## TGase-induced intracellular aggregation of Fe<sub>3</sub>O<sub>4</sub> nanoparticles for

## increased retention and enhanced T<sub>2</sub> MRI

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Fig. S1 <sup>1</sup>H-NMR spectrum of CTS and SCTS.

Table S1 Elemental analysis results of NPs, NPs-Q and NPs-

K. Key: S/N is abbreviated of sulfur versus nitrogen. S/C is

	Ν	С	S	S/N	S/C	Graft ratio
	(%)	(%)	(%)	(mol/mol)	(mol/mol)	(%)
NPs	3.760	19.570	13.027	1.513	0.249	
NPs-Q	5.126	21.932	12.649	1.078	0.216	20.1
NPs-K	5.185	22.120	12.721	1.071	0.209	20.7

abbreviated of sulfur versus carbon.



Fig. S2 FT-IR spectrums of NPs, NPs-K and NPs-Q.



Fig. S3 XRD pattern of NPs.



Fig. S4 TGA curve of NPs.



Fig. S5 Hydrodynamic sizes of NPs-Q, NPs-K, NPs-Q + TGase, NPs-K + TGase and NPs-Q&K, incubated for 24 h.



Fig. S6 Aggregated sizes with different ratios of NPs-Q and

NPs-K, incubated with 1U TGase for 4 h.



Fig. S7 Cytotoxicity evaluation of NPs-Q, NPs-K and NPs-Q&K in a) HeLa cells and b) MCF-7 cells using MTT assay; error bars indicate SD (n=5).



Fig. S8 Hemolysis evaluation on NPs-Q&K using fresh erythrocytes from rat blood. The picture is representative digital photo showing erythrocytes mixed with saline (negative control), NPs-Q&K at various concentrations (ranging from 0.01, 0.02, 0.05, 0.1, 0.2 to 0.3 mg/mL), or pure water (positive control).



Fig. S9 Hydrodynamic sizes of NPs-Q&K incubated in serum for 4 h and 12 h.



Fig. S10 Tissue distribution of NPs-Q and NPs-K in HeLa

tumors. Error bar indicated SD (n=3).



Fig. S11 Tissue distribution of NPs-Q&K in other organs.

Error bar indicated SD (n=3). \*\*p < 0.01.