Institut Européen de Chimie et Biologie

I E C B

Ultrafast dynamics of Photosynthesis and Alloyed Quantum dots and their applications.

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Ultrafast dynamics of Photosynthesis
Photosynthesis is the process that sun light energy is converted into chemical energy by plants, algae and cyanobacteria. The process of photosynthesis is studied in details for centuries, yet there are still aspects which are unclear. Especially, the quenching and the balance mechanisms in photosynthesis are still on debate and these mechanisms are studied with many different spectroscopic techniques. Amongst all, time-resolved fluorescence spectroscopic techniques are widely used in photosynthesis research area, which provide detailed information for ultrafast processes in photosynthesis (such as excitation energy transfer, charge separation…) in vivo. This talk will focus on how photosynthetic mechanisms can be explained by time-resolved fluorescence spectroscopic techniques by discussing a specific photosynthetic mechanism called state transitions in details.

Alloyed Quantum dots and their applications
Swift developments in nanoscience have allowed scientists to develop nanomaterials that have highly controlled and unique optical properties. Lately, biologists have started to use nanomaterials in different applications such as diagnosis of diseases, gene therapies, etc… Joining of biomaterials with semiconductor quantum dots or metal nanocrystals improves the impact of biophotonics and bioimaging in biological and medical sciences. In this talk, synthesis and several applications of highly luminescent colloidal CdSxSe1-x ternary quantum dots will be introduced. The alloyed CdSxSe1-x quantum dots were synthesized by two-phase method and injected into human breast cancer cells after surface modification. The movement of CdSxSe1-x quantum dots inside cells were tracked by confocal fluorescence microscopy.