

Accepted Manuscript

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PII: S0167-577X(18)31319-3
DOI: <https://doi.org/10.1016/j.matlet.2018.08.108>
Reference: MLBLUE 24819

To appear in: *Materials Letters*

Received Date: 26 May 2018
Revised Date: 31 July 2018
Accepted Date: 20 August 2018



Please cite this article as: Y. Liu, N. Fang, B. Liu, L. Song, B. Wen, D. Yang, Aligned porous chitosan/graphene oxide scaffold for bone tissue engineering, *Materials Letters* (2018), doi: <https://doi.org/10.1016/j.matlet.2018.08.108>

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Aligned porous chitosan/graphene oxide scaffold for bone tissue engineering

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Abstract

Chitosan/graphene oxide composites (CGs) were developed using directional freezing to create aligned porous three-dimensional (3D) scaffolds resembling bone lamellae. The contact provided by the anisotropic scaffolds played a critical role in guiding the alignment of MC3T3-E1 cells along the longitudinal direction. The higher mechanical strength, shape-memory, cell alignment guiding capabilities, and protein adsorption ability, render these composites potentially useful as scaffold materials in bone tissue engineering.

Keywords: Aligned scaffold; Graphene oxide; Chitosan; Composite materials; Shape memory materials; Bone tissue engineering

1. Introduction

Bone tissue engineering as an effective way to treat bone injuries, has attracted

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