

Abstract Submitted
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Probing the Dynamics of the Cellular Actomyosin Network with Magnetic Microposts YU SHI, Department of Physics and Astronomy, Johns Hopkins University, STEVEN HENRY, JOHN CROCKER, Department of Chemical and Biomolecular Engineering, University of Pennsylvania, DANIEL REICH, Department of Physics and Astronomy, Johns Hopkins University — The actomyosin network in living cells is commonly accepted as an archetypal example of an active matter system. To characterize the dynamic properties and the effects of non-thermal motion of such a system requires simultaneously measuring the fluctuation spectrum of internal stresses as well as its local viscoelasticity. Via use of PDMS micropost arrays with magnetic nanowires embedded in selected posts, we measure the local complex modulus of cells through mechanical actuation of the magnetic microposts using a dual magnetic tweezer system. The microposts are also used as passive probes to measure the force fluctuations inside the cytoskeleton. The active and passive responses of fibroblasts will be presented, together with measurements of correlations between different subcellular regions, and the influence of cytoskeletal and myosin inhibitors. Results on the anisotropy of internal stress fluctuations and their response to chemical perturbations will also be discussed.

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