CYCLE DE CONFÉRENCES DE CHIMIE

Avec le concours de : Manufacture Française des Pneumatiques MICHELIN
SIGMA Clermont
Institut de Chimie de Clermont-Ferrand (ICCF UMR 6296)
U.F.R. de Chimie

Mardi 23 octobre à 10 h

Salle 108 (site des Cézeaux)

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Mesoporous silica nanoparticles for intracellular target drug release

Lysosomes are cellular organelles responsible for degrade captured extracellular matter and digest intracellular substances. These compartments became the target site of the treatment of some infections and of many inflammatory, neurodegenerative and auto-immune diseases. These organelles have also an important influence on the effectiveness of gene therapy treatments applied to cancers and other genetic and acquired disorders.

Our research group is involved in the developing of mesoporous silica nanocarriers for use in gene therapy as non-viral vectors for DNA transfection. These vectors must present three main features: (i) have the right size and surface charge for being efficiently captured by cells through endocytosis; (ii) have the capability of complexing DNA molecules and protect them from the enzymatic degradation in lysosomes; (iii) ensure a rapid escape from lysosomes and promote the DNA release in the citosol. The vectors prepared satisfied quite well the first two and the studies are now focused on elaborating different strategies of promoting the delivery of lysosomotropic factors to accelerate the escape from the lysosomes. Prototypes of pH responsive mechanisms were developed to allow the target drug release only in lysosomes and some of them will be presented in the seminar.

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