

Accepted Manuscript

Title: High-throughput and high-yield fabrication of uniaxially-aligned chitosan-based nanofibers by centrifugal electrospinning

Author: Ariane E. Erickson Dennis Edmondson Fei-Chien Chang Dave Wood Alex Gong Sheeny Lan Levengood Miqin Zhang



PII: S0144-8617(15)00735-3
DOI: <http://dx.doi.org/doi:10.1016/j.carbpol.2015.07.097>
Reference: CARP 10199

To appear in:

Received date: 22-4-2015
Revised date: 29-7-2015
Accepted date: 30-7-2015

Please cite this article as: Erickson, Ariane E., Edmondson, Dennis., Chang, Fei-Chien., Wood, Dave., Gong, Alex., Levengood, Sheeny Lan., & Zhang, Miqin., High-throughput and high-yield fabrication of uniaxially-aligned chitosan-based nanofibers by centrifugal electrospinning. *Carbohydrate Polymers* <http://dx.doi.org/10.1016/j.carbpol.2015.07.097>

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.

High-throughput and high-yield fabrication of uniaxially-aligned chitosan-based nanofibers by centrifugal electrospinning

Ariane E. Erickson[‡], Dennis Edmondson[‡], Fei-Chien Chang, Dave Wood, Alex Gong, Sheeny Lan Levengood, and Miqin Zhang*

Department of Materials Science and Engineering, University of Washington, Seattle, WA 98195, USA

[‡]These authors contributed equally to this work.

*Corresponding author: 302L Roberts Hall, Department of Materials Science and Engineering, University of Washington, Seattle, WA 98195, USA. Tel.: 206 616 9356; fax: 206 543 3100;

E-mail address: mzhang@u.washington.edu (M. Zhang).

Highlights ►

► We present a high-yield method for producing aligned chitosan-based nanofibers. ► Our HTP-CES shows superior fiber characteristics over traditional electrospinning. ► Bead-less fibers were produced despite spinneret and compositional variations. ► Our approach allows controlled nanofiber diameters while maintaining alignment. ► A concave correlation between needle diameter and fiber diameter was identified. ► Our method can be scaled up for production of tunable aligned nanofibers. ► ►

ABSTRACT

The inability to produce large quantities of nanofibers has been a primary obstacle in advancement and commercialization of electrospinning technologies, especially when aligned nanofibers are desired. Here, we present a high-throughput centrifugal electrospinning (HTP-CES) system capable of producing a large number of highly-aligned nanofiber samples with high-yield and tunable diameters. The versatility of the design was revealed when bead-less nanofibers were produced from copolymer chitosan/polycaprolactone (C-PCL) solutions despite variations in polymer blend composition or spinneret needle gauge. Compared to conventional electrospinning techniques, fibers spun with the HTP-CES not only exhibited superior alignment,

Download English Version:

<https://daneshyari.com/en/article/7787165>

Download Persian Version:

<https://daneshyari.com/article/7787165>

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