

Probing the mechanical phenotypes of cells with Traction Force Microscopy

The mechanical properties of cells play a key role in regulating a large number of physiological functions. For instance, a change of motility would allow a single cell to detach from a primary tumor site, to infiltrate adjacent tissues, to penetrate vascular walls and finally to colonize competent organs.

To study the mechanical phenotype of cells, we use a technique (Traction Force Microscopy), which consists in the measurement of micron-sized particles embedded in a polyacrylamide gel when cells are seeded on its surface, or when they move in a 3D extracellular matrix environment. From the displacements of the probe particles, vector maps of the traction forces (applied by the cell on gel) can be determined.

In this project, we will apply this technique to correlate the change in the mechanical properties and the onset of a metastatic phenotype.

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