

Electronic Supporting Information

Supporting Figures:

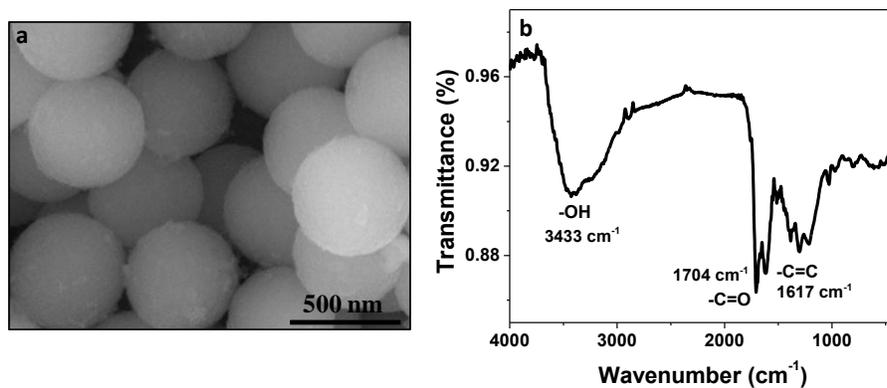


Fig.S1 Characterization of Csp. (a) FESEM image of Csp. (b) IR spectra of Csp.

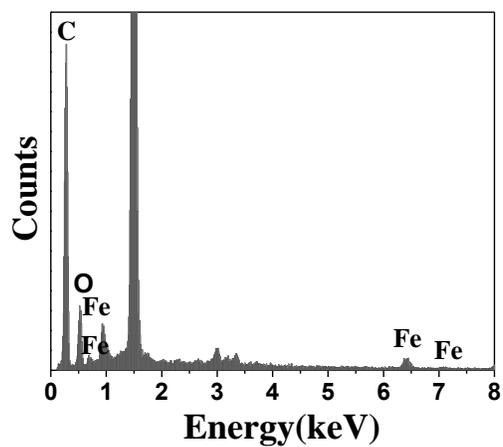


Fig.S2 EDX plot of Csp@Fe²⁺.

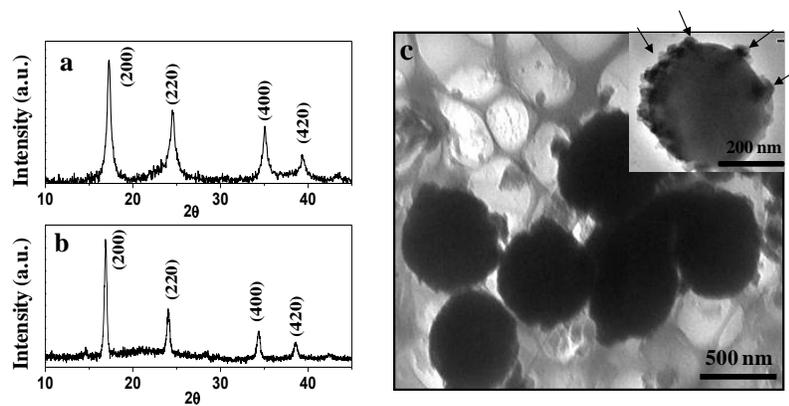


Fig.S3 (a) XRD of Csp@PB, (b) XRD of Csp@NC, (c) TEM image of Csp@PB (inset shows presence of nanoparticles on the Csp surface).

