Electronic Supplementary Information

For

A photoluminescence "switch-on" nanosensor composed of nitrogen and sulphur co-doped carbon dots and gold nanoparticles for discriminative detection of glutathione

Jizhou Li, Xinyue Rao, Feng Xiang, Jianjia Wei, Mengke Yuan, and Zhongde Liu*

Key Laboratory of Luminescent and Real-Time Analytical Chemistry (Southwest University), Ministry of Education, College of Pharmaceutical Science, Southwest University, Chongqing 400716, China. Tel: +86-23-68251910. Fax: +86-23-68251048. E-mail: lzdzhy@swu.edu.cn.

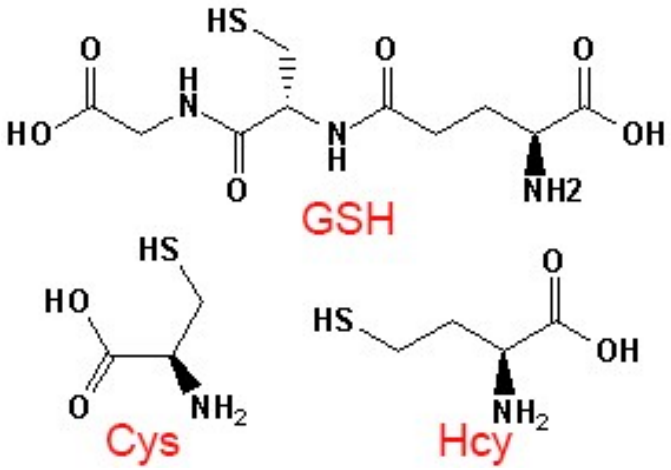

Fig.S1 The structure of GSH, Cys, and Hcy.

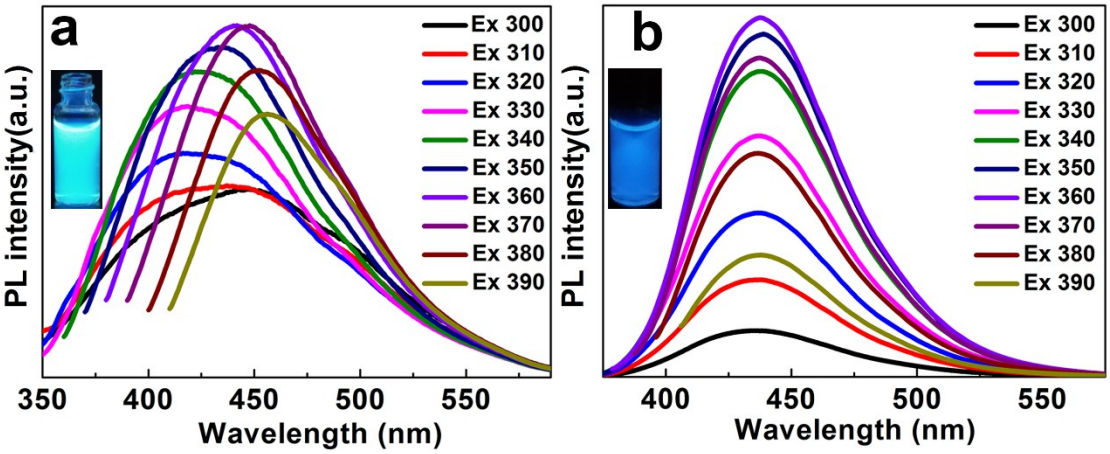

Fig.S2 PL spectra (recorded from 300 to 390 nm with 10 nm increment) of the N-CDs (a) and the N, S-CDs (b), respectively. The inset showing photographs of the N-CDs and the N, S-CDs under 365 nm UV light.

