Force Spectroscopy of Folding and Misfolding in Single Biomolecules

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Abstract:
Force spectroscopy is a powerful tool for investigating how structure forms in biological macromolecules. I will discuss applications of force spectroscopy to three different problems. First, I will demonstrate how equilibrium free energy landscapes can be recovered from non-equilibrium pulling measurements of DNA hairpins. Second, I will discuss force spectroscopy measurements of an adenine riboswitch, showing that the genetic switch is controlled thermodynamically rather than kinetically. Finally, I will present studies on single prion protein molecules, providing evidence for mutiple misfolding pathways which may lead to aggregation.

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