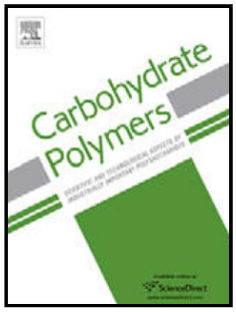

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aBioperformance of chitosan/fluoride-doped diopside nanocomposite coatings deposited on medical stainless steel

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Abstract

This work focuses on the structure, bioactivity, corrosion, and biocompatibility characteristics of chitosan-matrix composites reinforced with various amounts of fluoride-doped diopside nanoparticles (at 20, 40, 60, and 80 wt%) deposited on stainless steel 316L. Bioactivity studies reveal that the presence of the nanoparticles in the coatings induces apatite-forming ability to the surfaces. Based on electrochemical impedance spectroscopy and polarization experiments, the *in vitro* corrosion resistance of the substrate was enhanced by increasing the level of the nanoparticles in the coating. The sample containing 60% of the nanoparticles presented the highest osteoblast-like MG63 cell viability, in comparison to the other prepared and even control samples. Also, the cell attachment on the surfaces was improved with increasing the amount of the nanoparticles in the coatings. It is eventually concluded that the application of chitosan/fluoride-doped diopside nanocomposite coatings improves the bioperformance of metallic implants.