

Supporting information

A rheumatoid arthritis magnetic resonance imaging contrast based on folic acid conjugated PEG-b-PAA@SPION

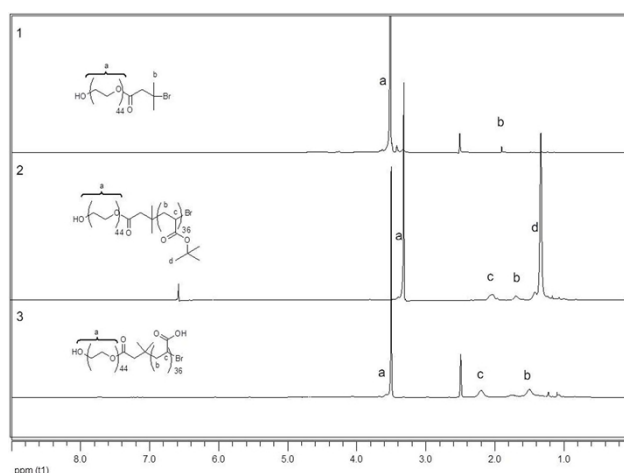


Fig. S1 ^1H NMR spectra of (1) PEG-b-PtBA₁₈, (2) PEG-b-PtBA₃₆ and (3) PEG-b-PtBA₅₇ dissolved in CDCl_3 .

The amounts of PEG-PAA_x on the SPIO were assessed by TGA (Fig. S2). As shown in Fig. 8, the weight percentages of organic polymer on PEG-b-PAA₅₇@SPIO, FA-PEG-b-PAA₅₇@SPIO, PEG-b-PAA₃₆@SPIO and FA-PEG-b-PAA₃₆@SPIO are 89.76%, 91.72%, 69.52% and 67.53% respectively. The major mass loss occurred from 200 to 450 °C and can be ascribed to the pyrolysis of PEG-b-PAA polymer, while mass loss of residual solvent or hydro dioxide during 0°C to 200°C are relatively low. The mass loss remains stable when the temperature come to 800 °C, which means all the organic content are pyrolysed.

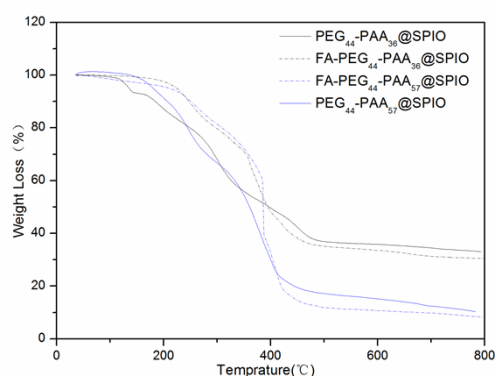


Fig. S2 Thermogravimetric analysis of PEG-b-PAA₅₇@SPIO, FA-PEG-b-PAA₅₇@SPIO, PEG-b-PAA₃₆@SPIO and FA-PEG-b-PAA₃₆@SPIO

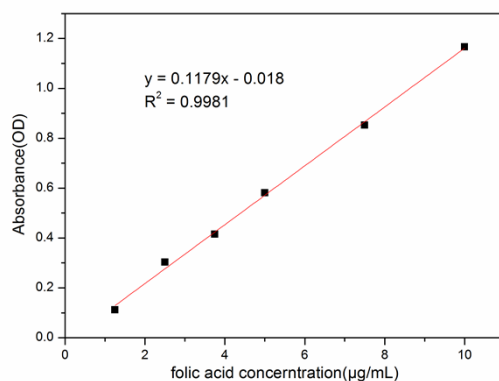


Fig. S3 calibration curve of free FA

In Fig. S4, the uptake of SPIO increased with the gradually increasing concentration of SPIO. At the concentration of 400 µg/mL, the cell uptake amount seems to reach a platform as the difference between 400 µg/mL and 800 µg/mL of FA-PEG-PAA₃₆@SPIO are not significantly distinct, which indicates that 400 µg/mL is an idea concentration for uptake. We chose 400 µg/mL as constant concentration for time dependent endocytosis (Fig. S5). Results show that cell uptake of FA-PEG-

PAA₃₆@SPIO increases with the increasing uptake time. Platform time is about 6 h after incubation. Therefore, the idea time and concentration for SPIO incubation is 6 h and 400 μg/mL.

