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Antimicrobial activity of collagen/silver doped hydroxyapatite composites against gram-pozitive and gram-negative bacteria

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Synthetic hydroxyapatite (HAp) was studied in the last decades due to its crystallographical and chemical resemblance with the mineral part of the human hard tissue. It was proven that HAp has the ability to bond directly with bone tissue. Recently, HAp was used extensively as a coating material in orthopaedic and orthodontic surgeries. In order to enhance the biocompatibility of HAp, researchers tried to dope it with divalent cations. Silver is well known for its microbiostatic and microbicidal properties. The size and dose of silver nanoparticles strongly influence the antimicrobial properties. Considering that the organic componet of bone tissue is collagen, researcher tried to combine the unique properties of hydroxyapatite, collagen and silver in order to obtain new biomaterials with improved properties with possible application in medicine. The aim of this study was to characterize the properties of collagen/silver doped hydroxyapatite composites (Coll/Ag:HAp). The Ag:HAp powders were obtained by co-precipitation method and Coll/Ag:HAp were obtained in agreement with previous studies. The obtained composites were investigated by XRD, showing that the structure of the sample belongs to hexagonal hydroxyapatite. The morphological studies revealead that the morphology of the composite is influenced by the precence of Ag. The antimicrobial activity of Coll/Ag:HAp composite angainst *S. aureus* and *P. stuartii* was evaluated, showing an efficient antibacterial activity against them. Antibacterial activity increased with the increase of Ag concentration in the samples. Our results suggest that Coll/Ag:HAp composite could be used in many biomedical applications.

Biography

A M Prodan is a young surgeon with a PhD and a postdoc fellowship in Chemical Engineering. Also, she is a PhD student in Medicine at Carol Davila University of Medicine and Pharmacy. Moreover, she is involved in research activities involving materials with biomedical applications. She is a co-author of more than 10 relevant papers in her field of work.

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