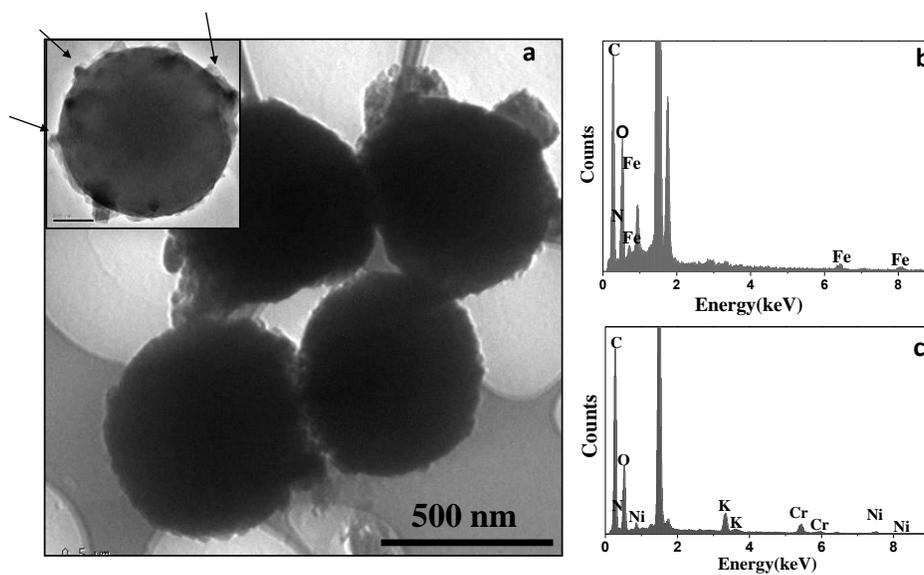


Fig.S4 TEM image of Csp@NC (a) and EDX analysis of Csp@PB (b) and Csp@NC (c). Inset of (a) shows nanoparticles (indicated by arrows) on the Csp surface.

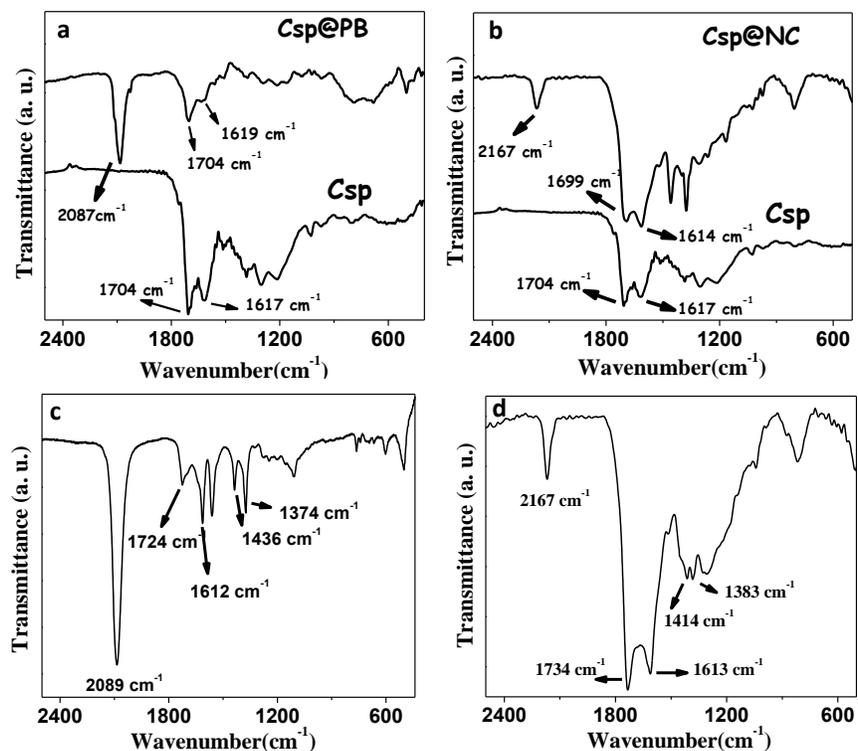


Fig.S5 IR spectra of Csp@PB and Csp (a), Csp@NC and Csp (b), Csp@PB tagged with BTC (c) and Csp@NC tagged with BTC (d).

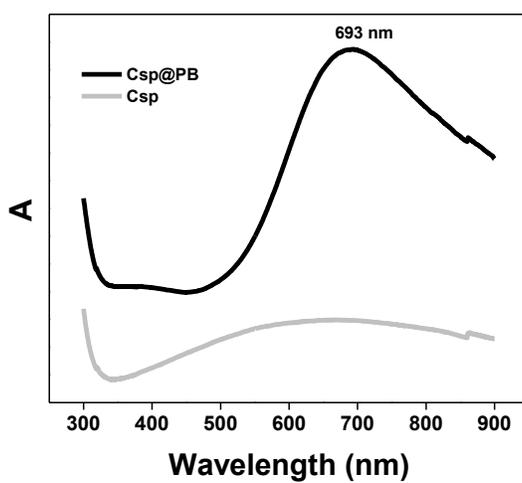


Fig.S6 UV-Vis spectra of Csp@PB and Csp.

