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**Xanthan gum/bioactive silica glass hybrid scaffolds reinforced with
cellulose nanocrystals: morphological, mechanical and *in vitro*
cytocompatibility study**

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ABSTRACT

Cellulose nanocrystals (CNCs) reinforced xanthan gum (XG)/silica glass (SG) hybrid scaffolds were prepared by freeze drying process. The results showed hybrid scaffolds highly porous structure with tunable and improved mechanical stability when incorporated with SG and CNCs. In addition, good pre-osteoblast cytocompatibility (MC3T3-E1 cells attachment and proliferation) was observed to increase with time and stiffness.

Keywords: Biomaterials; Sol-gel preparation; Cellulose nanocrystals; Tissue engineering.

1. Introduction

Bone tissue engineering needs a continuous research on appropriate bone scaffolds for proper regeneration of bone tissues. Several types of materials have extensively been investigated but xanthan gum (XG) as polysaccharide has not been investigated well in tissue engineering applications, especially for the regeneration of bone tissues. XG is a water-soluble, biodegradable, biocompatible and high molecular weight anionic polysaccharide with branched chains, produced by *Xanthomonas campestris*. Generally, in the presence of an appropriate amount of inorganic salt, XG aqueous suspension shows only weak 'gel-like' behaviour because of

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