

Supporting Information:

Electrostatic Attraction Driven and Shuttle-Like Morphology Assisted Enhancement for Tumor Uptake

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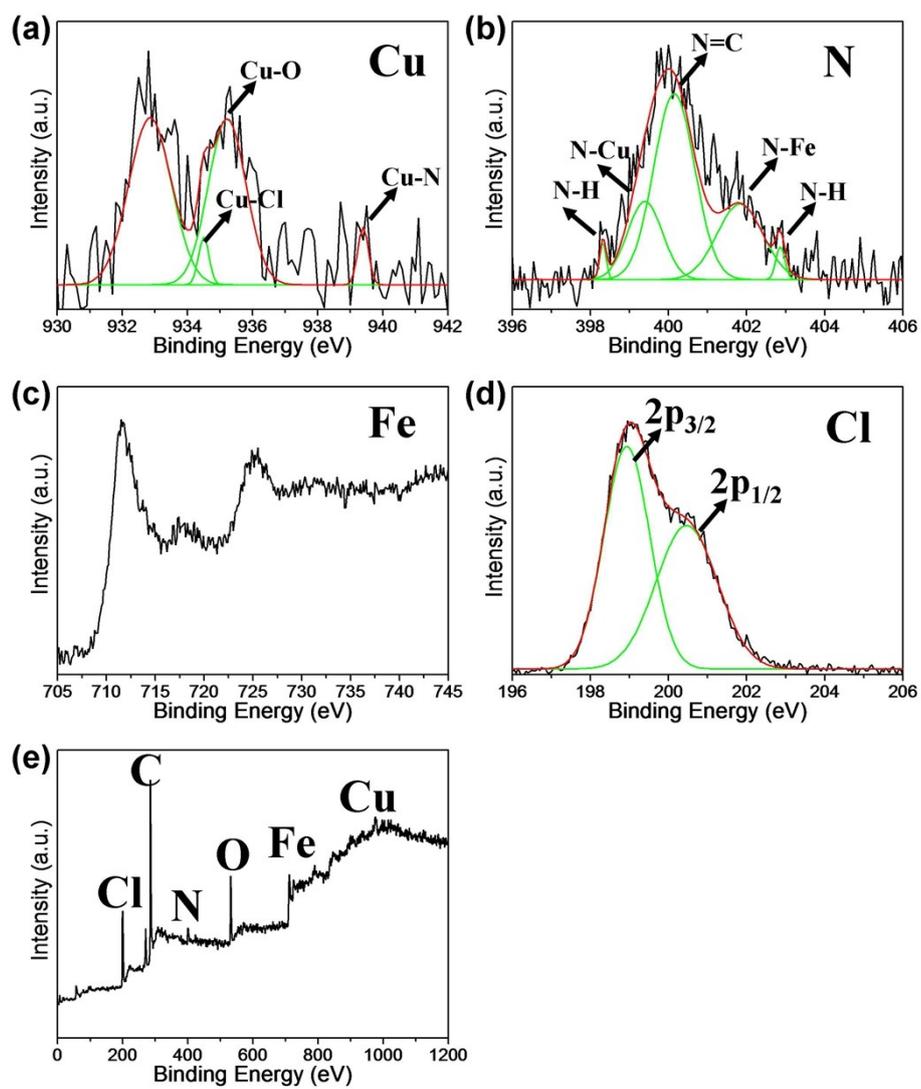


Figure S1. XPS of $Cu2p_{3/2}$ (a), $N1s$ (b), $Fe2p_{3/2}$ (c), $Cl2p$ (d) and total spectra (e) for CuPani NSs.

