WCCE10 ECCE11 ECAB4
1st - 5th October, 2017
Barcelona, Spain
10th World Congress OF CHEMICAL ENGINEERING
11th European Congress OF CHEMICAL ENGINEERING
4th European Congress OF APPLIED BIOTECHNOLOGY
10th World Congress of Chemical Engineering
Promoters: WCEC EFCE ESBES
Organized by EFCE-Spain Group: ANQUE SEQUI
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PLENARY SPEAKER

ABSTRACT

Monday, October 2nd 14:30 - 15:30 - Main Auditorium

Title: Tackling Global Challenges with the Nanotechnology Toolbox

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Nanotechnology allows for the unique design and functionalization of materials and devices at the nanometer scale for a variety of applications. It provides a remarkable tool box to create novel materials and systems that can help us to address major challenges in green chemical processes, global warming, clean energy, biotechnology, medicine and food safety.

This talk describes the synthesis of metallic, metal oxide and semiconducting nanocrystals of controlled size, morphology and architecture. The nanocrystalline building blocks are used to create multifunctional systems with excellent dispersion and unique properties. Nanoporous materials of metal oxide and organic backbone have also been synthesized with high surface areas and well-defined porosities. The nanostructured materials are successfully tailored towards catalysis and pharmaceuticals synthesis, biomass conversion, greenhouse gas sequestration and utilization, fuel cells and batteries.

Our laboratory has also developed polymeric and inorganic nanoparticles and nanocomposites for advanced drug delivery, antimicrobial, antifouling, stem cell culture, tissue engineering, and biosensing applications. We have microfabricated nanofluidic systems for drug screening, in vitro toxicology, clinical sample preparation, and diagnostic applications. The nanosystems allow for the rapid and automated processing of drug candidates and clinical samples in tiny volumes, greatly facilitating drug testing, genotyping assays, infectious disease detection, point-of-care monitoring, as well as cancer diagnosis and prognosis.