

# Colloquium

**Dr. Hamza Balci**

## **“Single Molecule Global Nanopositioning & 3D Tracking”**

Three single molecule fluorescence studies will be presented. In the first study the interactions between a helicase and a DNA oligo are studied by single molecule Förster resonance energy transfer (FRET) methodology. Helicases are ATP-dependent enzymes that use the structural changes induced by ATP binding, hydrolysis and release to unwind double stranded nucleic acids. We have studied the structural transitions of partial duplex DNA bound E. coli Rep helicase during ATP hydrolysis. Constrained triangulation procedures were applied globally on FRET measurements from multiple Rep mutants and DNA oligos to study these conformational states. In the second study, a novel method that is capable of measuring the separation between multiple fluorophores that are closer than the Abbe's resolution limit will be presented. The interhead separation between the heads of myosin VI dimer is measured and the implications of this measurement about the unusual walking mechanism of this motor protein are discussed. Finally, a method to track particles in 3D, both in vitro and in vivo, using multiplane imaging and its various applications will be presented.

**Thursday, April 23, 2009**

**4:30 p.m.**

**Room 110, Smith Hall**

