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Free Energy Surface Reconstruction Using Jarzynski's Equality CHING-HWA KIANG, NOLAN HARRIS, Department of Physics & Astronomy, Rice University — Atomic force microscope was used to manipulate and unfold individual molecules of the muscle protein titin. We reconstructed the free energy surface of stretching and unfolding of titin I27 domain using Jarzynski's equality. An exact formula that relates the nonequilibrium work fluctuations to the molecular free energy was used for the reconstruction. From the free energy surface, the unfolding free energy barrier, i.e. the activation energy, was directly obtained from experimental data for the first time.

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