Supporting Information (SI)

One-step synthesis of mitochondrion-targeted fluorescence carbon dots and fluorescent detection of silver ions

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Methods

Hydrothermal reaction vessel (FD-1A-50) was bought from Shanghai bilon Instrument Manufacturing Co., Ltd. Dialysis bags (MWCO: 100D) were bought from Fourier transform infrared spectroscopy (FTIR) was performed on a NEXUS-470 spectrometer at frequencies ranging from 400 to 4000 cm^{-1}. Samples for transmission electron microscopy (TEM) analysis were prepared by drying a colloidal solution of nanoparticles on amorphous carbon-coated copper grids. TEM were operated on a TECNAIG-S-TWIN transmission electron microscope operated at 200 kV. The zeta potential of the CDs (0.5 mg mL^{-1}) was recorded on a zeta sizer (Nanoplus-3, Micromeritics, the United States). X-ray photoelectron spectroscopy (XPS) was recorded on a AXIS Supra spectrometer. UV-vis absorption spectra were measured with a TU-1901 double-beam UV-vis spectrophotometer. Fluorescence spectroscopy was determined on a Hitachi F-4600 spectrometer.

Cell culture and fluorescence imaging

HeLa cells were incubated with the CDs at 37°C for imaging with Nikon A1Rmp Confocal microscopy. The fluorescent images were recorded at green and red channels with 500-550 nm and 663-738 nm filters separately, and the images were got after the cells incubated with the CDs (0.1 mg/mL) for 30 min. After adding 1.0×10^{-3} M Ag^{+} and incubation for 30 min, the fluorescent images were taken at the same situation. The fluorescence excitation was performed at 408 nm using a diode laser with pin hole and 60x oil objective lens.

Figures

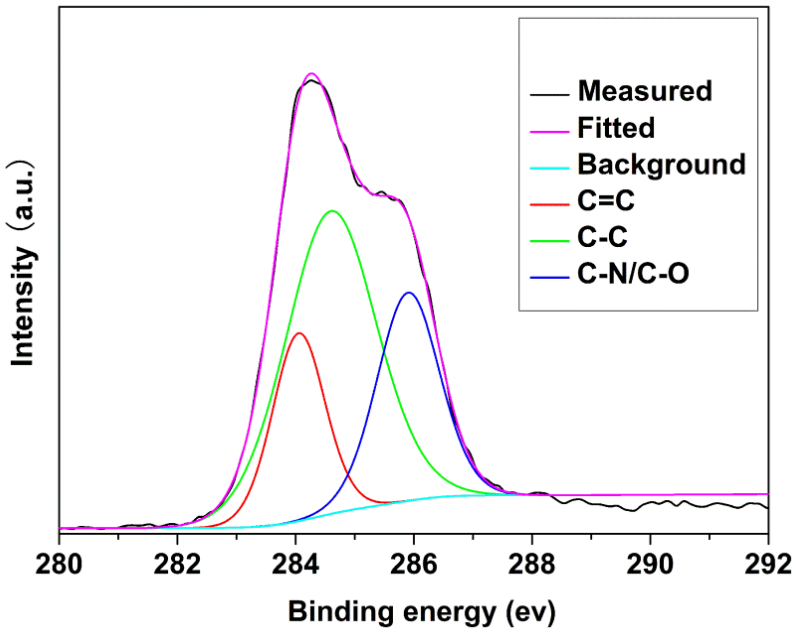

Fig. S1 High-resolution C1s XPS spectra of CDs.

