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The influence of myosin-generated force to the intracellular microrheology in living cells MING-TZO WEI, H. DANIEL OU-YANG, Lehigh University — The mechanics of cells are governed by cytoskeletal filaments and molecular motors forming a dynamic mechanical entity. A recent experimental study by Mizuno et al. showed local shear modulus of a synthesized cytoskeletal network could increase as a result of myosin-generated internal stresses. To examine whether similar behaviors could take place in living cells we combined active and passive microrheology to measure the myosin-generated fluctuating force and intracellular shear modulus in HeLa cells. While our experiment showed an increase in the fluctuations of the shear modulus with increasing motor forces, the experiment did not find a direct correlation between the mean intracellular shear modulus and the motor-generated fluctuating force. Based on Mizuno et al's assumption shear modulus is increasing as local tensions, the difference between the results obtained by the intracellular behavior and the synthesized cytoskeletal network could be due to the existence of a steady-state intracellular tension that is stronger than the motor-generated fluctuating force.

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