

Abstract - Biomaterials for tissue regeneration

A new strategy in the field of biomaterials is to design new prototypes that exhibit biomimetic functions, being successfully integrated in human body. The present thesis aims to present different synthesis routes and characterization techniques in order to design both bone and skin tissue regeneration materials with enhanced properties in terms of antimicrobial effect and biocompatibility requirements. Hydroxyapatite and its derivatives provide biocompatibility and promote the bone regeneration process. The association between hydroxyapatite and collagen - the organic part of the composite - *via* synergistic effects conduces to important changes in the biological properties of the implant regarding an appropriate simulation of the osteogenesis process. The increased number of cases with microbial infections arising from skin conditions, such as burns, has begun to affect the quality of life of patients. The appearance on the market of innovative dressings resulted in optimum healing by maintaining the moist environment, absorbing a significant amount of exudate, stimulating the regeneration process and providing an effective antimicrobial character. On the basis of the above, the present work proposes the development of biocomposite dressings that provide a porous structure and an accentuated reepithelization process through the presence of collagen, chitosan or carboxymethylcellulose matrixes, and a therapeutic, antimicrobial action through the presence of silver or zinc oxide nanoparticles.