Journal of Nanomaterials

Special Issue on

# Biopolymer-Based Nanocomposites from Synthesis, Modelling to Advanced Applications

CALL FOR PAPERS

Biopolymers, such as proteins, nucleic acids, or polysaccharides (which are the most abundant family of naturally occurring polymers), have gained considerable attention in recent decades as a source of innovative bio-based materials. Biopolymers are interesting and worth of study due to their biocompatibility and biodegradability. In addition, the combination of biopolymers with inorganic nanoparticles (oxides, metal oxides, silicates, phosphates, etc.) results in biopolymer-based nanocomposites (so called also as bionanocomposites) with improved mechanical and thermal properties. These bionanocomposites also offer interesting functional properties that allow for their use in a wide range of advanced applications, including sensors, bioplastics, environmental remediation, catalysis, and biomedical purposes (such as drug delivery, tissue engineering, regenerative medicine, and other health care applications).

In the context of fabrication, the synthesis of these functional biohybrid nanostructures can be carried out following bottom up strategies, where biopolymers and inorganic units are combined through molecular self-assembly—a phenomenon related to the physical and chemical interactions occurring at the nanoscale. Several bottom-up strategies include solvent casting, layer-by-layer (LbL), in situ methods, intercalation, or grafting processes. These different strategies can result in different properties and functionalities of the bionanocomposite material. Also, additive manufacturing methods may, in the future, play a crucial role in the fabrication and engineering of materials and components based on bionanocomposites.

This special issue aims to collect both original research and review articles with a focus on the synthesis, recent innovations, characterization, and exciting advanced applications of hybrid nanostructures based on biopolymers and bioinorganic solids.

Potential topics include but are not limited to the following:

- Design and synthesis of new biopolymer-based nanocomposite materials
- Modelling and simulation of nanocomposite materials involving biopolymers
- Additive manufacturing aspects in biopolymers-based nanocomposites such as 3D printing, electrospinning, and fused deposition modeling
- Applications of biopolymer-based nanocomposites in health care applications (drug delivery, tissue engineering, regenerative medicine, porous scaffolds, among others)
- Applications of biopolymer-based nanocomposites in environmental remediation (membranes of separation, adsorbents, etc.)
- Applications of biopolymer-based nanocomposites in the food sector as material packaging (bioplastic, edible films), as alternative for petroleum-based plastics
- Others innovative applications such as biodegradable supports in catalysis or bioinks in 3D printing
- Innovative techniques for characterization of bionanocomposites

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/jnm/fpph/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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