Abstract Submitted
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Prey capture by freely swimming flagellates[1] ANDERS ANDERSEN, JULIA DOLGER, Department of Physics and Centre for Ocean Life, Technical University of Denmark, LASSE TOR NIELSEN, THOMAS KIORBOE, National Institute of Aquatic Resources and Centre for Ocean Life, Technical University of Denmark — Flagellates are unicellular microswimmers that propel themselves using one or several beating flagella. Here, we explore the dependence of swimming kinematics and prey clearance rate on flagellar arrangement and determine optimal flagellar arrangements and essential trade-offs. To describe near-cell flows around freely swimming flagellates we consider a model in which the cell is represented by a no-slip sphere and each flagellum by a point force. For uniflagellates pulled by a single flagellum the model suggests that a long flagellum favors fast swimming, whereas high clearance rate is favored by a very short flagellum. For biflagellates with both a longitudinal and a transversal flagellum we explore the helical swimming kinematics and the prey capture sites. We compare our predictions with observations of swimming kinematics, prey capture, and flows around common marine flagellates.

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