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**How does Dicty find its way?** ERIN RERICHA, University of Maryland College Park, CAROLE PARENT, National Institute of Health, WOLFGANG LOSERT, University of Maryland at College Park — As a cell chemotaxes, moves towards a chemical signal, it transduces external chemical signals into mechanical motion. Efficient chemotaxis is crucial for many biological processes from wound healing to the spread of cancer. We present our experimental investigations on *Dictyostelium discoideum* a model organism for chemotaxis. We expose cells to three types of external signals: a shallow background gradient of the signaling molecule cyclic-AMP a localized signal composed of cyclic-AMP attached to beads and a mechanical stimulus caused by pushing beads against the exterior of the cell. For each stimulus we ask: what is the stability of the gradient sensing pathway and how does it influence the mechanical response. We find that the cell speed increases with increasing concentration of cyclic-AMP. In addition, Dictyostelium cells relay the signal by releasing internally manufactured cyclic-AMP out of the back of the cell. A collection of cells moves in streams, where cells follow closely behind one another. We find that the cells moving in a stream move slower towards a source of attractant than cells that are chemically treated such that they do not stream.

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