Electronic Supplementary Material (ESI) for RSC Advances.

Supplemental information for

Microwave-assisted synthesis of highly crystalline, multifunctional iron oxide nanocomposites for imaging applications

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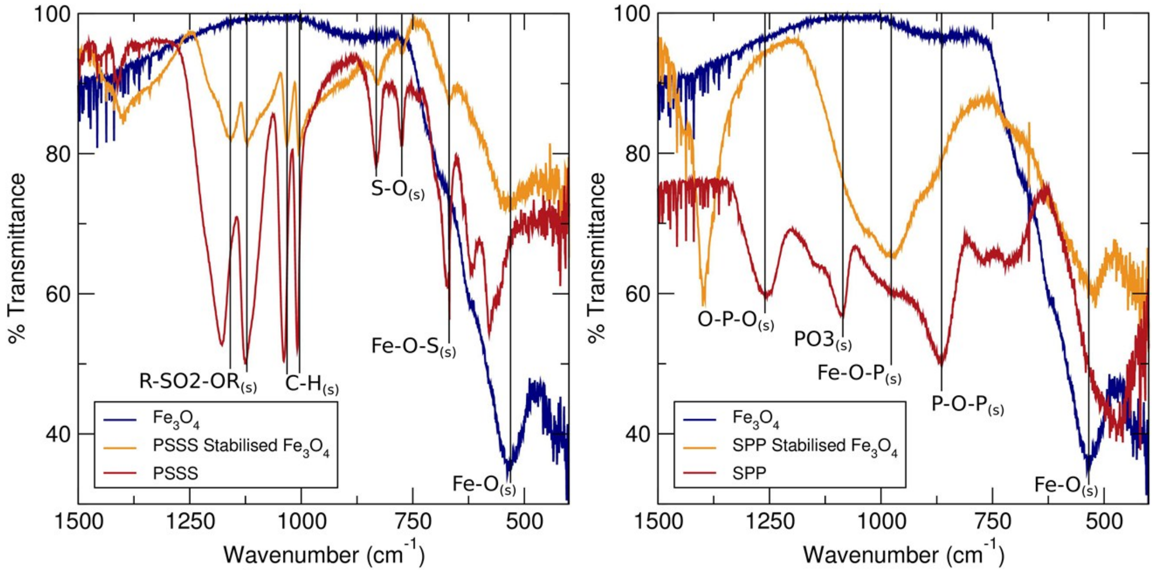

Figure S1: IR spectra of (left) PSSS-stabilised Fe_3O_4 and (right) SPP-stabilised Fe_3O_4. Functional groups are labeled in each figure.

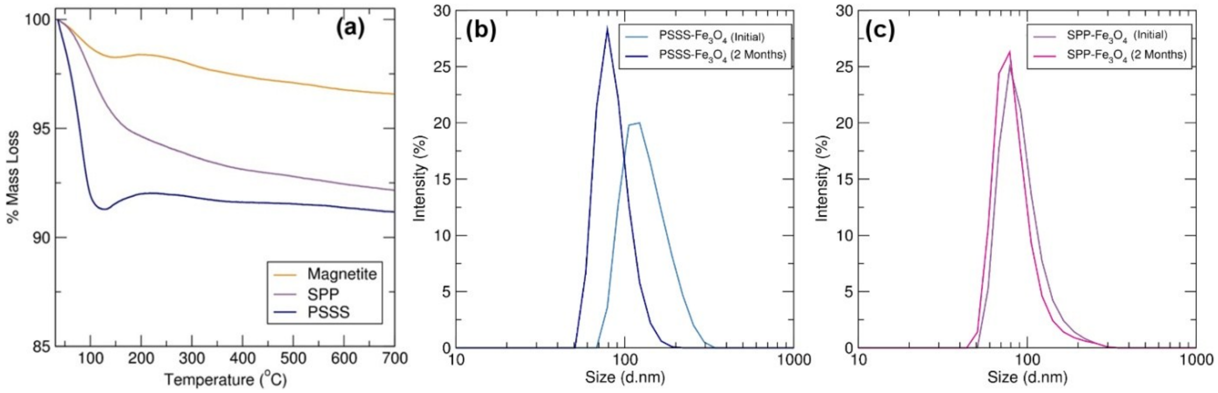

Figure S2: (a) TGA analysis of polyelectrolyte samples reveal greater mass losses compared to pure magnetite samples. (b, c) DLS experiments confirm the long-term water stability of the samples and reveal hydrodynamic radii for PSSS- and SPP-Fe$_3$O$_4$ samples on the order of 100 nm.

Table S1: Zeta potential measurements taken immediately after synthesis and one month prior to synthesis

	PSSS-Fe$_3$O$_4$	**SPP-Fe$_3$O$_4$**
Zeta potential initial	-55.9 mV	-48.2 mV
Zeta potential after one month	-41.5 mV	-46.9 mV

