

Author's Accepted Manuscript

CdZnTeS quantum dots based
electrochemiluminescent image immunoanalysis

Xiu-Li Liang, Ning Bao, Xiliang Luo, Shou-Nian
Ding



www.elsevier.com/locate/bios

PII: S0956-5663(18)30428-7
DOI: <https://doi.org/10.1016/j.bios.2018.06.006>
Reference: BIOS10526

To appear in: *Biosensors and Bioelectronics*

Received date: 11 May 2018
Accepted date: 2 June 2018

Cite this article as: Xiu-Li Liang, Ning Bao, Xiliang Luo and Shou-Nian Ding, CdZnTeS quantum dots based electrochemiluminescent image immunoanalysis, *Biosensors and Bioelectronics*, <https://doi.org/10.1016/j.bios.2018.06.006>

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.

CdZnTeS quantum dots based electrochemiluminescent image immunoanalysis**Xiu-Li Liang^a, Ning Bao^b, Xiliang Luo^c, Shou-Nian Ding^{a*}**

^a*Jiangsu Province Hi-Tech Key Laboratory for Bio-medical Research, School of Chemistry and Chemical Engineering, Southeast University, Nanjing 211189, China.*

^b*School of Public Health, Nantong University, 226019 Nantong, Jiangsu, China.*

^c*Key Laboratory of Sensor Analysis of Tumor Marker, Ministry of Education, College of Chemistry and Molecular Engineering, Qingdao University of Science and Technology, Qingdao 266042, China.*

*Corresponding author. (S.-N. Ding) Fax: (+86) 25-52090621. snding@seu.edu.cn.

Abstract:

In this work, quaternary CdZnTeS quantum dots (QDs) with a particularly strong electrochemiluminescence (ECL) were synthesized as ECL signal labels. The strong ECL signals can be obtained at both cathode and anode with the ECL efficiencies of 19.78% and 1.62%, respectively. The sandwich-structured ECL immunosensors for the detection of alpha-fetoprotein (AFP) and cancer antigen 125 (CA125) were accomplished with direct ECL image analysis. Under optimal conditions, the QDs-based ECL image immunoanalysis possessed good linearity from 0.5 ng/mL to 20 ng/mL for AFP and from 20 U/mL to 500 U/mL for CA125 with the detection limit of 0.1 ng/mL and 6 U/mL, respectively (S/N=3), and the lower detection limit obtained by photomultiplier tube were 0.1 fg/mL for AFP and 0.03 mU/mL for CA125 with the wide dynamic range from 0.5 fg/mL to 20 ng/mL and from 0.1 mU/mL to 500 U/mL, respectively (S/N=3). Furthermore, the ECL immunoanalysis was evaluated with commercial enzyme-linked immunosorbent assay in human serum samples. The good results indicated that CdZnTeS QDs-based ECL biosensor has great potential for fast biomedical screening and multi-assays in clinical diagnosis.

Download English Version:

<https://daneshyari.com/en/article/7229004>

Download Persian Version:

<https://daneshyari.com/article/7229004>

[Daneshyari.com](https://daneshyari.com)