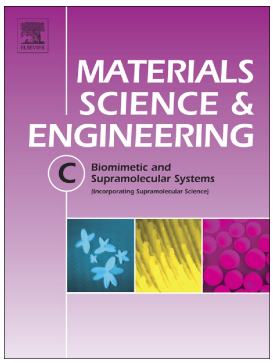

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PII: S0928-4931(17)32252-X
DOI: doi:10.1016/j.msec.2018.06.044
Reference: MSC 8683

To appear in: *Materials Science & Engineering C*

Received date: 14 June 2017
Revised date: 31 May 2018
Accepted date: 18 June 2018

Please cite this article as: Chaoqun You, Hongshuai Wu, Minxing Wang, Zhiguo Gao, Baiwang Sun, Xiangyang Zhang , Synthesis and biological evaluation of redox/NIR dual stimulus-responsive polymeric nanoparticles for targeted delivery of cisplatin. Msc (2018), doi:10.1016/j.msec.2018.06.044

Synthesis and biological evaluation of redox/NIR dual stimulus-responsive polymeric nanoparticles for targeted delivery of cisplatin

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Abstract

Functional drug delivery systems enabling various favorable characteristics including specific targets, efficient cellular uptake and controllable release. At present work, a folate and cRGD dual modified nanoparticles based on NIR light and glutathione dual stimuli-responsive release system was successfully prepared and which simultaneously deliver cisplatin and ICG to tumor sites to enhance controllability. The prepared nanoparticles showed a stable uniform spherical morphology of 77.59 nm particle size range in PBS (pH=7.4, 25 °C) and the encapsulated cisplatin were rapidly released in acidic environment especially added glutathione (GSH) and NIR irradiation. Moreover, the prepared nanoparticles can be efficiently internalized by tumor cells through the enhanced dual targeted ligands (folate and cRGD) for ICG imaging. The cytotoxicity assays showed that the cells viability decreased to 1.95% (SGC-7901) when been exposed to NIR light, and which further decreased to 1.25% in MCF-7 cells. Thus, the prepared nanoparticles showed excellent performance for photothermal conversion therapy of tumor cells and especially on human breast tumor cells. Our research highlights the great potential of stimuli-responsive smart