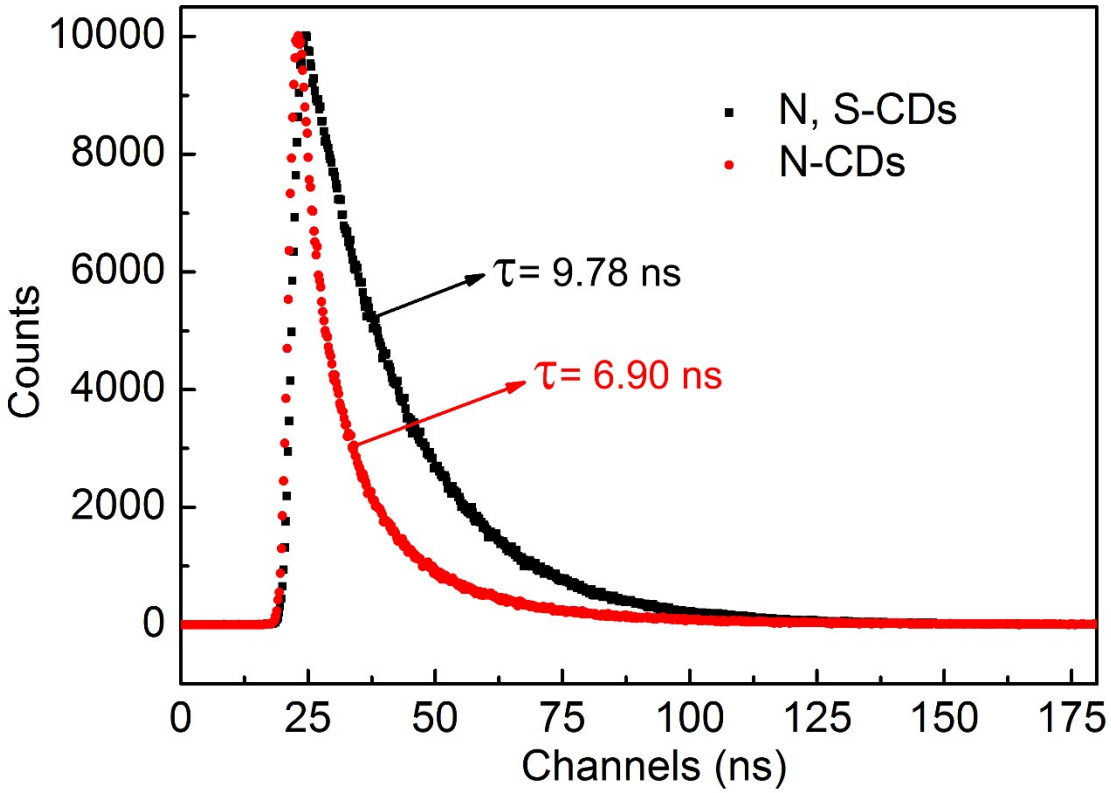

Fig.S3 PL decays (375 nm laser excitation, and monitored through 435 nm bandpass filter) of the N-CDs and the N, S-CDs, respectively.

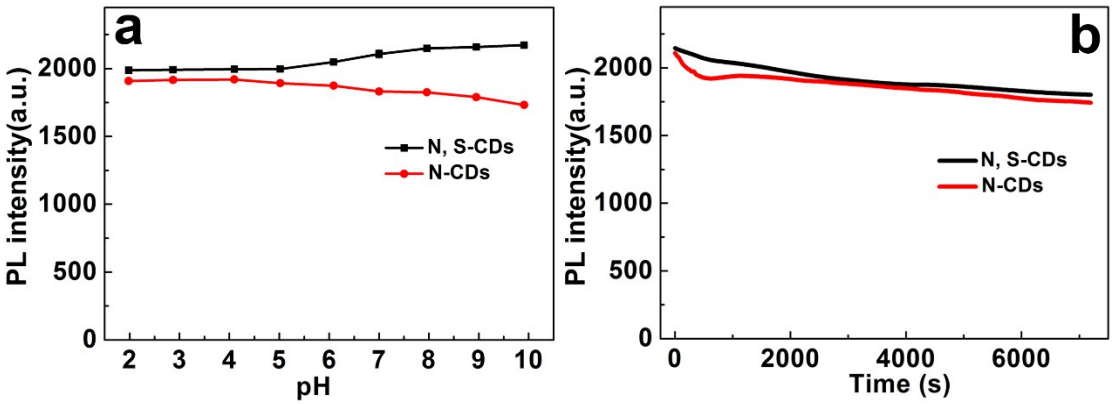

Fig.S4 (a) Effect of pH value on the PL intensity of the obtained N, S-CDs and N-CDs, respectively. (b) Photostability of the N, S-CDs and N-CDs under different illumination time.

