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Direct dynamical measurement of the cytoskeletal contribution to the adhesion and mechanics of living cells MARIE-JOSEE COLBERT, CECILE FRADIN, KARI DALNOKI-VERESS, Department of Physics and Astronomy, McMaster University — The cytoskeleton is involved in the interaction of the cell with its surroundings through adhesion and the elastic response of the cell. To dynamically probe these properties, we have developed a new tool that takes advantage of an ‘L’ shaped micropipette to micromanipulate a single cell and put it in contact with an adhesive surface mounted on a translation stage. The spring constant of the micropipette is carefully measured and its deflection is used to apply a calibrated force. This technique gives access to real time monitoring of the cell response to an applied deformation, thus exploring the relaxation processes of the cell when subjected to an external load. The polymerization of actin and microtubules is prevented to explore the cytoskeletal contribution to the processes involved in the interaction with the substrate, such as the elastic response and adhesion.

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