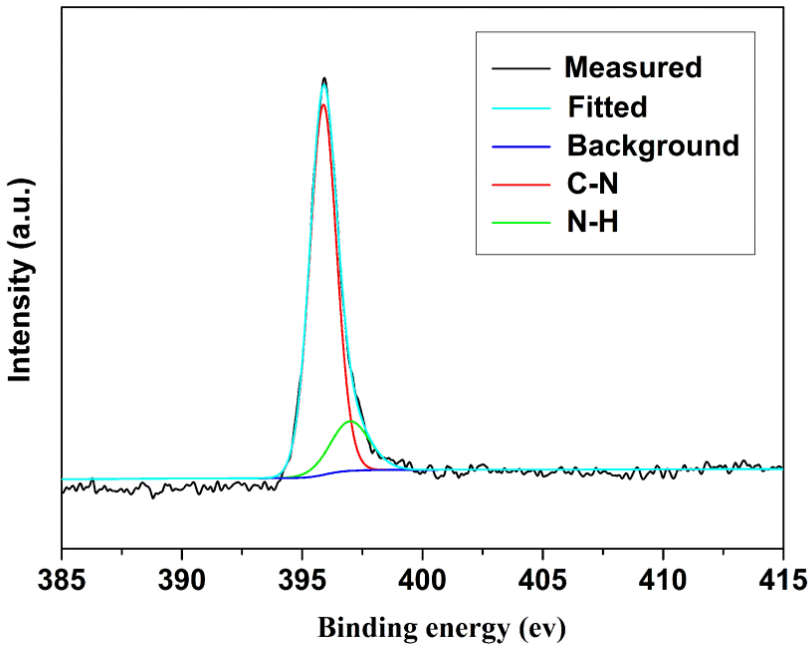

Fig. S2 High-resolution N1s XPS spectra of CDs.

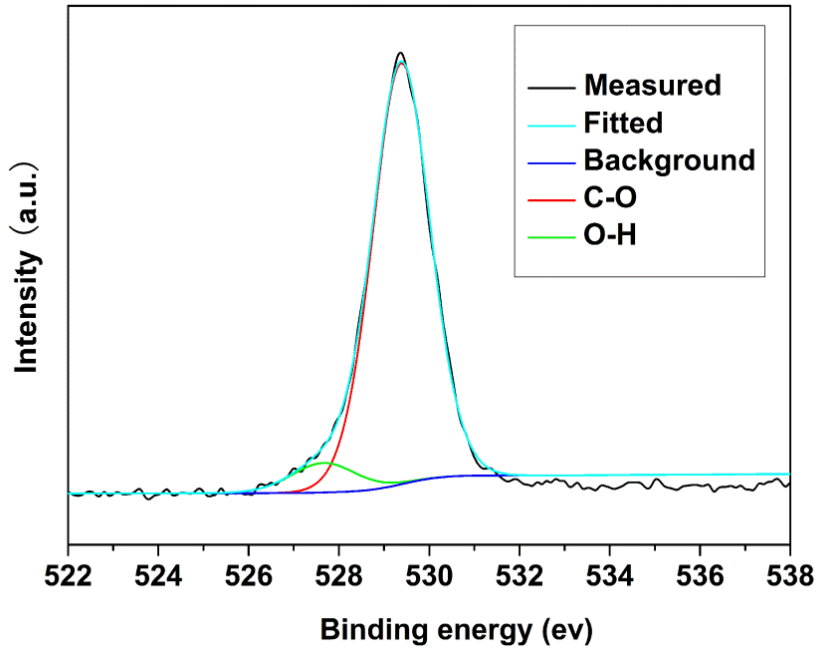

Fig. S3 High-resolution O1s XPS spectra of CDs.

