Analyzing the Bacterial Communities of Sick Versus Healthy Regions of the Lab Grown Coral Species *Pocillopora damicornis*

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Coral reefs are extremely important and productive environments. They are not only beautiful and biodiverse, but they also provide many ecosystem services including, storm protection, tourism, and fisheries. However, these useful ocean communities can be very sensitive to changes in their habitat, leaving them more and more susceptible to disease as human impacts continue to alter their living conditions. For example, nearly 80% of stony corals in some regions of the Florida Keys were killed by a disease called stony coral tissue loss disease syndrome in 2014, and the disease continues to spread into the Caribbean (Aeby et al., 2019). With diseases such as this becoming more prevalent and widespread, it is important to attempt to understand how disease affects the corals. In this observational study, we looked at some of our lab-grown corals of the species *Pocillopora damicornis* that had begun to show symptoms of disease and compared the microbiomes of the diseased and healthy portions of three different coral fragments. Previous studies comparing the bacterial communities of corals have pointed to higher taxonomic diversity and more evenness in diseased coral samples (Meyer et al., 2014; Zaneveld et al., 2016). Therefore, we expected to see similar results in our microbial communities. We sequenced the V4 16S rRNA region of our bacteria and identified amplicon sequence variants using QIIME2 and deblur. Our results show more bacterial orders and higher Pielou evenness scores in diseased samples than in healthy samples, and suggest an association between microbial diversity and dominance and the overall health of corals. Continuing this study with a larger sample size would likely be effective in helping us to understand the full scope of what is going on in these microbial communities. Further study may consist of analyzing the effects of specific environmental stressors on the microbiomes of our study species to potentially identify microbial disease states induced by different environmental imbalances. The ultimate goal is to be able to identify causes of coral disease in the wild and predict consequences of anthropogenic interferences.

Ceyenna is a fourth year Oakes affiliate and Marine Biology major with interest in the conservation of biodiverse environments. She has aspirations to continue research as a Ph.D. student and inspire others to do the same some day as a professor. Ceyenna is from Sacramento, California.