

A phase-field approach for studying actin-wave driven cell migration

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Cells migrate to search for nutrients as well as during immunological responses and developmental processes. Migration is driven by the actin cytoskeleton. How the network is organized in this process, is still poorly understood. Spontaneous actin waves have been observed in a large number of different cell types and present an attractive concept to understand cytoskeletal orchestration during migration. We introduce a mean-field description of actin waves. The actin network is confined to an evolving cellular domain by means of a phase field. We find erratic motion due to the formation of spiral waves and compare these findings to experiments.