Analysis of Bacterial Community Assembly Around Chitin Microparticles Through Cultivation

Sam Katz and Marian Schmidt

**Abstract**

For a long time microbiologists believed that aquatic bacteria were roughly evenly distributed throughout freshwater systems, but with the advancement of technology, scientists are beginning to learn more about nutrient hotspots that form in the water column. Zooplankton and other particulate organic matter (POM) are said to be drivers of bacterial diversity and dynamics yet, we still lack understanding of the bacterial communities that form around particulate carbon supplies. In this experiment we set out to increase our understanding of the individual roles played by primary degraders and secondary consumers, with an inoculum from Beebe Lake, focusing on the timeline in which communities of bacteria are assembled to break down particulate organic matter. To do this we used magnetic chitin beads, an abundant polysaccharide in freshwater ecosystems, to culture bacteria that associate with chitin particles over a 96 hour timeframe. We predict that there will be a group of highly specific primary degrading bacteria that first attach to the model particle, which will later be followed by secondary consuming bacteria surviving off the carbon supplied from the bacterial community rather than the original particle itself. This study will produce a culture collection of primary degraders or particle-associated bacteria, which will later be taxonomically identified with Sanger sequencing of the 16S gene and available for genetic manipulations to evaluate their role in the environment. The results of this experiment will help shape our understanding of how freshwater microhabitats develop over time and assist in our understanding of individual taxa's roles within these microbial communities.