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Mathematical Model and Simulation of Particle Flow around Choanoflagellates Using the Method of Regularized Stokeslets[1] NITI NARARIDH, Trinity University — Choanoflagellates are unicellular organisms whose intriguing morphology includes a set of collars/microvilli emanating from the cell body, surrounding the beating flagellum. We investigated the role of the microvilli in the feeding and swimming behavior of the organism using a three-dimensional model based on the method of regularized Stokeslets. This model allows us to examine the velocity generated around the feeding organism tethered in place, as well as to predict the paths of surrounding free flowing particles. In particular, we can depict the effective capture of nutritional particles and bacteria in the fluid, showing the hydrodynamic cooperation between the cell, flagellum, and microvilli of the organism.

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