Accepted Manuscript

Thiol-capped Bi nanoparticles as stable and all-in-one type theranostic nanoagents for tumor imaging and thermoradiotherapy

Nuo Yu, Zhaojie Wang, Jiulong Zhang, Zixiao Liu, Bo Zhu, Jing Yu, Meifang Zhu, Chen Peng, Zhigang Chen

PII: S0142-9612(18)30066-8

DOI: 10.1016/j.biomaterials.2018.01.047

Reference: JBMT 18462

To appear in: *Biomaterials*

Received Date: 11 September 2017

Revised Date: 15 January 2018

Accepted Date: 27 January 2018

Please cite this article as: Yu N, Wang Z, Zhang J, Liu Z, Zhu B, Yu J, Zhu M, Peng C, Chen Z, Thiol-capped Bi nanoparticles as stable and all-in-one type theranostic nanoagents for tumor imaging and thermoradiotherapy, *Biomaterials* (2018), doi: 10.1016/j.biomaterials.2018.01.047.

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

Thiol-capped Bi Nanoparticles as Stable and All-in-one Type Theranostic Nanoagents for Tumor Imaging and Thermoradiotherapy

Nuo Yu,[a,b] Zhaojie Wang,[b] Jiulong Zhang,[a] Zixiao Liu,[b] Bo Zhu,[b] Jing Yu,[c] Meifang Zhu,[b] Chen Peng[*,a] and Zhigang Chen[*,a,b]

[a]Department of Radiology, Shanghai Tenth People's Hospital, School of Medicine, Tongji university, Shanghai 200072, China

[b]State Key Laboratory for Modification of Chemical Fibers and Polymer Materials, College of Materials Science and Engineering, Donghua University, Shanghai 201620, China

[c]Department of Ophthalmology, Shanghai Tenth People's Hospital, School of Medicine, Tongji University, Shanghai 200072, China

*Corresponding authors: Email: zgchen@dhu.edu.cn, cpengrr@tongji.edu.cn

Abstract: Bismuth (Bi)-based semiconductors and composites have been well developed for cancer treatments due to their multimodal diagnostic and therapeutic functions, while the development of metallic Bi nanocrystals is rather hindered by the easy-oxidation and unsatisfactory near-infrared photoabsorption. Herein, we prepared uniform Bi nanoparticles (~40 nm) capped with thiol ligands (Bi-SR) through the chemical reduction method and then surfaced-modified them with PEGylated phospholipids. The resulting Bi-SR-PEG has strong NIR absorbance and high photothermal conversion efficiency of 45.3%. Importantly, thiol ligands on the surface of Bi-SR-PEG can significantly prevent the metal Bi core from oxidation because of the strong chemisorptions energy between sulfur and metal, thus matianing the high stability and long-term near-infrared photoabsorption. More importantly,

Download English Version:

https://daneshyari.com/en/article/6484642

Download Persian Version:

https://daneshyari.com/article/6484642

Daneshyari.com