BIOSHELL

Recycling crustaceans shell wastes for developing biodegradable wastewater cleaning composites

About the Project

Wastes from agriculture and fishery cause harmful effects on the environment and implicitly on humans. But, many of these wastes can be recycled. One of the current global issues refers to minimizing waste production, effective wastewater treatment, biosafe food production, and reducing hazards from the exposure to pathogens. Most of the threatening microorganisms especially emerging pathogens (EPs) derive from wastewater. Moreover, antibiotics residues present in wastewater lead bacterial pathogens to develop antibiotic resistance genes (ARGs). In addition, heavy metals are among the most harmful non-microbial pollutants due to their toxicity to humans.

BIOSHELL aims at synergistically solving economic, environmental and health problems. The project focuses on utilizing the wastes from sea food preparation such as crustacean carcasses in the development of innovative and efficient inorganic-organic functionalized hydrogel nanocomposites, suitable to facilitate the sustainable wastewater purification technologies about heavy metals retention, antibiotics elimination, EPs and ARGs removal. Objectives: Functional biopolymer-based hydrogels starting from valorized crustacean's shell wastes will be developed both for the metal and antibiotics retention in waters as well as for anti-bacterial treatment. These competitive materials will be ion imprinted polymers (IIPs) or molecularly imprinted polymers (MIPs). They will benefit from new synthesis methodologies applied for chelating the chitosan nanocomposites and for the chemical graftingof the bactericidal hybrid surfaces.

The development of new approaches for the valorization of crustacean wastes, by the new functionalized biohydrogels, will improve the on-site wastewater treatment in EU. The regeneration of new bio-based agents is also targeted. Results: (i) 6 scientific papers in ISI rated journals; (ii) 2 patent applications; (iii) attend prestigious Symposia (6); (iv) 3 workshops and 2 Invention Salons; (v) website.

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Blue BIO COFUND

Project Overview

The Cofunded Call | 2020

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Priority Area:

Exploring new bioresources