

Electronic Supplementary Information

A fluorescent probe based on N-doped carbon dots for detection of intracellular pH and glutathione

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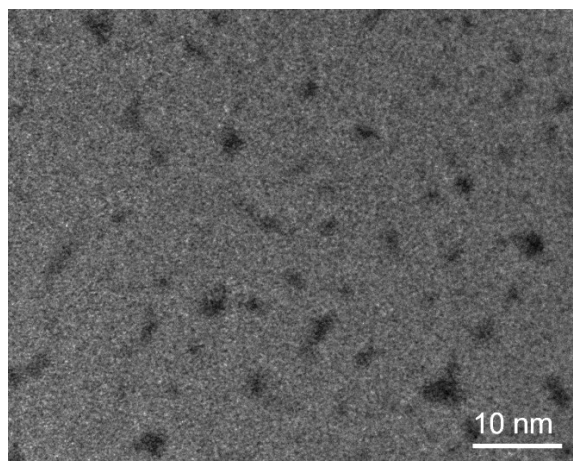


Fig. S1 TEM image of N-CDs.

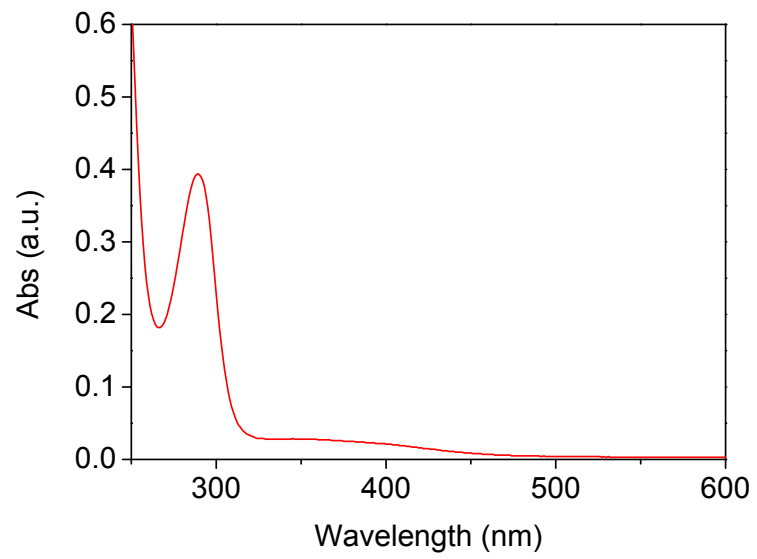


Fig. S2 UV-Vis absorption spectrum of N-CDs.

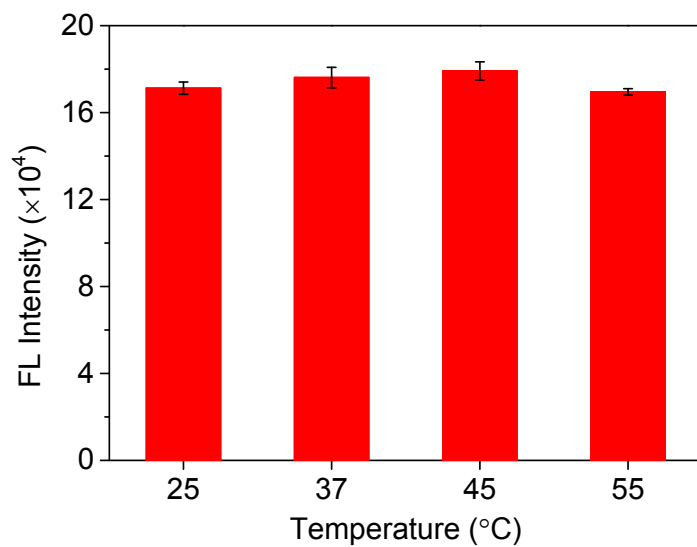


Fig. S3 Fluorescence intensity of N-CDs at 510 nm at different temperatures. The excitation wavelength is 360 nm. All experiments were repeated 3 times.

