

## Supporting Information

### **Carbon dots functionalized paper coupled with AgNPs composites platform: Application as a sensor for hydrogen peroxide detection based on surface plasmon-enhanced energy transfer**

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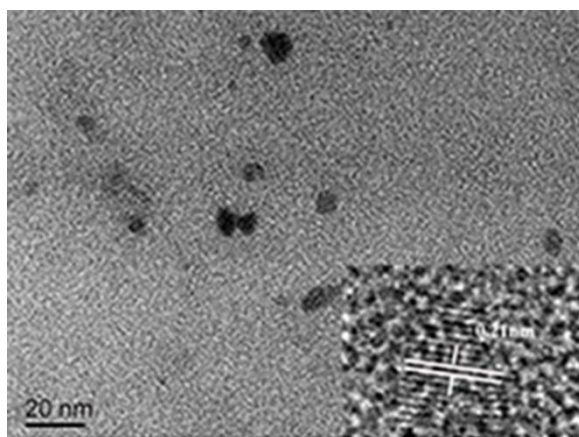
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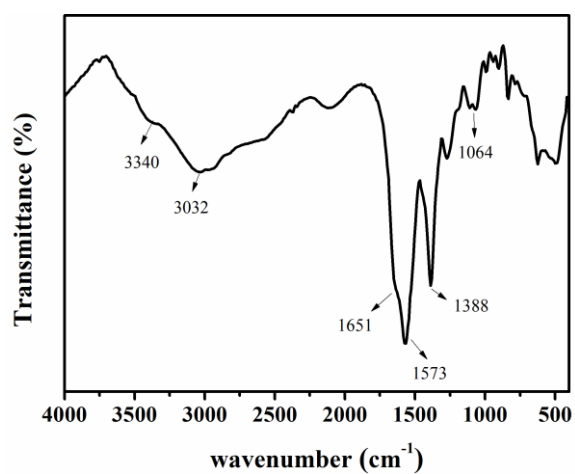
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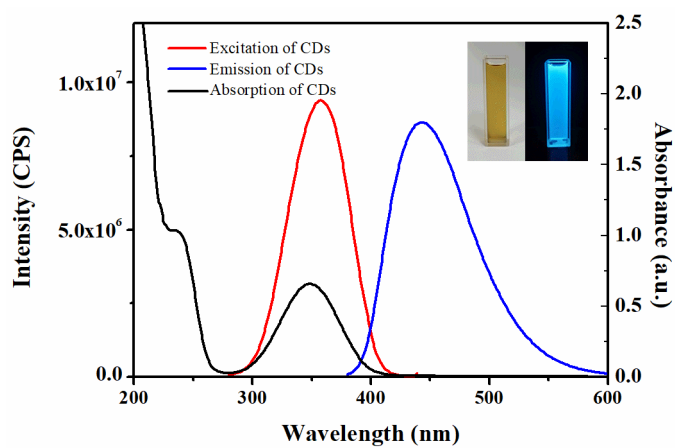
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**Figure S1.** TEM images of CDs (Inset: high magnification TEM image of the CDs).



**Figure S2.** FT-IR spectrum of the CDs.



**Figure S3.** UV-vis absorption spectrum, fluorescence excitation and emission spectra of the CDs. Inset: the images of CDs solution under daylight and 365 nm UV lamp.

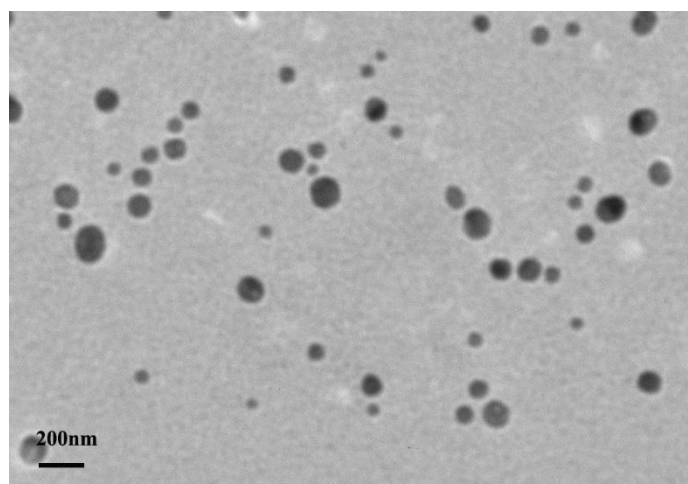


Figure S4. TEM images of AgNPs.

