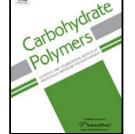
Accepted Manuscript

Title: Synthesis of graft copolymers based on hyaluronan and poly(3-hydroxyalkanoates)

Authors: Gloria Huerta-Angeles, Martina Brandejsová, Rinat Nigmatullin, Kateřina Kopecká, Hana Vágnerová, Daniela Šmejkalová, Ipsita Roy, Vladimír Velebný



PII: S0144-8617(17)30508-8

DOI: http://dx.doi.org/doi:10.1016/j.carbpol.2017.05.011

Reference: CARP 12297

To appear in:

Received date: 17-2-2017 Revised date: 2-5-2017 Accepted date: 3-5-2017

Please cite this article as: Huerta-Angeles, Gloria., Brandejsová, Martina., Nigmatullin, Rinat., Kopecká, Kateřina., Vágnerová, Hana., Šmejkalová, Daniela., Roy, Ipsita., & Velebný, Vladimír., Synthesis of graft copolymers based on hyaluronan and poly(3-hydroxyalkanoates). *Carbohydrate Polymers* http://dx.doi.org/10.1016/j.carbpol.2017.05.011

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.

ACCEPTED MANUSCRIPT

Synthesis of graft copolymers based on hyaluronan and poly(3-hydroxyalkanoates)

Gloria Huerta-Angeles,^{1*} Martina Brandejsová,¹ Rinat Nigmatullin,^{2,‡} Kateřina Kopecká,¹ Hana Vágnerová,¹ Daniela Šmejkalová,¹ Ipsita Roy² and Vladimír Velebný.¹

¹Contipro a.s., Dolní Dobrouč 401, 561 02 Dolní Dobrouč, Czech Republic

²Department of Life Science, Faculty of Science and Technology, University of Westminster, 115 New Cavendish Street, London W1W 6UW, United Kingdom

Corresponding author: huerta-angeles@contipro.com

* present address; The University of Exeter, Prince of Wales Road, Exeter, Devon, EX4 4SB, United Kingdom

Highlights

- Joining two natural motifs: hyaluronan (HyA) and poly(3-hydroxyalkanoates) (PHAs)
- Hydrolysis of PHAs yielded oligomers suitable for HyA covalent grafting
- 1,1, Carbonyldiimidazole allowed hyaluronan modification under mild conditions
- Water soluble copolymers as potential carriers for drug delivery

Abstract

This work reports the synthesis and characterisation of new amphiphilic hyaluronan (HA) grafted with poly(3-hydroxyalkanoates) (PHAs) conjugates. Hydrolytic depolymerisation of PHAs was used for the synthesis of defined oligo(3-hydroxyalkanoates)-containing carboxylic terminal moieties. A kinetic study of the depolymerisation was followed to prepare oligomers of required molecular weight. PHAs were coupled with hydroxyl groups of HA mediated by N, N'-carbonyldiimidazole (CDI) or HSTU Tetramethyl-O-(N-succinimidyl) uronium hexafluorophosphate. For the first time, the covalent bonding of oligo derivatives of P(3-hydroxybutyrate), P(3-hydroxyoctanoate), P(3-hydroxyoctanoate-co-3-hydroxydecanoate) and P(3-hydroxyoctanoate-co-3-hydroxydecanoate) and HA was achieved by "grafting to" strategy. Achieved grafting degree was a function of hydrophobicity of PHA, Mw and polarity of the solvent. The most suitable reaction conditions were observed for oligo (3-hydroxybutyrate) grafted to HA (grafting degree of 14 %). Graft

Download English Version:

https://daneshyari.com/en/article/5157595

Download Persian Version:

https://daneshyari.com/article/5157595

<u>Daneshyari.com</u>