DOPING OF SILVER NANOPARTICLES IN ALLOYS FOR BIOMATERIALS

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Titanium implants coated with calcium phosphates have had increasing application in dentistry and clinical studies indicate that healthy bone tissue responds positively to bioceramic surfaces. Calcium phosphates, in particular hydroxyapatite in the form of a coating, give the metal a bioactive surface, which induces direct union between the implant and the bone tissue. As a consequence, the time for osseointegration, and therefore the total time of treatment, can be reduced. In recent years, coatings with nanomaterial have been studied, and silver nanoparticles stand out because of their broad spectrum of antimicrobial activity and their surface plasmon resonance effects. The use of silver nanoparticles is due to the fact that silver is a good bactericidal agent, potentializing its effect because it is at the nanometric scale. The nanoparticles can be obtained by several methods of synthesis, in this paper was undertaken the principles of "Green Chemistry". The objective of this paper was to study the incorporation of silver nanoparticles in commercially pure titanium substrate coated with hydroxyapatite and to evaluate its performance as biomaterial. The techniques used were scanning electron microscopy coupled with dispersive energy spectroscopy, X-ray diffraction, thermal analysis, infrared spectroscopy. The efficiency of the coating was evaluated by bioactivity assays. The results showed the performance of silver nanoparticles to obtain biomaterials used in bone fills and implants with antibacterial properties. The authors thank FAPEMIG, CNPq, CAPES and FAPESP for the support they have received in their research.

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