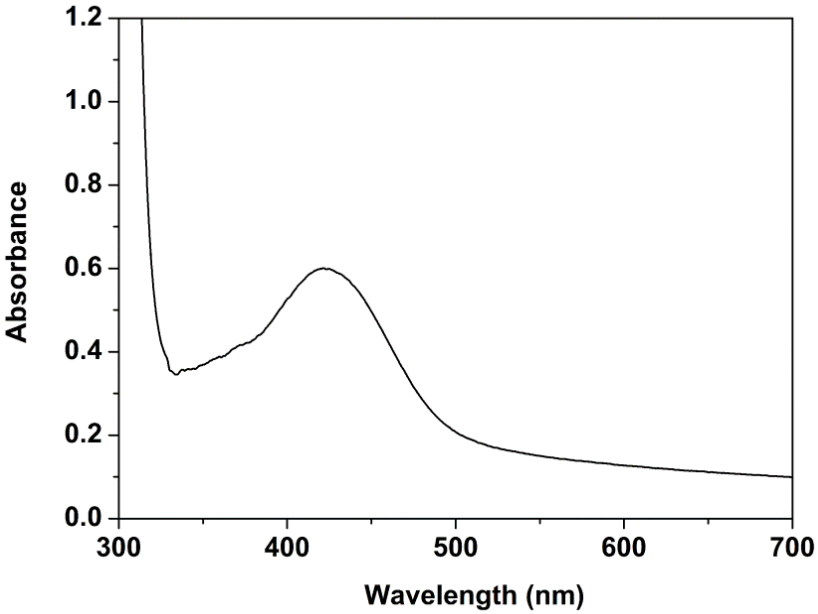

Fig. S4 UV-vis absorption spectrum of 0.1 mg/mL CDs water solution.

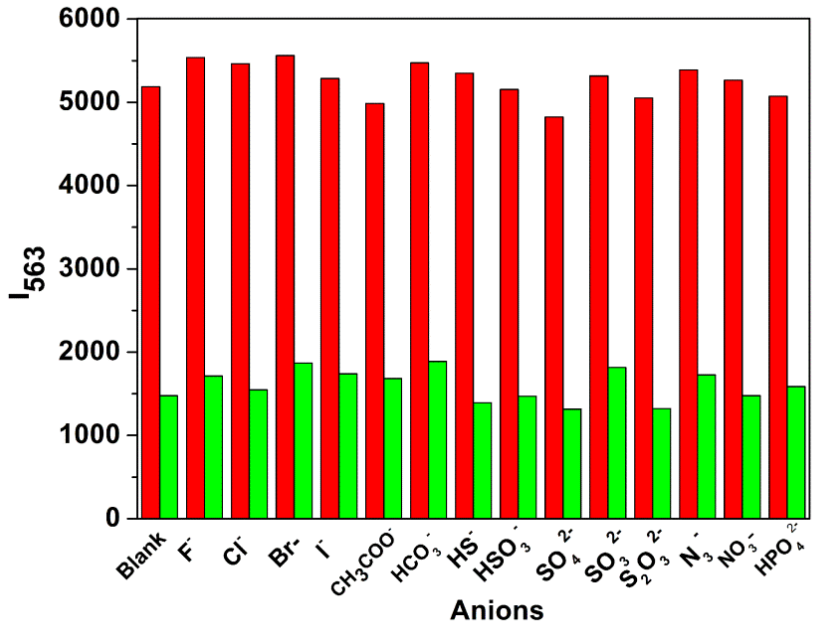

Fig. S5 Fluorescence responses of 0.1 mg/mL CDs water solution upon addition of different anions (100 μM water solution) (red bars), and fluorescence changes of the mixture of CDs and Ag^{+} (1 mM) after addition of the indicated anions (100 μM water solution) (green bars). The excitation wavelength was 420 nm. I_{563} represents the emission intensity at 536 nm.

