Oct 18, 2018

Transport of motile microorganisms and their interactions with surrounding fluids

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ABSTRACT:

The interaction of motile microorganisms and surrounding fluids is of importance in a variety of biological and environmental phenomena including the development of biofilms, colonization of microbes in human and animal bodies, and formation of marine algal blooms. Ambient fluid flow is pervasive in microbial environments and can have profound effects on the motility of microbes, affecting fundamental microbial processes such as their ability to take up nutrients and colonize surfaces. In this study, we scrutinize the role of properties of the surrounding fluid on the spatial distribution of motile microorganisms, their collective behavior in complex fluids, and the corresponding flow structures. The outcomes of this work provide us a framework to examine the effects of surrounding fluid environment and cell motility on the accumulation of microbes.

BIOGRAPHY:

Prof. Ardekani is currently an associate professor at the Purdue University. Prior to joining Purdue, she was an O'Hara Assistant Professor at the University of Notre Dame and a Shapiro Postdoctoral Fellow at the Massachusetts Institute of Technology. In summer 2016, she was a visiting professor at the Institut de Mécanique des Fluides de Toulouse. She graduated from University of California Irvine with her Ph.D. in 2009. She received the Society of Women Engineers and Amelia Earhart awards in 2007, Schlumberger Foundation faculty for the future grant in 2009, and NSF CAREER award in 2012. Prof. Ardekani was awarded the Presidential Early Career Award for Scientists and Engineers (PECASE) in 2016. She is a member of the board of editors of the Scientific Reports is serving in the advisory board of International Journal of Multiphase Flow. Her expertise is in fluid mechanics, biological and environmental flows.