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Supplementary Information

A nanoplatform based on mesoporous silica-coated gold nanorods for cancer triplex therapy

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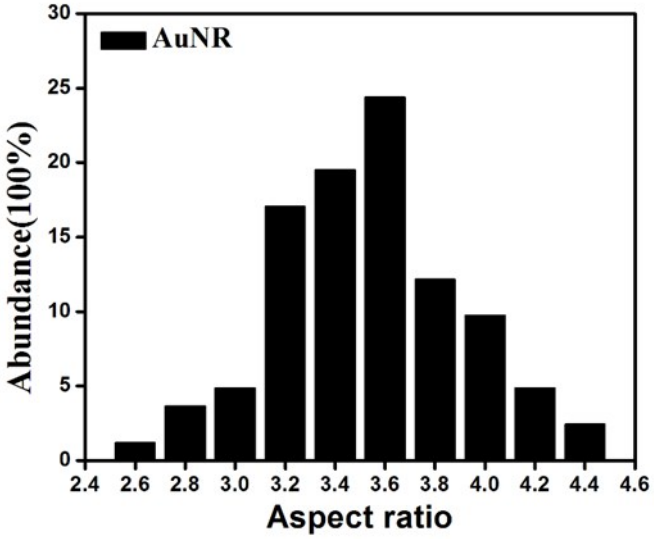

Figure S1. Aspect ratio distribution histogram of AuNR

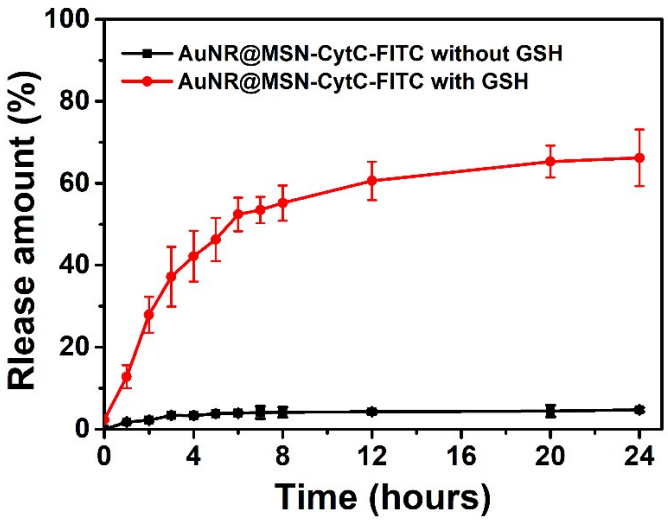

Figure S2. Redox-responsive release profiles of CytC from AuNR@MSN-CytC-FITC

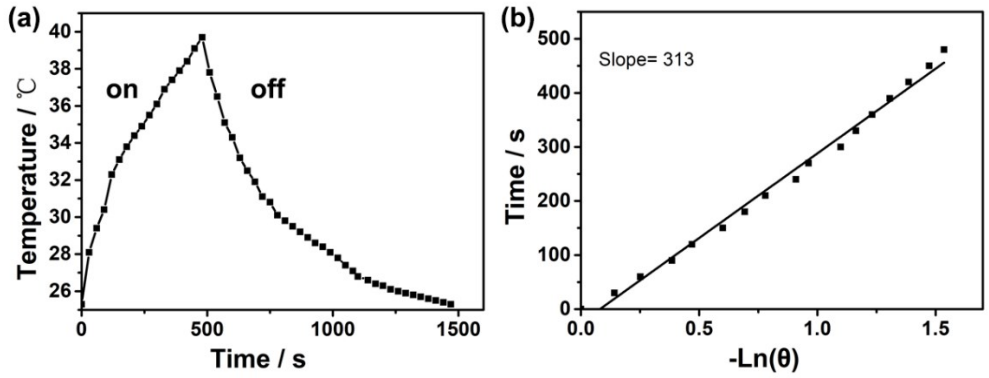

Figure S3. (a) The temperature response of AuNR@MSN-CytC@DOX (70 μg mL^{-1}) during one on/off cycle of the 808 nm NIR laser (1 W cm^{-2}). (b) Plot of cooling time versus negative natural logarithm of the temperature driving force (⊿T/⊿Tmax) in the cooling stage. The thermal time constant for heat transfer from the system is determined to be τs = 313 s.

