

# Author's Accepted Manuscript

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PII: S0039-9140(14)00328-2  
DOI: <http://dx.doi.org/10.1016/j.talanta.2014.04.050>  
Reference: TAL14722

To appear in: *Talanta*

Received date: 21 January 2014  
Revised date: 9 April 2014  
Accepted date: 12 April 2014

Cite this article as: Xiaoxiao Lv, Xiaoyu Wang, Dawei Huang, Chenggang Niu, Guangming Zeng, Qiuya Niu, Quantum dots and p-phenylenediamine based method for the sensitive determination of glucose, *Talanta*, <http://dx.doi.org/10.1016/j.talanta.2014.04.050>

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**Quantum dots and p-phenylenediamine based method for the sensitive determination of glucose**

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**Abstract:** By introducing p-phenylenediamine (PPD) to the hybrid system of Mn-doped CdS/ZnS quantum dots (QDs) and glucose oxidase (GOD), a sensitive label-free method was proposed for direct detection of glucose. With glucose and PPD as substrates, 2,5-diamino-N,N'-di-(4-aminophenyl)-2,5-cyclohexadiene-1,4-diimine (DDACD) that intensively quenches the fluorescence of QDs can be produced by the catalysis of GOD. A detection limit as low as 3.2  $\mu\text{M}$  was obtained with the high-efficient fluorescence quencher. Two linear ranges, from 5.0  $\mu\text{M}$  to 1000  $\mu\text{M}$  and from 1.0 mM to 10.0 mM, were identified between time-gated fluorescence intensity and the concentration of glucose. It is shown that the newly propose methods has high selectivity for glucose over other saccharides and coexisting biological species in serum. The method can be used directly to determine glucose in normal adult human serum without any complicated sample pretreatments. The recovery rate and repeatability of the method were also shown to be satisfactory.

**Keywords:** glucose, p-phenylenediamine, quantum dots, time-gated fluorescence, glucose oxidase

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