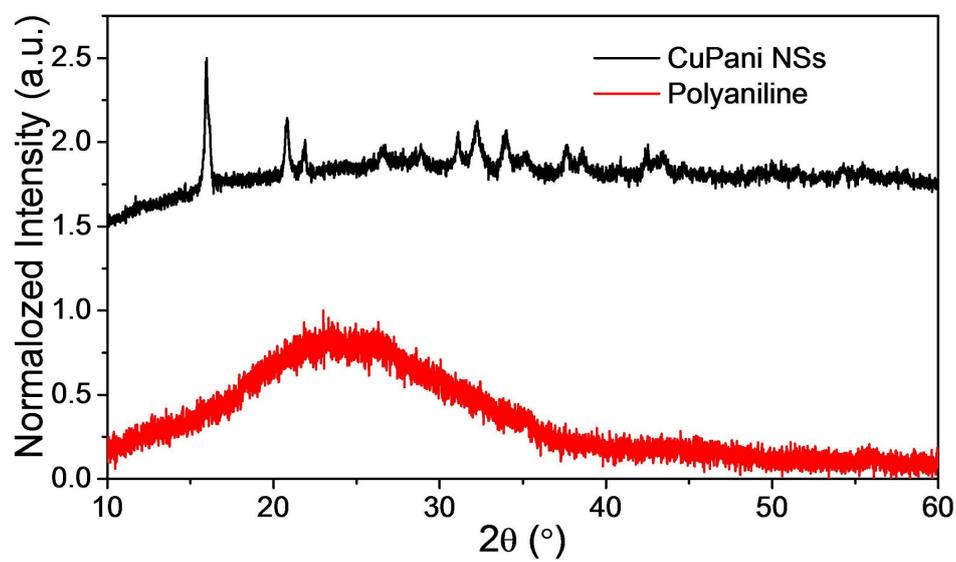


Figure S2. XRD patterns for CuPani NSs and polyaniline without doping of Cu(II).

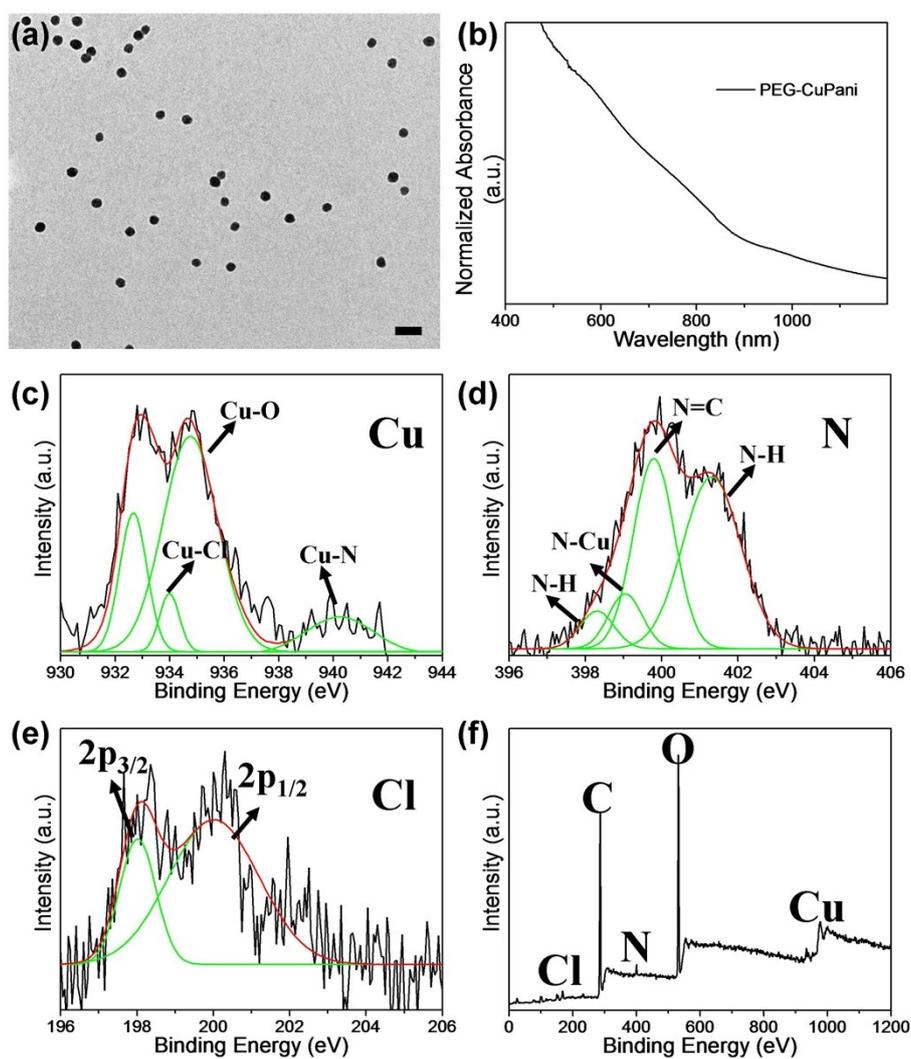


Figure S3. TEM image (a) and UV-vis-NIR absorption spectra (b) of PEG-CuPani NPs. The scale bar represents 200 nm. XPS Cu2p_{3/2} (c), N1s (d), Cl2p (e) and total spectra (f) for PEG-CuPani NPs.

