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Bioscaffolds of copper doped hydroxylapatite nanoparticles containing 1, 6-diisocyanatohexane-extended poly (1, 4-butylene succinate) with pH dependent drug delivery and degradation

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Copper doped hydroxylapatite nanoparticles have been prepared by co-precipitation method. Bioscaffolds synthesized from polymers and hydroxylapatite nanoparticles provide necessary sites for bone tissue regeneration. In the presented work, bioscaffolds have been prepared from 1, 6-diisocyanatohexane-extended poly (1, 4-butylene succinate) by solvent casting method from 10% w/v in pure chloroform with 2 wt% of hydroxylapatite nanoparticles containing different amount of copper at room temperature. Prepared scaffolds have been characterized by X-Ray Diffraction, Fourier Transform Infra –Red Spectroscopy, Transmission Electron Microscopy and Field Emission Scanning Electron Microscopy techniques. Incorporation of hydroxylapatite nanoparticles into the polymer matrix has been confirmed from the above mentioned techniques. Potential for use of scaffolds as successful drug delivery system has been checked with gentamycin. Controlled degradation of bioscaffolds is an important parameter. It has been seen that with the increase in the content of hydroxylapatite nanoparticles, degradation increase with leaching of more ions from the scaffold. Effect of pH on biodegradability has been investigated in phosphate buffer saline with two pH values (7.4 and 4.5) in detail. Potential for use of scaffolds as successful implant materials in human body has been checked during in vitro analysis by employing MG-63 cell lines. Results indicate that our scaffolds have the ability to support the cell attachment.

Biography

Kulwinder Kaur has completed her MSc in Applied Physics (Electronics) from Department of Applied Physics, Guru Nanak Dev University, India. Currently, she is doing Research as DST-INSPIRE Senior Research Fellow under the supervision of Prof. K. J. Singh at Department of Physics, Guru Nanak Dev University, India. Her area of research interest is the study the structural and biocompatible behavior of bio ceramics and bioscaffolds.

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