

Techniques for Single Molecule Micromanipulation

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In this lecture we shall first introduce the order of magnitude of forces and torque that one can apply on a single molecule as well as the detection issue related to single molecule. We shall stress the use of molecule labelling to visualize its motion with nanometer scale resolution. Next we shall discuss the possible means that can use to achieve this purpose: optical tweezers, AFM, flow stretching, magnetic tweezers. A comparative discussion of those techniques will be provided. In particular we shall show that some act as position clamp while other are force clamp. Signal to noise issue will be discussed for the various configuration. Finally typical example will be given illustrating the features of the various techniques.