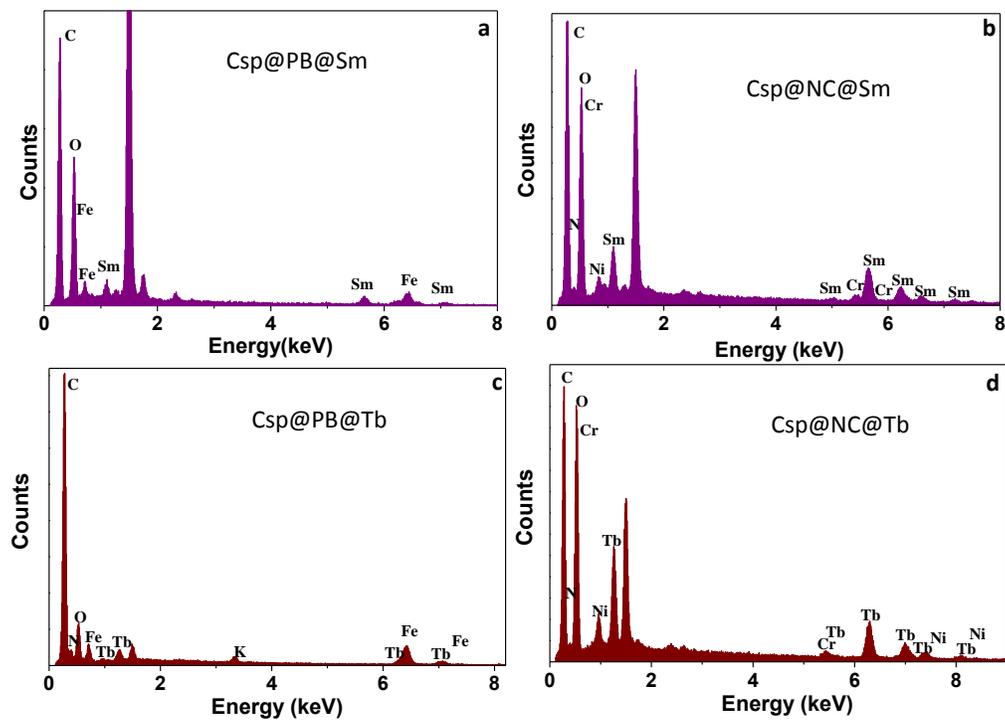


Fig.S7 EDX analysis of Csp@PB@Sm (a), Csp@NC@Sm (b), Csp@PB@Tb, (c) and Csp@NC@Tb (d).

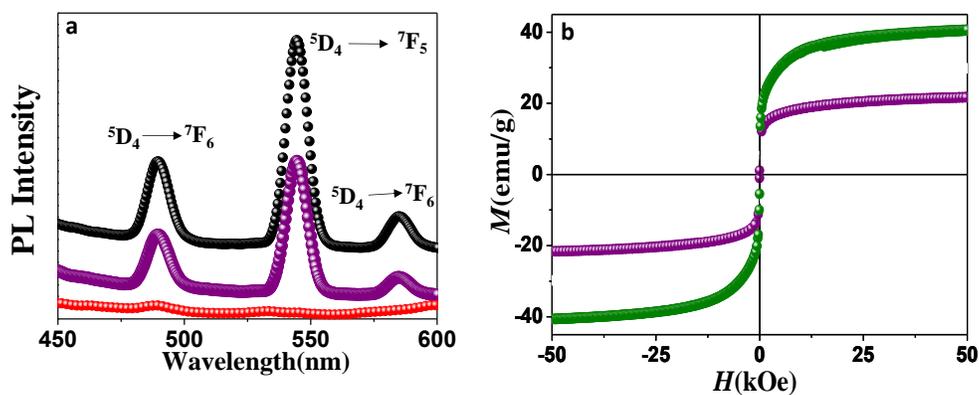


Fig. S8 (a) PL spectra showing enhancement in the fluorescence intensity, $\lambda_{ex} = 300$ nm, of Tb (red spheres) in Csp@PB@Tb (purple spheres) and Csp@NC@Tb (black spheres). (b) M vs H curve for Csp@PB (purple spheres), Csp@PB@Tb (green spheres).

