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Cell-cell interactions stabilize emerging collective migration modes JOSHUA PARKER, CAN GUVEN[1], CHENLU WANG, ED OTT, WOLFGANG LOSERT, Univ of Maryland-College Park — We propose a coarse-grained mechanistic model for simulating the dynamics of the biological model organism *Dictyostelium discoideum*, incorporating gradient sensing, random motility via actin protrusions, persistent random motion and signal relay. We demonstrate that our simple cell model does result in the macroscopic group migration patterns seen in no-flow gradient chambers, namely a transition from individual motion to multi-cell "streaming" to aggregation as the external signal is decreased. We also find that cell-cell adhesion further stabilizes the contact network independent of chemical signaling, suggesting no indirect feedback between mechanical forces and gradient sensing. We discuss further modifications to the model and as well as further applications to quantifying dynamics using spatio-temporal contact networks.

[1]Co-first author

Joshua Parker
Univ of Maryland-College Park

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