Soutenance de thèse

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"Cage" nano and micro-particles for biomedical applications

Drug delivery systems are engineered technologies to administer pharmaceutical ingredients to improve their therapeutic effects, aiming at minimizing their side effects by means of targeted delivery and/or controlled release. "Cage" particles recently drew special attention since they could act as "drug containers" which potentially load large amount of drugs, improve their stability and offer the possibilities to co-encapsulate synergic drugs.

Cyclodextrins (CDs) are typical "cage" molecules with a hydrophobic cavity and a hydrophilic outer surface. Porous microparticles of CD based metal organic frameworks (CD-MOFs) were successfully synthesiezed and lansoprazole was incorporated reaching payloads as high as 23.2 ± 2.1% (wt). However, these particles disassembled in aqueous media. Surface modification with polyacrylic acid polymers circumvented this drawback and enabled achieving a sustained release. Another strategy was to use water-stable MOFs made of iron trimesate. The mechanism of degradation was unraveled under the basis of analyzing each individual particle. Moreover, co-encapsulation of two synergic antibiotics (amoxicillin and potassium clavulanate) was achieved following a "green" procedure. Each drug preferentially located in a separate nanoMOF compartment. In vitro studies showed a good efficacy to kill intracellular S. aureus.

These studies highlight the potential of "cage" particles for efficient drug entrapment and controlled release and open numerous possibilities for applications.

Vendredi 13 octobre 2017 à 14h

Bât 520 – Amphithéâtre de l'ISMO (3ème étage)

Université Paris-Sud, 91405 Orsay Cedex

La soutenance sera suivie d'un pot auquel vous êtes chaleureusement conviés