**Hybrid Fluorescence-Force measurements for DNA-protein interactions**

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Next generation of single molecule techniques now allow us to apply tension and twist while using fluorescence as a reporter for molecular conformation. This allows one to measure mechanochemistry of biomolecules in low force regimes along molecular reaction coordinates that are not limited to end-to-end distances. I will discuss combined FRET-optical tweezer (Fleezers) technique (1) and its application to mapping the force dependent unwrapping landscape of DNA from single stranded DNA binding proteins from bacteria (2). Furthermore, Fleezers can allow us to investigate the mechanism of protein translocation based on effect of force of diffusion properties.

(1) Hohng, S., R. Zhou, M. K. Nahas, J. Yu, K. Schulten, D. M. J. Lilley and T. Ha, "Fluorescence-force spectroscopy maps two-dimensional reaction landscape of the Holliday junction", Science 318(5849), 279-283 (2007)

(2) Zhou, R., A. G. Kozlov, R. Roy, J. Zhang, S. Korolev, T. M. Lohman and T. Ha, "SSB Functions as a Sliding Platform that Migrates on DNA via Reptation", Cell 146, 222-232 (2011)