulnificus* Genotypes Exhibit a “Rock-Paper-Scissors” Pattern of Integration into Marine Aggregates and Uptake into Oyster Matrices

Committee Chair: Dr. Brett Froelich

Committee Members: Dr. Monique van Hoek, Dr. Jennifer Salerno

All are invited to attend the defense.

ABSTRACT: Oysters are among the most economically beneficial species with regards to aquaculture. As such, in order to ensure that oyster farming remains profitable, it is necessary to maintain a product that is safe for consumption. As oysters are oftentimes consumed raw, they have been known to cause seafood-based disease, particularly from the bacteria *Vibrio*. *Vibrio* infection can be costly to treat and depending on the severity of disease, even be potentially fatal. With sea water temperatures increasing due to global warming, infection rates have also been on the rise. There is therefore a need to rapidly develop therapies that will prevent a further number of clinical cases. Gaining a better understanding of *Vibrio* ecology would aid with doing so, however, data examining this is limited. Previous studies have examined higher oyster uptake levels when bacteria are integrated onto marine aggregates. This project aims to observe the relationship between three different strains of pathogenic *Vibrio vulnificus* species both on artificially generated marine aggregates and within oyster matrices.

This study found that within both aggregate and oyster competitions the three *Vibrio vulnificus* strains displayed an “rock-paper-scissors” effect. In competition between two Environmental (E) genotype strains VV JY1305 pVSV102 (hereby dubbed VV5-102) and SREL 106 pVSV208 (VV8-208), VV5-102 was outcompeted. Strain VV5-102 was able to outcompete the Clinical (C) genotype strain VV C7184 pVSV208 (VV2-208). Unexpectedly, VV2-208 was found to be more abundant than strain SREL 106 pVSV102 (VV8-102). This is a novel discovery as it was previously observed that E genotypes are predominantly recovered from contaminated oysters. These results expand upon our understanding of *Vibrio* interactions as well as highlight the need for more uptake experimentation in order to create viable treatments.