Simple One-step Synthesis of Water-soluble Fluorescent Carbon Dots from Waste Paper

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Electronic Supplementary Information

In Vitro Cytotoxicity Study

The cytotoxicity of CDs was assessed by using the MTT assay. L02 human hepatocyte cells (or S180 sarcoma cells) \(1 \times 10^4\) cells/well) were grown at 37 °C and under 5% CO\(_2\) atmosphere in RPMI-1640 medium in a 96-well plate, supplemented with calf serum (10%) and 1% penicillin−streptomycin in a fully humidified incubator. Then, the CDs solutions with a concentration of 10, 20, 40, 80, 160, 320, and 640 μg/mL were added to cell dishes, respectively, and then these cell dishes were put into incubators at 37 °C for 12 h. After incubation for a defined time, the culture medium was removed and 20 μL of MTT reagent (diluted in culture medium, 0.5 mg/mL) was added, followed by incubating for another 2 h. The MTT/medium was removed carefully and DMSO (150 μL) was added to each well to dissolve the formazan crystals. Absorbance of the colored solution was measured at 570 nm using a microplate reader.

Cell Imaging

After confirming the fluorescence from CDs and no distinct autofluorescence from the cell itself under similar conditions, the cellular image was obtained with a laser scanning confocal microscope (LSCM, ZEISS, LSM 510 Meta, Germany). S180
sarcoma cells ($6 \times 10^4$ cells/well) were seeded on a 6-well plate at 37 °C for 24 h. After that, the CDs solution with a concentration of 3 mg/mL was added to the cell dishes. After a further 2 h incubation, these CDs-loaded cells were washed with PBS three times to remove the free CDs attached on the outer surface of cell membrane. Cell luminescence imaging was detected on LSCM under excitation wavelength of 364 nm and 488 nm.

**Figure S1**

![Raman spectrum of CDs ($\lambda_{ex} = 532$ nm)](image)

**Fig. S1** Raman spectrum of CDs ($\lambda_{ex} = 532$ nm).
Figure S2

![Zeta Potential Distribution]

**Fig. S2** Zeta potential of CDs.

-32.8 mV

Figure S3

![Normalized PL intensity vs. Time (h)]

**Fig. S3** The photostability of CDs under 365 nm UV light.
Figure S4

Fig. S4 TEM images of CDs prepared at (a) 200 °C and (b) 150 °C, respectively. Insets: the corresponding size distribution histograms.

Figure S5

Fig. S5 PL spectra of CDs prepared at (a, b) 200 °C and (c, d) 150 °C, respectively.
Figure S6

**Fig. S6** UV-Vis absorbance spectra of CDs prepared at 200 °C, 180 °C and 150 °C, respectively.

Figure S7

**Fig. S7** PL decay curves of CDs prepared at 200 °C, 180 °C and 150 °C, respectively.
Figure S8

**Fig. S8** Cell viability by MTT assay.