

Polymer physics in confined space at single molecule level: Experiments and scaling laws

Abdelghani Oukhaled^a

a. Laboratoire LAMBE, UMR 8587, Université de Cergy Pontoise 95000

* abdelghani.oukhaled@u-cergy.fr

Statics and dynamics of polymers in confined space were examined both theoretically and experimentally since more than 4 decades. In the first part of my talk I will briefly introduce the physics of polymers in confined spaces and then I will discuss the statics and dynamics of polymer chains in the situation where the polymers do not interact with the tube walls. In the second part I will examine the situation where the polymer chains interact with the tube walls and I will discuss the driving forces leading the partitioning of polymers into these pores. Relevant experimental results dealing with the statics and dynamics of chains (synthetic polymers, DNA, proteins, peptides) inside nanopores coupled to an electrical detection will be highlighted. In the third part I will summarize the research activity of the group which has been dealing with nanopores for years and I will introduce recent works of the group in particular using nanopore as a mass spectrometer for the size discrimination of polymers towards de novo protein sequencing.