

Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Bacterial chemotaxis in the ocean: microfluidic studies ROMAN STOCKER, MIT — Bacteria are key players in the biogeochemistry of the ocean. We present microfluidic experiments to mimic nutrient conditions experienced by marine bacteria. Using videomicroscopy, we quantified the intensity and time scale of the response of bacteria to nutrient pulses. We found that marine bacteria are capable of superior chemotaxis compared to *Escherichia coli* (the classic model of chemotactic motility), likely an adaptation to the ephemeral nutrient conditions in the ocean. For moving nutrient sources, performance depends on the speed of the source: we present the first experimental evidence that marine bacteria can colonize plumes of marine snow particles, for slow to moderate particle settling speeds. Finally, preliminary numerical results reveal that turbulence can play a significant role in bacterial foraging in the ocean.

Roman Stocker
MIT

Date submitted: 03 Aug 2008

Electronic form version 1.4