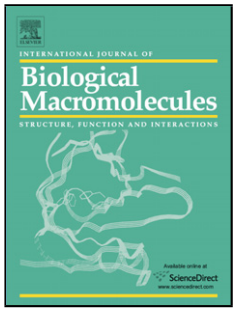

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Authors: P.R. Sivashankari, A. Moorthi, K.Mohamed Abudhahir, M. Prabaharan

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Preparation and characterization of three-dimensional scaffolds based on hydroxypropyl chitosan-*graft*-graphene oxide

P. R. Sivashankari [1,2], A. Moorthi [3], K. Mohamed Abudhahir [3], M. Prabaharan [1,*]

[1]*Department of Chemistry, Hindustan Institute of Technology and Science, Padur, Chennai – 603 103, India*

[2]*CENCON, Hindustan Institute of Technology and Science, Padur, Chennai – 603 103, India*

[3]*Faculty of Allied Health Scienes, Chettinad Hospital and Research Institute, Kelambakkam, Chennai - 603 103, India*

[*]Corresponding author. Tel.: +91 9500013036; fax: +91 44 2747 4208.

E-mail address: mprabaharan@yahoo.com

Abstract

Hydroxypropyl chitosan (HPCH), a water soluble derivative of chitosan, is widely considered for tissue engineering and wound healing applications due to its biocompatibility and biodegradability. Graphene oxide (GO) is a carbon-based nanomaterial which is capable of imparting desired properties to the scaffolds. Hence, the integration of GO into HPCH could allow for the production of HPCH-based scaffolds with improved swelling character, mechanical strength, and stability aimed at being used in tissue engineering. In this study, hydroxypropyl chitosan-*graft*-graphene oxide (HPCH-*g*-GO) with varying GO content (0.5, 1, 3 and 4 wt. %) was prepared using HPCH and GO as a tissue engineering scaffold material. The formation of HPCH-*g*-GO was confirmed by FTIR and XRD analysis. Using the HPCH-*g*-GO as a matrix material and glutaraldehyde as a crosslinking agent, the three dimensional (3D) porous scaffolds were fabricated by the freeze-drying method. The HPCH-*g*-GO scaffolds exhibited uniform