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The mechanics of cell crawling over a flat surface BALDOMERO ALONSO-LATORRE, JAVIER RODRIGUEZ-RODRIGUEZ, University of California, San Diego, ALBERTO ALISEDA, Universidad Carlos III de Madrid, RUDOLF MEILI, RICHARD FIRTEL, JUAN LASHERAS, University of California, San Diego — We present some recent observations of the motion of cells of the amoeba *Dictyostelium Dicoideum* under the effects of a well-controlled linear distribution of chemo-attractant concentration (chemotaxis). The kinematics and dynamics of chemotaxis have been analyzed from microscopy images using a combination of image processing and feature tracking techniques. The trajectory of the cell's center of mass, as well as cell polarization along gradient lines, have been found to follow a quasi-periodic evolution. The frequency of this motion can be related to biochemical processes that are known to be responsible for the internal remodeling of the structure of the cell cytoskeleton and cell motion. The traction force that the cell exerts, through adhesion points, on the substrate has been estimated from the contribution of cell inertia, lubrication layer between the cell and the substrate, and hydrodynamic drag of the flow around the cell.

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