Electronic Supplementary Material (ESI) for RSC Advances.

Electronic Supplementary Information (ESI)

MRI Contrast Enhancement of Liver Pre-neoplasia Using Iron-Tannic Nanoparticles

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Calculation of concentration of the Fe-TA NPs

Fe-TA NPs were firstly lysed with a mixed acid solution (1:1 of HCl:HNO_3) for 30 min at 60 °C. After that, the free ferric ions were then reacted with thiocyanate salt to from the iron-thiocyanate complexes ($[Fe(SCN)_6]^{3-}$(aq)). Then, the iron concentration is determined by spectrophotometric measurements at 478 nm (ε_{478}=4584 $M^{-1}cm^{-1}$) using an Agilent 8453 UV-visible spectrophotometer. The obtained equivalent concentration of iron was used to estimate the concentration of Fe-TA NPs according to empirical stoichiometry of Fe_3TA (Based on Job's plot, the optimal structure chelation of Fe-TA NPs was about 3:1 mole ratio of Fe to TA).

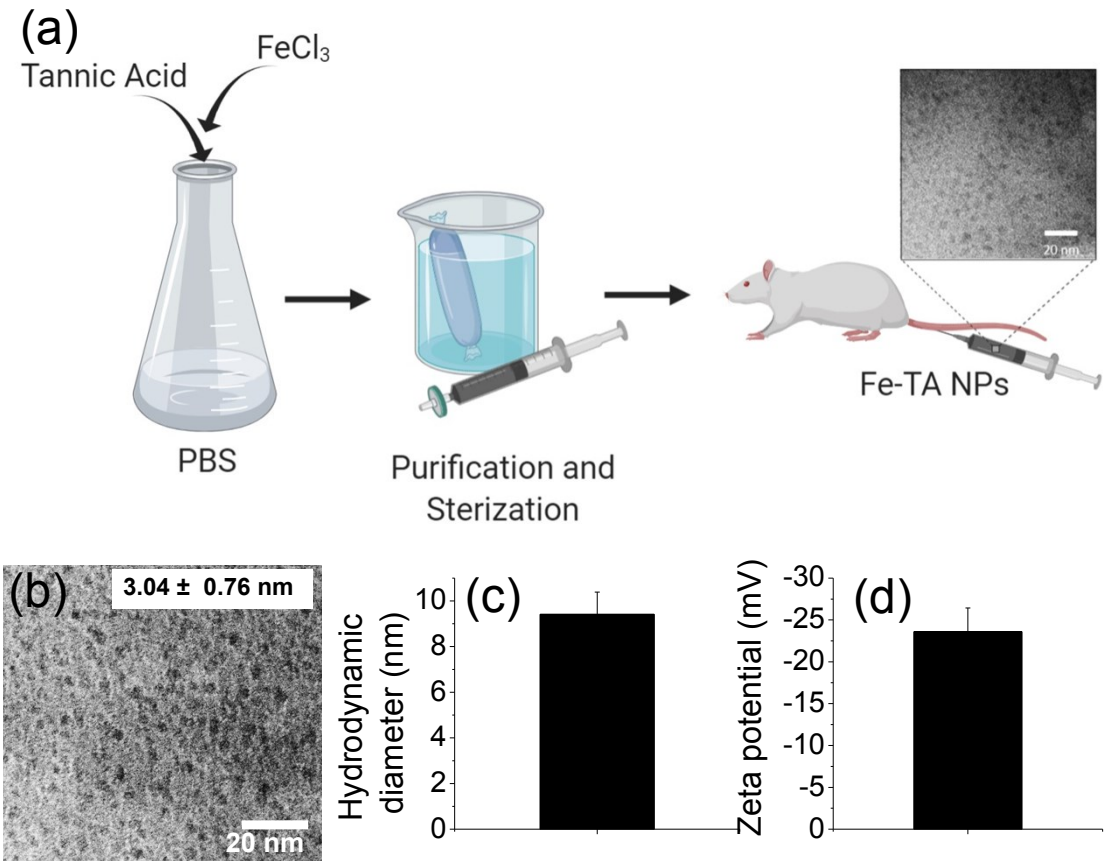

Figure S1. (a) Illustration of key steps for Fe-TA NPs preparation. (b) TEM image of Fe-TA NPs with their physical size. (c,d) Hydrodynamic diameter (HD) and zeta potential of Fe-TA NPs, measured after being incubated in PBS for 1 h.