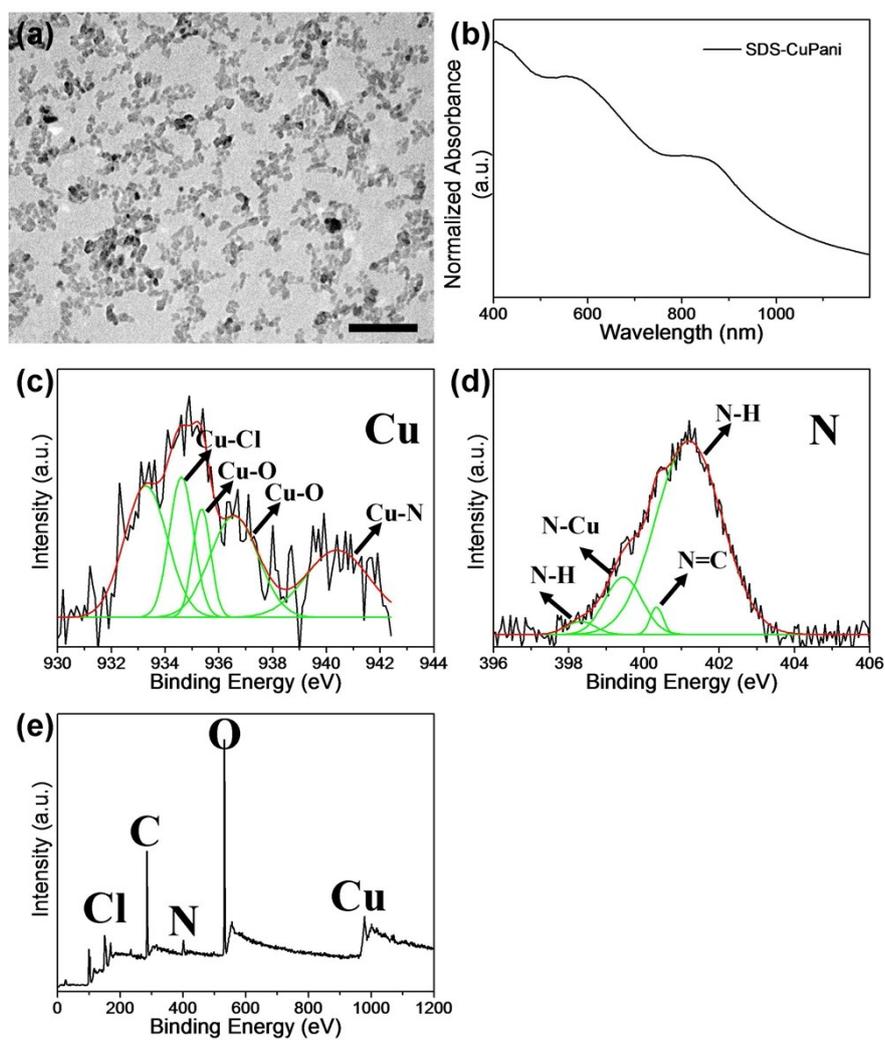


Figure S4. TEM image (a) and UV-vis-NIR absorption spectra (b) of SDS-CuPani NPs. The scale bar represents 200 nm. XPS Cu_{2p_{3/2}} (c), N1s (d) and total spectra (e) for SDS-CuPani NPs.

