

Abstract Submitted  
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**Bacterial accumulation mediated by flow compression-expansion**

GASTÓN L. MIÑO, MIT, ERNESTO ALTSHULER, Physics Faculty-IMRE, University of Havana, Cuba, ANKE LINDNER, PMMH-ESPCI, France, ROMAN STOCKER, MIT, CARLOS A. CONDAT, ADOLFO J. BANCHIO, VERONICA I. MARCONI, IFEG-CONICET and FaMAF-Universidad Nacional de Cordoba, Argentina, ERIC CLÉMENT, PMMH-ESPCI, France — Swimming bacteria can be concentrated using a suitable microfluidic device. The combination of flow rate and surface shape can have significant impact on the microorganisms' behavior. In those processes rheotaxis, accumulation caused by ratchets and even attachment to surfaces leading biofilm formation can be observed. Under these conditions, the transport of the active suspension is deeply modified, and differs significantly from passive suspensions. In this work, we present experimental evidence of *Escherichia coli* suspension flowing in a straight channel with a funnel-like constriction in the middle. This constriction is characterized by the aperture ( $w_f$ ) and its angle ( $\Theta_f$ ). We explore how the modification of  $w_f$  and  $\Theta_f$  affects the accumulation of bacteria in the channel. Concentrations of bacteria passing the constriction were observed for all the cases. However, the range of the flow rate that produced such accumulation varied with the geometry. In order to obtain a better understanding of this phenomenon, experiments are compared with a simple phenomenological model.

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