Abstract Submitted
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Nanotopography-induced symmetry-breaking and guidance of actin polymerization waves and cell migration[1] WOLFGANG LOSERT, CAN GUVEN, XIAOYU SUN, JOHN FOURKAS, University of Maryland, ANDERS CARLSSON, Washington University St Louis, MEGHAN DRISCOLL, UT Dallas — Many types of eukaryotic cells on a surfaces exhibit reaction diffusion-type waves of actin polymerization. Exposing migrating Dictyostelium discoideum cells to asymmetries at a length scale relevant to actin waves (300 nm) results in guidance of actin polymerization and of the migration of the cells themselves. Quantitative measurements of actin wave speed and direction distributions show that actin polymerization is preferentially localized to nanoridges and directed along the ridges, and that the velocity of guided actin polymerization waves decreases with decreasing ridge spacing. A stochastic growth model of actin polymerization dynamics reproduces these key observations.

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