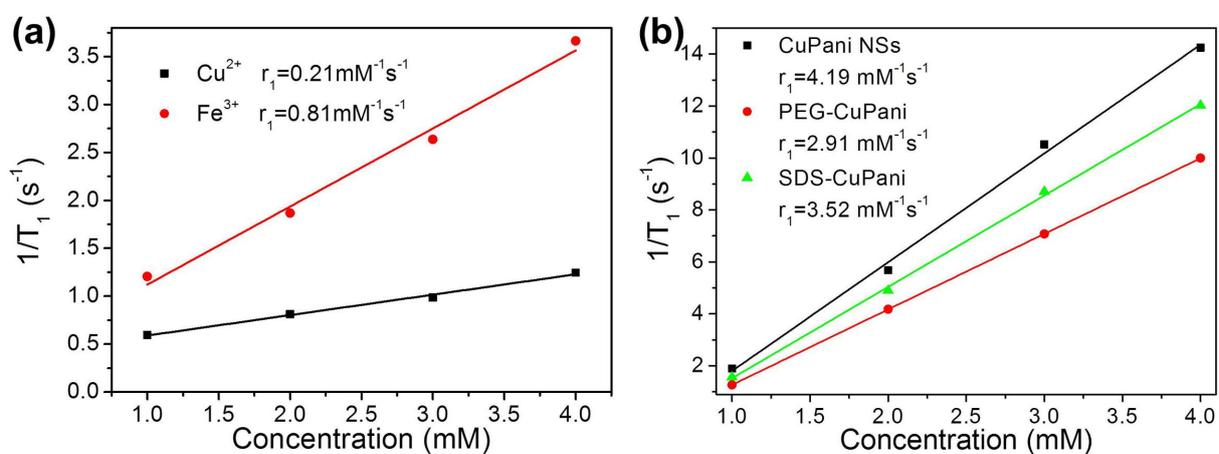


Figure S5. Concentration-dependent longitudinal relaxation T_1 of Cu(II) and Fe(III) (a), and CuPani NSs, PEG-CuPani and SDS-CuPani NPs (b). T_1 is tested by a 500 M NMR spectrum.

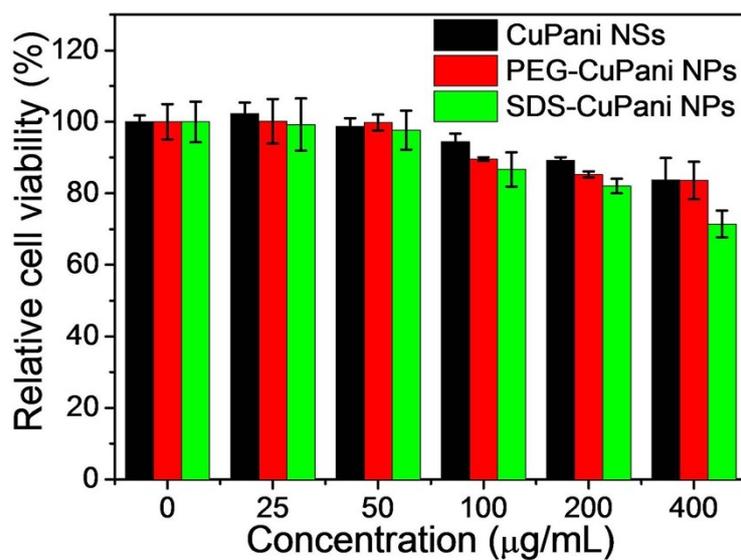


Figure S6. Cytotoxicity of KB cells for CuPani NSs, PEG- and SDS-CuPani NPs. The relative cell viability is determined by MTT assay after 24 h incubation with NSs and NPs at different concentration.