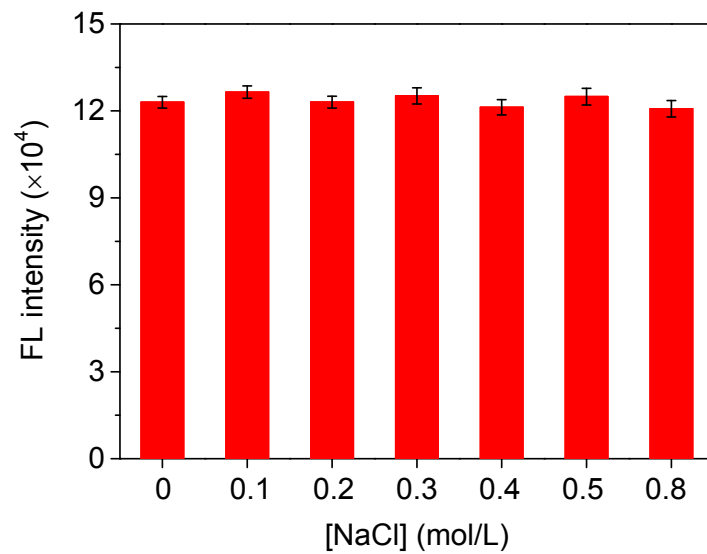


Fig. S4 Fluorescence intensity of N-CDs at 510 nm at different NaCl concentrations. The excitation wavelength is 360 nm. All experiments were repeated 3 times.

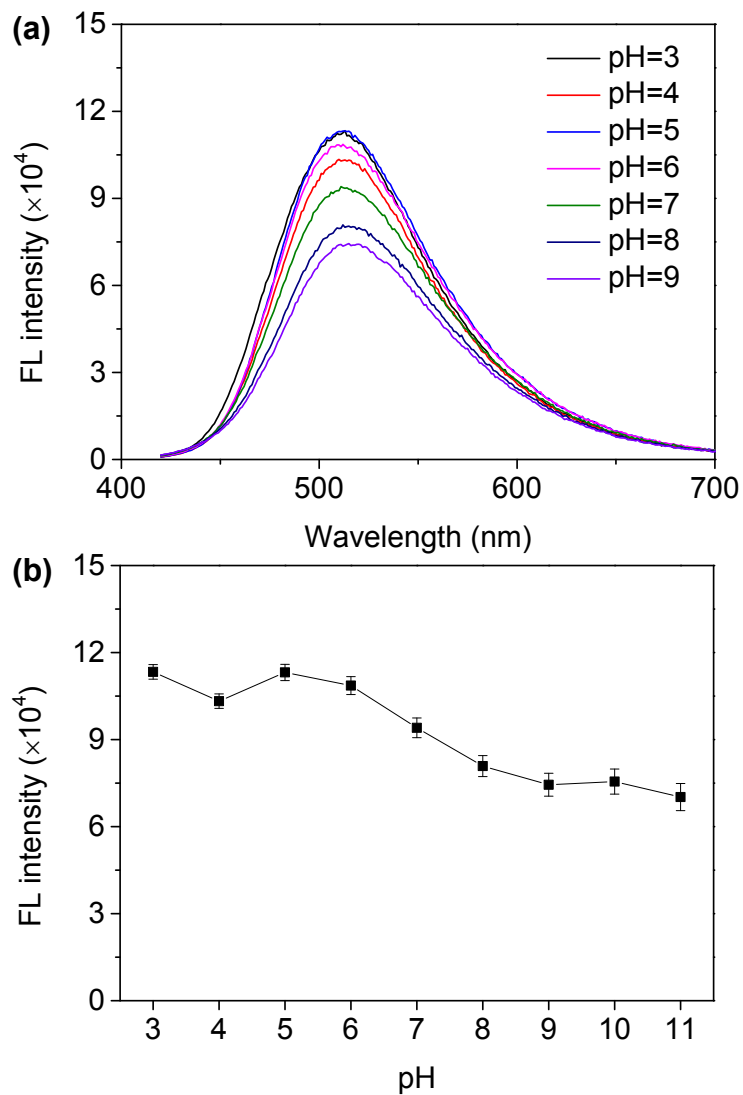


Fig. S5 (a) Fluorescence spectra of N-CDs in disodium citrate-citrate buffer solution and (b) relationship between fluorescence intensity at 510 nm and pH. All experiments were repeated 3 times.

