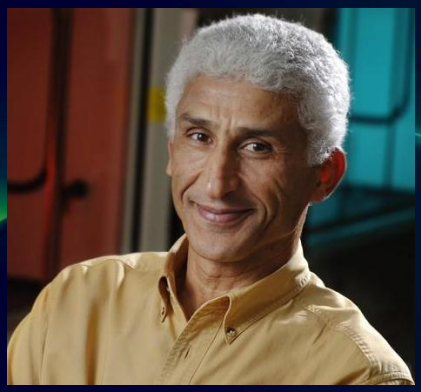
Faculté de pharmacie

Séminaire de l'axe

« Formulation et analyse des médicaments »



Integrating inorganic nanocrystals and clusters with biological systems: novel platforms for sensing and imaging

Hedi Mattoussi, Ph.D.
Professor, Florida State University
Department of Chemistry and Biochemistry
& Integrated Nanoscience Institute

Mercredi, 28 mai 2014
Pavillon Jean Coutu
14h00 – S1-111

À l'invitation du professeur Françoise Winnik

Colloidal inorganic nanocrystals, such as luminescent quantum dots (QDs), metal clusters and magnetic nanoparticles, exhibit unique photophysical properties not shared by their bulk parent materials. They also present large surface areas and can provide flexible platforms for arraying various functional molecules ranging from proteins and peptides to redox active molecules. For example, the emission of QDs can be highly sensitive to potential interactions with proximal dyes and metal complexes. We have developed approaches based on covalent coupling and non-covalent self-assembly to conjugate various biomolecules to CdSe-ZnS core-shell QDs, Au nanoparticles (AuNPs) and Au clusters. These nanocrystals were rendered water-soluble using polyethylene glycol (PEG) - or zwitterion based multidentate and multifunctional ligands. In this presentation, we will start with a description of the ligand design ranging from PEG-based molecular scale to oligomers and the phase transfer strategies we have developed as applied to luminescent QDs, AuNPs and magnetic nanocrystals. We then provide a few specific examples of hybrid bioconjugates, and the use of those conjugates in sensor design based, for example, on fluorescence resonance energy transfer or charge transfer interactions, and for probing specific biological processes in live cells.

Ce séminaire a été rendu possible grâce à la collaboration de Rx&D

Université de Montréal