Supporting Information

Glypolymer-Coated Iron Oxide Nanoparticles: Shape-controlled Synthesis and Cellular Uptake

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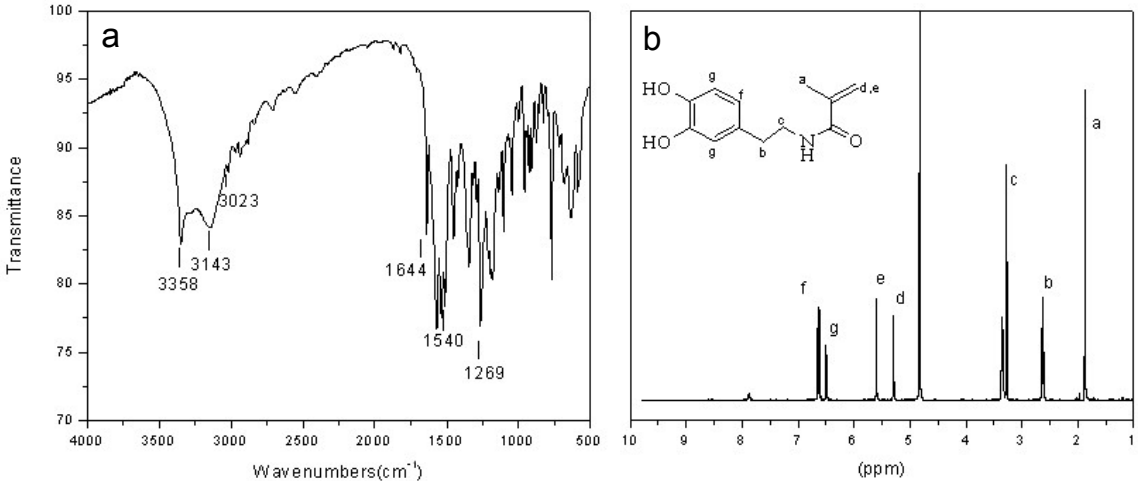

Figure S1 (a) FTIR and (b) ^{1}H-NMR (in CD_3OD) spectra of DMA.

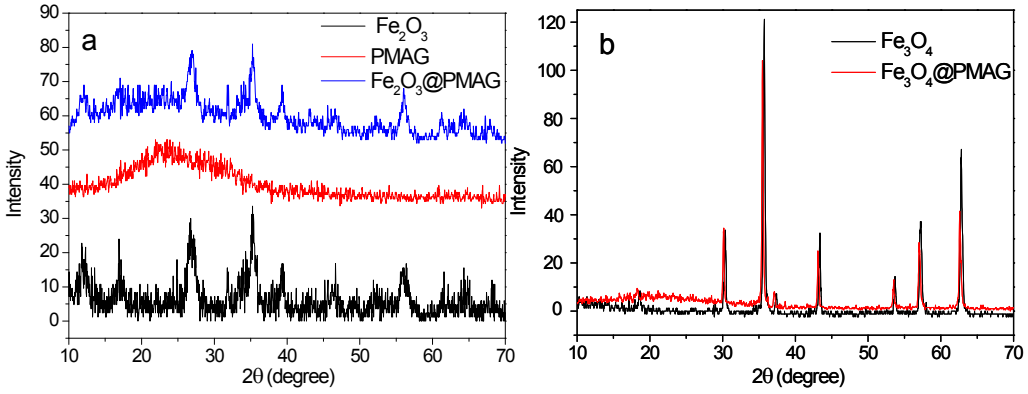

Figure S2 XRD patterns of (a) Fe_2O_3, PMAG and Fe_2O_3@PMAG particle; (b) Fe_3O_4, and Fe_3O_4@PMAG particle.

X-ray diffraction (XRD) was performed on the nanoparticle samples in order to investigate their structure and composition. The position of spindle iron oxide diffraction peaks (2θ reflections: 24.1, 35.6, 39.2, 49.4, 62.4°) can be indexed as (012), (110), (006), (024) and (214), respectively, indicating a hematite. For Figure S 2b,

the position and relative intensity of all diffraction peaks (2θ reflections: 30.1, 35.5, 43.1, 57.0, 62.7°) well matched those of the standard PDF cards for magnetite (19-0629) and could be indexed as (220), (311), (400), (511) and (440), respectively. The XRD pattern of glypolymer-coated iron oxide (Figure S2) exhibits the characteristic diffraction peaks of iron oxide, with the observation of the PMAG peaks.

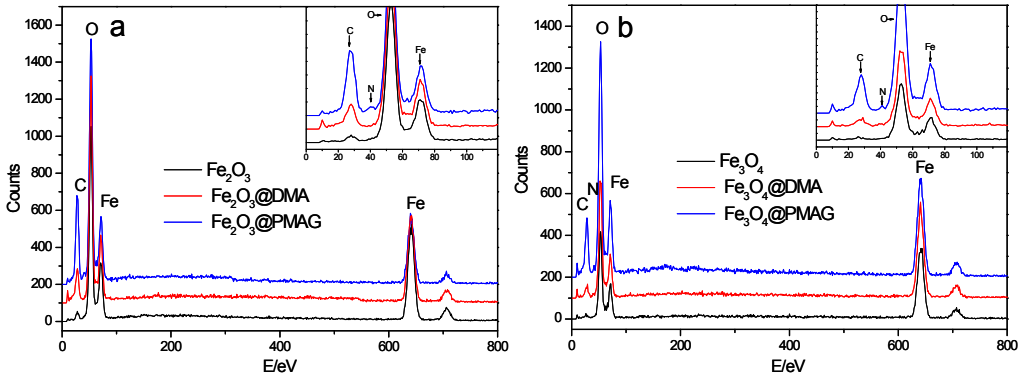

Figure S3 EDS spectra of (a) Fe_2O_3, Fe_2O_3@DMA and Fe_2O_3@PMAG particle; (b) Fe_3O_4, Fe_3O_4@DMA and Fe_3O_4@PMAG particle.