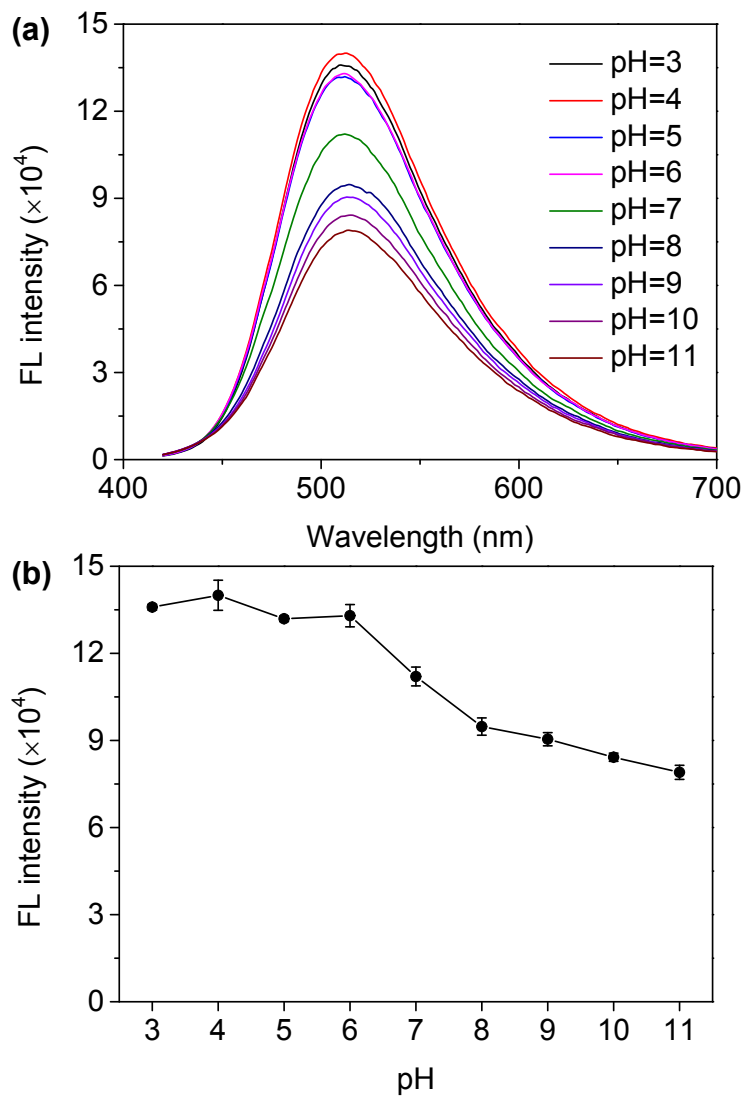


Fig. S6 (a) Fluorescence spectra of N-CDs in Tris-HCl buffer solution and (b) relationship between fluorescence intensity at 510 nm and pH. All experiments were repeated 3 times.

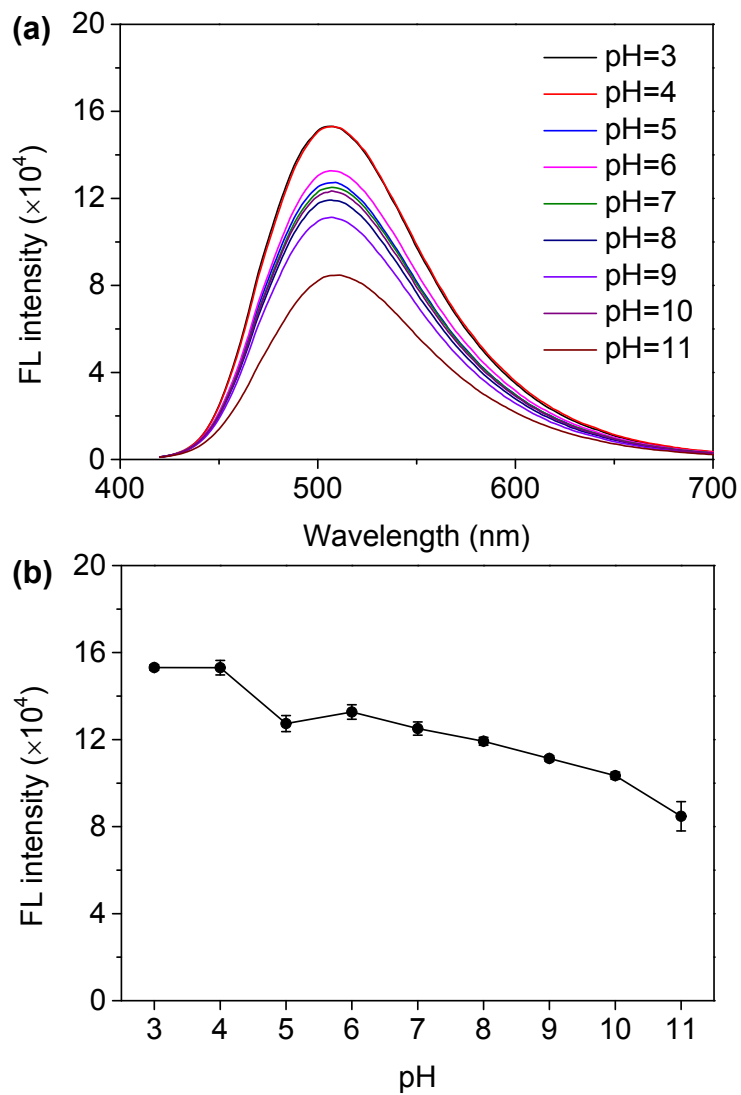


Fig. S7 (a) Fluorescence spectra of N-CDs in HCl/NaOH solution, (b) relationship between fluorescence intensity at 510 nm and pH. All experiments were repeated 3 times.