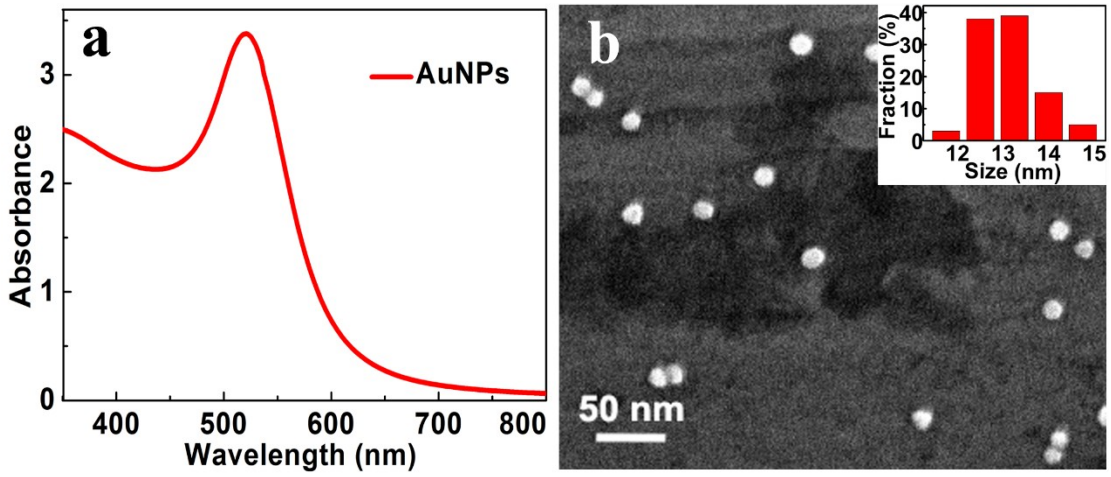

Fig.S5 Characterization of the as-prepared AuNPs. (a) UV-vis spectra of the AuNPs. (b) SEM image of the AuNPs, the inset showing the size distribution of the AuNPs.

