

Accepted Manuscript

Tunable hydrophilicity of redox D-mannitol-based polyurethanes modulates glutathione response

Lucía Romero-Azogil, Elena Benito, M. Gracia García-Martín, Juan A. Galbis

PII: S0014-3057(17)30964-3
DOI: <http://dx.doi.org/10.1016/j.eurpolymj.2017.07.012>
Reference: EPJ 7965

To appear in: *European Polymer Journal*

Received Date: 29 May 2017
Revised Date: 28 June 2017
Accepted Date: 9 July 2017

Please cite this article as: Romero-Azogil, L., Benito, E., Gracia García-Martín, M., Galbis, J.A., Tunable hydrophilicity of redox D-mannitol-based polyurethanes modulates glutathione response, *European Polymer Journal* (2017), doi: <http://dx.doi.org/10.1016/j.eurpolymj.2017.07.012>

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.



Tunable hydrophilicity of redox D-mannitol-based polyurethanes modulates glutathione response

Lucía Romero-Azogil, Elena Benito, M. Gracia García-Martín*
and Juan A. Galbis

Departamento de Química Orgánica y Farmacéutica, Facultad de Farmacia, Universidad de Sevilla, C/ Profesor García González 2, 41012-Sevilla, Spain

Corresponding author: graciagm@us.es

ABSTRACT

Disulfide bond-containing polymers are the most widely explored stimuli-responsive materials used as drug delivery carriers, especially in cancer therapeutics. However, they are conditioned by a process of biodegradation under hypoxic physiological microenvironments of cancer cells, where higher levels of the reductant glutathione are present. Furthermore, it is well known that hydrophilicity enhances degradation of disulfide linkage-containing materials in aqueous media, such as physiological conditions. In this context, a series of disulfide bond-containing homo- and co-polyurethanes has been synthesized by the polyaddition reaction of 3,4-O-isopropylidene-D-mannitol and/or 2,2'-dithiodiethanol to 2,2'-dithiodiethyl diisocyanate, in THF at room temperature, in good yields. The obtained polyurethanes have average molecular weights in the 23000-97000 g mol⁻¹ range, with narrow polydispersities. Hydrophilicity of these materials is provided by the content of free hydroxyl groups in the polymer backbones, in partially or totally unprotected D-mannitol moieties, which could be achieved by copolymerization followed by O-deprotection processes. Glutathione-mediated degradation studies of these materials showed how the ratio of hydroxyl to disulfide groups modulates the response of this bio-redox regulator.

Download English Version:

<https://daneshyari.com/en/article/5159348>

Download Persian Version:

<https://daneshyari.com/article/5159348>

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