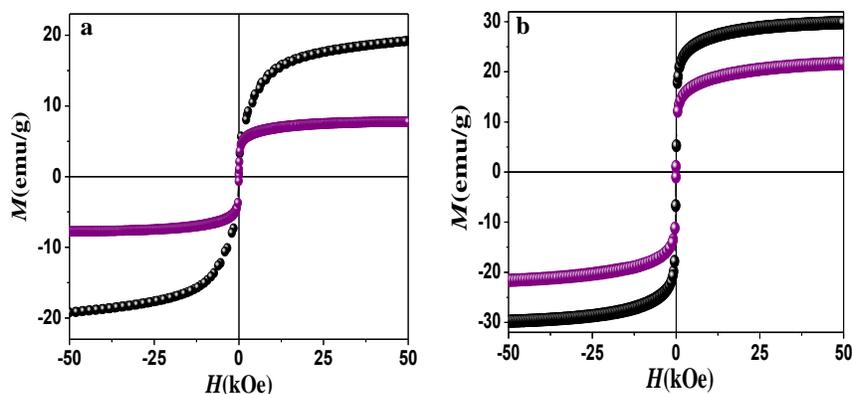


Fig. S9 (a) M vs H curve for Csp@PB (purple spheres), and Csp@PB@Sm (black spheres), (b) M vs H curve for Csp@NC (purple spheres) and Csp@NC@Sm (black spheres).

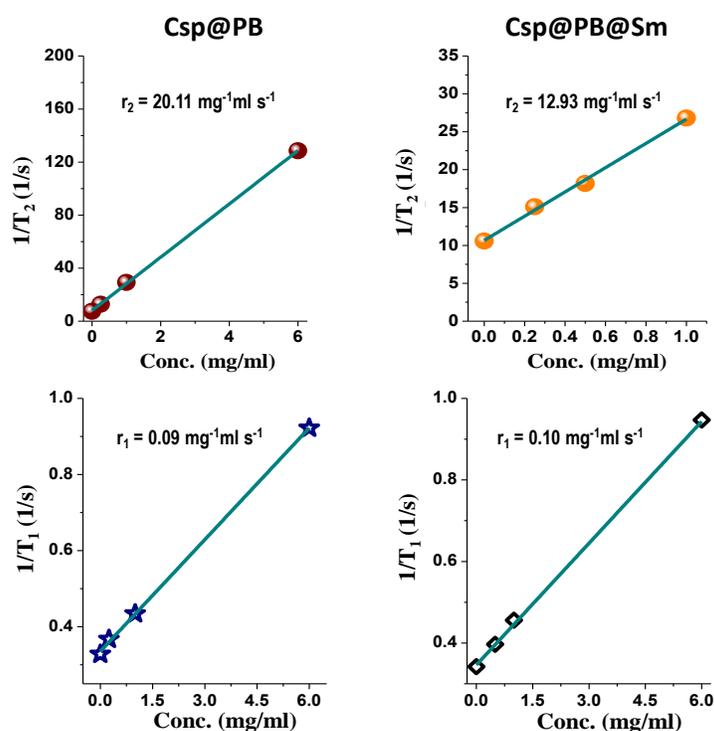
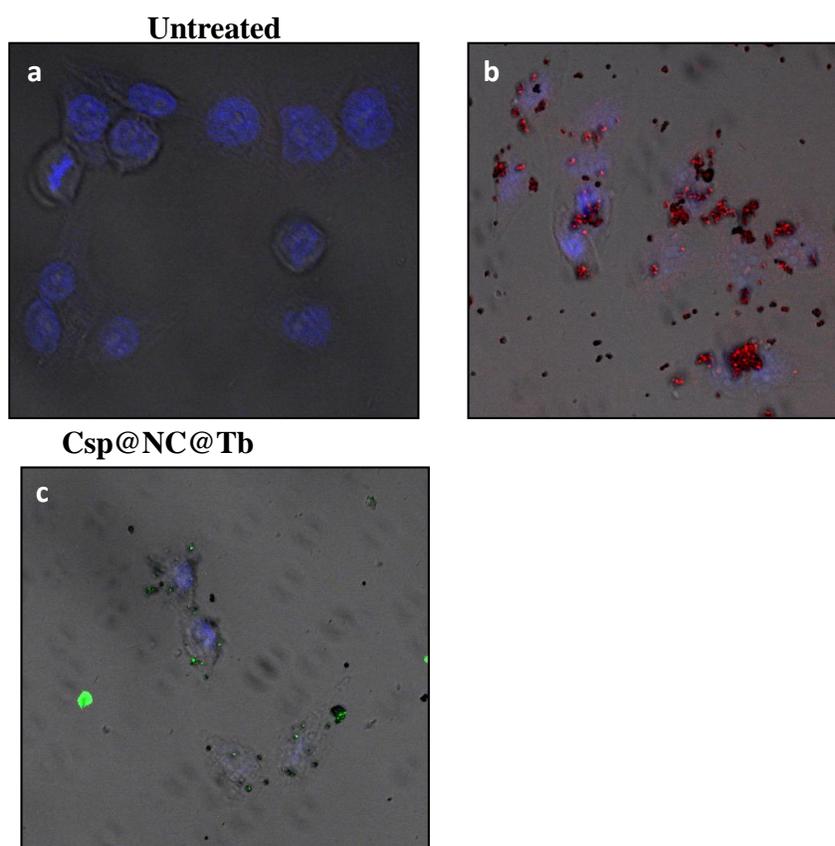


