

Seminar

Watching '3R's of life' at single-molecule level

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DNA replication, repair, and recombination (3R's) are essential for life. Single-molecule techniques such as Optical tweezer combined fluorescence microscopy, total-internal reflection fluorescence microscopy (TIRF), microfluidics and DNA manipulations have made it possible to observe these biological events at single-molecule level in real-time.

RecBCD pathway is one of the major double-strand breaks repair (DSBR) pathway in *E. coli*. RecBCD enzyme is a helicase and nuclease that processes double strand breaks (DSBs) and initiates homologous recombination by facilitating RecA loading on to ssDNA. In this talk, I will discuss about optical tweezers, TIRF, microfluidics and DNA manipulation techniques that enabled us to observe DSBs processing and initiation of homologous recombination in real-time by individual RecBCD enzyme molecules.

In addition, application of TIRF technique in direct observation of DNA replication by individual replisomes; and a method that enables site-specific labeling of proteins for the single-molecule Forster Resonance Energy Transfer (smFRET) studies will be discussed.

Monday, Oct 14th 2019

4:00 PM (Tea/Coffee at 3:30 PM)

Auditorium, TIFR-H