Supporting Information

Novel Dual-function SERS Identification Strategy for Preliminary Screening and Accurate Diagnosis of Circulating Tumor Cells

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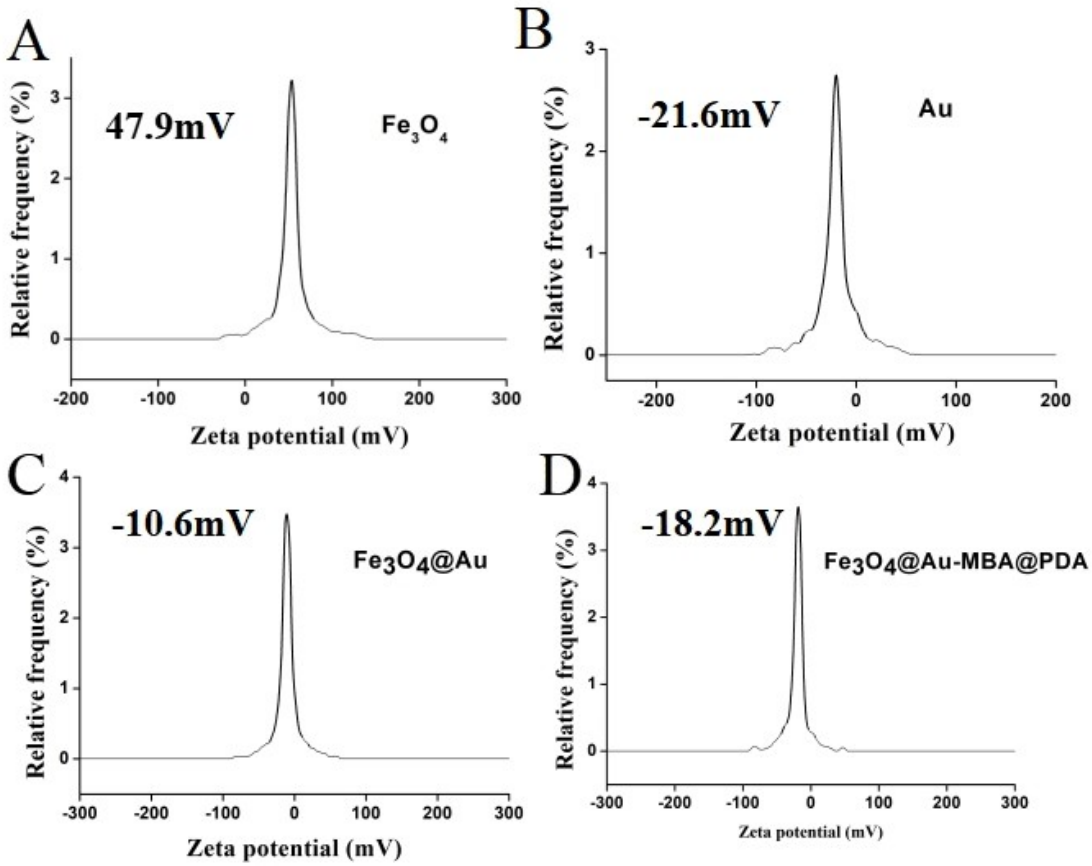

Figure S1. Zeta potential of Fe_3O_4 NPs (A), Au NPs (B),Fe_3O_4@Au NPs (C) and Fe_3O_4@Au-MBA@PDA (D), respectively.

