

Electronic Supplementary Information

Synthesis of chiral fluorescence silver nano-clusters and study on the aggregation-induced emission enhancement and chiral flip

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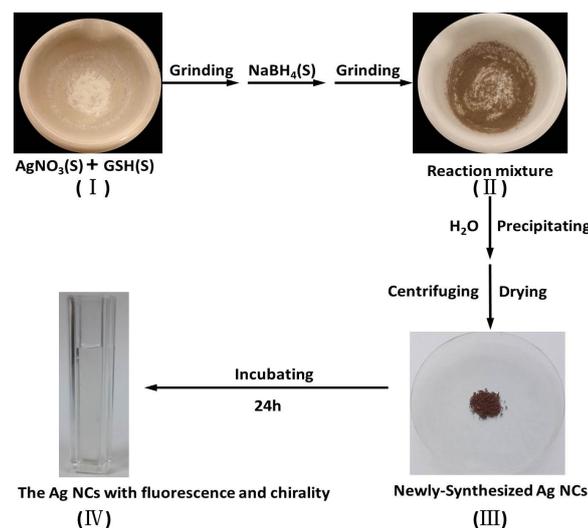


Figure S1. Schematic diagram of the synthesis process of Ag NCs.

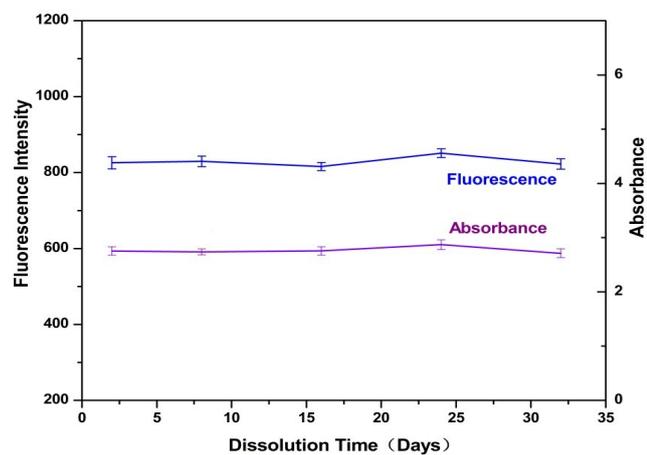


Figure S2. Fluorescence and UV absorption intensity of AgNCs at different storage time. Fluorescence emission was recorded at 440 nm with an excitation wavelength of 353 nm. Emission slit:4.0, AgNCs concentration:0.375mg.mL⁻¹

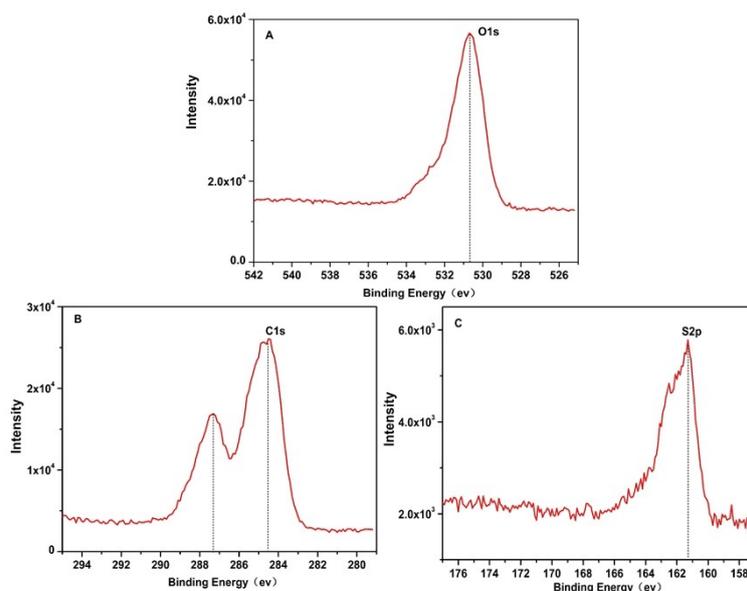


Figure S3. X-ray photoelectron spectroscopy (XPS) of AgNCs powder. A, B, C, represent O, C and S elements XPS energy Spectrum, respectively.