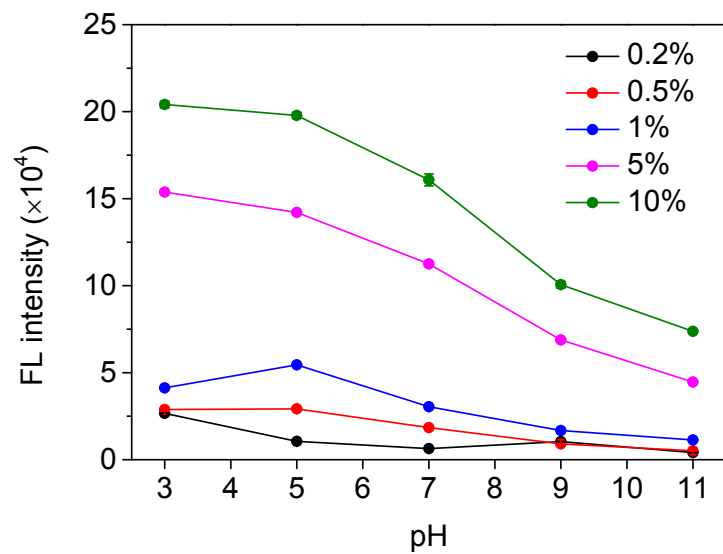


Fig. S8 Relationship between fluorescence intensity of N-CDs at 510 nm and pH at different N-CDs concentrations. All experiments were repeated 3 times.

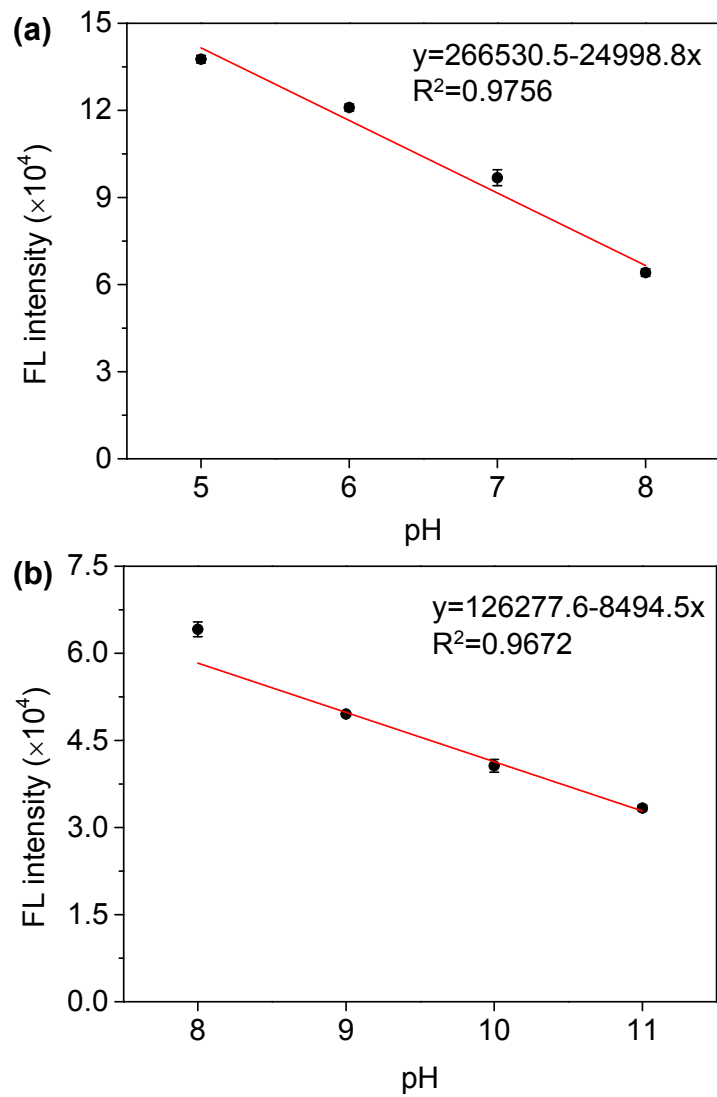


Fig. S9 Linear relationship of fluorescence intensity of N-CDs at 510 nm versus pH in the range of (a) 5-8 and (b) 8-11. All experiments were repeated 3 times.

