

Abstract Submitted
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Flow Induced by Bacterial Carpets and Transport of Microscale Loads AMY BUCHMANN, LISA FAUCI, Tulane University, KARIN LEIDERMAN, University of California Merced, EVA STRAWBRIDGE, James Madison University, LONGHUA ZHAO, Case Western Reserve University — Microfluidic devices carry very small volumes of liquid through channels and may be used to gain insight into many biological applications including drug delivery and development. In many microfluidic experiments, it would be useful to mix the fluid within the chamber. However, the traditional methods of mixing and pumping at large length scales don't work at small length scales. Experimental work has suggested that the flagella of bacteria may be used as motors in microfluidic devices by creating a bacterial carpet. Mathematical modeling can be used to investigate this idea and to quantify flow induced by bacterial carpets. We simulate flow induced by bacterial carpets using the method of regularized Stokeslets, and also examine the transport of vesicles of finite size by arrays of rotating flagella.

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