2 de FEBRERO de 2022

12.00 h
Sala de Grados, Edificio A (Ciencias), Campus San Francisco

INMA Junior

POLYOXOMETALATE-POLYPEPTIDE HYBRIDS

Héctor Soria Carrera
INMA-CSIC/UNIZAR

Self-assembly has been essential to the evolution of biomolecules since the very beginning. It is accepted that metalloenzymes evolved from simple peptides capable of folding allocating metal ions inside suitable catalytic pockets. Furthermore, Polyoxometalates (POMs) – redox-active transition metal oxo-clusters – have also been integrated into biomolecules and display important roles in metabolism. For example, the molybdenum storage protein, present in nitrogen-fixing bacteria, templates the biosynthesis of POMs and protects them against hydrolysis. Fascinated by these structures, we exploited an amino-derivatized POM to get covalent POM-polypeptide hybrids (POMlymers) through the Ring Opening Polymerization (ROP) of N-carboxyanhydrides. We prepared peptides composed of positively charged and hydrophobic residues to emulate the amphiphilic character of natural antimicrobial peptides. With this unique structure, we can assess both self-assembly and antimicrobial properties. In this communication, I will first talk about POMlymers as surface antimicrobial coatings and then I will move to the study of how they self-assemble in solution. Plus, POMlymer nanoparticles also display peroxidase-like activity which surpass parent POM's. POMlymers are really interesting building blocks for developing new materials. In one step, we gather the unique chemistry and folding of peptides and the redox properties of POMs. Further design of both components will provide excellent materials with a broad set of new properties.

DEVELOPMENT OF 2D NANOSTRUCTURED SYSTEMS BY SUPRAMOLECULAR CHEMICAL PROCEDURES FOR MOLECULAR ELECTRONICS APPLICATIONS

Enrique Escorihuela López
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The difficulties that the global production of microchips is facing nowadays is a problem that affects hundreds of industrial sectors of all the World. Although the topicality of this issue, this problem has been actually under consideration for a long time. The rate of improvement of these devices has been stagnant for the last years due to the technological limitations of the manufacturing processes and technical difficulties of working at the nanometric scale. For this reason, the development of new technologies to overcome these problems is necessary, and a possible alternative is to use organic molecules as conventional electronic components. Herein, we expose the development of a series of nanostructured architectures following this approach: The fabrication of two-dimensional arrays of host-guest complexes and the building of a molecular scaffolding by a *Layer-by-Layer* methodology. The purpose of these materials is to obtain a functional structure with a high degree of control over the orientation and distribution of the electronic components for the construction of millions of parallel electronic circuits, following a simple, versatile, and easy-to-implement methodology.

Síguelo vía zoom:

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