The peak at 530.68 corresponded to the binding energy of O1s (Fig. S2A).^{1, 2} The spectra of C1s was composed of two peaks located at about 284.5 and 287.3 eV (see Fig. S2B), which could be attributed to the -C-C and -COO- structures, respectively.^{1, 3, 4} The peak at 161.33eV was characteristic of S2p_{3/2} (see Fig. S2C), but there was no free thiol value in the range of 164 eV, which suggested that GSH-Ag metal thiolates were formed.

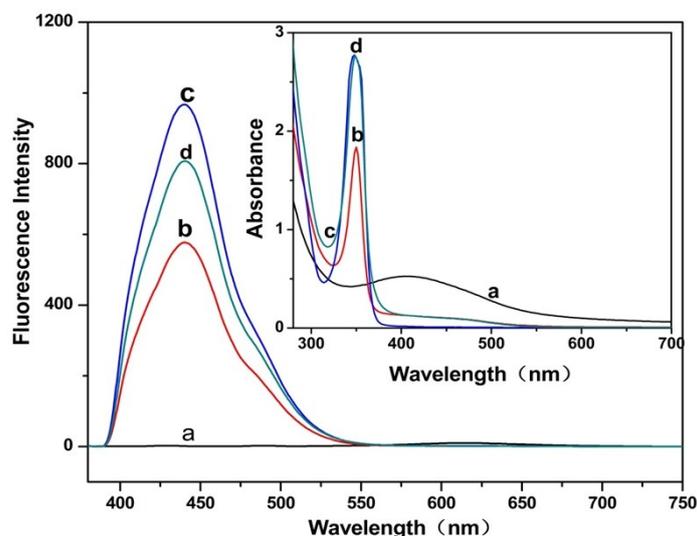


Figure S4. Fluorescence emission spectra of AgNCs under different GSH: AgNO₃(R). GSH: AgNO₃(R): 1:1(a), 2:1(b), 3:1(c), 4:1(d). Inset: UV absorption spectra of AgNCs. Fluorescence emission was recorded at 440 nm with an excitation wavelength of 353 nm. Emission slit: 4.0, AgNCs concentration: 0.375mg.mL⁻¹.

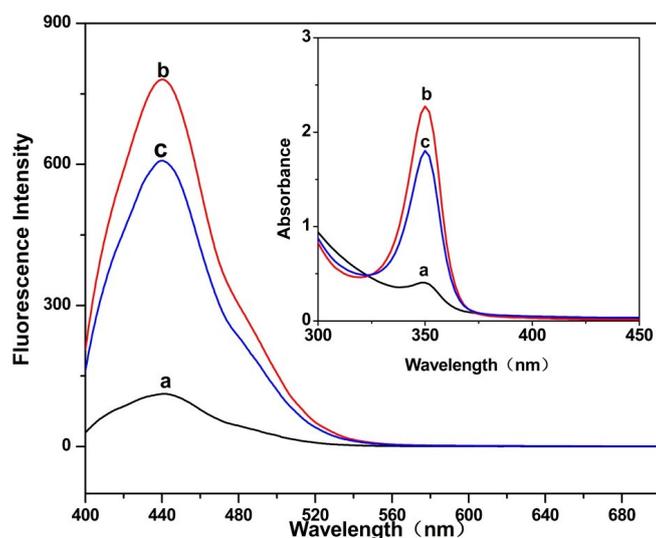


Figure S5. Effect of temperature on the synthesis of AgNCs. Temperature: 20°C(a),27°C(b)and30°C(c). Inset for the corresponding UV absorption spectra. Fluorescence emission was recorded at 440 nm with an excitation wavelength of 353 nm. Emission slit: 4.0, AgNCs concentration: 0.375mg.mL⁻¹.

