Woods Hole Oceanographic Institution

Biology Department Seminar

Thursday, September 21, 2023 – 12:00 Noon

Olympic Swimmer or Couch Potato? Survival Strategies for Marine Microbes

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The ocean interior is commonly considered a proverbial desert devoid of much biological activity and with low nutrient supply to support whatever microbial life does exist. Yet, the oceans are full of microorganisms, nearly a billion cells per liter, revealing a conundrum of how the oceans maintain this wealth of biota despite the seeming lack of organic materials to support biological growth. Recent work has uncovered the importance of microenvironmental hotspots that promote intense, but by their very nature, highly localized and ephemeral, activity. Often, however, these hotspots are equated with copiotrophic fast growing organisms that typically are motile and chemotactic. Yet, the vast majority of marine microorganisms are non-motile and non-chemotactic cells that must linger within the ocean and wait for diffusion to supply their organic substrate requirements. Moreover, the single most abundant organism in the ocean — SAR11 — is a non-motile cell and comprises in excess of a quarter of all marine life. Here we set out to discover the mechanisms that promote non-motile cells to thrive in the ocean. The talk will explore a lab-based microfluidic system designed to investigate the interactions of bacteria with a range of motility characteristics with marine particles and complementary numerical modeling experiments to show how organisms differentially benefit from marine snow. We will further use field particle observations and a new quantitative framework to discover how long a cell must wait for its next meal in the global oceans.

HYBRID! **In person**: Redfield Auditorium **Zoom:** https://whoi-edu.zoom.us/j/94710784955 Meeting ID: 947 1078 4955 **By phone**: Find your local number: https://whoi-edu.zoom.us/u/abrzMuB8OM