

*Supporting Information*

**Duplex-immunoassay of ovarian cancer biomarkers CA125  
and HE4 based carbon dots decorated dendritic mesoporous  
silica nanoparticles**

Zi-Xuan Wang, Shou-Nian Ding\*

<sup>a</sup> Jiangsu Province Hi-Tech Key Laboratory for Bio-medical Research, School of  
Chemistry and Chemical Engineering, Southeast University, Nanjing 211189, China

\*Corresponding authors. (S.-N. Ding) Fax: (+86) 25-52090621.

E-mail: snding@seu.edu.cn

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## **Materials**

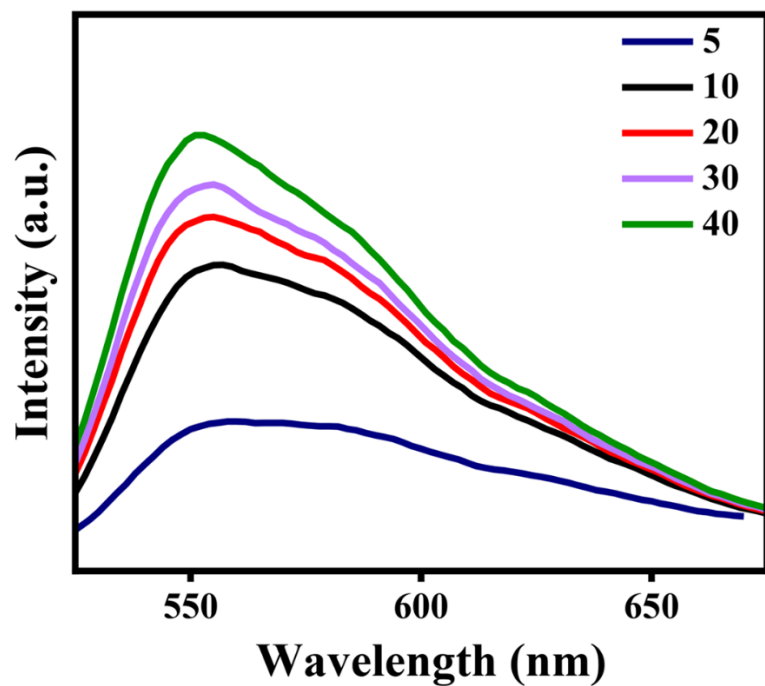
cetyltrimethylammonium bromide (CTAB), sodium salicylate, ethyl orthosilicate (TEOS), triethanolamine (TEA), succinic anhydride, N, N-dimethylformamide (DMF), hydrochloric acid (HCl), ethanol, sodium chloride (NaCl), NaBH<sub>4</sub> are purchased from Sinopharm Chemical Reagent Co., Ltd., (3-Aminopropyl)trimethoxysilane (APTMS), (3-aminopropyl)triethoxysilane (APTES), Bengal rose (RB) were purchased from Aladdin Chemical Reagent Co., Ltd. Bovine serum albumin (BSA) were obtained from Sangon Biotech Co., Ltd. N-(3-dimethylaminopropyl)-N'-ethylcarbodiimide hydrochloride (EDC·HCl) purchased from Energy and Chemical Co., Ltd., The Anti-CA125 monoclonal antibody (Ab<sub>1</sub>&Ab<sub>2</sub>), Anti-HE4 monoclonal antibody (Ab<sub>1</sub>&Ab<sub>2</sub>) were purchased from Shanghai Linc-Bio Science Co., LTD (Shanghai, China). Goat anti-mouse IgG antibody, sample pads, nitrocellulose membranes, absorbent pads, and black plastic adhesive cards were purchased from Shanghai Joey Biotechnology Co. Ltd. (Shanghai, China).

