Abstract Submitted for the DFD17 Meeting of The American Physical Society

Microfluidic systems for investigating host-microbe relationship¹ ARUNIMA BHATTACHARJEE, LIONEL VINCENT, Department of Aerospace and Mechanical Engineering, University of Southern California, Los Angeles, JANNA NAWROTH, Wyss Institute for Biologically Inspired Engineering at Harvard University, Boston, NED RUBY, MARGARET MCFALL-NGAI, Pacific Biosciences Research Center, University of Hawaii at Manoa, Honolulu, EVA KANSO, Department of Aerospace and Mechanical Engineering, University of Southern California, Los Angeles, BIODYNAMICS LABORATORY COLLABORATION, PA-CIFIC BIOSCIENCES RESEARCH CENTER COLLABORATION — The symbiosis between the bioluminescent bacterium, Vibrio fisheri, and the Hawaiian bobtail squid, Euprymna scolopes, has been widely studied, and this association is used as a model system for studying bacterial colonization of ciliated host tissues. The recruitment of Vibrio fisheri to a specialized light organ in the nascent squid is facilitated by various chemosensing and mechanosensing events. To decipher the effects of such environmental and host-derived sensors on bacterial physiology, we use specifically designed microfluidic channels to engineer chemical and mechanical fields similar to those observed in the light organ of the squid. These in vitro studies are aimed at complementing ongoing *in vivo* studies in the system squid-vibrio system. This approach enables us, for the first time, to isolate the effect of mechanical and chemical cues on bacterial motility in this symbiosis and to quantify the bacterial response to these cues.

¹NSF Inspire

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Date submitted: 25 Jul 2017

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