

## Electronic Supplementary Information

### One-step Facile Synthesis of Fluorescent Gold Nanoclusters for Rapid Bio-imaging of Cancer Cells and Small Animals

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† Electronic Supplementary Information (ESI) available: [details of any  
supplementary information available should be included here]. See  
DOI: 10.1039/x0xx00000x/

**Figure S1.** TEM images of the Au-BSA NCs. Inset: high resolution image with the crystallinity of the metallic structure.

**Figure S2.** Optical characterization of the Au-BSA NCs. Curves a, b show the UV/vis absorption spectrum and the emission spectrum (Em) of the Au-BSA NCs. Inset: photographs of (c) BSA

solution under visible, (d) Au-BSA NCs in water under visible, (e) BSA solution under UV light, and (f) Au-BSA NCs under UV light (excited at 365 nm).

**Figure S3.** Fluorescence decay curve of the Au-BSA NCs.

**Figure S4.** Representative *ex vivo* fluorescence images of excised MCF-7 tumors and other visceral organs in Au-BSA NCs-injected xenograft tumor mouse after 12 h treatment. (a) spleen (b) heart (c) kidney (d)liver (e) lung (f) tumor.

**Figure S5.** The viabilities of cells after incubation 24 h with Au-BSA NCs. Two kinds of cancer cells were tested for studying the toxicity of the as-obtained materials against the cells: (A) U87 cell, (B) A549 cell.

**Fluorescence quantum yield:**

The quantum yield of the as-prepared Au-BSA NCs is measured using the comparative method, which relies on the use of fluorescence standards with known fluorescence quantum yields (Rhodamine B, QY = 95% ). The formula as follows:

$$QY_u = QY_s * [D_u / D_s] * [A_s / A_u] * [n_u / n_s]^2 \quad (A \leq 0.05)$$

where the Quantum Yield of Rhodamine B in ethanol is taken as 0.95.  $A_s$  and  $A_u$  are the UV absorption of the standard s and the sample u.  $D_s$  and  $D_u$  are the integrated area of the standard s and the sample u under the corrected fluorescence emission spectrum. Meanwhile, the integrated areas under the fluorescence emission spectrum curves were calculated by means of Origin software. The n is the index of refraction with  $n_s = 1.36$  for ethanol and  $n_u = 1.33$  for water. Briefly, series of diluted samples Au-BSA NCs in water and Rhodamine B at specific concentration (5  $\mu\text{g/mL}$ ) were prepared and fluorescence emission scans and UV absorption were performed. In summary, We use the equation cited above to determine the quantum yield of Au-BSA NCs.