Electronic Supplementary Material (ESI) for Analytical Methods.

An "on-off-on" selective fluorescent probe based on nitrogen and sulfur co-doped carbon dots for detecting Cu^{2+} and GSH in living cells

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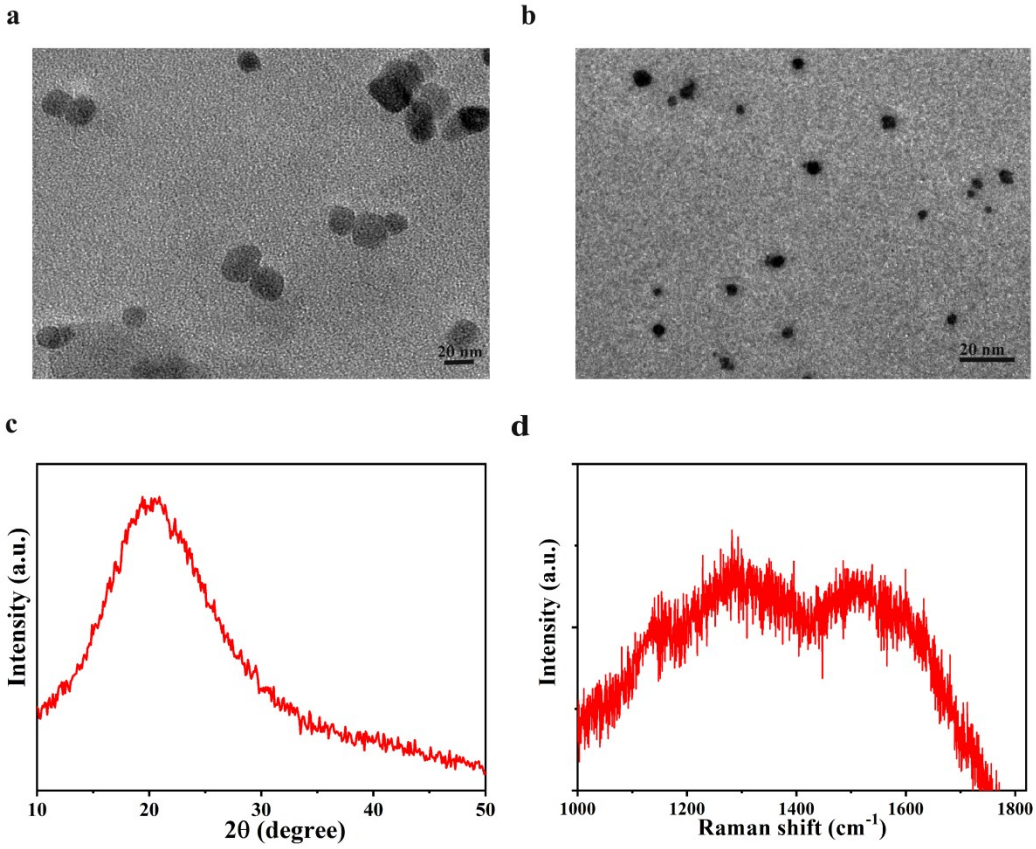

Figure. S1 (a) The TEM images of N, S-CDs/Cu^{2+}. (b) The TEM images of N, S-CDs/Cu^{2+}/GSH. (c) The XRD pattern of the N, S-CDs. (d) Raman spectroscopy of N, S-CDs.

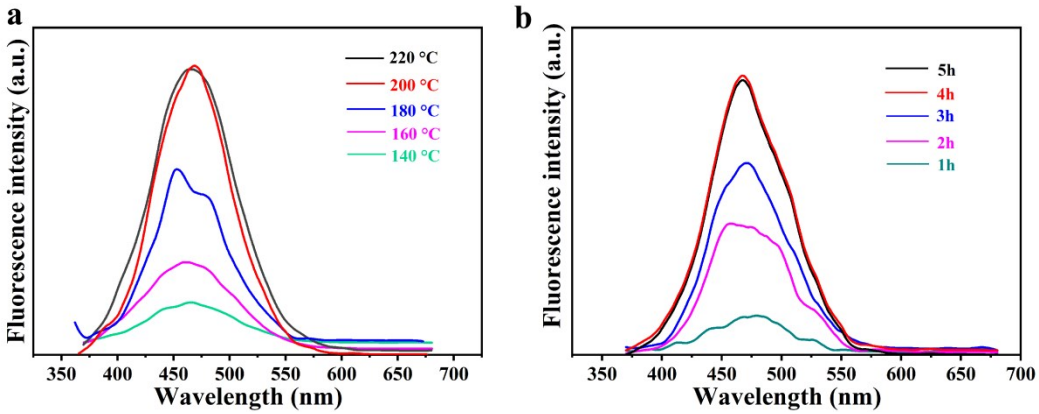

Figure. S2 (a) The reaction temperature (140-160 ˚C) , **(b)** reaction time (1-5h) of N, S-CDs.

