

## Supporting Information

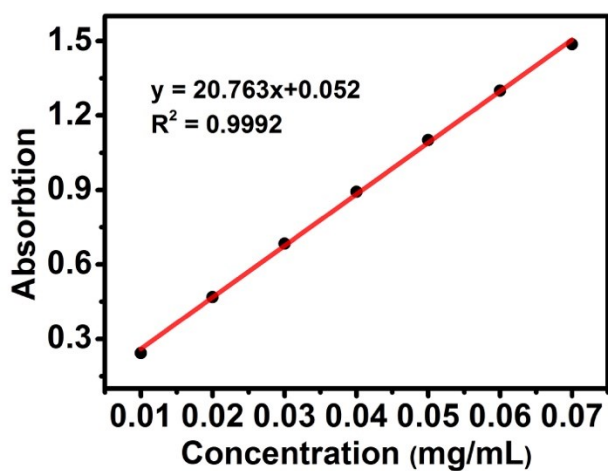


Fig. S1 DOX calibration curve with DOX standard solutions

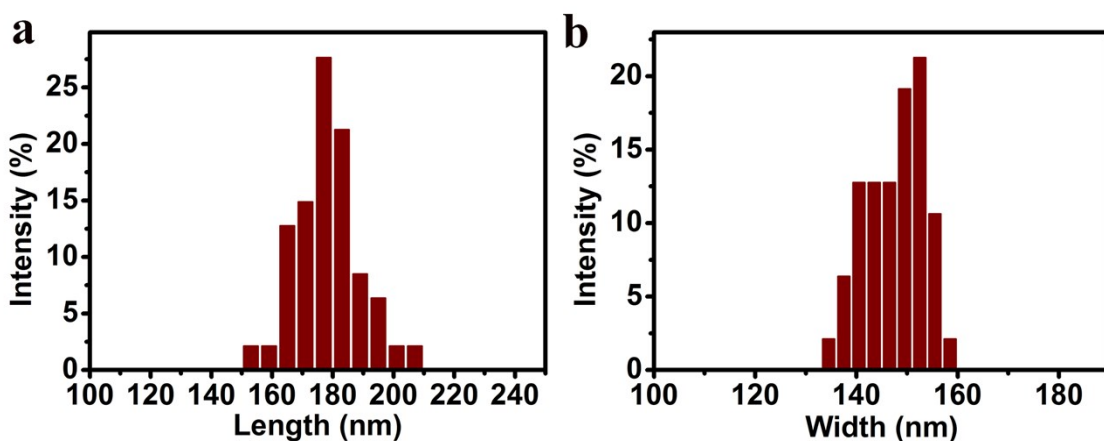
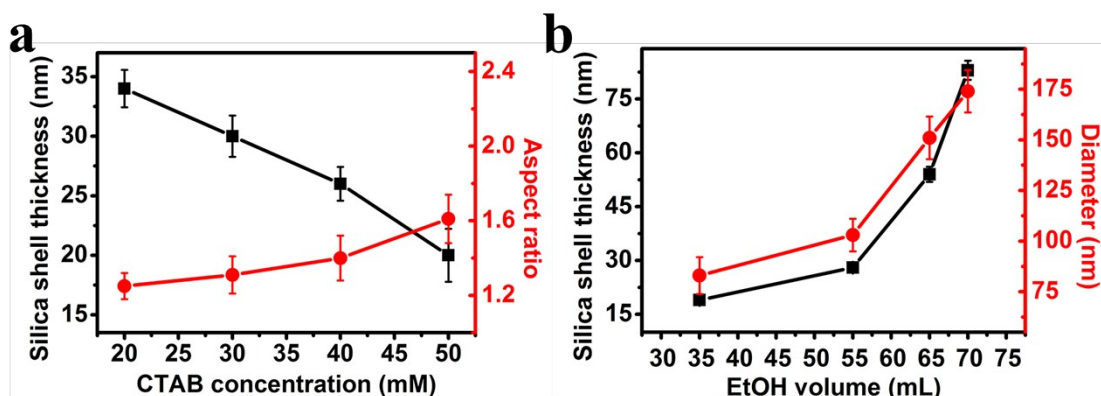
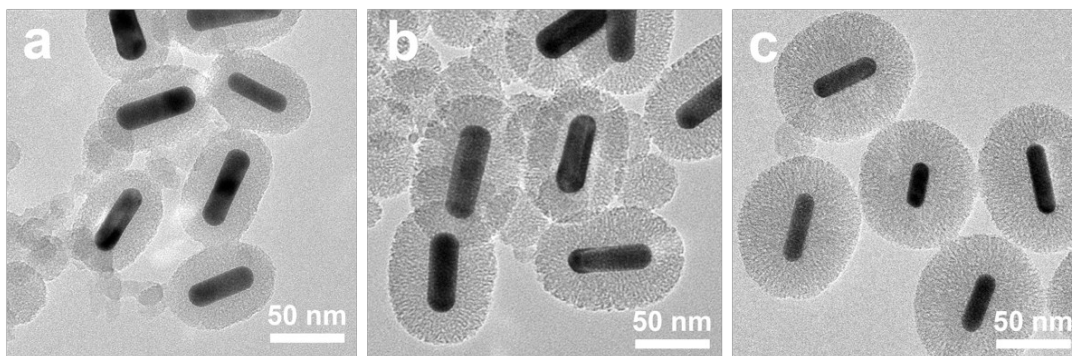


