

Micromechanical study of proteins interacting with single DNA molecules

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I will discuss the use of single-DNA micromanipulation - studying elastic properties of individual molecules of roughly tens of kb in length - as a tool to investigate protein-DNA interactions. Many proteins effect dramatic physical changes in DNA organization, by folding, looping or otherwise modifying double helix conformation. Single-DNA experiments offer the possibility to watch these proteins interact with the double helix in a direct way, allowing observation of the random dynamics of small numbers of molecules which are usually inaccessible in bulk solution phase experiments. I will focus in particular on two studies recently done in our lab: measurements of changes in DNA mechanics resulting from binding of the DNA-bending proteins HU, NHP6A and HMGB1, and the assembly/disassembly dynamics of nucleosomes observed in *Xenopus* egg extracts.