

Abstract Submitted
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Simultaneous AFM force spectroscopy and FRET measurements on single biological molecules HUI LI, CHI-FU YAN, SANJEEVI SIVASANKAR, Department of Physics and Astronomy, Iowa State University, Ames, Iowa 50011, DEPARTMENT OF PHYSICS AND ASTRONOMY, IOWA STATE UNIVERSITY, AMES, IOWA 50011 TEAM — Single Molecule Fluorescence Resonance Energy Transfer (FRET) and single molecule force measurements with the Atomic Force Microscope (AFM) are two powerful techniques that have facilitated much progress in the biological sciences. However each of these techniques suffers from limitations that can be overcome by the use of a combined single molecule AFM-FRET approach. Here, we describe an instrument that successfully combines single molecule AFM with FRET to apply forces on individual biological molecules and simultaneously monitor their conformational dynamics. To validate this technique, we measured the force induced shearing of dye-labeled, double stranded DNA. Single DNA molecules were sheared and mechanical transitions corresponding to DNA rupture were correlated with changes in FRET.

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