The photothermal conversion efficiency (η) of AuNR@MSN-CytC@DOX was determined to be 16.4% according to the following equation used in the reported studies:[1]

$$\eta = \frac{hS(T_{max} - T_{surr}) - Q_0}{I\left(1 - 10^{-A_{808}}\right)} \quad (1)$$

$$\tau_s = \frac{m_d C_d}{hS} \quad (2)$$

$$Q_0 = hS(T_{max,\ water} - T_{surr}) \quad (3)$$

The value of τ_s (313) can be calculated from the curve in Figure, m_d is the mass of the nanoparticle solution(1g), and C_d is the heat capacity of water (4.2 J g^{-1} K^{-1}), the value of hS is calculated by equation (2). Then, Q_0 is calculated via equation (3), Where *h* is the heat transfer coefficient, *S* is the sample container surface area, $T_{max,\ water}$ represent the steady state maximum temperature of water (30.2 °C) and T_{surr} is the

ambient room temperature (25.2 °C), respectively. Then the photothermal conversion efficiency (η =) can be calculated based on equation (1). T*max* is the steady state maximum temperature of AuNR@MSN-CytC@DOX (39.7℃). I is the laser power, and A808 is the absorbance of AuNR@MSN-CytC@DOX at 808 nm (0.58).

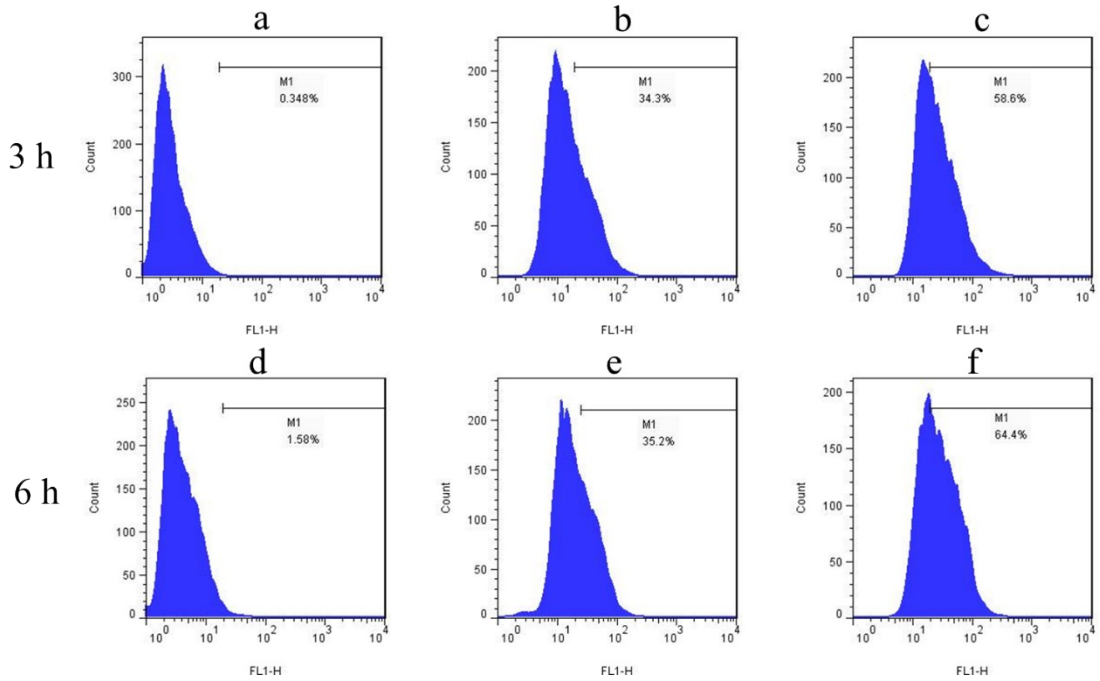

Figure S4. Representative analysis photos of FACS with free FITC (a, d), AuNR@MSNs@FITC (b, e) and AuNR@MSNs-CytC@FITC (c, f).

