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Preparation and *in vitro* evaluation of chitosan/apatite composite for bone regeneration applications

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Contemporary bone repairing and regeneration techniques require biomaterials able to bond tightly to new bone, to permit bone growth and propagation. In this context, special attention has been given to chitosan/apatite composites (CHI/Ap) for bone regeneration because they have favorable properties of both components: bioactivity and osteoconductivity provided by apatite and degradation and flexibility supplied by chitosan. In this research CHI/Ap composites with different weight ratios (20/80; 50/50; 80/20) were obtained using a methodology for obtaining the inorganic apatite material *in situ* inside the chitosan matrix. The composites were characterized by Fourier Transform Infrared Spectrometer (FTIR) indicating the presence of the main functional groups of each component in the material. *In vitro* physiological stability and enzymatic degradation resulting materials were evaluated using solutions of phosphate buffered saline (PBS, pH=7.4). Composites with higher polymeric content showed the lowest physiological stability and the highest enzymatic degradation. The material bioactivity was demonstrated by deposition of a calcium phosphate layer with apatite morphology on the composite surface after immersion in simulated body fluid (SBF, pH=7.4). Preliminary cytotoxicity tests evidenced that the studied materials did not modify the natural proliferation of the hamster ovary cells (CHO-K1), demonstrating their cytocompatibility under physiological conditions. The results suggest that chitosan/apatite composites obtained are promising materials for bone regeneration applications.

Biography

Miriela Tomas has completed her Bachelor's degree from the Faculty of Chemistry at the University of Havana. She has been working in the Research Department at Laboratories AICA. She is currently doing a research stay to complete her Master's degree at the Radiology Department of Leiden University Medical Center (LUMC) in The Netherlands. She has presented 8 communications in International Scientific Congresses.

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