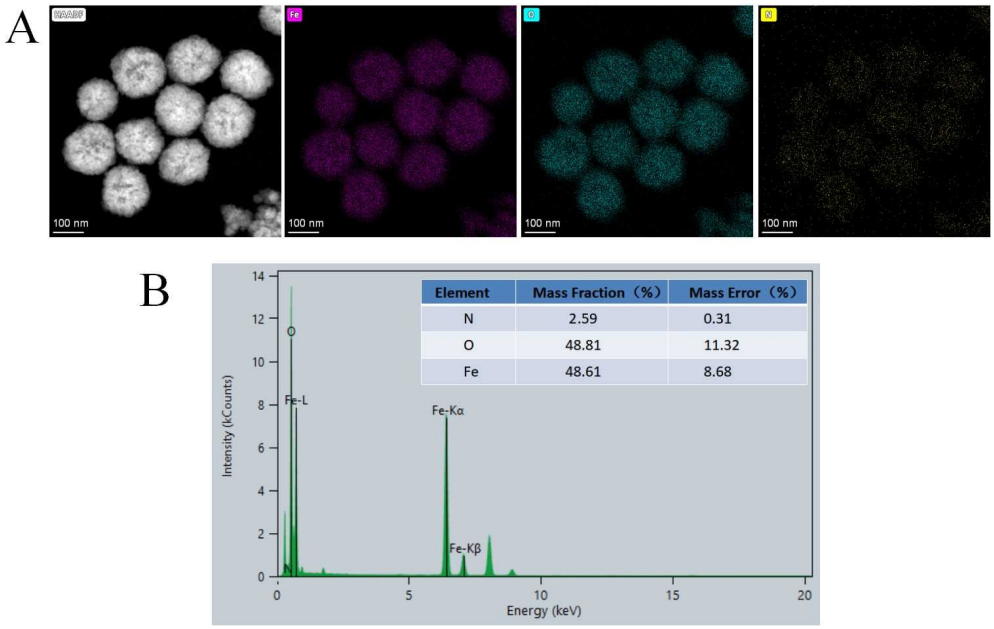

Figure S2. (A) Element mapping images and (B) distribution ration of Fe, O, and N in Fe_3O_4 NPs.

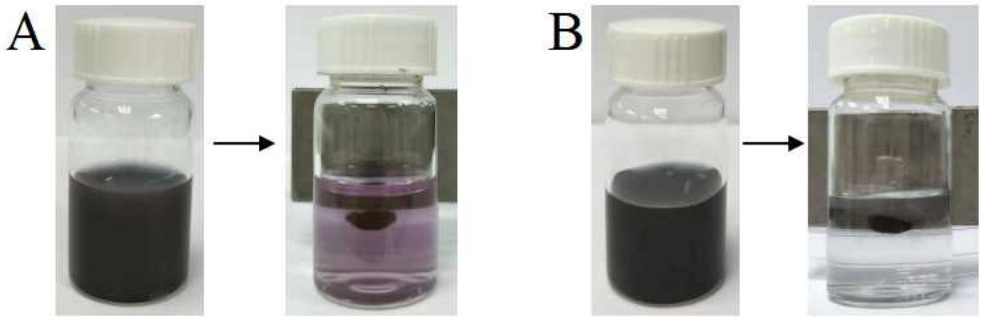

Figure S3. Solution color of Fe_3O_4@Au NPs (A) and Fe_3O_4@Au-MBA@PDA NPs (B) after magnetic separation.

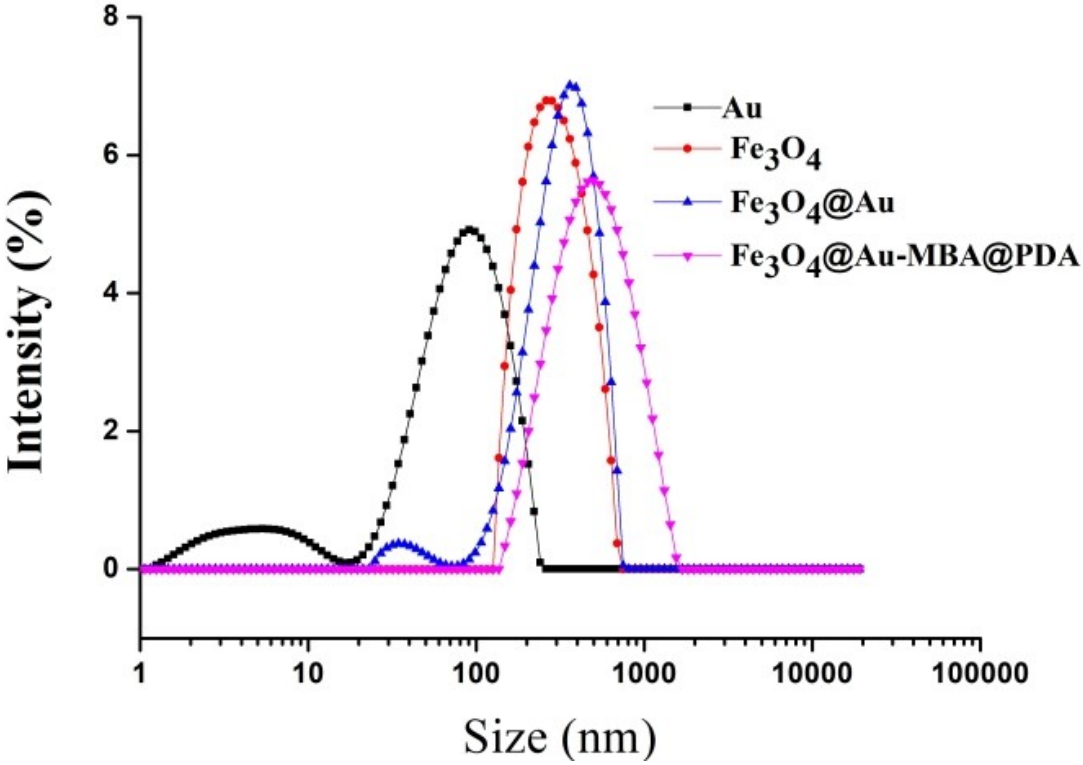

Figure S4. The particle size of Fe_3O_4 NPs (A), Au NPs (B), Fe_3O_4@Au NPs (C) and Fe_3O_4@Au-MBA@PDA (D) measured by DLS, respectively.