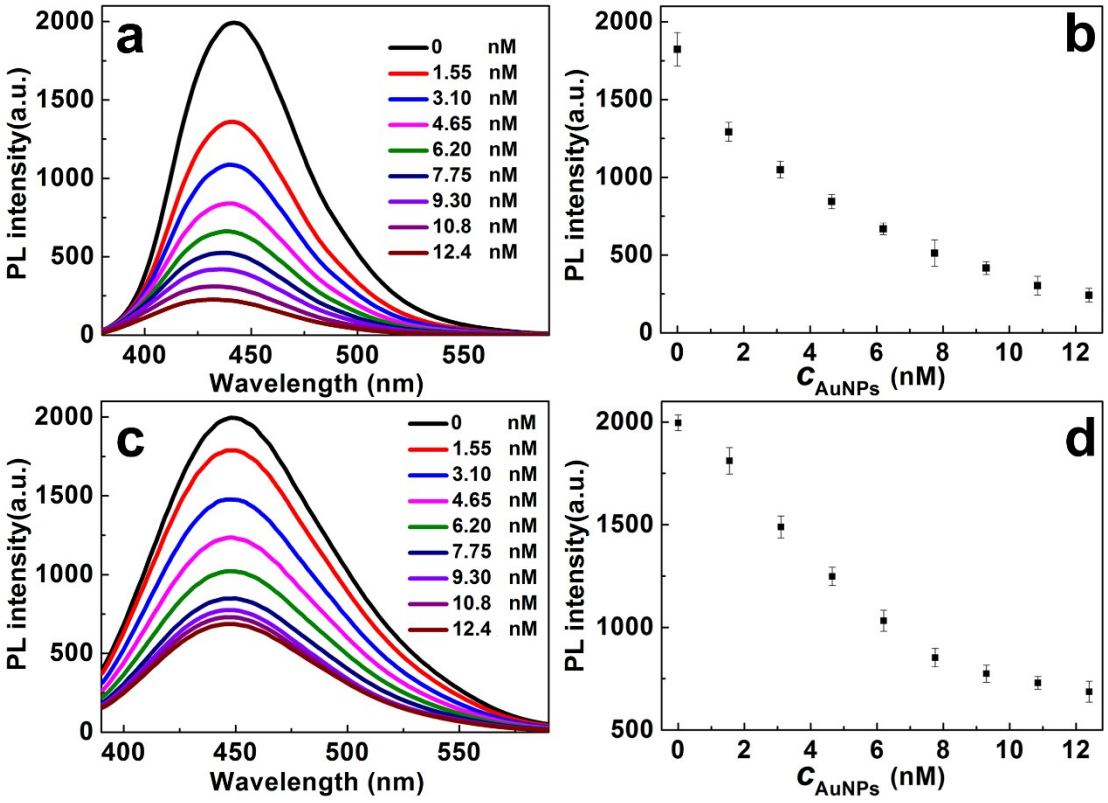

Fig.S6 (a) PL spectra of the N, S-CDs in the absence and presence of different concentration of AuNPs; (b) The variation of PL intensity of the N, S-CDs at 437 nm with the increasing concentrations of AuNPs; (c) PL spectra of the N-CDs in the absence and presence of different concentration of AuNPs; (d) The variation of PL intensity of the N-CDs at 448 nm with the increasing concentrations of AuNPs.

