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#### **Electronic Supplementary Information**

# Cysteine, Homocysteine and Glutathione guided hierarchical selfassemblies of spherical silver nanoparticles paving the way for their naked eye discrimination in human serum †

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**Figure S1.** Photograph showing (A) no AgNPs were synthesized using  $\beta$ - naphthol; (B) AgNPs synthesized using trisodium citrate.



Figure S2. UV-visible spectrum of AgNPs.





**Figure S3.** TEM and EDX of AgNPs.



**Figure S4.** UV-visible spectrum of AgNPs with Cys, Hcy and GSH (10.0  $\mu$ L of 1.0×10<sup>-1</sup>M).



Figure S5. Sedimentation occurring after -24 hrs.



Figure S6. Practical applicability of the silver nanoprobe on cotton balls.



**Figure S7.** UV-visible and naked eye response of Citrate-AgNPs with Cysteine, Homocysteine and Glutathione (5  $\mu$ L of 10<sup>-1</sup> M of each).



Figure S8. Calibration Curve for Cys within the concentration range of  $1.67-13.36 \mu M$ .



Figure S9. Calibration Curve for Hcy within the concentration range of 0.067-0.335  $\mu$ M.



**Figure S10.** Calibration Curve for GSH within the concentration range of 16.7-116.9 µM.



**Figure S11.** TEM images from low to high magnification (A and B) of aggregated AgNPs triggered by Cys.



**Figure S12.** TEM image from low to high magnification (A and B) of aggregated AgNPs triggered by Hcy.



Figure S13. TEM image of aggregated AgNPs triggered by GSH.



**Figure S14.** The slow evolution of spherical AgNPs to flowers like assembly on the addition of increasing concentration of Cys (10.0  $\mu$ L, 30.0  $\mu$ L and 50.0  $\mu$ L of 1.0×10<sup>-1</sup> M).



**Figure S15.** The slow evolution of spherical AgNPs to thorns like assembly on the addition of increasing concentration of Hcy (10.0  $\mu$ L, 30.0  $\mu$ L and 50.0  $\mu$ L of 1.0×10<sup>-1</sup> M).



**Figure S16.** The slow evolution of spherical AgNPs to petals like assembly on the addition of increasing concentration of GSH (10.0  $\mu$ L, 30.0  $\mu$ L and 50.0  $\mu$ L of 1.0×10<sup>-1</sup> M).



**Figure S17.** EDX of the (A) flowers like assembly triggered by Cys; (B) thorns like assembly triggered by Hcy; (C) petals like assembly triggered by GSH.



**Figure S18.** Kinetic curve of AgNPs with Cysteine. Here increasing concentration of Cysteine (from 0 to 50.0  $\mu$ L of 1.0×10<sup>-1</sup> M) is added to 3.0 mL of AgNPs solution for different time periods.



**Figure S19.** Kinetic curve of AgNPs with Homocysteine. Here increasing concentration of Homocysteine (from 0 to 50.0  $\mu$ L of 1.0×10<sup>-1</sup>M) is added to 3.0 mL of AgNPs solution for different time periods.



**Figure S20.** Kinetic curve of AgNPs with Glutathione. Here increasing concentration of Glutathione (from 0 to 50.0  $\mu$ L of 1.0×10<sup>-1</sup>M) is added to 3.0 mL of AgNPs solution for different time periods.



Figure S21. pH study of silver nanoprobe with Cys, Hcy and GSH.



**Figure S22.** Naked eye response and UV-visible spectrum of AgNPs alone and on the addition of ethanethiol, thiosalicylic acid and 4-methylthiophenol (5.0  $\mu$ L of 1.0×10<sup>-1</sup> M) to AgNPs.



**Figure S23**. Naked eye response of AgNPs + spiked serum samples with  $1.6 \times 10^{-4}$  M of Cysteine (Cys), Homocysteine (Hcy) and Glutathione(GSH).



**Figure S24.** UV-visible spectrum of AgNPs alone, AgNPs + non-spiked serum, serum samples spiked with Cysteine (5.01  $\mu$ M), Homocysteine (0.201  $\mu$ M) and Glutathione (50.1  $\mu$ M).



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