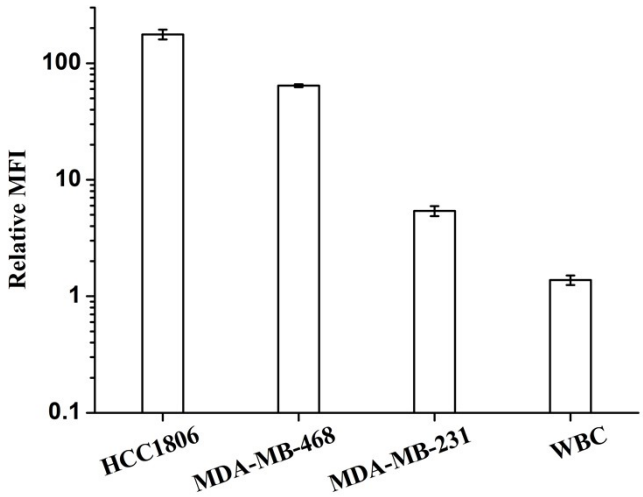

Figure S5. Relative Mean Fluorescence Intensity (MFI) of trop2 protein; MFI of trop2 was normalized using MFI of the IgG in each cell line, respectively.

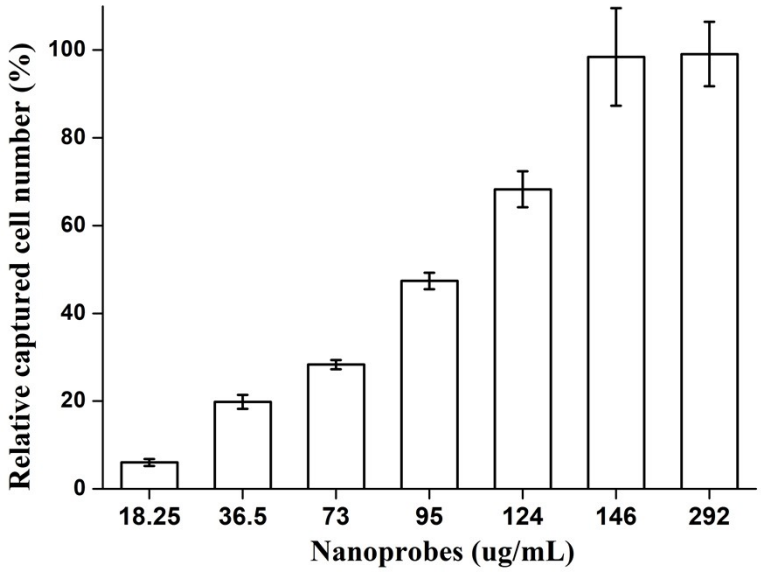

Figure S6 Capture efficiencies of the bioprobes with different concentrations for high trop2-expressing HCC1806 cells.

