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Narrower bottlenecks could be more efficient for concentrating choanoflagellates G. MIÑO, Massachusetts Institute of Technology, Cambridge, USA, J. SPARACINO, FaMAF-UNC and IFEG-CONICET, Córdoba, Argentina, M.A.R. KOEHL, N. KING, University of California, Berkeley, USA, R. STOCKER, Massachusetts Institute of Technology, Cambridge, USA, A.J. BANCHIO, V.I. MARCONI, FaMAF-UNC and IFEG-CONICET, Córdoba, Argentina — In evolutionary biology choanoflagellates are broadly investigated as the closest living relatives of the animal ancestors. Under diverse environmental cues, choanoflagellate *Salpingoeca rosetta* can differentiate in two types of solitary swimming cells: slow and fast microswimmers. Here we present a first phenomenological 2D–model for the choanoflagellates dynamics confined into a flat device divided by a wall of asymmetric microconstrictions. The model allow us to optimize the geometry of the microchannels for directing and concentrating cell populations under strict control. We solve our set of dynamical equations using Langevin dynamics. Experimental parameters for the motility of the slow and fast cells were measured and used for our numerical estimations of the directed transport efficiency, otherwise we have no adjustable parameters. We find remarkable differences in the rectification results for slow and fast choanoflagellates, which give us a strategy to develop a suitable microfluidic sorting device. For a given population velocity, narrower bottlenecks, of similar size to the cell dimension, show to be more efficient as concentrator of populations. Experiments and simulations are in good agreement.

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