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Actin-Polymerization-Driven Motility with Site Specific Tethering EDWARD BANIGAN, ANDREA LIU, University of Pennsylvania — A recent numerical simulation by Lee and Liu (2008) has demonstrated a new possible mechanism for actin-polymerization-driven motility. The simulation is a physically consistent version of the Brownian dynamics formulation of the dendritic nucleation model. The model shows that motility can indeed be achieved with the constituent proteins of the dendritic nucleation model, but that motility arises from a mechanism completely different from those proposed before. In the simulations, the build-up of F-actin behind the moving surface drives the surface forwards if the surface has a net repulsion with actin. In this work, we extend the model to include a site specific tethering interaction between the moving surface and actin, to imitate, for example, the effects the ActA or N-Wasp protein. We study the effects of varying binding strength and binding site coverage.

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