Supramolecular assemblies based on cyclodextrines :

Applications for the (co)encapsulation of active molecules

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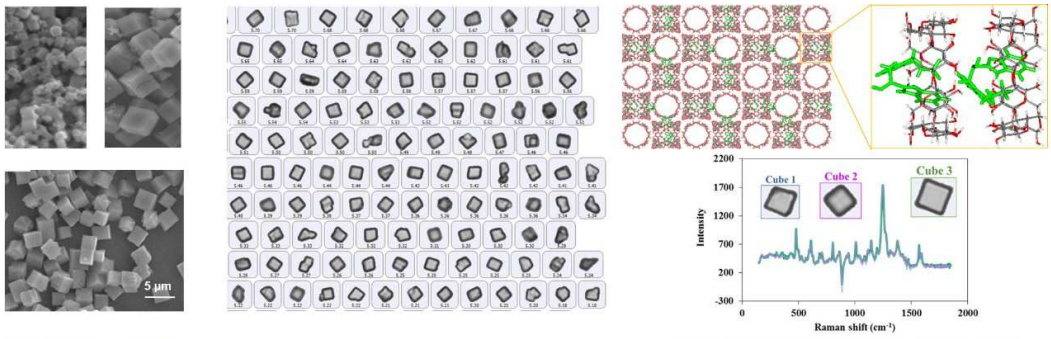
Due to their capability to form molecular inclusions with apolar molecules (or part of them) cyclodextrins (CDs) constitute a powerful tool to elaborate more efficient drug delivery systems such as nanoparticles. This presentation focuses on polymeric nanoparticles for cancer therapy or for the treatment of severe infections prepared from either engineered CD molecules or CD (coordination) polymers. A first example are CD-based metal organic frameworks [1,2]. Prepared in a simple manner in aqueous media, they are able to load high amounts of active molecules inside their crystalline 3D structures.



Crystalline particles with regular structures

Study of the morphology of individual particles

High drug loadings; determination of the composition of individual particles

In another example, CDs were advantageously used to coat nanoparticles made of metal organic frameworks and loaded with anticancer drugs [3-7]. Finally, CD-based nanoparticles were able to co-incorporate synergic drugs [8-10]. They were found nontoxic *in vivo* after repeated administration. In a model of *Mycobacterium tuberculosis*-infected mice, the bacterial payloads in the lungs could be decreased by 3 log as compared to untreated mice. These studies highlight the usefulness of CD in the design of drug delivery devices.

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