Abstract Submitted
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Strategy Dependent Swimming Dynamics Change among a Predatory Algae Species with Different Strains[1] JOSEPH KATZ, Johns Hopkins University, JIAN SHENG, University of Minnesota, EDWIN MALKIEL, Johns Hopkins University, JASON ADOLF, ALLEN PLACE, University of Maryland, Marine Biotechnology Center — Digital holographic microscopic cinematography is used for measuring the 3D, time resolved, swimming behavior of toxic and non-toxic strains the marine dinoflagellate *Karlodinium veneficum*. We focus on the response of predators of the same species, but with different predation strategy, to the presence of prey, *Storeatula major*. Experiments are performed in a 3×3 mm cuvette, at densities extending to 100,000 cells/ml. Holograms are recorded at 60fps and at 20X magnification. In each case, we simultaneously track 200-500 cells in the 3mm deep sample, at a spatial resolution of 0.4×0.4×2 μm. We show that responses are largely dependent on the predation strategy. *K. veneficum* 2064, a toxic mixotroph, slows down and decreases the helix radius and clusters around the prey. Conversely, MD5, a non-toxic, autotrophic-like strain is completely oblivious to prey. Strain 1974, which is toxic and twice as motile, shows heterotrophic-like responses with characteristics of an active hunter. Also, on going spectral analysis of the 3-D motion provides quantitative insight on the swimming dynamics of microorganisms.

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