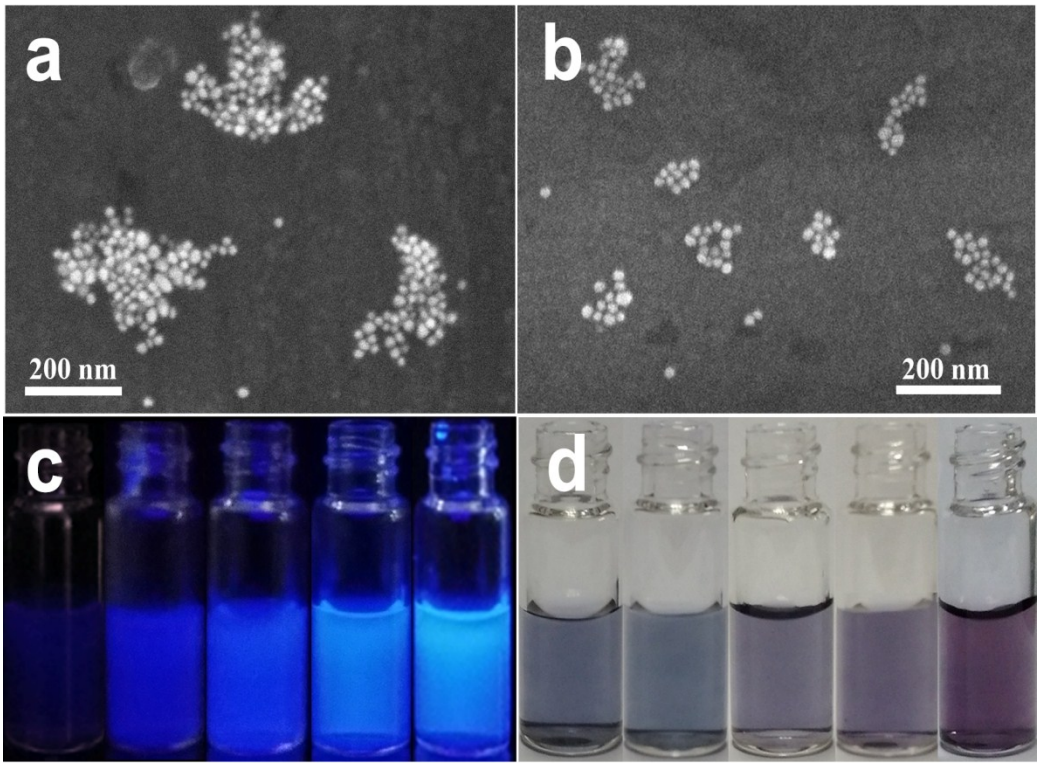

Fig.S7 (a, b) The SEM images of the AuNPs containing the N, S-CDs in the absence and presence of 0.2 μM of GSH; (c, d) photographic images of the mixture of N, S-CDs and AuNPs in the absence and presence of different concentration of GSH (0, 0.02, 0.1, 2.0, 5.0 μM) under 365 nm UV light and daylight, respectively.

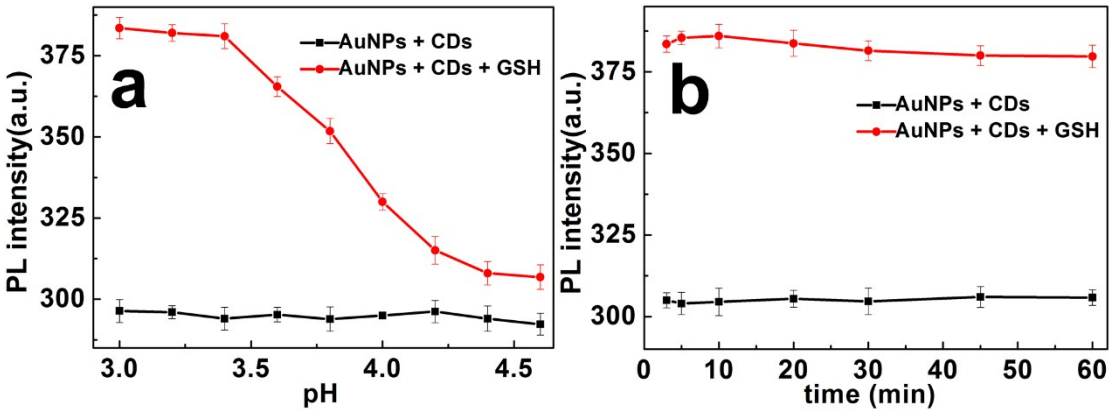

Fig.S8 (a) Effect of pH value on PL of the N, S-CDs/AuNPs in the absence and presence of GSH. (b) Effect of incubation time on PL of the N, S-CDs/AuNPs in the absence and presence of GSH. Concentration: N, S-CDs, 100 μg/mL; AuNPs, 10.8 nM; GSH, 1.0 μM.

Table.S1 Comparison of different optical nanosensors for GSH determination

Probe	Linear range	LOD	Reference
Naphthalimide-capped AuNPs	0.025-2.28 μM	17 nM	Xu et al. (2012)
AuNPs + ppzdtc	8-250 nM	8 nM	Li et al. (2011)
AuNC conjugated with water-soluble polymer	0-6 μM	29 nM	Uehara et al. (2010)
R6G-QDs conjugate	0.05-80 μM	15 nM	Gui et al. (2012)
QD-MV^{2+}	5-250 μM	0.6 μM	Liu et al. (2010)
AuNCs + Hg^{2+}	0-250 μM	9.4 nM	Park et al. (2013)
PEI-capped AgNCs	0.5-6 μM	380 nM	Zhang et al. (2013)
NCQDs/DTNB	0.01-40 μM	3.23 nM	Yang et al. (2018)
NHPDA/FePt/CNT	0.004-340 μM	1 nM	Karimi-Maleh et al. (2014)
Mu- Hg^{2+}	0.1-40 μM	10 nM	Zhao et al. (2017)
c-dots-MnO_2	1-10 μM	300 nM	Cai et al. (2015)
N,S-CDs/AuNPs	0.01-5 μM	3.6 nM	This work

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