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Flagellated bacteria trace out a parabolic arc under low shear condition YONGTAE AHN, University of Vermont, SARA HASHMI, Yale University, SHARON WALKER, University of California, Riverside, JANE HILL, University of Vermont — The measurement and prediction of bacterial transport of bacteria in aquatic systems is of fundamental importance to a variety of fields such as groundwater bioremediation ascending urinary tract infection. The motility of pathogenic bacteria is, however, often missing when considering pathogen translocation prediction. Previously, we reported that flagellated E. coli can translate upstream under low shear flow conditions (Hill *et al.*, 2007). The upstream swimming of flagellated microorganisms depends on hydrodynamic interaction between cell body and surrounding fluid flow. In this study, we use a breathable microfluidic device to image swimming *E. coli* and *P. aeruginosa* at a glass surface under low shear flow condition. We find the dominant experimental variables that lead to upstream swimming are: fluid shear, bacterium velocity, and bacterium length. We will present data showing that the sum of forces and torques acting on a bacterium lead to them tracing out a parabolic arc as they turn into the flow to swim upstream.

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