Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Insights into the Cell Shape Dynamics of Migrating *Dictyostelium discoideum* MEGHAN DRISCOLL, University of Maryland, TESS HOMAN, University of Twente, COLIN MCCANN, University of Maryland and the National Cancer Institute, National Institutes of Health, CAROLE PARENT, National Cancer Institute, National Institutes of Health, JOHN FOURKAS, WOLFGANG LOSERT, University of Maryland — Dynamic cell shape is a highly visible manifestation of the interaction between the internal biochemical state of a cell and its external environment. We analyzed the dynamic cell shape of migrating cells using the model system Dictyostelium discoideum. Applying a snake algorithm to experimental movies, we extracted cell boundaries in each frame and followed local boundary motion over long time intervals. Using a local motion measure that corresponds to protrusive/retractive activity, we found that protrusions are intermittent and zigzag, whereas retractions are more sustained and straight. Correlations of this local motion measure reveal that protrusions appear more localized than retractions. Using a local shape measure, curvature, we also found that small peaks in boundary curvature tend to originate at the front of cells and propagate backwards. We will review the possible cytoskeletal origin of these mechanical waves.

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Date submitted: 20 Nov 2009 Electronic form version 1.4