## **Characterization**

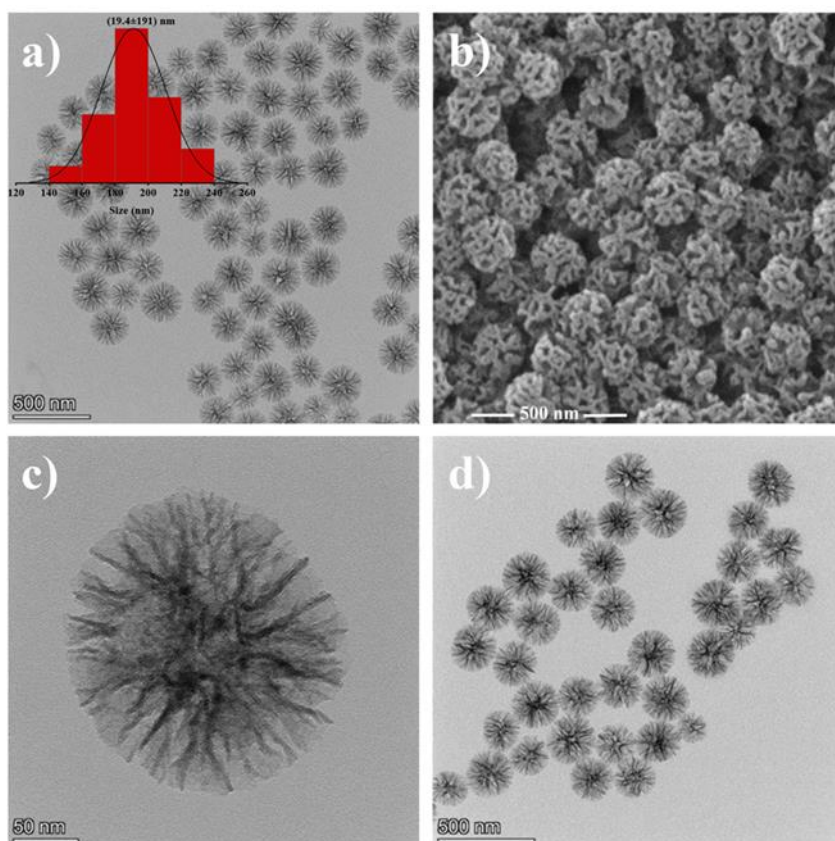
Transmission electron microscopy (TEM) measurements were carried out under a field-emission high-resolution transmission electron microscopy Talos F200X (Thermo Scientific, USA). Scanning electron microscopy (SEM) measurements were carried out under a field emission scanning electron microscopy (Thermo Scientific, USA) operated at 20 kV. The fluorescent spectra were performed on a Shimadzu RF-6000 Spectro Fluorophotometer (Japan). Fourier transform infrared (FT-IR) spectrum was collected from a Nicolet 5700 (Thermo Nicolet Corporation, USA). The Zeta potential is obtained through the Marvern Zetasizer Instrument (Nano ZS, England). UV-vis absorbance spectra were obtained on a Shimadzu UV 2600 spectropolarimeter (Japan).



**Figure S1.1** Fluorescence image of CD<sub>560</sub> synthesized from APTMS under 365 nm UV lamp;  
2 Fluorescence image of CD<sub>2</sub> synthesized from APTES under 365 nm UV lamp;  
3 Fluorescence image of CD<sub>3</sub> synthesized from AEEA under 365 nm UV lamp.



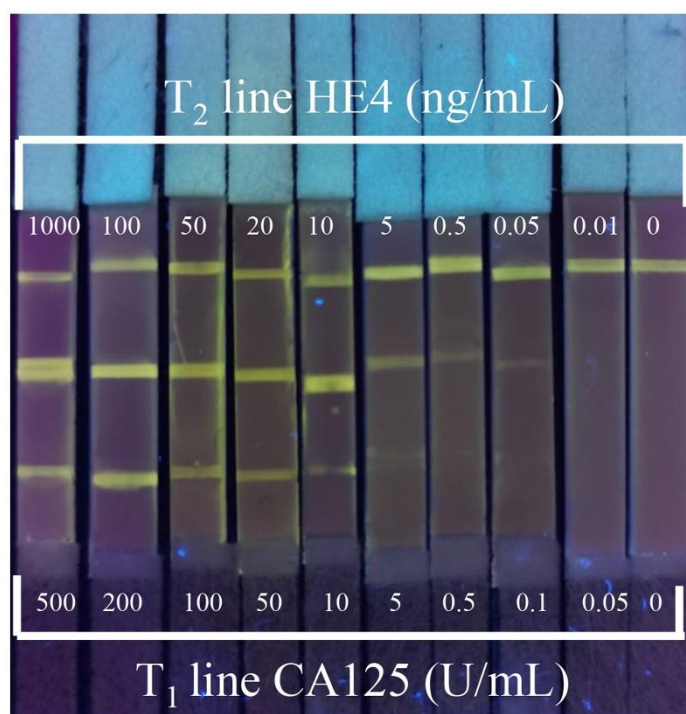
**Figure S2.** Fluorescence Spectra of CD<sub>560</sub> with different Volumes ( $\mu\text{L}$ ) in 10 mg DMSNs.