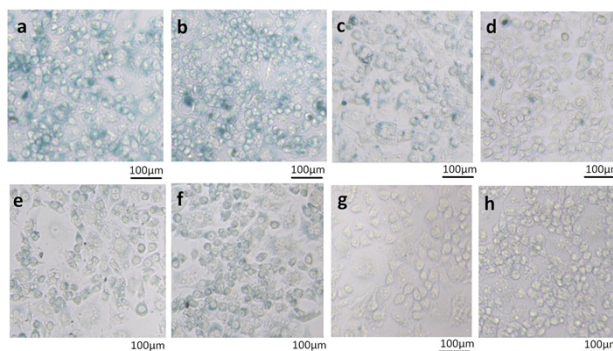


Fig. S4 Prussian blue staining of RAW 264.7 cells incubated with SPIO at the iron concentrations of 800 μg/mL (a: FA-PEG-PAA₃₆@SPIO, e: PEG-PAA₃₆@SPIO), 400 μg/mL (b: FA-PEG-PAA₃₆@SPIO, f: FA-PEG-PAA₃₆@SPIO), 200 μg/mL (c: FA-PEG-PAA₃₆@SPIO, g: FA-PEG-PAA₃₆@SPIO), and 100 μg/mL (d: FA-PEG-PAA₃₆@SPIO, h: FA-PEG-PAA₃₆@SPIO) for 6 h.

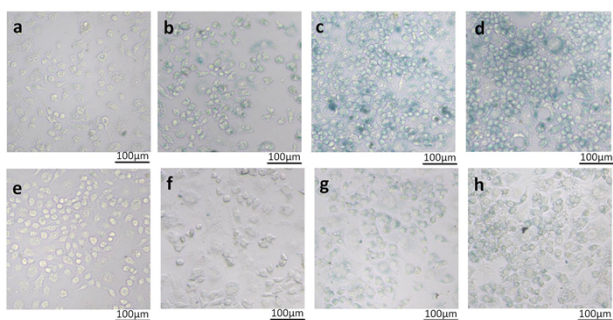


Fig. S5 Prussian blue staining of RAW 264.7 cells incubated with SPIO at the iron concentration of 400 μg/mL for 2h ((a: FA-PEG-PAA₃₆@SPIO, e: PEG-PAA₃₆@SPIO), 4h (b: FA-PEG-PAA₃₆@SPIO, f: PEG-PAA₃₆@SPIO), 6h (c: FA-PEG-PAA₃₆@SPIO, g: PEG-PAA₃₆@SPIO) and 8h (d: FA-PEG-PAA₃₆@SPIO, h: PEG-PAA₃₆@SPIO).

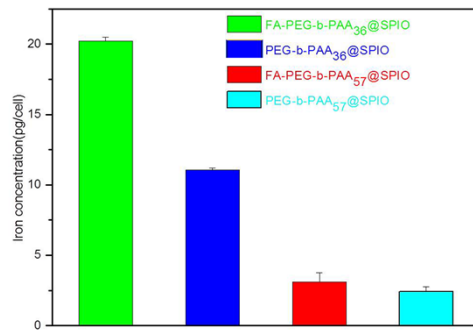


Fig. S6 Fe concentration (pg/cell) of the RAW 264.7 cells uptake FA-PEG-b-PAA₅₇@SPION, FA-PEG-b-PAA₃₆@SPION, PEG-b-PAA₅₇@SPION, and PEG-b-PAA₃₆@SPION.

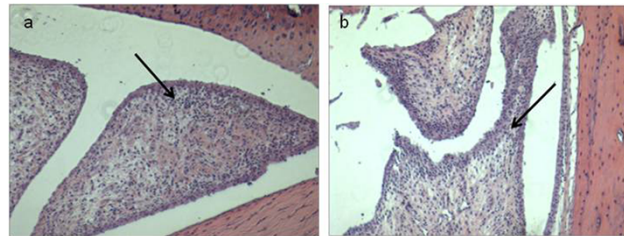


Fig. S7 H&E staining of adjuvant induced arthritic ankle joint synovium, heterogeneous distributed massive of macrophage (arrows) can be observed in synovium(a,b).