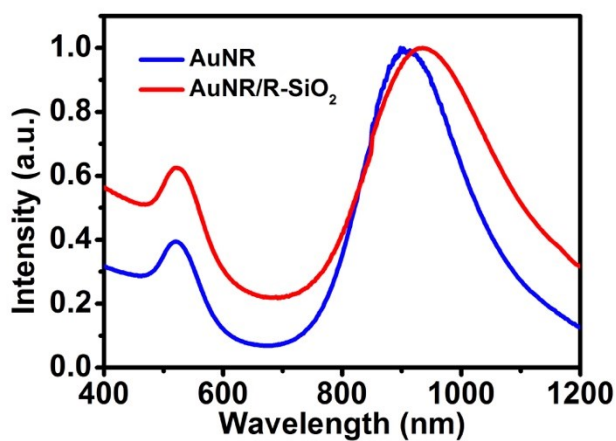
Fig. S2 Size distribution of AuNR/R-SiO<sub>2</sub> (a) Length, (b) Width.



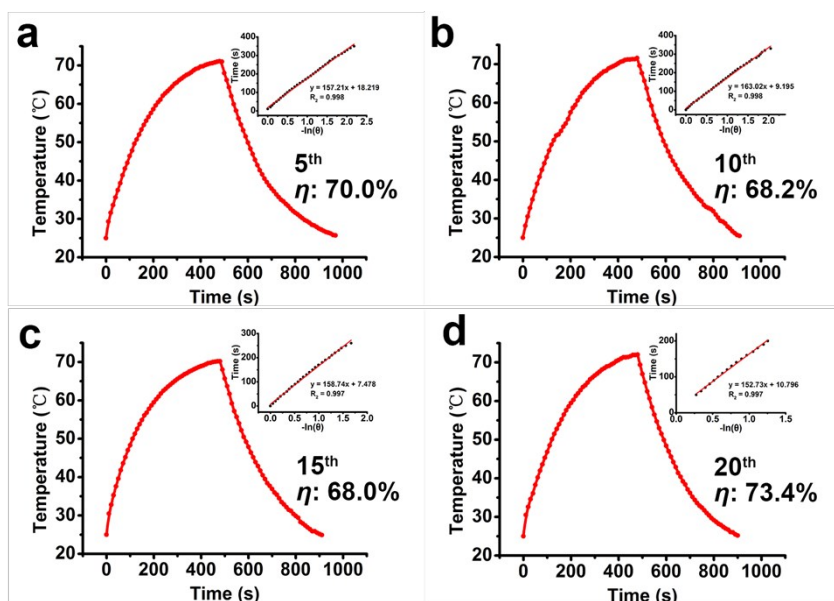
**Fig. S3** (a) Silica shell thickness and aspect ratio of AuNR/R-SiO<sub>2</sub> with different CTAB concentration (Volume of EtOH: 75 mL); (b) Silica shell thickness and diameter of AuNR/R-SiO<sub>2</sub> with different EtOH volume (Concentration of CTAB: 10mM)



**Fig. S4** TEM images of AuNR/R-SiO<sub>2</sub> were collected under different volume of EtOH. (a) 35 mL; (b) 55 mL; and (c) 65 mL. Concentration of CTAB: 10 mM.

