

Effects of Microgravity on mutualistic bacteria

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Changes in environmental conditions represent a challenge for all terrestrial organisms, including the organisms involved in mutualistic associations (when both organisms obtain a benefit from each other). Changes in environment might include fluctuations in gravity and microgravity which represents a new frontier for space biology research. In this study we utilized *Vibrio fischeri*, a beneficial symbiotic bacterium of squids and monacentrid fishes. First, *Vibrio fischeri* was grown under gravity and microgravity conditions using a 2D clinostat design, after 24 and 48 hours of growth, we examined crucial phenotypic changes that might affect bacterial physiology and phenotypic changes involved in host colonization, mutualism and virulence. We will conduct an initial study of microbial colonies (known as biofilms) and antibiotic resistance profiles (relevant to host colonization and virulence). Additionally, we will perform a transcriptomic analysis in order to identify the relevant genes responsible for genotypic changes that occur under modeled microgravity. This study will provide a window to the adaptive bacterial changes and responses in an effort to shed light into understanding microbiome changes and adaptations in space.