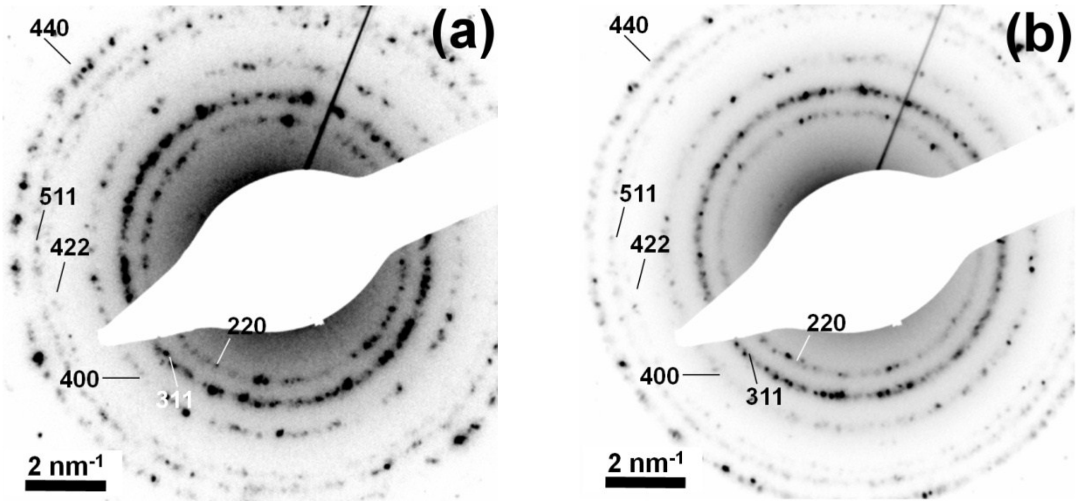

Figure S3: SAED patterns for (a) PSSS-Fe_3O_4 and (b) SPP-Fe_3O_4 nanoparticles, with each pattern indexed to magnetite.

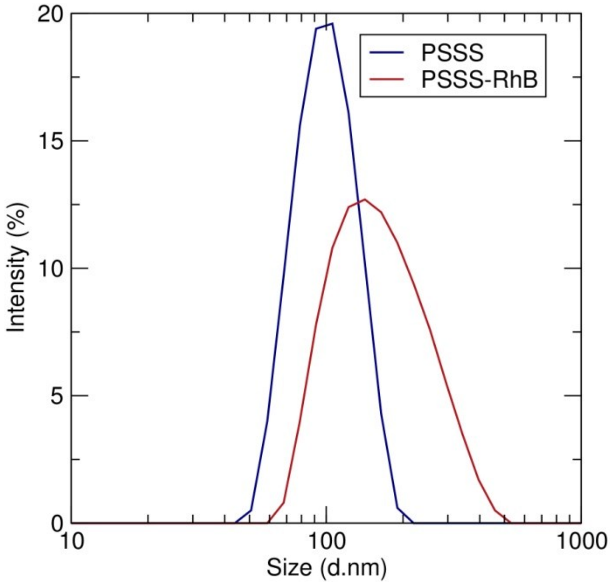

Figure S4: DLS observations of PSSS-Fe_3O_4 (blue line) and Rhodamine B-functionalised PSSS-Fe_3O_4 (red line), showing an increase in cluster size for the dye incorporated sample due to increased electrostatic interactions.

Release profile of rhodamine from Rhodamine-PSSS-Fe_3O_4:

Rhodamine-PSSS-Fe_3O_4 colloidal suspension (1 ml) was transferred to a dialysis bag (Molecular weight of 14 kDa). This bag was immersed in distilled water at 25 °C under magnetic stirring. The released rhodamine solution (3 ml) from the dialysis bag was collected in regular intervals of times (over a period of seven days) without changing the medium (distilled water). The emission spectra from the released rhodamine solution was monitored at excitation of 522 nm and emission recorded in the interval of 550 nm to 700 nm with a silt width of 10 nm. All these measurements were done on a RF-5301PC spectrofluorophotometer (Shimadzu). Any release of Rhodamine B was observed by fluorescence emission spectra at a maximum fluorescence emission wavelength of 571 nm.

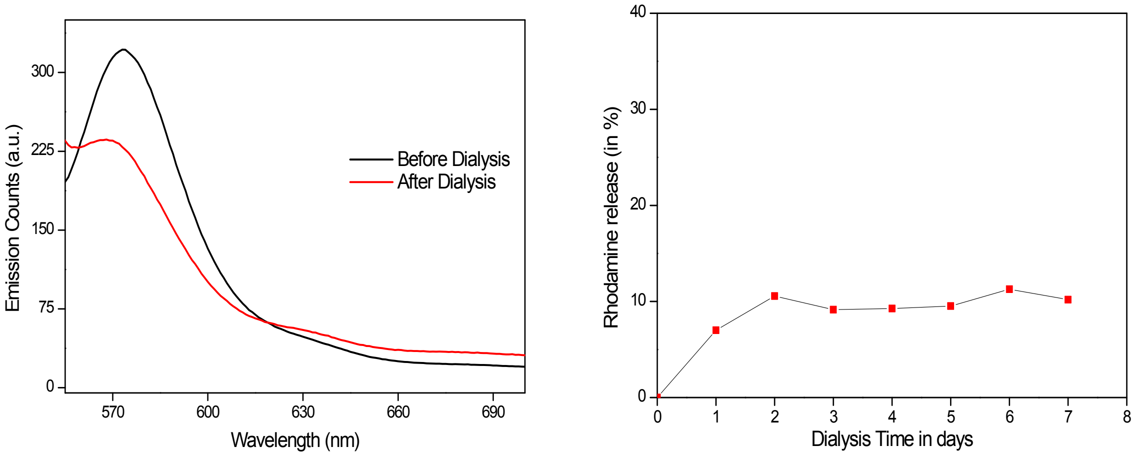

Figure S5: (Left) Emission spectra of Rhodamine-PSSS-Fe_3O_4 colloidal suspension before and after dialysis. (Right) Rhodamine release profile of rhodamine from Rhodamine-PSSS-Fe_3O_4 colloidal suspension.