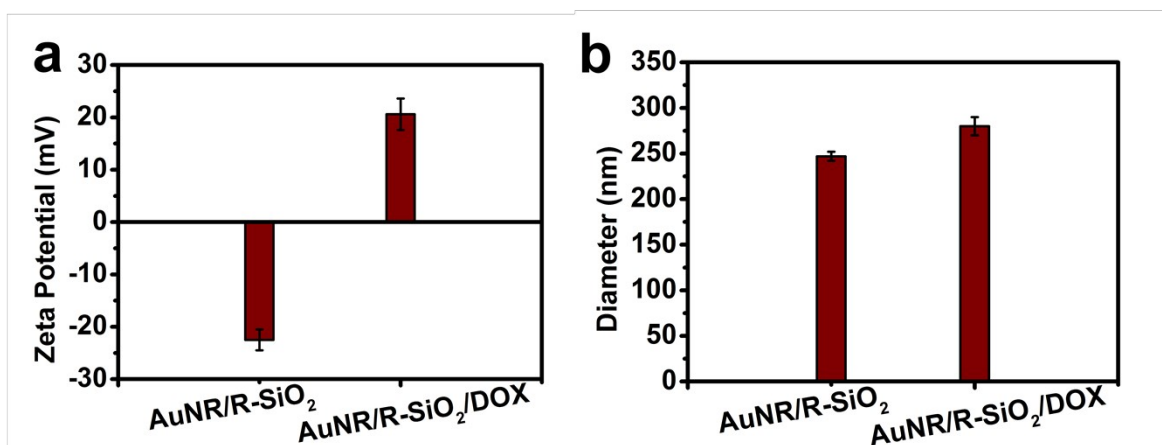


**Fig. S5** UV-vis-NIR absorption spectra of AuNR and AuNR/R-SiO<sub>2</sub>.



**Fig. S6** Temperature profile of AuNR/R-SiO<sub>2</sub> solution (250  $\mu$ g/mL) under 2.0 W/cm<sup>2</sup> 808 nm laser irradiation and corresponding linear time data vs  $-\ln(\theta)$  obtained from the cooling period

(inset).



**Fig. S7** (a) Zeta potentials and (b) Hydrodynamic diameters of AuNR/R-SiO<sub>2</sub> and AuNR/R-SiO<sub>2</sub>/DOX

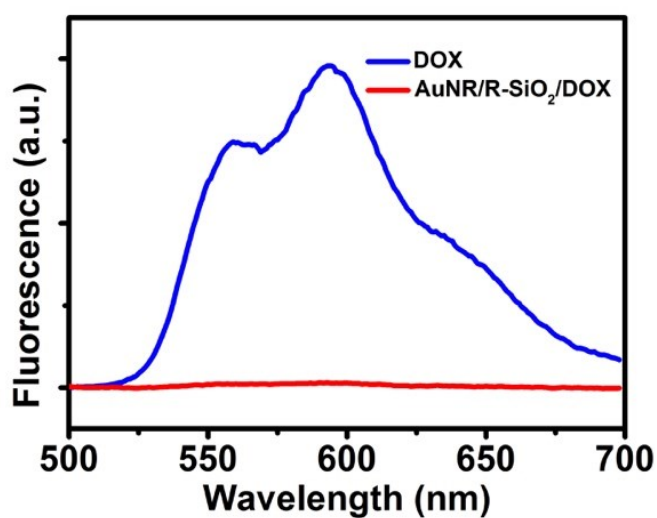


Fig. S8 Fluorescence intensities of DOX and AuNR/R-SiO<sub>2</sub> (with the equivalent DOX concentrations)

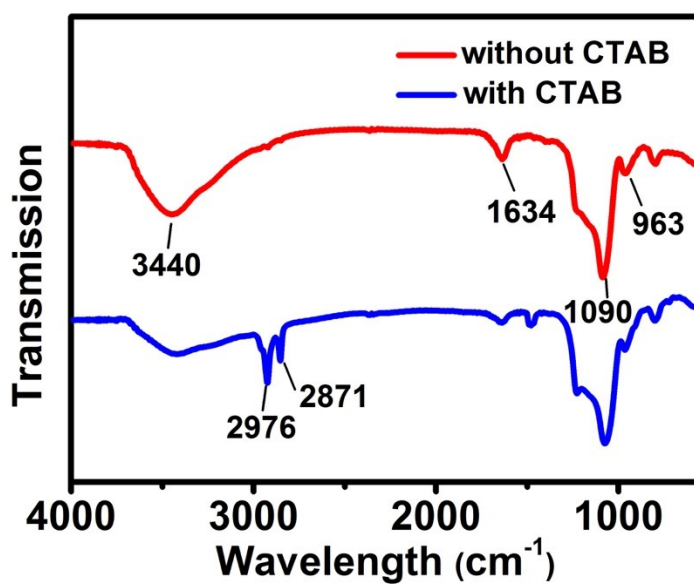


Fig. S9 FT-IR spectra of AuNR/R-SiO<sub>2</sub> before and after thermal annealing

Table S1. Dimensions of AuNR coated with ultra-thick silica shell before and after thermal annealing

<b>Temperature (°C)</b>	<b>Length (nm)</b>	<b>Width (nm)</b>	<b>Aspect ratio</b>
Control	72.8 ± 7.6	13.4 ± 1.3	5.5 ± 0.5
400	70.8 ± 8.3	14.6 ± 1.0	4.9 ± 0.5
500	67.6 ± 4.4	15.4 ± 0.7	4.4 ± 0.1
600	66.0 ± 4.9	15.5 ± 0.5	4.2 ± 0.3
700	62.2 ± 7.4	15.6 ± 1.8	4.0 ± 0.1
800	60.8 ± 6.4	16.0 ± 0.9	3.8 ± 0.6