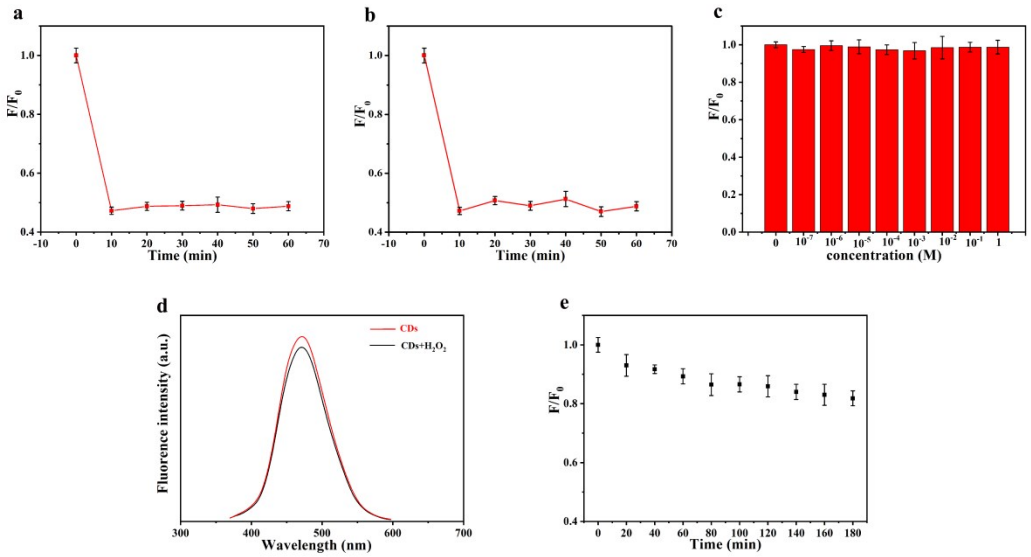

Figure. S3 (a) Relationship between reaction time (0-60 min) of N, S-CDs/Cu^{2+}. (b) Reaction time (0-60 min) of N, S-CDs/Cu^{2+}/GSH. (c) Fluorescence spectra of N, S-CDs treated with different concentrations of NaCl solutions. (d) Fluorescence spectra of N, S-CDs (red) and N, S-CDs+ H_2O_2 (black) (e) Fluorescence spectra of N, S-CDs irradiation for 3 hours under UV light.

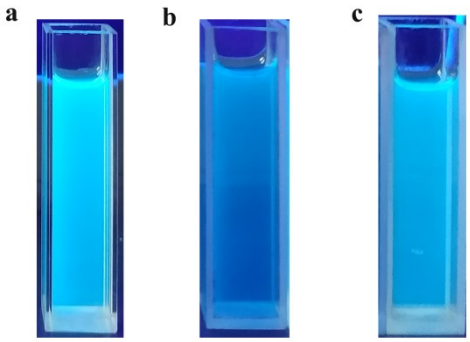

Figure. S4 The N, S-CDs is irradiated at a wavelength of 365 nm with an ultraviolet lamp, a is the N, S-CDs, b is the N, S-CDs/Cu^{2+} and c is the N, S-CDs/Cu^{2+}/GSH.

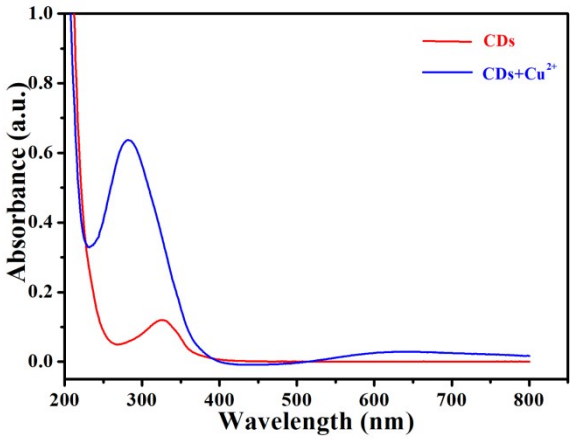

Figure. S5 UV-vis absorption spectra of N, S-CDs and N, S-CDs/Cu^{2+}.

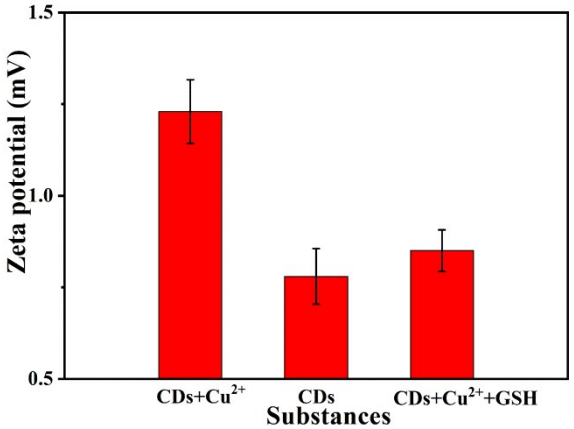

Figure. S6 Zeta potential of N, S-CDs, N, S-CDs/Cu^{2+} and N, S-CDs/Cu^{2+} /GSH,

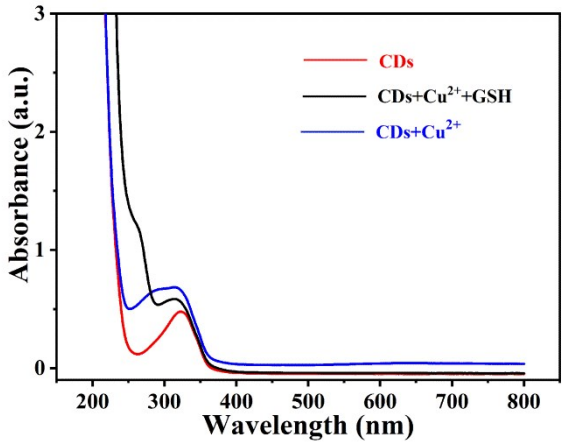

Figure. S7 UV-vis absorption spectra of N, S-CDs (red), N, S-CDs/Cu^{2+} (blue), and N, S-CDs/Cu^{2+}/GSH (black).

Table S1 Optical parameters of pH, reaction time and used amount for the detection of Cu^{2+} and GSH

Analyte	pH	Time (min)	Amount (μL)
Cu^{2+}	7	10	50
GSH	7	10	100