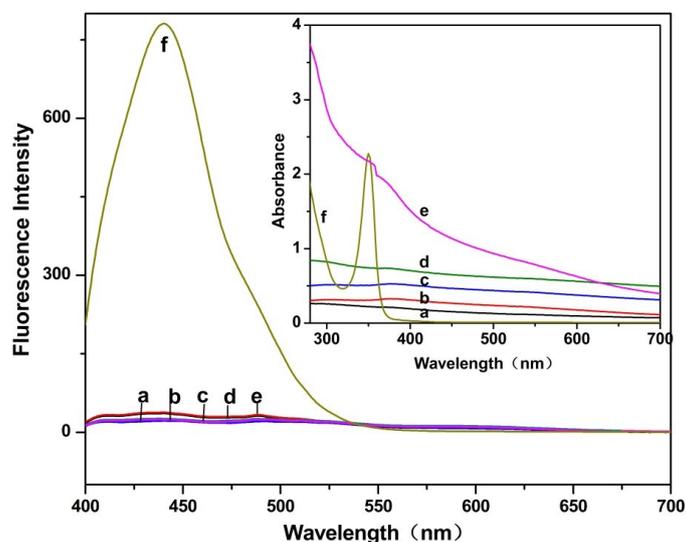


Figure S6. The effect of solvents on the synthesis of AgNCs. a-f represent with petroleum ether (0.01), n-butanol (3.7), ethanol (4.3), ethylene(6.9), dimethyl sulfoxide (7.2) and water (10.2) dissolve AgNCs, solvent polarity values are shown in brackets. Inset: UV absorption spectra of AgNCs. Fluorescence emission was recorded at 440 nm with an excitation wavelength of 353 nm. Emission slit: 4.0, AgNCs concentration: 0.375mg.mL⁻¹.

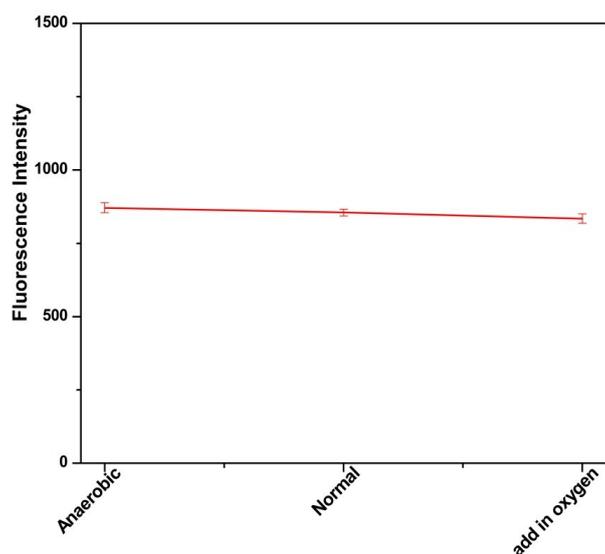


Figure S7. Fluorescence intensity of AgNCs with different oxygen content. Anaerobic Group: 100mL ultrapure water continued to add in N_2 for 5min. Normal group: did not do any treatment. Add oxygen group: 100mL ultrapure water continued to add in O_2 for 5min. Fluorescence emission was recorded at 440 nm with an excitation wavelength of 353 nm. Emission slit: 4.0, AgNCs concentration: $0.375\text{mg}\cdot\text{mL}^{-1}$.

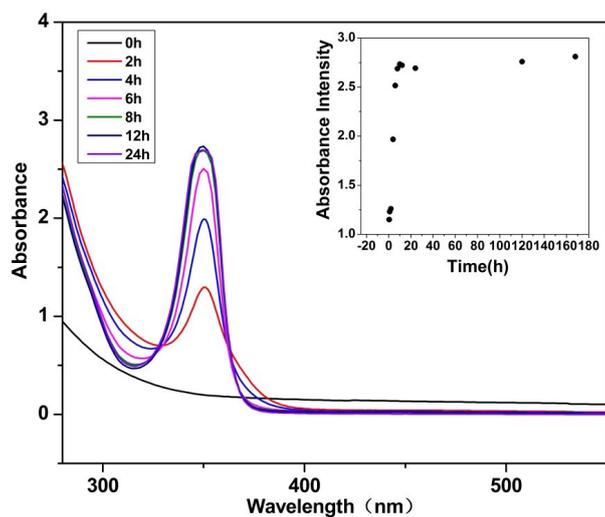


Figure S8. The influence of incubation time for AgNCs optical properties. Inset: the absorbance (350nm) intensity dependent upon incubation time. AgNCs ($3\text{mg}/\text{mL}$) is incubation under ambient conditions, samples (0.5mL) were taken measured was diluted to $0.375\text{mg}/\text{mL}$.

