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Unrevealing (un)folding pathways of the Human immunodeficiency virus type 1 protease (HIV1-PR) at single molecule level using optical tweezers

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Understanding protein folding and unfolding of the Human immunodeficiency virus type 1 protease (HIV1-PR) at single molecule level is a challenging mission for both experiments and molecular dynamic (MD) simulations. In the present study, we proposed a novel folding mechanisms using optical tweezers (OT) and MD simulations. Our results confirm that the HIV1-PR reveal multiple pathways through different intermediate on their journey to native state. These include HIV1-PR unfold and refold at high forces. The characterized pathways provide precious information for the design of novel and effective anti-HIV drug.

Biography

I. Valpapuram is working as a postdoc at King Abdulla University of Science and Technology (KAUST), KSA. Project: "Optical tweezers studies of DNA unzipping and replication at single molecule level" June 2013. Postdoc at University of Modena and Reggio Emilia, Italy; Project: "Energy landscape and inhibition of the folding process of the HIV-1 protease through single molecule manipulation using optical tweezers" 2012-2013. Ph.D. in Physical Sciences at University of Modena and Reggio Emilia, Italy; Thesis: "Single molecule optical tweezers studies of the unfolding/refolding processes of Acyl-Coenzyme A Binding Protein" 2009-2012. Advance Masters in Nanophysics at the University of Antwerp, Belgium, Thesis: "Time resolved photoluminescence investigation of charge transfer in organic solar cell materials with novel conjugated polymers" 2008.

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