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Characterization of Collective Cell Migration Dynamics RACHEL LEE, Univ of Maryland-College Park, HAICEN YUE, WOUTER-JAN RAPPEL, Univ of California-San Diego, WOLFGANG LOSERT, Univ of Maryland-College Park — During cancer progression, tumor cells invade the surrounding tissue and migrate throughout the body, forming clinically dangerous secondary tumors. This metastatic process begins when cells leave the primary tumor, either as individual cells or collectively migrating groups. Here we present data on the migration dynamics of epithelial sheets composed of many cells. Using quantitative image analysis techniques, we are able to extract motion information from time-lapse images of cell lines with varying malignancy. Adapting metrics originally used to study fluid flows we are able to characterize the migration dynamics of these cell lines. By describing the migration dynamics in great detail, we are able to make a clear comparison of our results to a simulation of collective cell migration. Specifically, we explore whether leader cells are required to describe our expanding sheets of cells and whether the answer depends on individual cell activity.

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