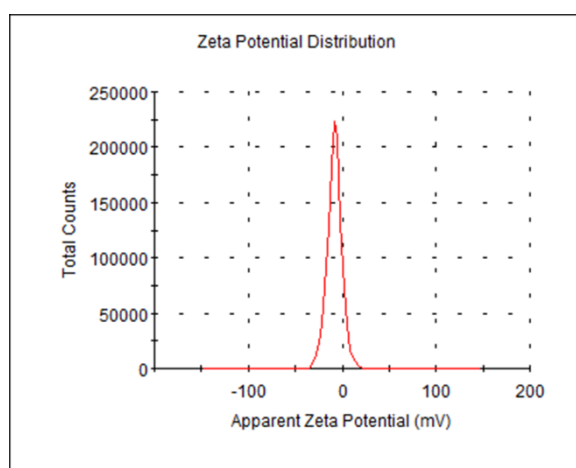


Figure S5. Zeta potential distribution of AgNPs.

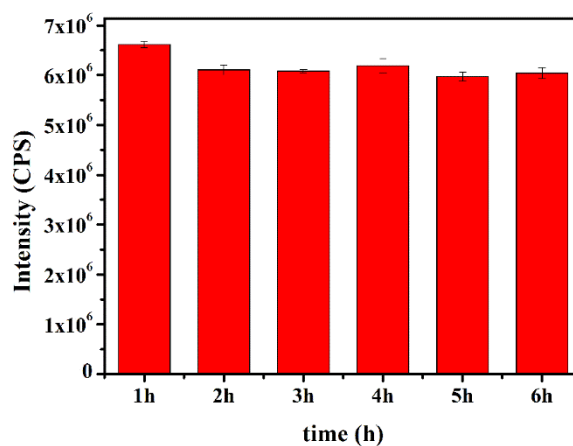
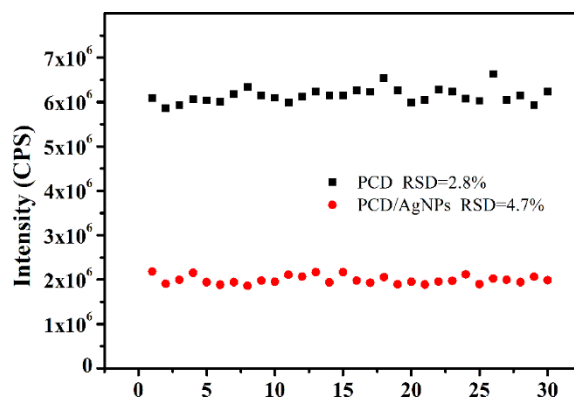
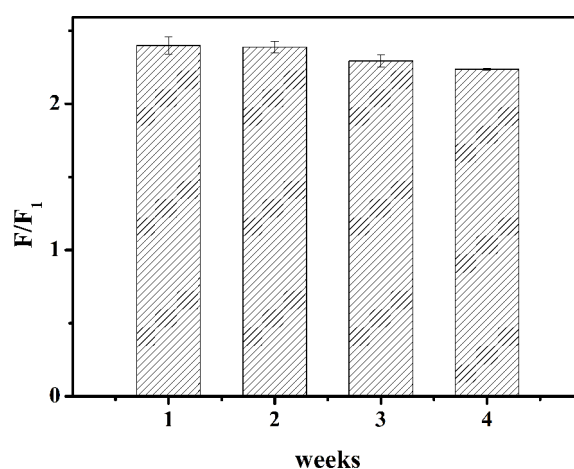


Figure S6. The photostability of PCD.



