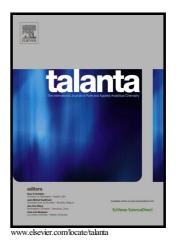
Author's Accepted Manuscript

A novel fluorescence "turn off–on" nanosensor for sensitivity detection acid phosphatase and inhibitor based on glutathione-functionalized graphene quantum dots

Zhengyi Qu, Ning Li, Weidan Na, Xingguang Su



 PII:
 S0039-9140(18)30918-4

 DOI:
 https://doi.org/10.1016/j.talanta.2018.09.009

 Reference:
 TAL19023

To appear in: Talanta

Received date: 26 June 2018 Revised date: 28 August 2018 Accepted date: 3 September 2018

Cite this article as: Zhengyi Qu, Ning Li, Weidan Na and Xingguang Su, A novel fluorescence "turn off–on" nanosensor for sensitivity detection acid phosphatase and inhibitor based on glutathione-functionalized graphene quantum dots, *Talanta*, https://doi.org/10.1016/j.talanta.2018.09.009

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 galley proof before it is published in its final citable 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

A novel fluorescence "turn off-on" nanosensor for sensitivity detection acid phosphatase and inhibitor based on glutathione-functionalized graphene quantum dots

Zhengyi Qu^a, Ning Li^{a,b}, Weidan Na^a, and Xingguang Su^{a*}

^aDepartment of Analytical Chemistry, College of Chemistry, Jilin University, Changchun 130012, China

^bDepartment of Respiratory, China-Japan Union Hospital of Jilin University, Changchun, 130012, China

*Corresponding author: Xingguang Su, Tel.: +86-431-85168352. E-mail address: suxg@jlu.edu.cn

JSCR

Abstract

In this paper, we developed a label-free and sensitive fluorescence sensor for acid phosphatase (ACP) and its inhibitor parathion-methyl (PM) detection based on glutathione-functionalized graphene quantum dots (GQDs@GSH). Upon addition of MnO_2 nanosheets, the fluorescence of GQDs@GSH could be efficiently quenched via a fluorescence resonance energy transfer. ACP could easily catalyze the hydrolysis of L-Ascorbic acid-2-phosphate (AAP) to ascorbic acid (AA), which could reduce MnO_2 nanosheets to Mn^{2+} in acidic environment, leading to dramatically increase of the fluorescence intensity of GQDs@GSH. Quantitative detection of ACP in a broad range from 0.1 to 9 mU mL⁻¹ with a detection limit of 0.027 mU mL⁻¹ could be achieved. The feasibility of the proposed sensor in real samples analysis was also studied and satisfactory results were obtained. Furthermore, the fluorescence assay Download English Version:

https://daneshyari.com/en/article/10154523

Download Persian Version:

https://daneshyari.com/article/10154523

Daneshyari.com