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Hydrodynamics of cell–cell mechanical signaling ROLAND BOUFFANAIS, Singapore University of Technology and Design, DICK K.P. YUE, Massachusetts Institute of Technology — Mechanotactic cell motility, i.e. directed motion mediated by a mechanical stress at the cell's surface, has recently been shown to be a key player in the initial aggregation of crawling cells such as leukocytes and amoebae. The effects of mechanotactic signaling in the early aggregation of amoeboid cells has been investigated using a general mathematical model based upon known biological evidence. We elucidate the hydrodynamic fundamentals of the direct guiding of a cell through mechanotaxis in the case where one cell transmits a mechanotactic signal through the fluid flow by changing its shape. It is found that any mechanosensing cells placed in the stimulus field of mechanical stress are able to determine the signal transmission direction with a certain angular dispersion which does not preclude the aggregation from happening. The ubiquitous presence of noise is accounted for by the model.

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