

I – Enfisul
Palestra 10
Dia 26/11 – 14:00

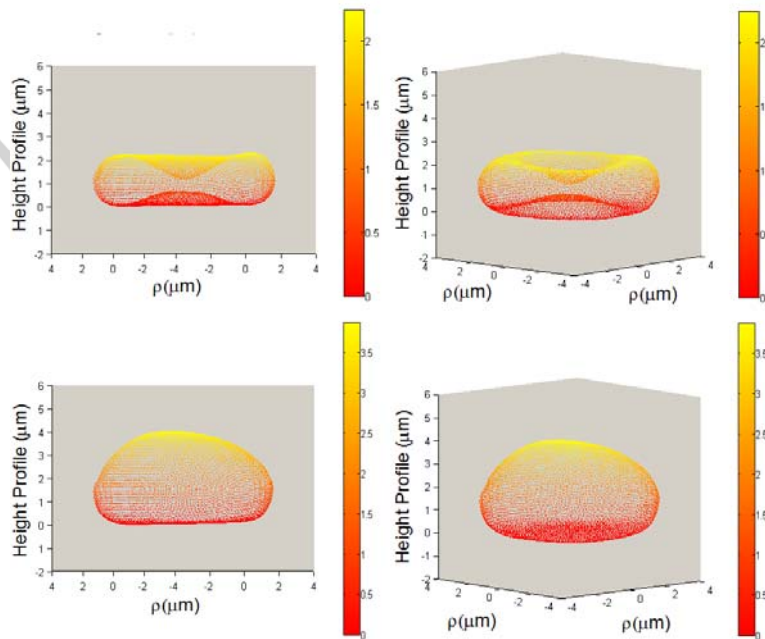
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Optical Tweezers and Defocusing Microscopy to study DNA-ligand interactions and mechanical properties of red blood cells

In the first part of the talk, I will present our results on single-molecule DNA stretching experiments using Optical Tweezers. From the experiments we obtain the persistence and contour lengths of the DNA molecule. When DNA interacts with cationic cyclodextrin (CD), the persistence length of the complex formed changes non-monotonically: for smaller concentrations of CD the persistence length decreases and then increases as the CD concentration increases further. We propose a two-sites quenched disorder statistical model, which fits the data very well and returns the local changes in persistence length, chemical affinity and cooperativity of DNA-CD reaction. Our model also fits well the literature data for the HU-DNA interaction.

In the second part of the talk, I will present “Defocusing Microscopy”, a simple bright-field optical microscopy technique developed by us, which allows actual 3D imaging of transparent objects (phase objects). I will show our results for red blood cells (RBC) both for isotonic and hypotonic concentrations, where the image of the lower RBC membrane deformed due to adhesion to the glass substrate, can clearly be distinguished from the image of the upper membrane. In addition, by studying contrast fluctuations of the images we can obtain the elastic constants along each RBC membrane.



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