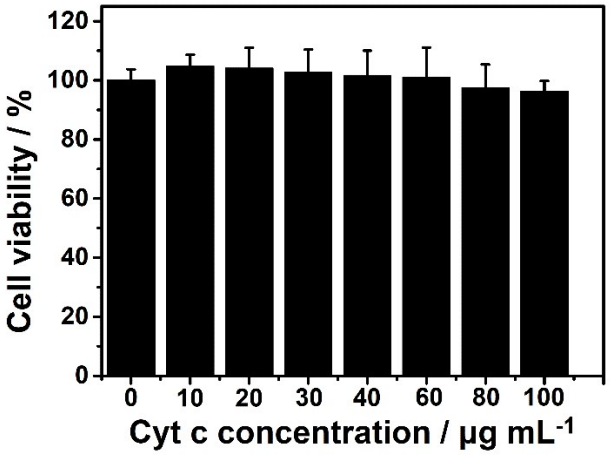

Figure S5. Evaluation of the cytotoxicity for MCF-7 cells treated with free CytC at varying concentrations for 24 h.

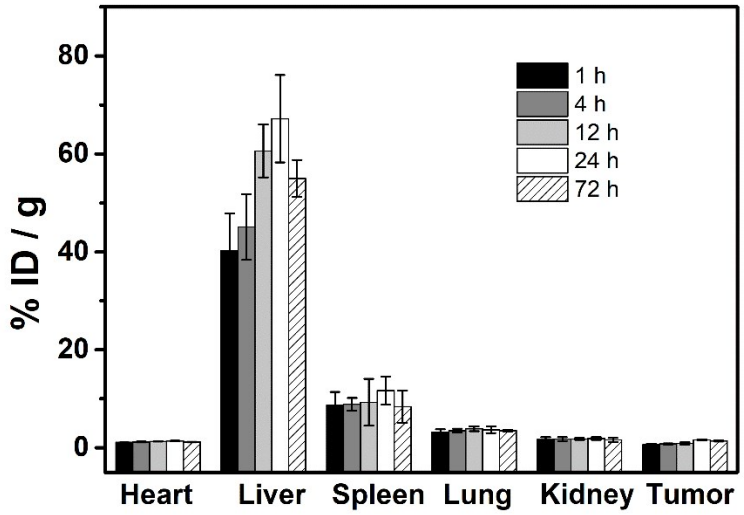

Figure S6. Time-dependent biodistribution of AuNR@MSN-CytC@DOX after intravenous injection by ICP assay.

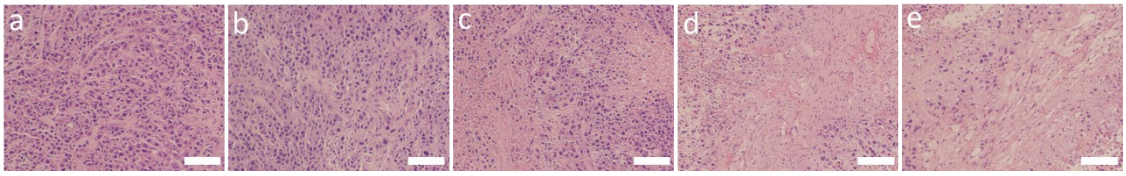

Figure S7. Histologic assessments of tumor tissues by Hematoxylin and eosin (HE) staining (pink: cytoplasm and Extracellular matrix, blue purple: nuclei): saline (a, control group), DOX (b), AuNR@MSN-CytC + Irradiation (c), AuNR@MSN-CytC@DOX (d) and AuNR@MSN-CytC@DOX + Irradiation (e) respectively. The scale bar is 100 μm.

