

Accepted Manuscript

Title: Biologically anchored chitosan/gelatin-SrHAP scaffold fabricated on Titanium against chronic osteomyelitis infection

Authors: D. Nancy, N. Rajendran

PII: S0141-8130(17)32994-X
DOI: <https://doi.org/10.1016/j.ijbiomac.2017.11.174>
Reference: BIOMAC 8654



To appear in: *International Journal of Biological Macromolecules*

Received date: 10-8-2017
Revised date: 9-11-2017
Accepted date: 28-11-2017

Please cite this article as: D.Nancy, N.Rajendran, Biologically anchored chitosan/gelatin-SrHAP scaffold fabricated on Titanium against chronic osteomyelitis infection, *International Journal of Biological Macromolecules* <https://doi.org/10.1016/j.ijbiomac.2017.11.174>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Biologically anchored chitosan/gelatin-SrHAP scaffold fabricated on Titanium against chronic osteomyelitis infection

D. Nancy and N. Rajendran*

Department of Chemistry, Anna University, Chennai – 25, India.

Abstract

The obstacles faced to treat chronic osteomyelitis infection clinically led to the search for an ideal biomaterial, resulted in combining two major aspects of bone tissue engineering namely surface modified metallic implant and polymer nanocomposite scaffold. In the present study Gelatin – Strontium incorporated Hydroxyapatite (SrHAP) forming HG scaffold, vancomycin loaded chitosan – gelatin polyelectrolyte complex incorporated gelatin-SrHAP, forming HV scaffolds (HV1 – 0.5 wt% and HV2 – 1 wt% vancomycin) were investigated. The HG, HV1 and HV2 scaffolds were successfully fabricated on Cp-Ti through anchoring by treatment with dopamine, which forms a bidentate co-ordination through NH bonding. Interconnected porous morphology of the scaffolds was confirmed, besides the globular Sr-HAP found in HV2 scaffold. The total amount of vancomycin encapsulation for HV1 and HV2 scaffolds were determined to be 47.55 ± 1.6 μg and 82.45 ± 3.5 μg respectively. Among the scaffolds studied HV2 scaffold were found to have a significant antibacterial activity for both MRSA and MSSA strains compared to Cp-Ti, HG and HV1 scaffolds. The HV2 scaffold also had significantly higher % of cell viability compared to Cp-Ti, HG and HV1 scaffolds. Furthermore, the presence of the drug vancomycin had no toxic effect on the cells, rather it aided in enhanced cell proliferation and spreading.

Keywords: Osteomyelitis; Metallic Implants; Polymer Nano-composites

Download English Version:

<https://daneshyari.com/en/article/8327918>

Download Persian Version:

<https://daneshyari.com/article/8327918>

[Daneshyari.com](https://daneshyari.com)