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Dual-wavebands-resolved electrochemiluminescence multiplexing immunoassay with dichroic mirror assistant photomultiplier-tubes as detectors

Fang Zhang^a, Yupeng He^a, Kena Fu^a, Li Fu^a, Bin Zhang^{a,*}, Huaisheng Wang^b, Guizheng Zou^{a,*}

^a School of Chemistry and Chemical Engineering, Shandong University, Jinan 250100, PR China

^b Department of Chemistry, Liaocheng University, Liaocheng 252059, PR China

binzhang68@sdu.edu.cn (B. Zhang),

zouguizheng@sdu.edu.cn (G.-Z. Zou)

*Corresponding authors. Tel.: +86 531 88364464; fax: +86 531 88564464

ABSTRACT

A dual-wavebands-resolved electrochemiluminescence (ECL) multiplexing immunoassay (MIA) was developed for simultaneously detecting alpha fetoprotein antigen (AFP) in greenish waveband with CdSe550 ($\lambda_{\max} = 550$ nm) nanocrystals (NCs) and cancer antigen 125 (CA125) in near-infrared waveband with CdTe790 ($\lambda_{\max} = 790$ nm) NCs via one-pot ECL reaction, in which dichroic mirror works as a key part to reflect ECL from CdSe550 to one photomultiplier-tube (PMT) and transmit ECL from CdTe790 to the other PMT for dual-wavebands-resolved assay. The proposed ECL-MIA strategy was capable of simultaneously determining AFP with linearly response from 5 pg/mL to 5 ng/mL and limit of detection at 1 pg/mL, and CA125 with linearly response from 5 mU/mL to 1 U/mL and limit of detection at 1 mU/mL, with desired specificity and without obvious energy-transfer between ECL

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