

Supplementary Information

Novel H₂S sensing mechanism derived from the formation of oligomeric sulfide capping the surface of gold nanourchins

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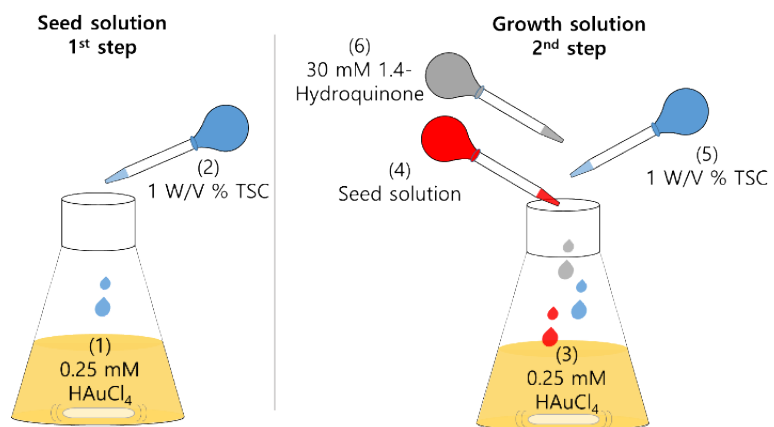


Fig. S1 Diagram showing the sequential synthesis procedure ((1)→(6)) of the AuNU solution.

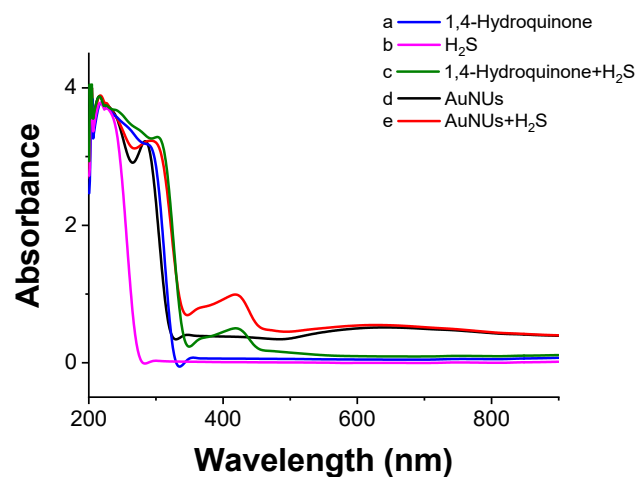


Fig. S2 UV-Vis absorption spectra of (a) 1,4-hydroquinone, (b) H₂S, (c) 1,4-hydroquinone + H₂S, (d) AuNUs, and (e) AuNUs + H₂S at pH 4.0 and 25 °C in 20 mM NaCl.

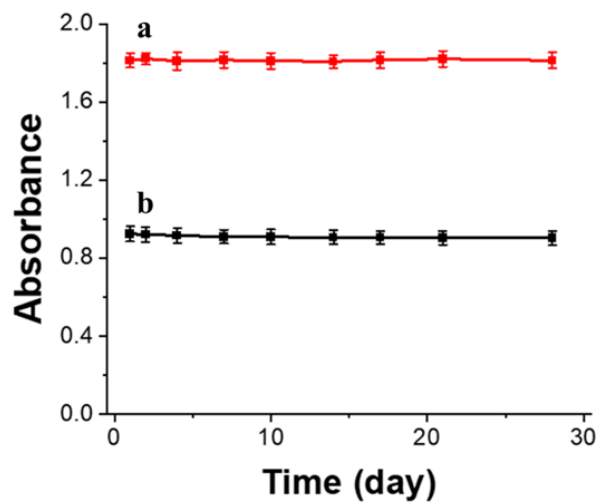


Fig. S3 Long-term stability plot of (a) the AuNUs+H₂S absorbance at 421 nm as well as (b) the stability of the AuNUs absorbance at 672 nm for four weeks (at pH 4.0 and 25 °C in 20 mM NaCl).

