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Hydrodynamic Hunters[1] HOSSEIN JASHNSAZ, Indiana University - Purdue University Indianapolis (IUPUI), MOHAMMED AL JUBOORI, Biomedical Eng., IUPUI, COREY WEISTUCH, Stony Brook Univ., , NICHOLAS MILLER, Biomedical Eng., IUPUI, TYLER NGUYEN, Indiana Univ. School of Medicine, VIKTORIA MEYERHOFF, BRYAN MCCOY, STEPHANIE PERKINS, ROSS WALLGREN, BRUCE RAY, KONSTANTINOS TSEKOURAS, GREGORY ANDERSON, STEVE PRESSE, IUPUI — In order to pinpoint the location of mobile bacterial prey from diffuse chemical cues in 3D, bacterial predators would need to be exquisitely sensitive to those cues. In addition, bacterial predators would need to forecast their mobile prey's future position on the basis of previously detected chemical signals. While not implausible, this is a difficult search problem for a bacterium. Here we identify a novel, hydrodynamic, mechanism by which the model predator bacterium, *Bdellovibrio bacteriovorus* (BV), locates its prey bacteria. We demonstrate that BV strongly interacts with its own, self-generated, hydrodynamic flow field, reducing the dimensionality of the predator's search space. This work illustrate how bacteria may use hydrodynamics to resolve a difficult search problem and provide a starting point to investigate hydrodynamic effects on bacterial interactions that go beyond the chemical sensing paradigm.

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