As show in Figure S3, when the iron oxide was modified with DMA, the peak of element C increased obviously, although the peak of N is not clear for the DMA modified iron oxide, due to the relatively low content. After being further modified with PMAG, the peak for C keep increasing, together with a clear observation of N peaks, indicating the successful modification of PMAG.

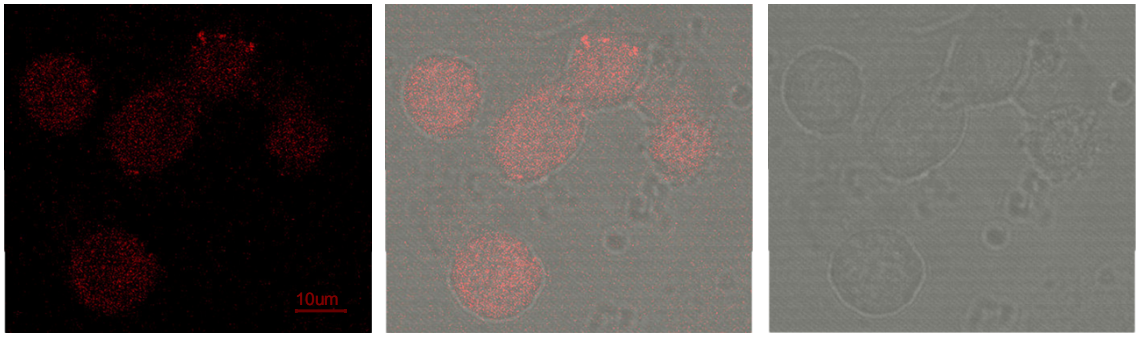

Figure S4 Confocal micrographs of RD-Fe_2O_3@PMAG interacting with Hela cells，including fluorescence, transmission and merged images.

Table S1 Fe concentration and mass fraction of polymer in glyco-nanoparticles solution determined with the aid of ICP.

Polymers	Concentration (mg L^{-1})	Volume (ml)	ICP measured content of Fe (mg L^{-1})	Mass fraction of Fe (%)	Concentration of iron oxide (mg L^{-1})	Mass ratio (%)	
						DMA	PMAG
Fe_2O_3@DMA	2	50	1.319	70.0	1.885	5.76	---
Fe_2O_3@PMAG	2	50	0.953	70.0	1.362	---	26.14
Fe_3O_4@DMA	2	50	1.420	72.4	1.961	1.20	---
Fe_3O_4@PMAG	2	50	1.155	72.4	1.595	---	19.00

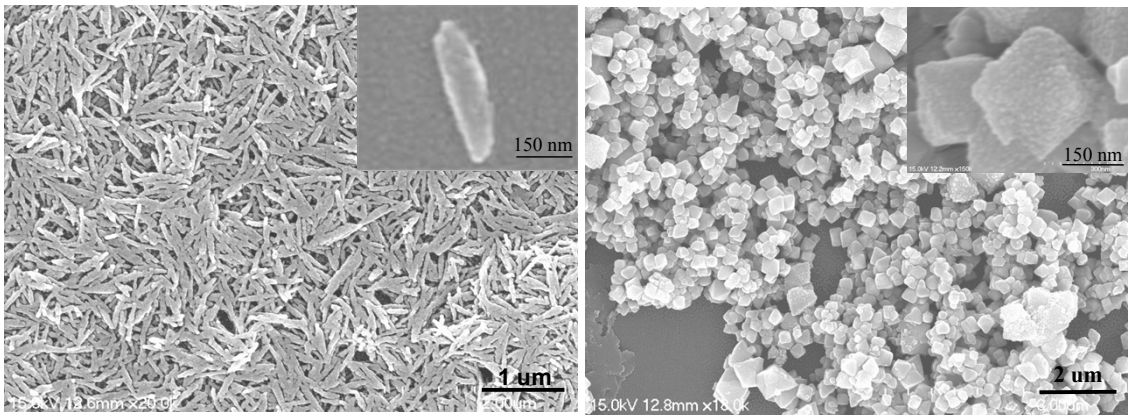

Fig. S3 SEM micrograph of Fe_2O_3@PMAG and Fe_3O_4@PMAG.

Table S2 Volume calculations of Fe_2O_3@PMAG, Fe_3O_4@PMAG. (a,b,c* estimated from the SEM and DLS data)

Shape	Side length (nm)			Density (g cm^{-3})	Formula	Volume (m^3)
	a	b	c			
Spindle	330	100	100	5.24	$D = \frac{2}{3} \cdot \pi abc$	6.90×10^{-21}
Cubic		190		5.18	$D = a^3$	6.86×10^{-21}

*For spindle, a, b and c is the average length of the x axis, y axis and z axis. For cubic, a is the average length of the x axis, also, a, b, c is equal.