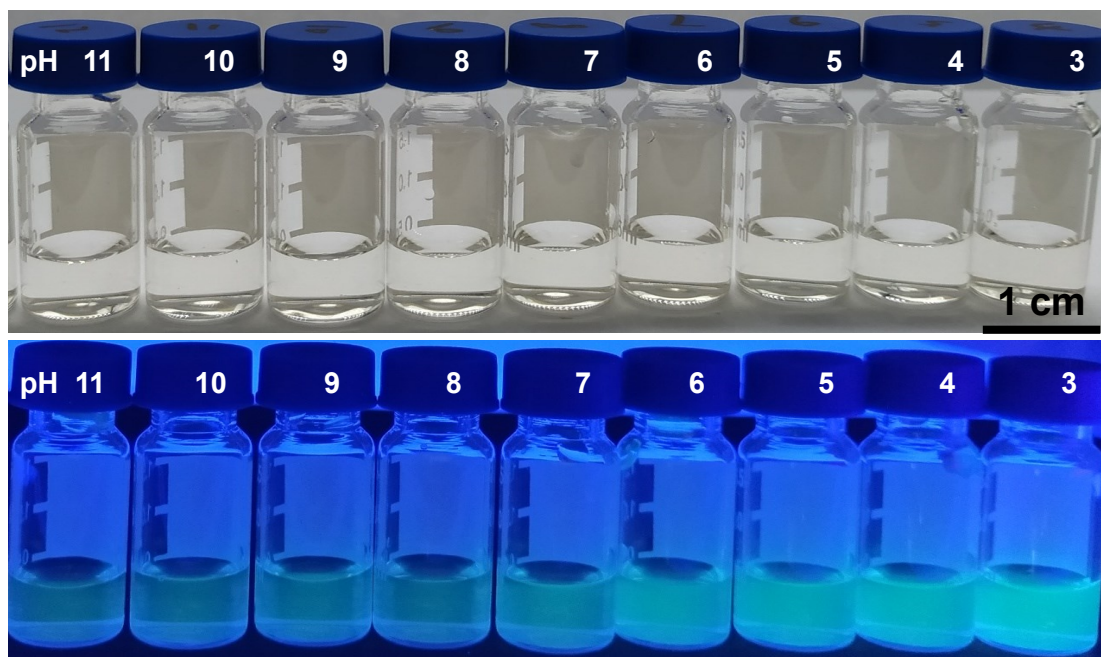


Fig. S10 Photographs of N-CDs under daylight and UV lamp (365 nm) irradiation.

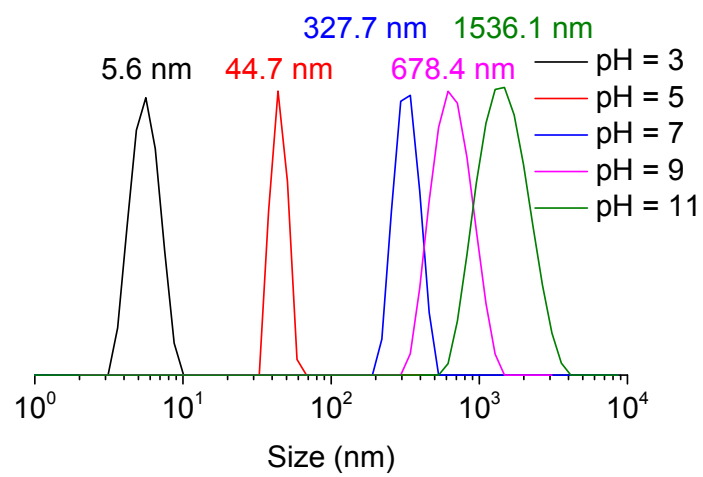


Fig. S11 DLS patterns of N-CDs at different pH.

