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Effects of High Forces on Integrin-Mediated Adhesion Protein Complexes in Fibroblast Cells MONICA TANASE, MICHAEL P. SHEETZ, Department of Biological Sciences, Columbia University — Magnetic tweezers were designed and used to generate large forces on ferrous beads bound to the surface of adherent fibroblasts. Cells sense and exert forces on the extracellular matrix via integrins, a family of transmembrane receptors. On the cytoplasm end, the signaling from the integrins to the cytoskeleton is mediated by a complex of proteins, which were fluorescently tagged, and tracked in live cells. The magnetic beads were functionalized with a fibronectin construct designed to enhance the spatial efficiency of the integrin binding domain FNIII7-10. Rapid protein reorganization was observed in response to modulated forces applied in the lamella region. This allowed for tracking of the spatial and temporal response of proteins involved in the adhesion pathways.

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