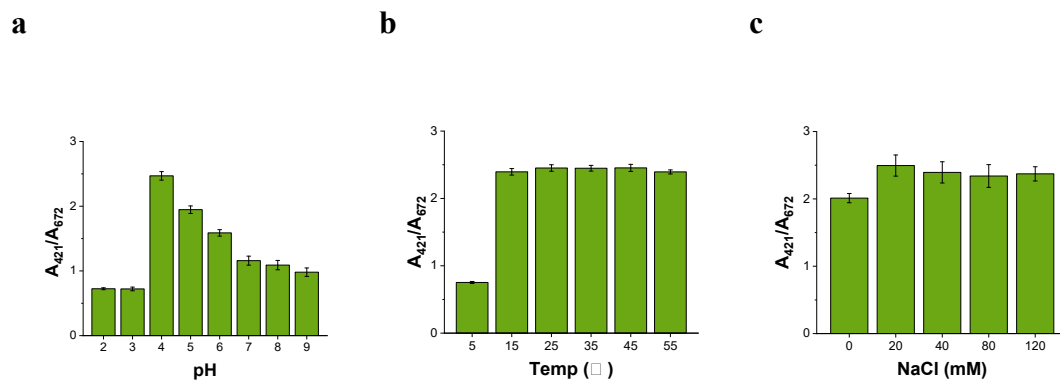


Fig. S4 Absorption ratios ($A_{421\text{nm}}/A_{672\text{nm}}$) of AuNUs-H₂S as a function of (a) pH in the presence of 20 mM NaCl at 25 °C, (b) Temperature in the presence of 20 mM NaCl at pH 4.0 and (c) NaCl concentration at pH 4.0 and 25 °C.

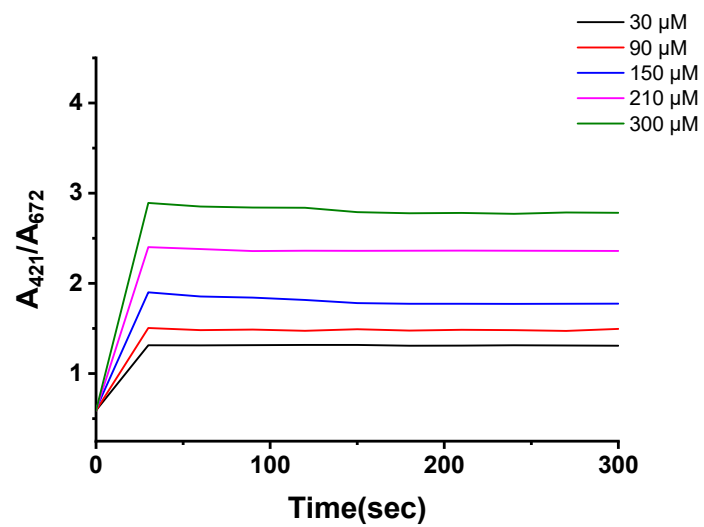


Fig. S5 Plots of the absorbance ratios ($A_{421 \text{ nm}}/A_{672 \text{ nm}}$) of AuNUs as a function of time (sec) with 30 sec intervals using various concentrations of H_2S at pH 4.0 and 25 °C in 20 mM NaCl.

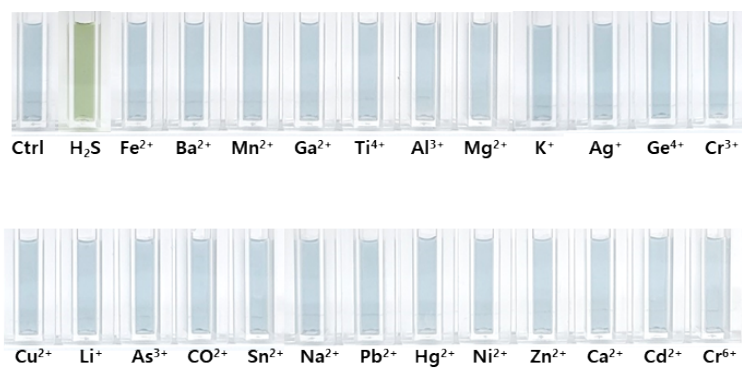


Fig. S6 Photographs of the AuNU dispersions upon the addition of 0.15 mM H₂S or 1.5 mM of various metal ions at pH 4.0 and 25 °C in 20 mM NaCl.