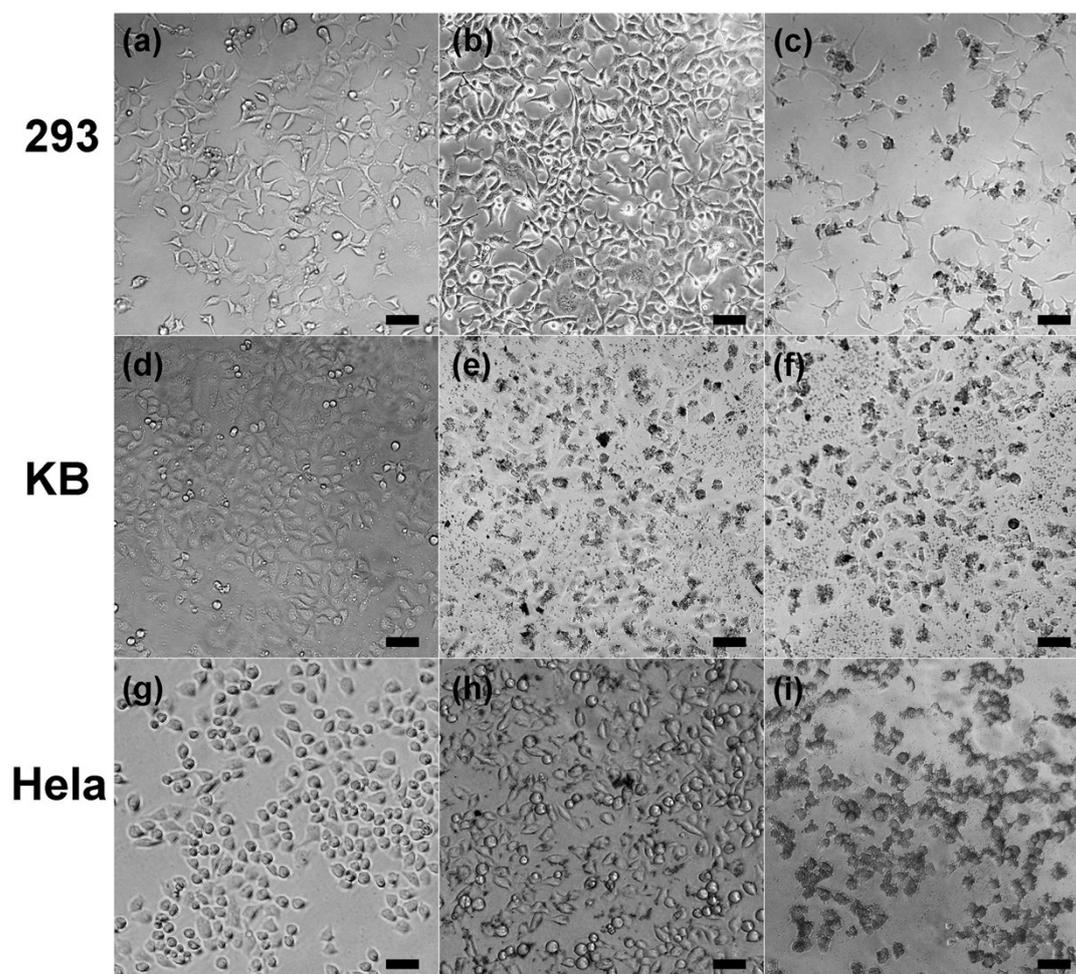


Figure S7. The nonspecific cellular adhesion/internalization of CuPani NSs. The photographs of NSs adhered/internalized to 293 (a-c), KB (d-f), and HeLa (g-i) cells at the concentration of 0 (a, d, g), 25 (b, e, h), and 50 $\mu\text{g}/\text{mL}$ (c, f, i). The scale bar is 50 μm .