Fig.S10 The transverse (r_2) and longitudinal (r_1) relaxivity measurement of the Csp@PB and Csp@PB@Sm. The T_1 and T_2 were measured using saturation recovery and multiecho method, respectively, where the axial images of the microfuge tube filled with agarose gel were obtained. The T_1 and T_2 values were determined by fitting an exponential function to signal intensity versus repetition time and signal intensity versus echo time graph, respectively. The longitudinal (r_1) and transverse relaxivity (r_2) were calculated from the slope of R_1/R_2 versus concentration graph.

Table 1. Relaxivity properties of the composite materials.

Sample	Longitudinal Relaxivity r_1 ($\text{mg}^{-1} \text{ml s}^{-1}$)	Transverse Relaxivity r_2 ($\text{mg}^{-1} \text{ml s}^{-1}$)
Csp@PB	0.09	20.11
Csp@PB@Sm	0.10	12.93



FigS11 Confocal images of untreated HeLa cells (a), HeLa cells treated with Csp@NC@Sm (b) and HeLa cells treated with Csp@NC@Tb (c).

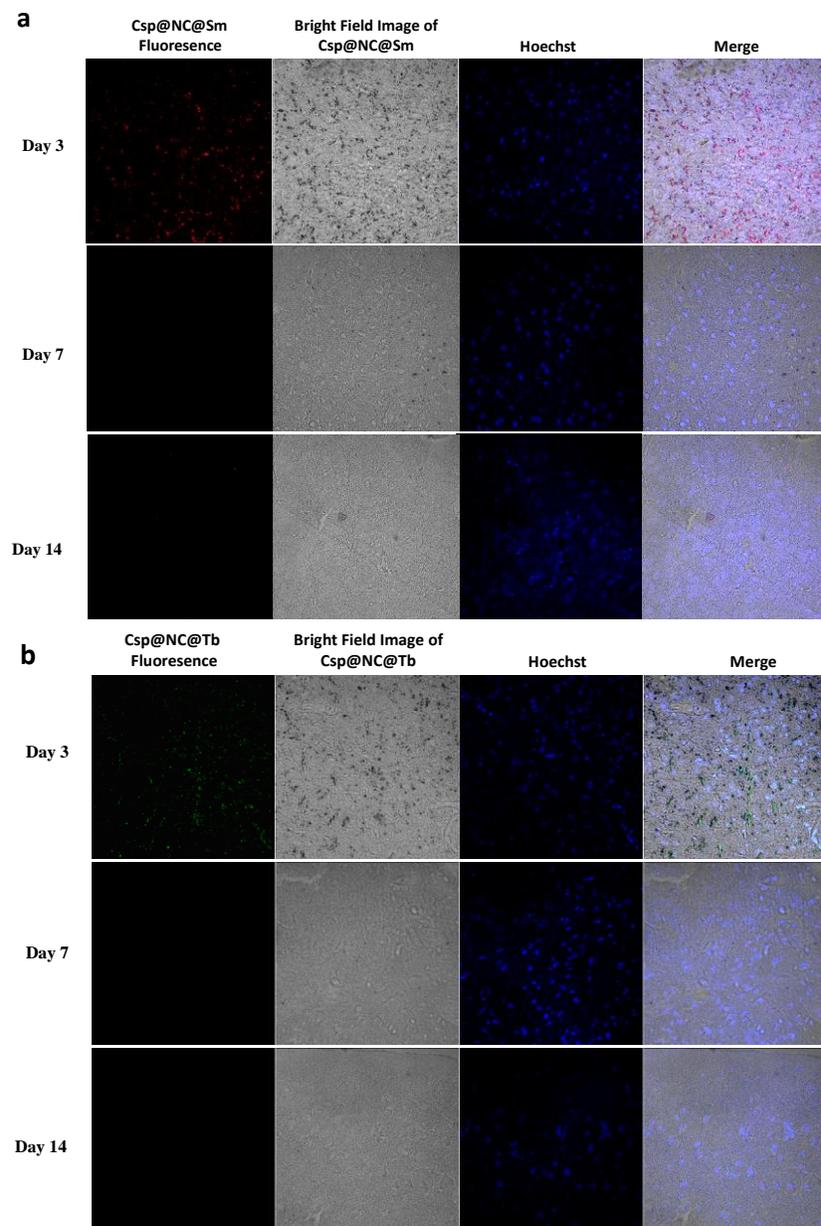


Fig.S12 (a) Confocal images of Csp@NC@Sm inside the brain tissue of mice sacrificed after 3 days, 7 days and 14 days of injection, (b) Confocal images of Csp@NC@Tb inside the brain tissue of mice sacrificed after 3 days, 7 days and 14 days of injection.

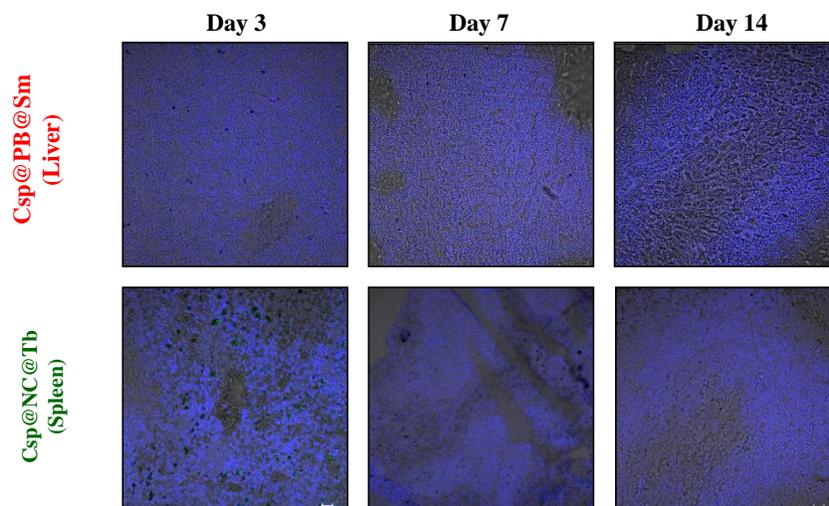


Fig.S13 Confocal images of Csp@PB@Sm inside the liver tissue of mice sacrificed after 3 days, 7 days and 14 days of injection and confocal images of Csp@NC@Tb inside the spleen tissue of mice sacrificed after 3 days, 7 days and 14 days of injection.