Supporting Information

Pb (II) detection and versatile bio-imaging of green-emitting carbon dots with excellent stability and bright fluorescence

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1.1 Characterization

Transmission electron microscopy (TEM) observations were carried out on a Tecnai F20 microscope. XPS measurements were recorded using a ESCALAB 250Xi (Thermo Scientific). The solids for X-ray diffraction (XRD) patterns were obtained using RINT 2200 Science diffractometer. UV–vis absorption spectra of samples were collected on UV-3600 (Shimazu, Japan). The FT-IR spectrum of Y-CDs was recorded in the range of 400-4000 cm−1 with PerKin EImer FT-IR spectrometer Frontier using samples embedded in KBr tablet. Fluorescence spectra and lifetime decay cures of samples were measured with FLS980 fluorescence spectrometer (Edinburgh, UK). The cellular imaging was carried out using confocal laser fluorescence microscopy (LSM 700, Carl Zeiss, Germany). The zebrafish imaging was observed by fluorescent inverted microscope (Axio Observer). Slit width, integration time and light source of UV5200 spectrometer is 2.0 nm, 300 s and 24 W Osram 64653 halogen lamp, respectively. Light source of FLS980 spectrometer for PL/PLE and decay lifetime measurement is Xe900 and nF900 lamp, respectively. The power of Xe900 and nF900 lamp is 450 w and 150 W flash, and the corresponding spectral range is 200-2000 nm and 220-800 nm. The pulse width of nF900 is 1.0-1.6 ns, while Xe900 is a continuous wave lamp.

1.2 Cytotoxicity test

A-549 cells were cultured in Dulbecco's modified Eagle's medium (DMEM) containing 10 % fetal bovine serum (FBS) in humidified 5% CO_2 atmosphere at 37 ℃. In details, cells were seeded in 96-well plates at a density of 1×10^5 /mL, with 100 μL medium per well. After incubation for 24 h, the

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original medium in each well was discarded and 100 mL of medium containing various concentrations of G-CDs was added to the designated wells. The controls were treated with medium only. Then, 10 μL of CCK-8 was added to each well since the cells were cultured for another 24 h. The plates were incubated for 4 h at 37 ℃ and the absorbance at 450 nm was detected with a microplate reader (Biotek, Vermont, USA).

1.3 Cell imaging

To observe the influence of carbon dots on cell imaging, A-549 cells were seeded into a glass bottom cell culture dish and cultured at 37 °C for 24 h. Then, the same concentrations of G-CDs were separately added in each plate. After cultivate for 8 h at 37 °C respectively, the supernatant was removed, and the cell was washed with PBS for three times and refilled with 4 % paraformaldehyde. Images were captured with a confocal microscope (Zeiss LSM7000 confocal) and 488 nm was used as excitation wavelength to measure the fluorescence intensity of G-CDs.