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Motion in partially and fully cross-linked F-actin networks ELIZA MORRIS, ALLEN EHRLICHER, DAVID WEITZ, Harvard University — Single molecule experiments have measured stall forces and procession rates of molecular motors on isolated cytoskeletal fibers in Newtonian fluids. But in the cell, these motors are transporting cargo through a highly complex cytoskeletal network. To compare these single molecule results to the forces exerted by motors within the cell, an evaluation of the response of the cytoskeletal network is needed. Using magnetic tweezers and fluorescence confocal microscopy we observe and quantify the relationship between bead motion and filament response in F-actin networks both partially and fully cross-linked with filamin We find that when the transition from full to partial cross-linking is brought about by a decrease in cross-linker concentration there is a simultaneous decline in the elasticity of the network, but the response of the bead remains qualitatively similar. However, when the cross-linking is reduced through a shortening of the F-actin filaments the bead response is completely altered. The characteristics of the altered bead response will be discussed here.

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