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Dynamical measurement of the physical properties of single cells
MARIE-JOSEE COLBERT, CECILE FRADIN, KARI DALNOKI-VERESS, Department of Physics & Astronomy and the Brockhouse Institute for Materials Research, McMaster University — The mechanical response of living cells to external forces has attracted the attention of many researchers. 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, and probe the mechanical properties of the cell. As the cell is compressed between the pipette and substrate, dynamical measurements of the elasticity of the cell and the adhesion of the membrane to the substrate are obtained by monitoring the displacement of the micropipette. This technique gives access to real time monitoring of the cell response to a constant applied force, thus exploring the relaxation processes of the cell when subjected to deformation.

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