

Abstract Submitted
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Hydrodynamic interactions of bacteria and particles with ciliated surfaces JANNA NAWROTH, Harvard University, JOHN DABIRI, Caltech — Cilia are microscopic, hair-like structures on the surface of cells that enable animals to interact with bacteria and fluid boundary layers. Here we present experimental data showing that, in addition to transporting fluids and particles along the surface, the coordinated movement of cilia ensembles generates 3-dimensional, rotational flow fields extending far beyond the length scale of individual cilia. Further, our results suggest that combining such vortices with adhesive stagnation zones creates particle traps that can be tuned to preferentially retaining particles with particular surface properties, and size, on the ciliated surface.

Janna Nawroth
Harvard University

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