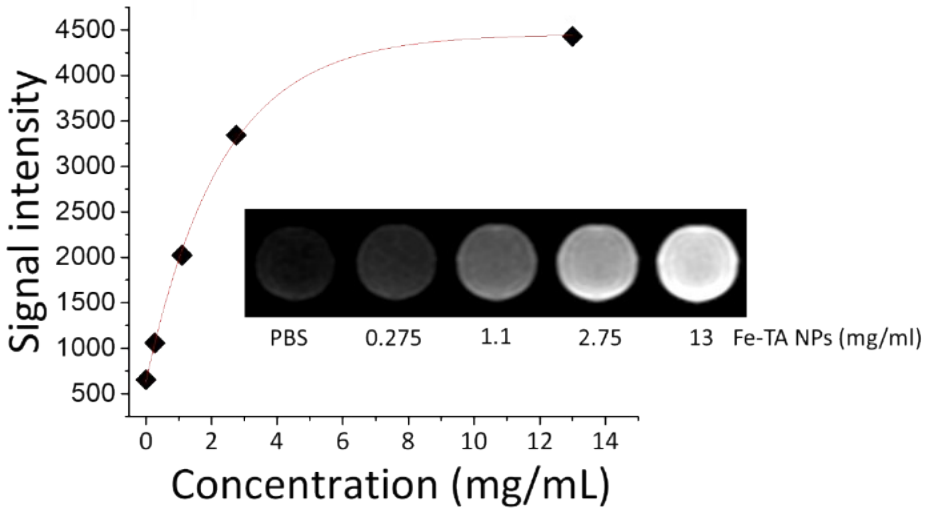

Figure S2. Signal intensity with the corresponding MRI image of different concentrations of Fe-TA NPs dispersed in PBS. Signal intensity was directly measured from the T_1-weighted MR image using Phillips DICOM viewer software.

Table S1. Body weight, organ weight and hematological values of rats in acute toxicity tests WBC: White blood cell, RBC: Red blood cell, PLT: Platelet, N.D.: Not determined, * $p<0.05$ compared to control. All data have shown in Mean ± SD

Parameters		PBS	Fe-TA NPs (mg/kg b.w.)		
			17.5	27.5	55
Started weight (g.)		183 ± 10	197 ± 6	195 ± 5	186 ± 11
End weight (g.)		196 ± 18	205 ± 13	215 ± 9	200 ± 14
Organ weight (g)	Liver	7.28 ± 0.59	8.22 ± 0.74	7.83 ± 0.61	7.11 ± 0.41
	Spleen	0.44 ± 0.06	0.50 ± 0.06	0.50 ± 0.06	0.46 ± 0.08
	kidney	1.42 ± 0.11	1.72 ± 0.10*	1.53 ± 0.03	1.44 ± 0.16
Relative organ weight (%)	Liver	3.71 ± 0.04	4.01 ± 0.13	3.65 ± 0.31	3.56 ± 1.17
	Spleen	0.22 ± 0.01	0.24 ± 0.03	0.23 ± 0.03	0.23 ± 0.04
	kidney	0.72 ± 0.01	0.84 ± 0.02*	0.71 ± 0.02	0.72 ± 0.04
Blood test	WBC ($\times 10^3/\mu$L)	3.23 ± 0.75	N.D.	3.45 ± 0.25	3.60 ± 1.17
	RBC ($\times 10^6/\mu$L)	7.24 ± 0.13	N.D.	7.36 ± 0.57	7.42 ± 0.72
	PLT ($\times 10^3/\mu$L)	805 ± 91	N.D.	892 ± 111	688 ± 195