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Cell migration on ridges and cliffs MEGHAN DRISCOLL, University of Maryland, COLIN MCCANN, University of Maryland and the National Cancer Institute, National Institutes of Health, RAEL KOPACE, JOHN WATTS, University of Maryland, TESS HOMAN, University of Twente, WOLFGANG LOSERT, University of Maryland — The amoeba *Dictyostelium discoideum* is a model system for the study of cellular migration, an important physiological process that occurs in embryonic development, wound healing, and cancer metastasis. We study the motion of *D. discoideum* on surfaces with various topographies, particularly those that affect the direction of cellular migration. Topographical features, such as ridges and cliffs, were fabricated using multiphoton absorption polymerization. As the cells encountered these topographical features, we tracked their overall motions and shapes, as well as the locations and intensities of certain intracellular signals. We found that when cells undergoing chemokinesis, random migration in response to a chemical signal, encounter a ridge, they tend to move along that ridge, even if the ridge is shorter than the cell. When cells undergoing chemotaxis, directed migration in response to a chemical signal, are directed off of a cliff, they do not fall off the cliff. Instead, they search for new attachment points, eventually change direction, and continue moving along the edge of the cliff. Both ridges and cliffs affect more than just the motion of a cell; they also affect its shape.

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