

Abstract Submitted
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Attraction of undulatory swimmers, such as nematodes, to surfaces¹ JINZHOU YUAN, DAVID RAIZEN, HAIM BAU, University of Pennsylvania — Nematodes play a significant role in the ecosystem; agriculture; human, animal, and plant disease; and medical research. The interactions between nematodes and surfaces may play an important role in nematodes' life cycle and ability to invade a host. We studied the effect of a surface on the dynamics of low-Reynolds number, undulating swimmers such as *Caenorhabditis (C.) elegans* – both wild type and touch-insensitive. The experiments demonstrated that swimmers located far from a surface selected randomly their direction of motion. In contrast, surface-proximate swimmers rotated towards, collided with, and swam along the surface for considerable time intervals, periodically contacting the surface with their anterior. Likewise, swimmers in a swarm were present at higher concentrations close to the surface. Both resistive force theory-based calculations and symmetry arguments predict that short range hydrodynamic torque, resulting from the interaction between the swimmer-induced flow field and the surface, rotate the swimmer towards the surface. We conclude that the surface attraction and following results from the interplay between short-range hydrodynamic and steric forces and is genotype-independent.

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