

## BioSyM Seminar Series 2017

### Fluorescence Resonance Energy Transfer in quantum dot–dye systems

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**Date** : 19<sup>th</sup> June 2017, Monday  
**Time** : 4 pm to 5 pm  
**Venue** : Level 5, Perseverance Room



#### **Abstract**

Development of sensitive and reusable environmental sensors is a strong scientific priority. Thus, recognition based biosensors capable of specifically detecting chemicals, toxins and bio-agents in their environments are under active development in many laboratories. This is accomplished by designing sensor components to carry out analyte recognition and binding while simultaneously producing useful signals through an integrated signal transduction system. Such type of optically addressed biosensors often use fluorescence resonance energy transfer (FRET) in signal transduction. FRET has been used in carefully designed sensing systems for proteins, peptides, nucleic acids and small molecules. A critical aspect of FRET biosensor development involves optimizing energy donor and acceptor dyes to function in concert with desired recognition elements. Recent advances in luminescent colloidal semiconductor nanocrystals or quantum dots (QDs) technology have expanded the range of potentially useful fluorophores in FRET based sensing applications. The unique properties of the QDs permit development of FRET based nanoscale assemblies capable of continuously monitoring target biochemical species in diverse environments. Investigation of FRET in QDs-dye systems and to determine FRET parameters such as efficiency, Forster's distance, FRET rate, etc. using steady state and time resolved fluorescence anisotropy decay measurements are in progress at Karnatak University. Study of FRET in QDs-bioconjugate systems of interest with a view to develop biosensors is also being pursued. Results of experiments using few quantum dots-laser dyes (donor-acceptor systems) will be presented.

#### **Short Biography**

Dr. INAMDAR is a Professor of Physics at Karnatak University. He worked on energy transfer dye lasers (ETDLs) for his PhD with Prof. M.I. Savadatti, one of the finest spectroscopists of India. He worked as a Research Associate at DRDO. Prof. Inamdar conducted a novel frequency up-conversion experiment, based on three wave mixing phenomena and studied the finer details of solvation dynamics of a laser dye which was the first report of its kind in India (1995). He has rich experience in experimental research on lasers and fluorescence spectroscopy. Prof. Inamdar successfully collaborated with scientists from French Space Agency (CNES) and ISRO, India and carried out international collaborative research work viz., Indian Ocean Experiment (INDOEX). He has published 72 research papers in International and National journals of repute. He is Coordinator of the UGC-Centre with Potential for Excellence in Particular Area. He has been recipient of Sir C.V. Raman Young Scientist award in 2006 from Govt. of Karnataka. He was elected the Sectional President (Physical Sciences) of the 101st Indian Science Congress held at Jammu University, Jammu in 2014.