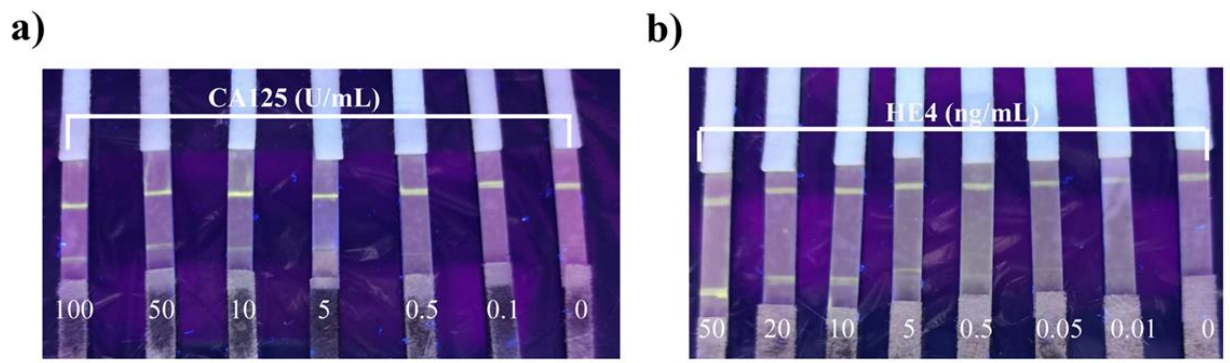
**Figure S3.** (a) TEM image of DMSNs; (b) SEM image of DMSNs; (c,d) TEM image of DMSNs@CD<sub>560</sub>.



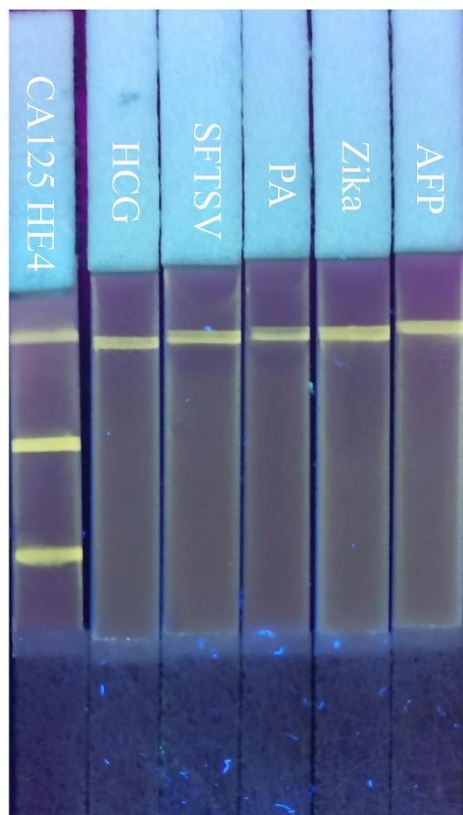
**Figure S4.** Photo of DMSNs@CD<sub>560</sub> dispersed in different PH aqueous solutions



**Figure S5.** DMSNs@CD<sub>560</sub>-FLFIA two-component detection photos of CA125 and HE4 (Strips were dried).



**Figure S6.** (a) Photo of DMSNs@CD<sub>560</sub>-FLFIA testing CA125;(b) Photo of DMSNs@CD<sub>560</sub>-FLFIA testing HE4



**Figure S7.** DMSNs@CD<sub>560</sub>-FLFIA for CA125 and HE4 selective test picture