

Electronic Supplementary Information

Non-toxic Luminescent Au Nanoclusters@Montmorillonite Nanocomposites Powders for Latent Fingerprints Development

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Synthesis and characterization of Au NCs

In our previous studies, it was found that excessive heat from the MW irradiation would reduce quantum yield of fluorescent AuNCs.¹ Consequently, a MW programme with temporarily paused is also employed in this work. Fig. S1a shows the fluorescence intensities of Au NCs products synthesized under a 30 seconds continuous MW irradiation (curve 2 of Fig. S1a) and the MW programme consisting of 15 seconds MW irradiation, 30 seconds pause, and then 15 seconds MW irradiation (curve 1 of Fig. S1a). It is demonstrated that the Au NCs product from the temporarily paused MW programme shows higher emission intensity than that from the successive MW programme. The results indicate once again excessive heat from the successive MW irradiation would form larger NPs of no fluorescence. At the same time, without MW irradiation, no fluorescence was obtained (curve 3 of Fig. S1a). As a result, a MW programme consisting of 15 seconds MW irradiation, 30 seconds pause, and 15 seconds MW irradiation was applied to subsequent MW-assisted preparation of fluorescent Au NCs.

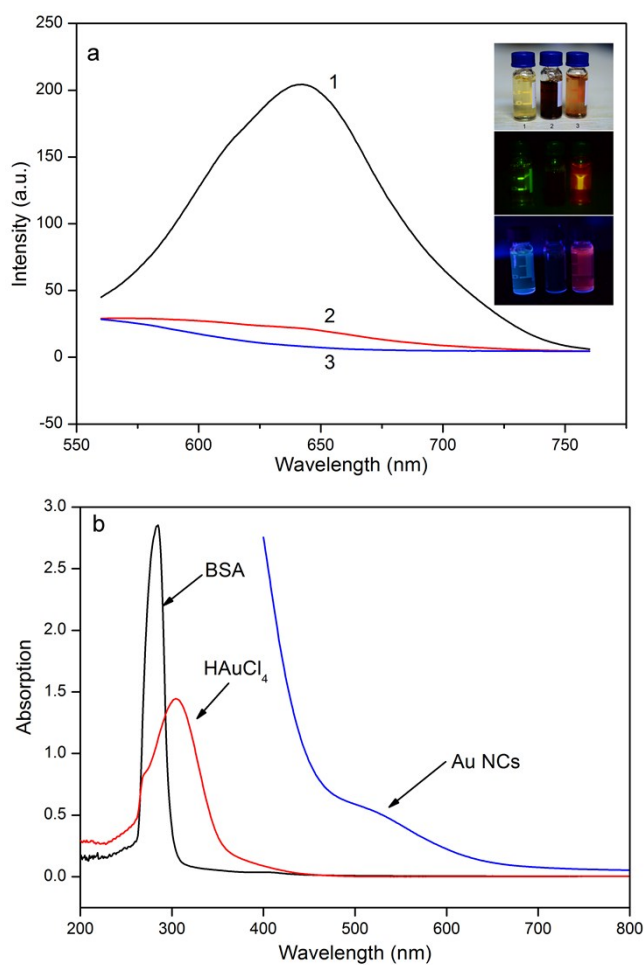


Fig. S1 (a) Fluorescence emission spectra of Au NCs synthesized from different MW irradiation procedures: (1) initial 15 s irradiation, pause 30 s, and final 15 s irradiation (2) 30 s continuous irradiation, and (3) reaction mixture without MW irradiation, λ_{ex} of 525 nm are used. The inset displays the photographic images of reaction solutions (1) before and (3) after MW programme irradiation, and (2) after 30 s successive MW irradiation taken under broad sunlight (top), green light (middle) and UV light ($\lambda=365$ nm) (bottom). (b) Absorption spectra of BSA ($4.24 \text{ mg}\cdot\text{mL}^{-1}$), HAuCl_4 ($0.476 \text{ mmol}\cdot\text{L}^{-1}$) and Au NCs ($5.39 \text{ mg}\cdot\text{mL}^{-1}$).

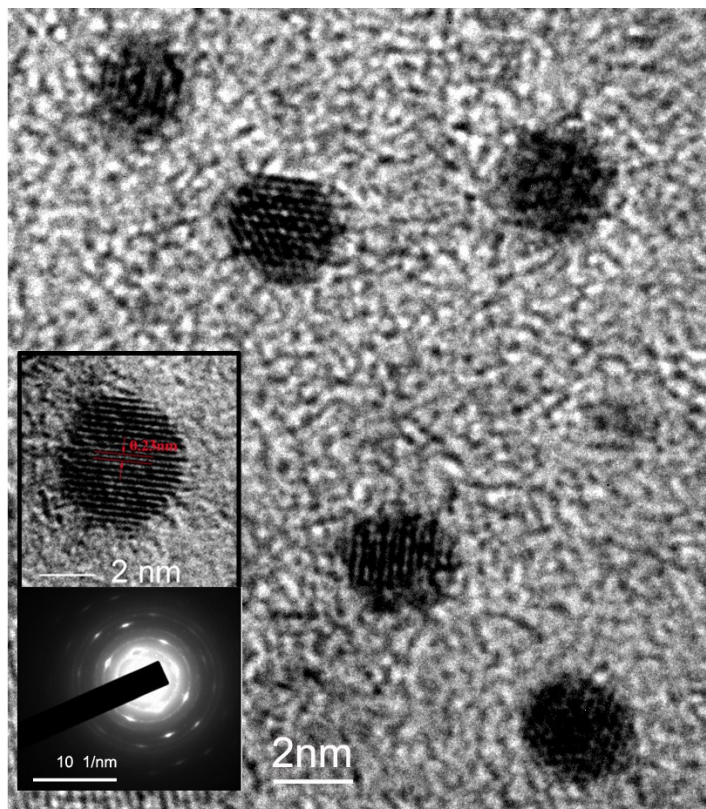


Fig. S2 TEM image of BSA-Au NCs bioconjugates. The top and bottom insets display the HRTEM image and SAED pattern of Au NCs.

Reference:

1. L. Yan, Y. Cai, B. Zheng, Y. Guo and D. Xiao, *Journal of Materials Chemistry*, 2012, 22, 1000-1005.