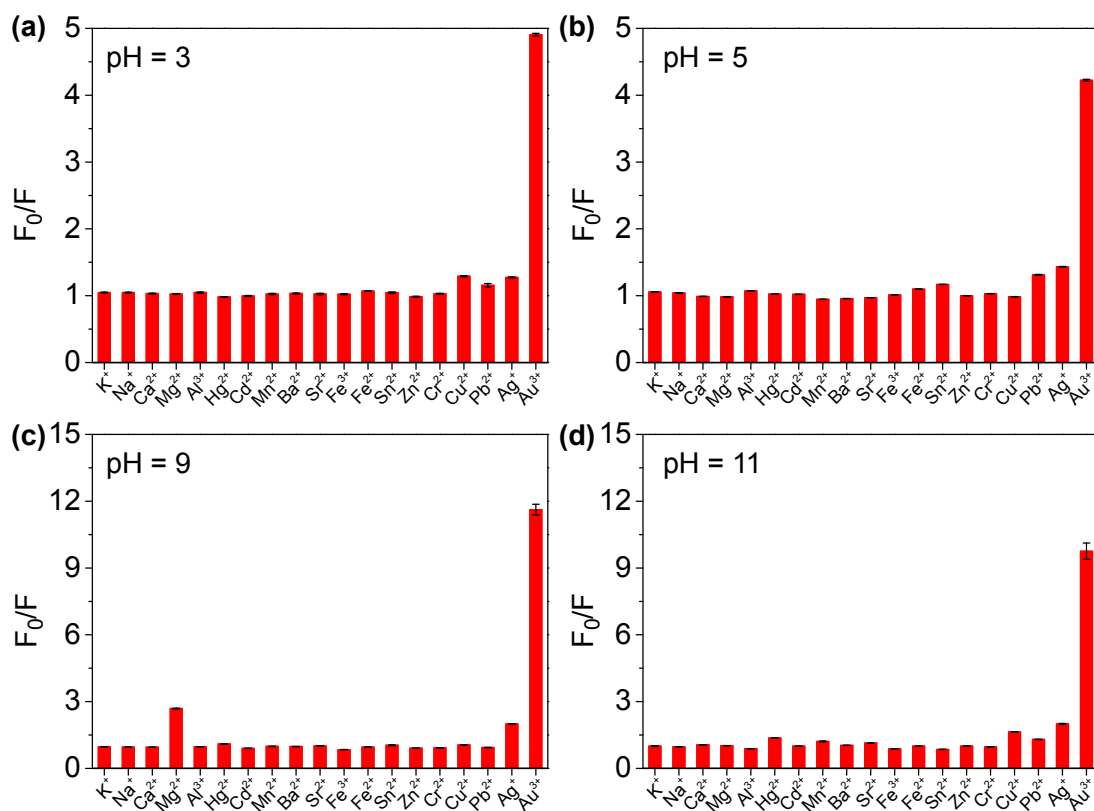


Fig. S12 Selectivity of the probe for different analytes. F_0 and F represent fluorescence intensity of N-CDs and N-CDs+analyte at 510 nm, respectively. The analyte concentration is 1 mM. Ex = 400 nm. (a) pH = 3, (b) pH = 5, (c) pH = 9, and (d) pH = 11. All experiments were repeated 3 times.

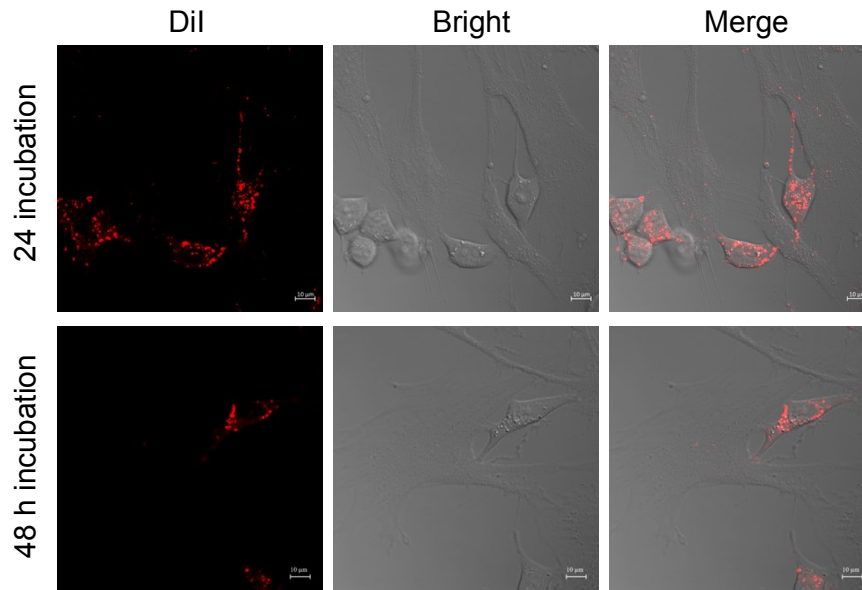


Fig. S13 Confocal image of co-culturing DiI-labeled HeLa and HESC cells, Ex = 544 nm, Em = 555-575 nm. DiI was incubated with HeLa cells for 24 h and 48 h. Scale bar: 10 μm.