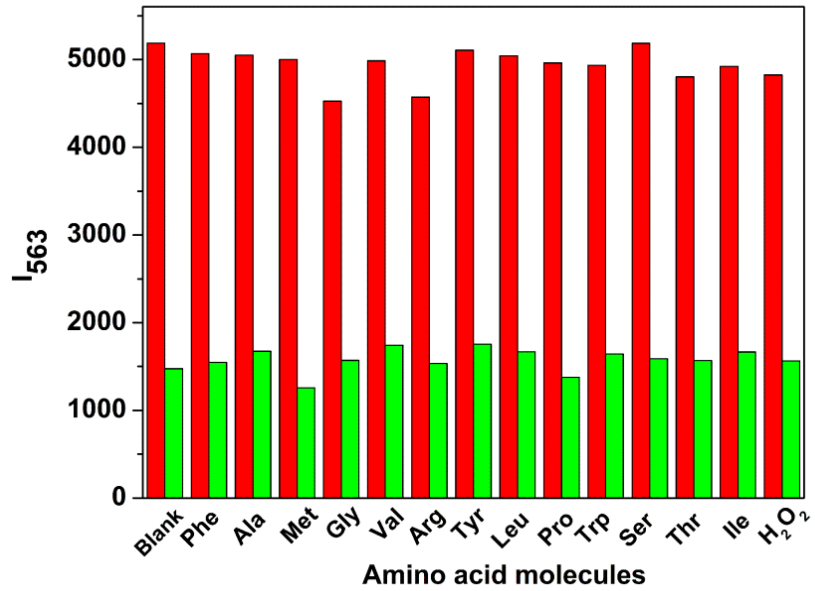

Fig. S6 Fluorescence responses of 0.1 mg/mL CDs water solution upon addition of different amino acid molecules (1.0×10^{-3} M) (red bars), and fluorescence changes of the mixture of CDs and Ag^{+} (1 mM) after addition of the indicated amino acid molecules (1.0×10^{-3} M) (green bars). The excitation was at 420 nm. I_{563} represents the emission intensity at 536 nm.

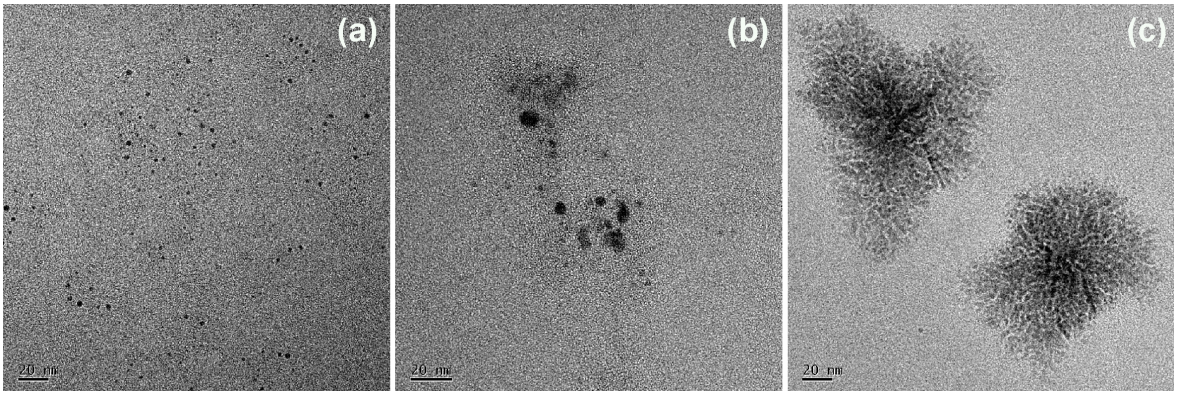

Fig. S7 TEM images of CDs (a), CDs and Ag^{+} (b), CDs and Cd^{2+} (c).

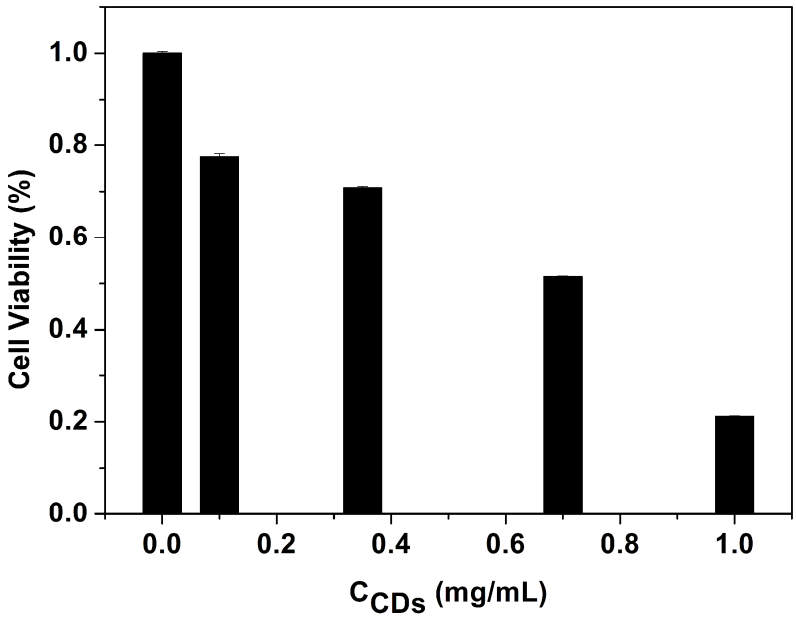

Fig. S8 Viability assay for HeLa cells treated with probe CDs in dark.