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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>

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

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### **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<sub>2</sub> 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<sub>2</sub> nanosheets to Mn<sup>2+</sup> 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<sup>-1</sup> with a detection limit of 0.027 mU mL<sup>-1</sup> 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

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