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Binding of HU proteins and DNA elasticity

We present a model of non-specific cooperative binding of proteins to DNA in which the binding of isolated proteins generates local bends but binding of proteins at neighboring sites on DNA straightens the polymer. We solve the statistical mechanical problem and calculate the effective persistence length, site occupancy and cooperativity. Cooperativity leads to non-monotonic variation of the persistence length with protein concentration, in qualitative agreement with recent single molecule experiments on HU-DNA complexes. Elastic effects on adsorption of proteins (a bent chain has a higher entropy!) lead to unusual shape of the binding isotherm.