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1 **Synthesis and Characterization of Amphiphilic Photocleavable Polymers based**
2 **on Dextran and Substituted- ϵ -caprolactone**

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7 **Abstract**

8 In this study, we synthesized photocleavable amphiphilic block copolymers
9 containing photodegradable linkers, 5-hydroxy-2-nitrobenzyl alcohol, as junction
10 points between hydrophilic dextran (or maltodextrin) and hydrophobic
11 poly(4-substituted- ϵ -caprolactone) chains, by using a combination of ring-opening
12 polymerization and nucleophilic substitution reactions. When the polymer solutions
13 were exposed to ultraviolet (UV) irradiation, major structural and morphological
14 changes were observed in the particles. The copolymers were biodegradable and
15 biocompatible, and they can self-assemble into spherical photoresponsive micelles.
16 Fluorescence emission measurements indicated the release of Nile red, a hydrophobic
17 dye, encapsulated by the Dex-ONB-PXCL micelles, in response to irradiation caused
18 by the disruption of the micelles. Light-triggered bursts were observed for
19 indomethacin (IMC)-loaded Dex-ONB-PXCL micelles during the first 5 h. The
20 nanoparticles were associated with nonsignificant toxicity at concentrations of less

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