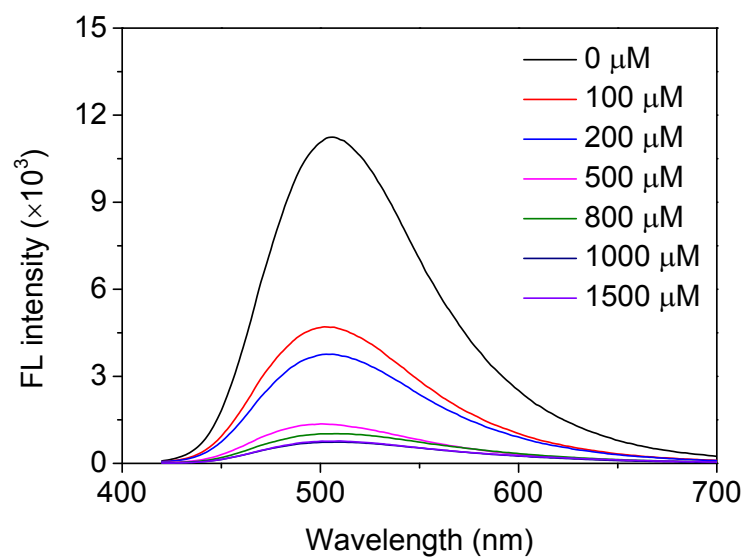


Fig. S14 Fluorescence spectra of N-CDs after adding Au³⁺. Au³⁺ concentration is 0-1500 μM.

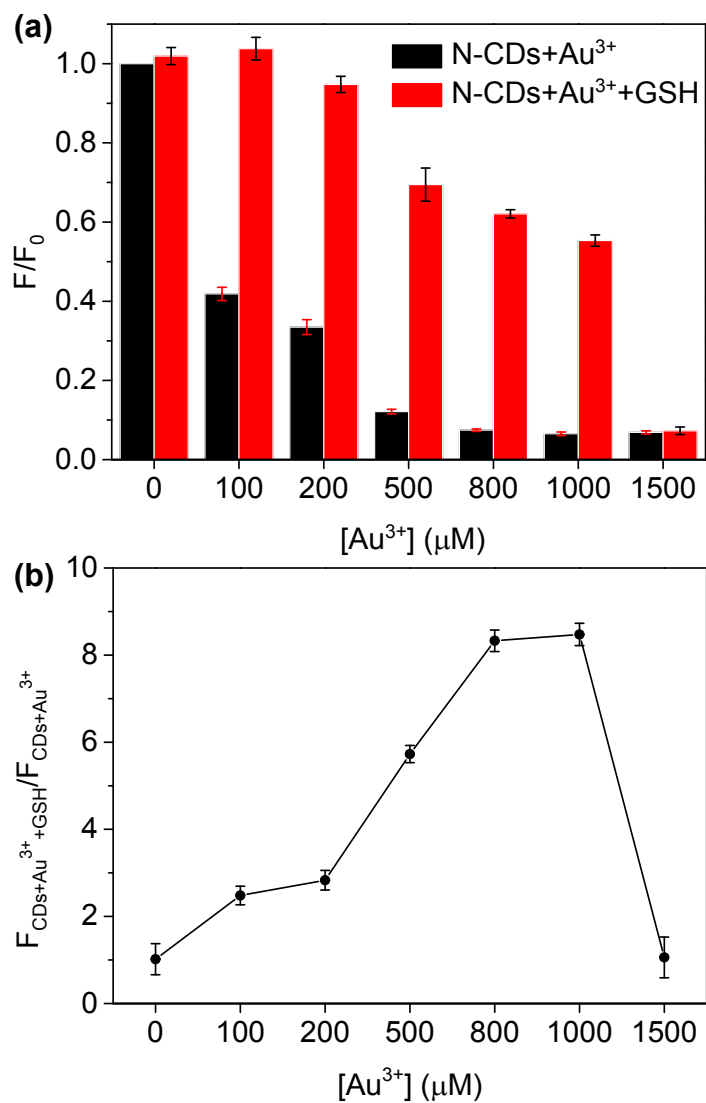


Fig. S15 (a) Fluorescence intensity of N-CDs+ Au^{3+} and N-CDs+ Au^{3+} +GSH. F_0 represents fluorescence intensity of N-CDs at 510 nm. (b) Ratio of fluorescence intensity of N-CDs+ Au^{3+} +GSH and N-CDs+ Au^{3+} . All experiments were repeated 3 times.