**Figure S7.** Fluorescence intensity of 30 sites on PCD and PCD/AgNPs (n=15).

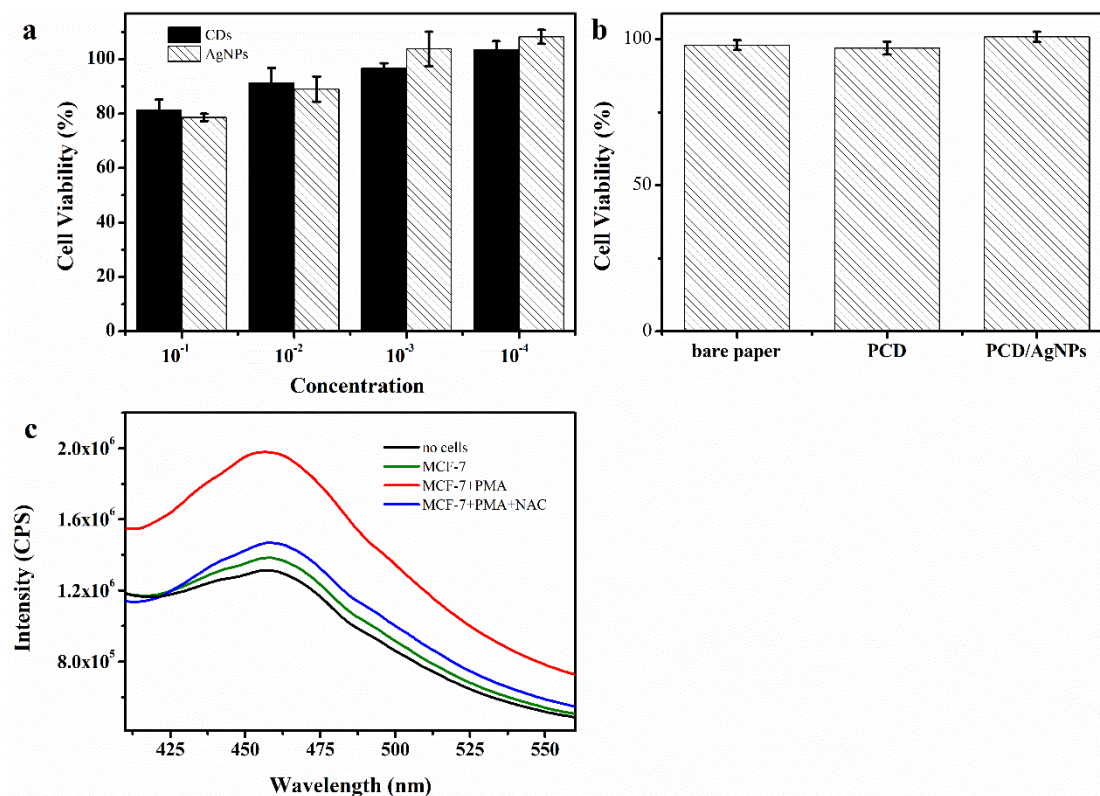


**Figure S8.** The storage stability evaluation of PCD/AgNPs (n=3).

To determine the biocompatibility of CDs and AgNPs, cytotoxicity test was performed using MTT assay on human MCF-7 cells. Briefly, MCF-7 cells were seeded in a 96-well plate at a density of  $4.0 \times 10^4$  per well, followed by the addition of CDs and AgNPs at various concentrations into the wells. After incubation at 37 °C for 24 h, MTT solution ( $5 \text{ mg mL}^{-1}$ ) was added into each well, and the cells were cultured for a further 4 h. After adding 200  $\mu\text{L}$  DMSO into each well, the 96-well plate was incubated for 10 min and shaken for 60 s, then the cell viability was measured and counted using a microplate reader.

To sterilize PCD and PCD/AgNPs completely, the PCD and PCD/AgNPs were immersed ethanol for 30 minutes three times in a 24-well plate, and then soaked in PBS solution for 10 minutes three times to replace the residual ethanol. We soaked the bare paper, PCD and PCD/AgNPs in serum-free medium and incubated at 37 °C for 24 h. The resulting extract is stored in a sterile centrifuge tube at 4 °C until

use. The *in vitro* cytotoxicity evaluation of bare paper, PCD and PCD/AgNPs extract were investigated by the MTT assay on human MCF-7 cells. The MTT experiment process is the same as above.



**Figure S9.** (a) Cell viability (%) estimated by MTT proliferation test versus incubation concentrations of CDs and AgNPs. (b) Cell viability (%) estimated by MTT proliferation test of the bare paper, PCD and PCD/AgNPs extract. (c) Fluorescence spectra of the PCD/AgNPs in the absence and presence of MCF-7 cells triggered by PMA and PMA with NAC.