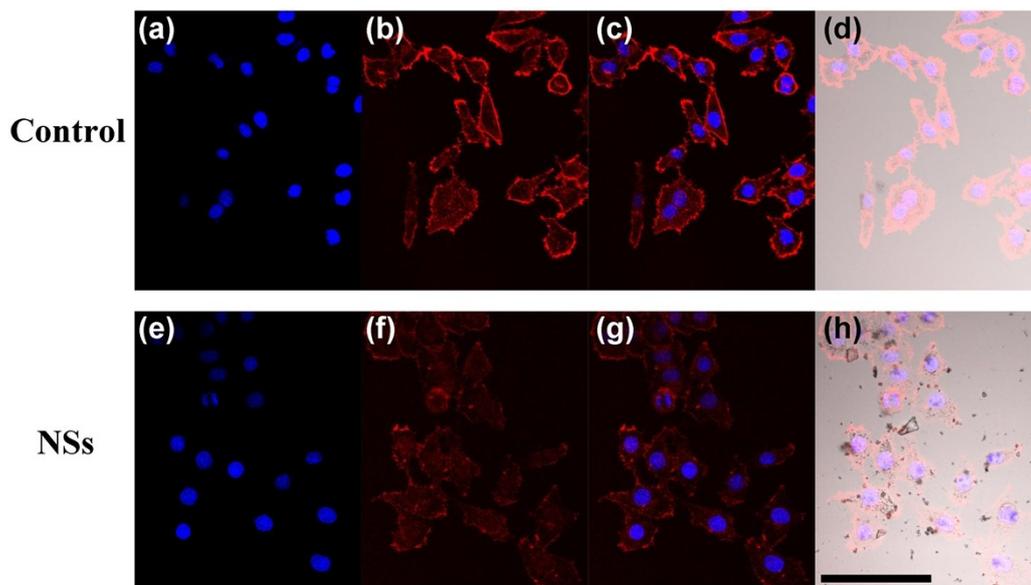


Figure S8. Fluorescent confocal images of HeLa cells before (a-d) and after (e-h) nonspecific cellular adhesion/internalization of CuPani NSs. Fluorescent images of the nucleuses (a, e), cytoskeletons (b, f), overlays in dark fields (c, g) and overlays in bright fields (d, h) of HeLa cells. The nucleuses and cytoskeletons are stained by phalloidin and 4',6-diamidino-2-phenylindole, separately. The scale bar is 50 μm .

	Zeta potential (mV)
293	-18.1±0.7
KB	-23.4±0.5
Hela	-29.1±1.1
CuPani NSs	+33.0±0.1
Neutral NSs	-5.8±0.2
Negative charged NSs	-20.5±0.2
PEG-CuPani NPs	-5.6±0.4
SDS-CuPani NPs	-20.1±0.3
Pani NSs	+26.3±0.1

Table S1. Zeta potentials for 293, KB, Hela cells, CuPani NSs, neutral NSs, negative charged NSs, Pani NSs, PEG-CuPani and SDS-CuPani NPs dispersed in saline.

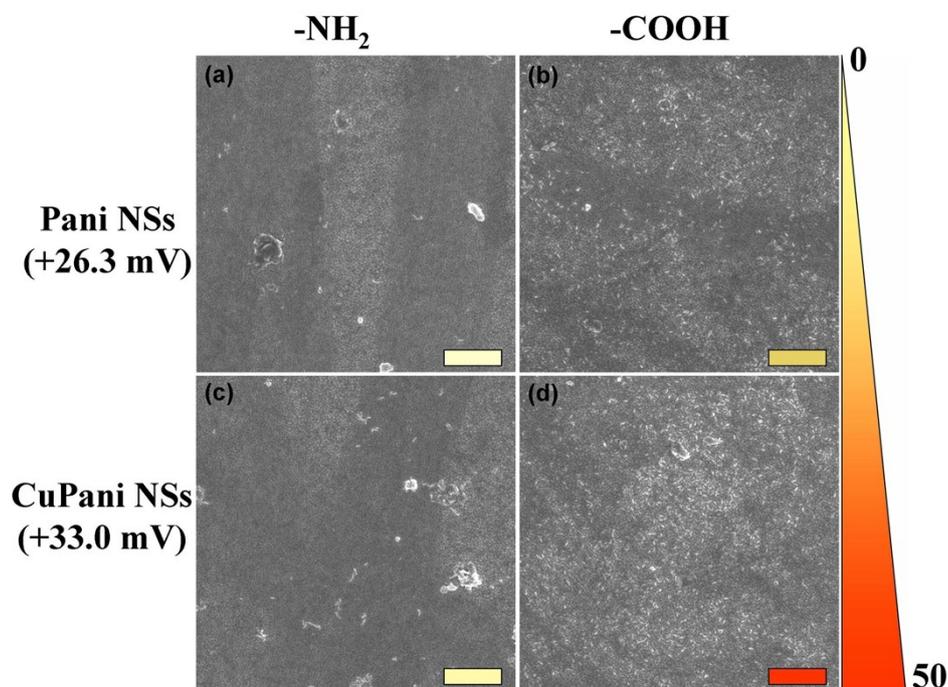


Figure S9. SEM images of Pani (a, b) and CuPani (c, d) NSs adhered on the gold substrates modified with $-\text{NH}_2$ (a, c) and $-\text{COOH}$ (b, d). The gold substrates are first immersed in the solution of 2-mercaptoethylamine and 3-mercaptopropionic acid separately and then vertically placed into the solution of 1 mg/mL CuPani and Pani NSs for 24 h. The scale bar is 1 μm and the color of scale bar represents the relative quantity of adhered NSs on the basis of the reduced reflective rate. The reduced reflective rate of CuPani NPs adhered on $-\text{NH}_2$ -modified substrates is set as “1”.