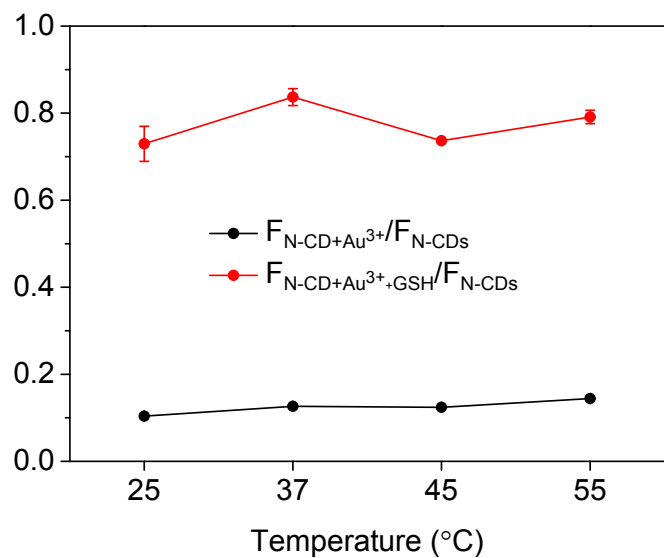


Fig. S16 Ratio of fluorescence intensity of N-CDs+Au³⁺ or N-CDs+Au³⁺+GSH to fluorescence intensity of N-CDs at 510 nm at different temperatures. All experiments were repeated 3 times.

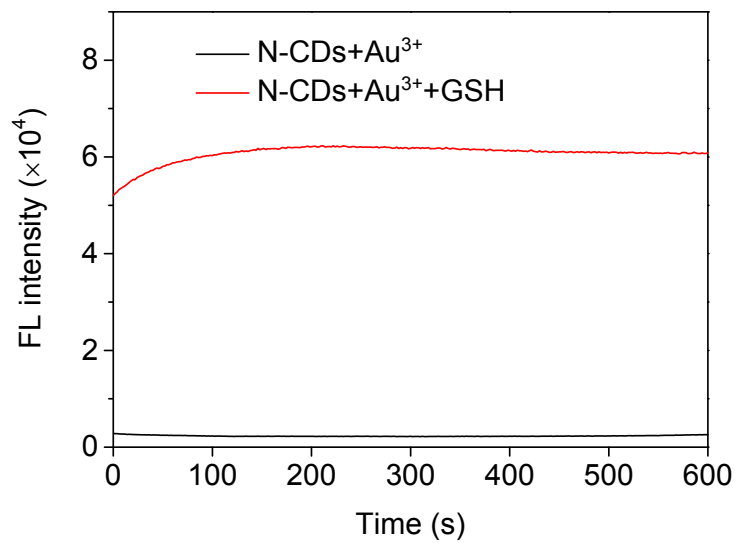


Fig. S17 Relationship between fluorescence intensity of N-CDs+Au³⁺ or N-CDs+Au³⁺+GSH at 510 nm and incubation time.

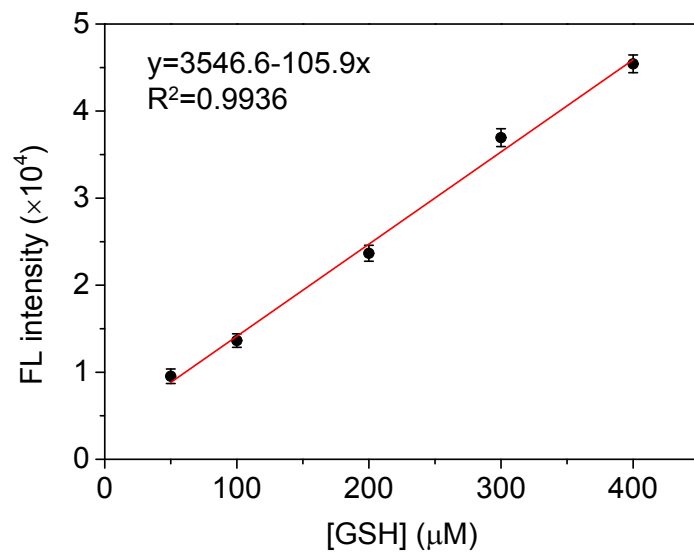


Fig. S18 Linear relationship of fluorescence intensity of N-CDs+Au³⁺ at 510 nm versus GSH concentration in the range of 50-400 μM. All experiments were repeated 3 times.