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Analysis of Shape Dynamics and Actin Polymerization of Collectively Migrating Streams of Cells CHENLU WANG, Biophysics Program, University of Maryland, College Park, CAROLE A. PARENT, LCMB, National Cancer Institute, National Institutes of Health, WOLFGANG LOSERT, Department of Physics, University of Maryland, College Park — We use Princiapl Component Analysis (PCA) to investigate cell-cell coupling during collective cell migration of Dictyostelium discoideun, and explore the underlying mechanisms that regulate the coupling. From PCA of the cell boundary motion obtained from time-lapse images of multicellular streams, we find that cells in streams exhibit more localized anterior protrusions than individually migrating cells. We also find that traveling protrusion waves along cell boundaries connect from cell to cell with high correlation. Further analysis of actin polymerization indicates that actin polymerization is significantly enhanced at the leading edge of cells at cell-cell contacts. The coupling of waves disappears when reducing F-actin polymerization with Latrunculin A.

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