

Accepted Manuscript

Rational design of novel water-soluble ampholytic cellulose derivatives

Naglaa Salem El-Sayed, Mohamed El-Sakhawy, Peter Hesemann, Nicolas Brun, Samir Kamel



PII: S0141-8130(18)30539-7
DOI: doi:[10.1016/j.ijbiomac.2018.03.147](https://doi.org/10.1016/j.ijbiomac.2018.03.147)
Reference: BIOMAC 9369

To appear in:

Received date: 2 February 2018
Revised date: 20 March 2018
Accepted date: 24 March 2018

Please cite this article as: Naglaa Salem El-Sayed, Mohamed El-Sakhawy, Peter Hesemann, Nicolas Brun, Samir Kamel , Rational design of novel water-soluble ampholytic cellulose derivatives. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Biomac(2017), doi:[10.1016/j.ijbiomac.2018.03.147](https://doi.org/10.1016/j.ijbiomac.2018.03.147)

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.

Rational design of novel water-soluble ampholytic cellulose derivatives

Naglaa Salem El-Sayed¹, Mohamed El-Sakhawy¹, Peter Hesemann², Nicolas Brun², Samir Kamel^{1*}

¹ Cellulose and Paper Department, National Research Centre, 12622 Dokki, Giza, Egypt

² Institut Charles Gerhardt de Montpellier, CNRS UMR 5253 CNRS-UM-ENSCM, Place Eugène Bataillon, 34095 Montpellier Cedex 05, France

ABSTRACT

The development of new biocompatible, biodegradable functionalized biopolymers that can serve as scaffold for tissue regeneration or work as carriers for different bioactive molecules such as drugs, proteins, and enzymes remains a continuous challenge that need to be extensively explored. For this purpose, three water-soluble cellulose derivatives; namely 4(celluloseamino) butyric acid (CABA) 2(celluloseamino) succinic acid (CASA), and 3(celluloseamino) propane sulfonic acids (CAPSA) were synthesized from microcrystalline cellulose (MCC) via esterification with tosyl chloride that was followed by nucleophilic substitution by the proper aminoalkyl acid derivative. The products were characterized by elemental analyses, FTIR, ¹³C NMR spectroscopy. The thermal stability, surface morphology, and the elemental composition of the new ampholytic biopolymers were also studied by TGA, EDX-SEM. The new ampholytic cellulose derivatives were evaluated for their *in vitro* cytotoxicity on normal human retina cell line (RPE1) by MTT assay.

Keywords: Ampholytic cellulose, tosyl cellulose, *in vitro* cytotoxicity.

1. Introduction

The use of smart biocompatible new materials based on renewable natural resources with tolerable biological activity and proper physical and mechanical properties and structure morphology in the pharmaceutical and biomedical applications is considered a promising alternative route to the synthetic toxic or non-biodegradable polymeric materials [1]. Biomaterials demonstrated encouraging prospects in several industrial, environmental, and biomedical applications in the last two decades [2-4].

Cellulose and its derivatives have attracted attention as promising materials for biomedical and pharmaceutical applications because of their outstanding properties such

Download English Version:

<https://daneshyari.com/en/article/8327273>

Download Persian Version:

<https://daneshyari.com/article/8327273>

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