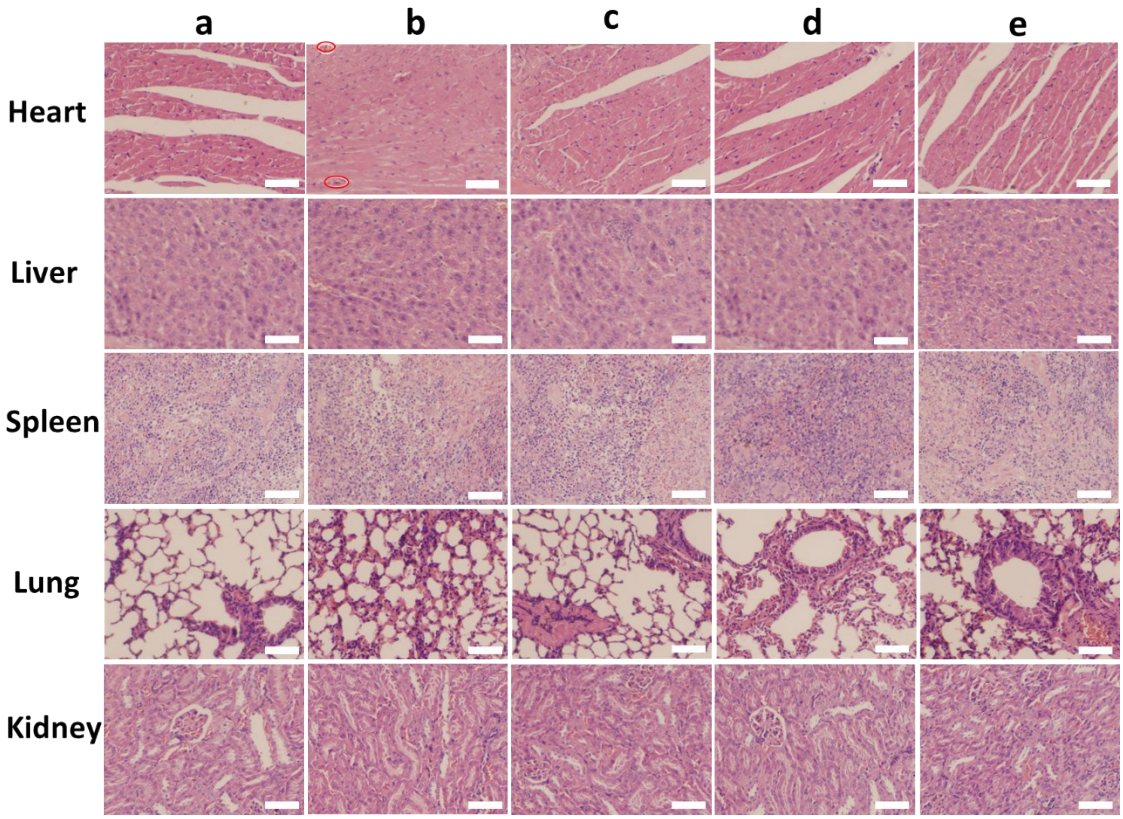

Figure S8. HE staining assessments of main organs in tumor bearing nude mice treated with saline (a, control group), DOX (b), AuNR@MSN-CytC + Irradiation (c), AuNR@MSN-CytC@DOX (d) and AuNR@MSN-CytC@DOX + Irradiation (e). The scale bar is 50 μm.

Table 1. The zeta-potentials of AuNR@MSN before and after each step of modification.

Materials	ζ-potential (mV)
AuNR@MSN	-11.1
AuNR@MSN-HS	-20.5
AuNR@MSN-S-S	10.6
AuNR@MSN-Cyt c	26.3

1. Y. X. Xing, J. X. Zhang, F. Chen, J. J. Liu and K. Y. Cai, *Nanoscale*, 2017, **9**, 8781-8790.