# Twisting DNA and Its Biological Implications

**Vincent Croquette**

*Département de Physique, Ecole Normale Supérieure, 24, rue Lhomond, 75230 Paris Cedex 05, France*

DNA and RNA are special polymers having two complementary strands, while no torsionnal stress may be applied on a single stranded polymer this not anymore the case on double stranded polymers. In the cell, the tension on DNA is not a significant parameter on the other hand the torsionnal state of DNA is controlled with extreme accuracy. A complete family of enzymes control this parameter: the topoisomerases. We shall discuss the physical effects arising on DNA when a torque is applied on it. We shall demonstrate that single molecule techniques allow controlling the torsionnal stress on DNA with a tremendous accuracy. Finally we shall demonstrate how topoisomerases may be studied in details using this techniques.