Abstract Submitted
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**Quantifying actin wave modulation on periodic topography**[1] CAN GUVEN, MEGHAN DRISCOLL, XIAOYU SUN, JOSHUA PARKER, JOHN FOURKAS, University of Maryland College Park, ANDERS CARLSSON, Washington University St. Louis, WOLFGANG LOSERT, University of Maryland College Park — Actin is the essential builder of the cell cytoskeleton, whose dynamics are responsible for generating the necessary forces for the formation of protrusions. By exposing amoeboid cells to periodic topographical cues, we show that actin can be directionally guided via inducing preferential polymerization waves. To quantify the dynamics of these actin waves and their interaction with the substrate, we modify a technique from computer vision called "optical flow." We obtain vectors that represent the apparent actin flow and cluster these vectors to obtain patches of newly polymerized actin, which represent actin waves. Using this technique, we compare experimental results, including speed distribution of waves and distance from the wave centroid to the closest ridge, with actin polymerization simulations. We hypothesize the modulation of the activity of nucleation promotion factors on ridges (elevated regions of the surface) as a potential mechanism for the wave-substrate coupling.

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