ALGAL BIOACTIVE METABOLITES FOR BIOMEDICAL APPLICATIONS

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INTRODUCTION:

Natural polymers, due to their inherent biocompatibility and biodegradability, are highly appreciated as valuable ingredients for biomaterials and therefore are widely exploited in the biomedical field. Polysaccharides, incorporating various functionalities in their structures and exhibiting interesting physicochemical properties and significant biological activities, are considered attractive materials for the development of novel systems for biomedical applications, such as drug delivery and tissue engineering.

OBJECTIVES:

The aim of the study was the exploitation of marine polysaccharides as biopolymers for the preparation of nanofibrous matrices for drug release and scaffolds for cell cultures and tissue engineering.

METHOD / DESIGN:

Polysaccharides were extracted from green and brown algae and their molecular size was determined by size exclusion chromatography. The nanofibrous matrices were prepared by the electrospinning technique involving a variety of other copolymers and bioactive agents in the spinning solutions. The morphological characterization was performed by Scanning Electron Microscopy and the physicochemical characterization by Infrared Spectroscopy and Thermogravimetric and Differential Scanning Analyses.

RESULTS:

Nano- microfibrous matrices, based on marine polysaccharides and incorporating bioactive reagents were prepared by the electrospinning technique and tested on hairless mice or humans for their wound healing properties, exhibiting very high activity.

CONCLUSIONS:

The current results, in combination with the inherent cytocompatibility and the wide spectrum of biological properties of marine biopolymers, highlight the potential uses of the prepared polysaccharide-based biomaterials as novel nanofibrous matrices for biomedical applications.

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