

# A nonlinear study of symmetry-breaking in actin gels - Implications for cellular motility

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Force generation by actin polymerization is an important step in cellular motility and can induce the motion of organelles or bacteria, which move inside their host cells by trailing an actin tail behind. Biomimetic experiments on beads and droplets have identified the biochemical ingredients to induce this motion, which requires a spontaneous symmetry breaking in the absence of external fields. We find that the symmetry-breaking can be captured on the basis of elasticity theory and linear flux-force relationships. Furthermore, we develop a phase-field approach to study the fully nonlinear regime and show that actin-comet formation is a robust feature, triggered by growth and mechanical stresses. We discuss the implications of symmetry-breaking for self-propulsion.

## Références

1. K. John, P. Peyla, K. Kassner, J. Prost, and C. Misbah, Phys. Rev. Lett. (2008), accepted.