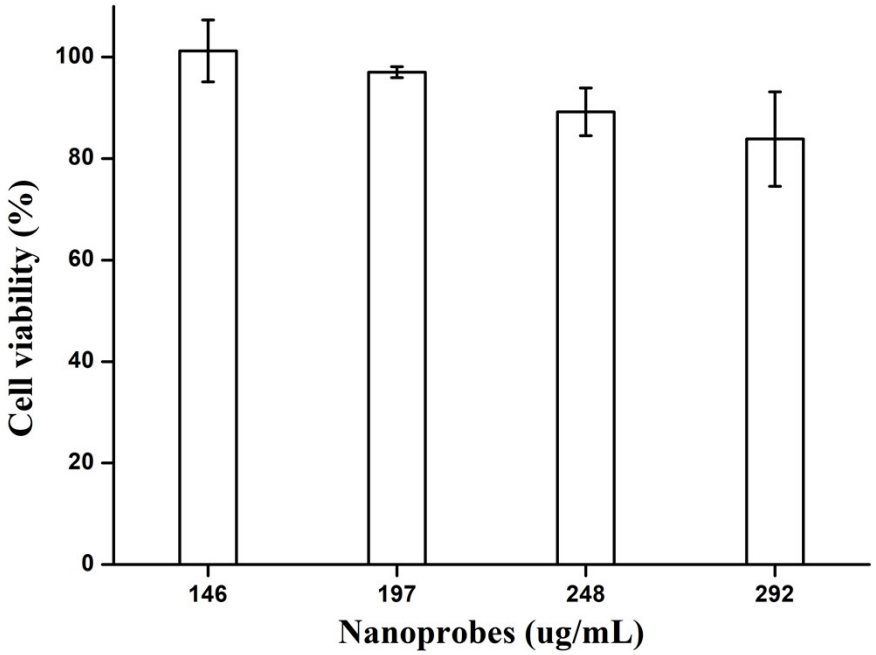

Figure S7. Cytotoxicity of bioprobes at different concentrations on HCC1806 cells within 24 h.

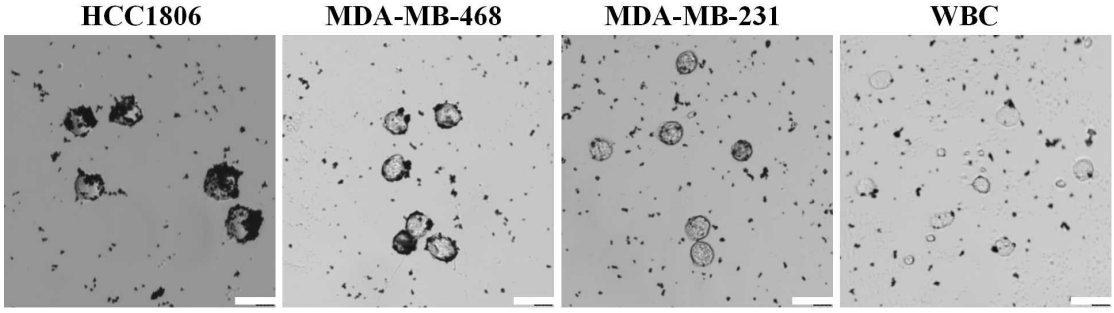

Figure S8. Representative optical microscope images of HCC1806, MDA-MB-468, MDA-MB-231, and WBC incubated with the bioprobes, respectively. Scale bar = 20 μm.

Table S1. Average SERS intensity of TNBC cell lines and WBC. Data were expressed as mean ± standard deviation.

Group	Average SERS intensity of cells
WBC	147.19±77.19
MDA-MB-231	242.66±65.65[a]
MDA-MB-231	394.97±125.64[a,b]
HCC1806	848.05±208.24[a,b,c]

a: $p < 0.01$versus WBC group; b: $p < 0.01$ versus MDA-MB-231group;
c: $p < 0.01$ versus MDA-MB-468 group.

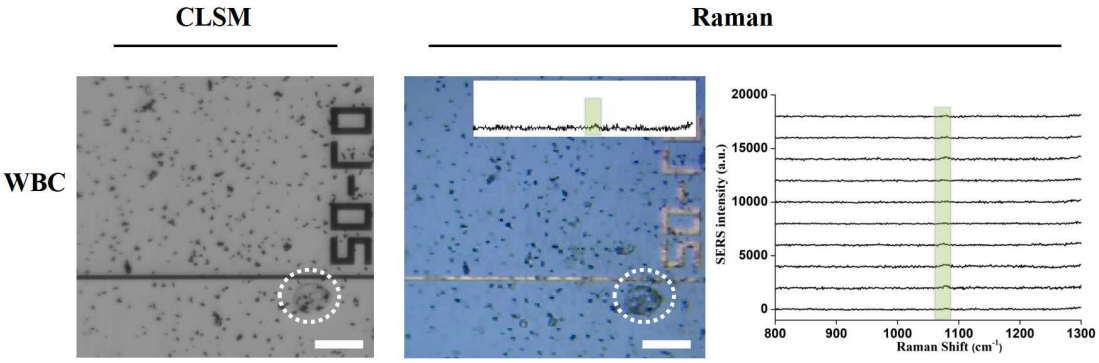

Figure S9. CLSM images and SERS signal of the WBC. Scale bar = 20 μm.

Table S2. SERS detection sensitivity and specificity of the two cut-off values 281 and 206.

cut-off	Number of cells detected				Sensitivity	Specificity
	WBC	MDA-MB-231	MDA-MB-468	HCC1806	(231+468+1806)/30	1-(WBC/10)
281	0	1	8	10	63%	100%
206	2	5	10	10	83%	80%