Tensional Homeostasis in Single Fibroblasts Probed with Traction Force Microscopy

ROSTISLAV BOLTYANSKIY, HENRY FOOTE, AARON MERTZ, KATHRYN ROSOWSKI, HOLLY LAURIDSEN, VALERIE HORSLEY, JAY HUMPHREY, MARTIN SCHWARTZ, ERIC DUFRESNE, None

— Many tissue types, including skin and blood vessels, respond to mechanical perturbations by remodeling to maintain a constant level of stress. This is called tensional homeostasis. Does similar remodeling and adaptation occur in single cells? To address this question, we have developed a technique to measure cell traction forces as the extra-cellular matrix is stretched. The time- and strain-dependent cellular response sheds light on active adaptive processes, like tensional homeostasis, and passive mechanical properties, such as stiffness.