J Nanomed Nanotechnol 2013, 4:6
http://dx.doi.org/10.4172/2157-7439.S1.015

OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference on
Nanotek & Expo

December 02-04, 2013 Hampton Inn Tropicana, Las Vegas, NV, USA

Byproducts as profitable alternative for antimicrobial peptide production and its application in bacterial nanocellulose

Angela Faustino Jozala
School of Pharmaceutical Science, University of Sao Paulo, Brazil

The use of waste as culture media promotes economical advantages, since it can reduce environment pollution and stimulates new researches aiming science sustainability. Bacterial nanocellulose (BC) production using waste as culture media is a novelty, stimulating scale-up for industrial production and extended applications. The incorporation of antimicrobial, such as nisin, in bacterial cellulose has a wide applicability in pharmaceutical, medical, chemical, cosmetic, food and other areas. Nisin is a natural antimicrobial peptide, commonly used as food preservative; being effective at controlling a broad range of Gram-positive bacteria, including the multidrug-resistant pathogen. Evaluation of BC production and nisin activity after incorporation in the BC membranes were studied. BCs were submersed in a solution of 250 μg/mL nisin (Sigma®), in phosphate buffer saline (PBS) pH 4.5. After absorption, BCs were kept at 4oC and the nisin activity was determined, by agar diffusion assay with *L. sakei* as bioindicator, in several periods, up to 45 days. Results demonstrated that BC membranes have the ability to incorporate nisin after 4 hours. Nisin activity was higher in BC membranes, although only 43% of initial proteins were transferred into the membranes. The stability results indicated that nisin activity in the BC membranes was maintained up to 45 days of storage. Our studies highlighted the importance of an effective antimicrobial system able to assure safety and stability to pharmaceutical and medical products. On a near future, the BC membranes combined with nisin will be tested against Gram-positive and Gram-negative microorganisms, and its cytotoxicity effects.

Biography

Angela Faustino Jozala has completed her Ph.D. at the age of 29 years at School of Pharmaceutical Science, University of São Paulo, Brazil. At the moment she is participating a postdoctoral program at the same School. She has been working with scientific researches since 2000 and as long of the time, she acquired knowledge for develop researches in industrial microbiology, biomaterials and biotechnology fields. Until the present, she published 18 scientific articles in indexed journals.

ajozala@gmail.com

New bioactive, bioresorbable magnetic nanoparticles: A new platform for tissue regeneration and theranostic

Anna Tampieri, Monica Sandri, Michele Iafisco, Elisa Savini and Silvia Panseri
ISTEC-CNR Institute of Science and Technology for Ceramics, Italy

Nowadays, magnetic materials are receiving special attention due to their potential applications in medicine. The use of magnetic stimulation or guidance in regenerative medicine is coming up as one of the most attractive concept to design magnetic nano-devices. Moreover magnetic nanoparticles (MNPs) have been progressively employed as support materials for enzyme immobilization, drug-delivery vehicles and contrast agents for magnetic resonance imaging as well as heat mediators for hyperthermia-based anti-cancer treatments.

The big challenge is the production of magnetic materials with good biocompatibility and biodegradability. In fact, the long-term cytotoxic effect of iron oxide (maghemite or magnetite), the most popular magnetic phase used in medicine, are not yet completely assessed.

Recently we developed an innovative biocompatible and bioresorbable superparamagnetic phase by doping nano-hydroxyapatite with Fe^{2+}/Fe^{3+} ions (FeHA). The new phase is an apatitic-like phase where Fe^{2+} and Fe^{3+} occupied the two independent calcium sites with a specific coordination so that to generate intrinsic superparamagnetism. Studies *in vitro* and in vivo have assessed the biocompatibility of FeHA nanoparticles. Magnetic FeHA can be used as a conceptually new type of biomaterial for hard tissue regeneration or as a valid substitute of magnetite in theranostics. Moreover, thanks to the high hyperthermia of Fe-HA it can be used in regenerative medicine as thermo-sensitive drug delivery systems and /or in cancer therapy as cell killers.

anna.tampieri@istec.cnr.it