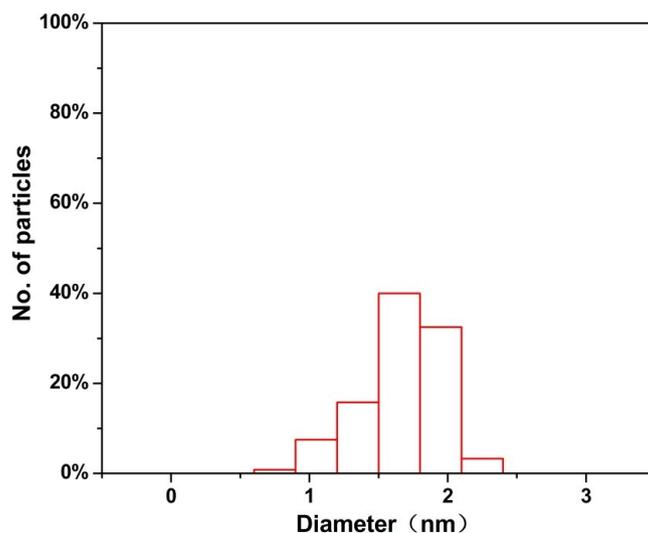


Figure S9. The size distribution corresponding to HR-TEM(0h) image of AgNCs. AgNCs (0.375mg/mL, 0h) solution drops to the ultra-thin carbon film preparation TEM sample. After the ultra-thin film was naturally dried, the samples were measured HR-TEM.

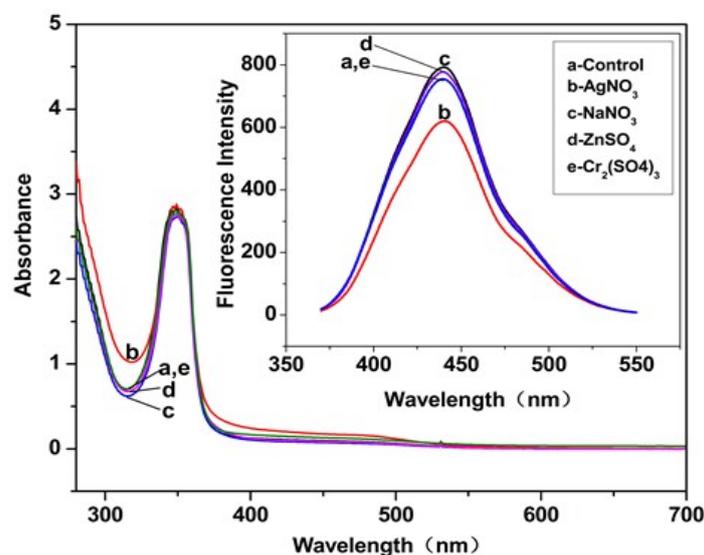


Figure S10. Effect of cations (such as Ag⁺(b), Na⁺(c), Zn²⁺(d) and Cr³⁺(e)) on the fluorescence intensity of AgNCs. Aqueous solution (pH=5.0) containing metal cations dissolved AgNCs powder after 24h were detected by fluorescence and UV. Fluorescence emission was recorded at 440 nm (Emission slit: 4.0) with an excitation wavelength of 353 nm. Guarantee the same ion concentration (1mM) and AgNCs concentration (0.375mg.mL⁻¹).

Table S1. Assignments of peaks in XPS

Name	Start BE	Peak BE	End BE	Height CPS	FWHM eV	Area(P) CPS.eV	Area(N)KE ^{0.6}	At. %
S2p	167.1	161.3	159.1	3686.3	1.0	9473.7	0.1	12.5
Ag3d	377	367.6	364.3	41993.3	1.3	104174.6	0.1	13.2

References

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