1141-76-106 **Hoa Nguyen*** (hnguyen5@trinity.edu), **Christian Oakes**, **M. A. R. Koehl** and **Lisa Fauci**.
Effects of cell morphology and surface attachment on the hydrodynamic performance of unicellular choanoflagellates.

Choanoflagellates are unicellular organisms whose intriguing morphology includes a set of collar/microvilli emanating from the cell body, surrounding the beating flagellum. As the closest living relative to animals, they are important for both ecological and evolutionary studies. We consider two unicellular types: slow swimmers and thecate cells (attached to a wall by a stalk). Assuming they have similar morphologies, we use the method of regularized Stokeslets to (i) simulate cell-fluid interactions of the slow swimmers and thecate cells with the surrounding environment and (ii) show hydrodynamic effects on the amount of fluid flow across a capture zone around the collar (net flux). The results shed light on how each morphological feature of the cell aids in bacteria captures during feeding. We have found that the existence of the collar not only attracts more fluid particles but also impedes the fluid flow close to the microvilli. Among the two choanoflagellate types, slow swimmers gain the most net flux which shows an advantage of being motile. Due to the wall effect, thecate cells have less net flux but the interactions of cell-fluid-wall-stalk create small eddies around the stalk which can be used to explain bacterial gathering in that area. (Received July 20, 2018)