Electronic Supplementary Information (ESI)

Pluronic Stabilized Fe_3O_4 Magnetic Nanoparticles for Intracellular Delivery of Curcumin

K. C. Barick[a,*], Ekta[a,b,‡], Santosh L. Gawali[a,c,‡], Avipsha Sarkar[a],
A. Kunwar[d], K. I. Priyadarsini[c,d], P. A. Hassan[a,c,*]

[a]Chemistry Division, Bhabha Atomic Research Centre, Trombay, Mumbai – 400 085, India
[b]Department of Pharmaceutical Chemistry, Manipal College of Pharmaceutical Sciences,
Manipal University, Manipal – 576104, India
[c]Homi Bhabha National Institute, Anushaktinagar, Mumbai – 400 094, India
[d]Radiation and Photochemistry Division, Bhabha Atomic Research Centre, Trombay, Mumbai – 400 085, India

[*]Corresponding author: Tel.: +91 22 2559 0284, Fax: +91 22 2550 5151,
Email: kcbrick@barc.gov.in (K. C. Barick), hassan@barc.gov.in (P. A. Hassan)
[‡]These authors are equally contributed to this work.

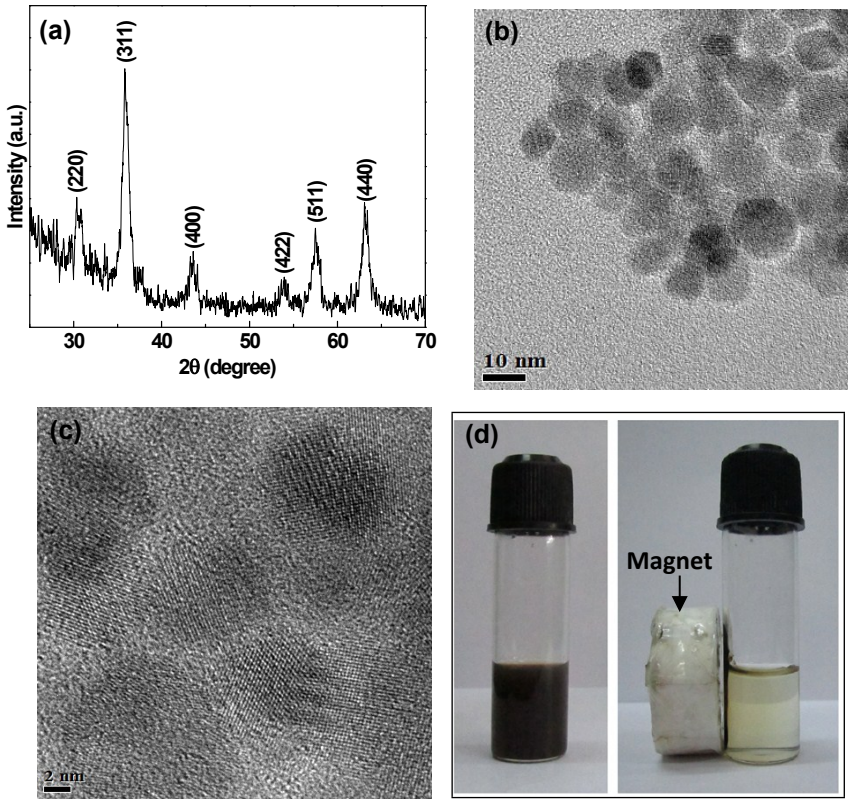

Fig. S1. XRD pattern, (b) TEM micrograph, (c) HRTEM micrograph and (d) magnetic field responsivity of Pluronic stabilized Fe_3O_4 magnetic nanoparticles (PSMNPs). The field strength of table-top magnet used in Fig. S1(d) is of 0.25 kOe. It has been observed that PSMNPs are highly dispersible in water, but they are attracted towards the permanent magnet in the presence of its magnetic field. However, these particles are easily redispersible in water upon removal of magnetic field.

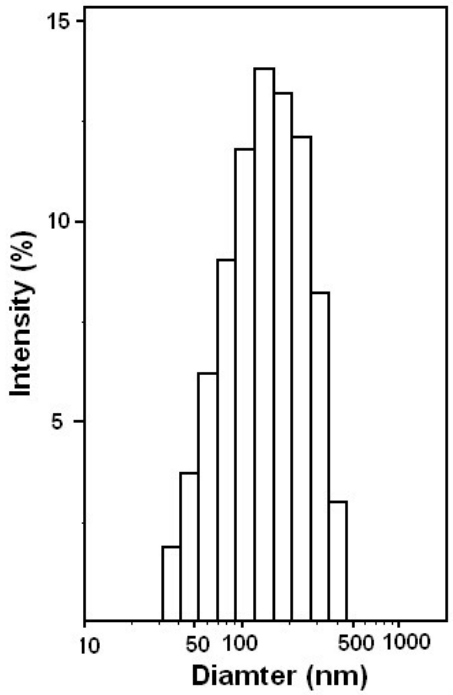

Fig. S2. Size distribution of HMNPs in hexane as obtained from DLS analysis.

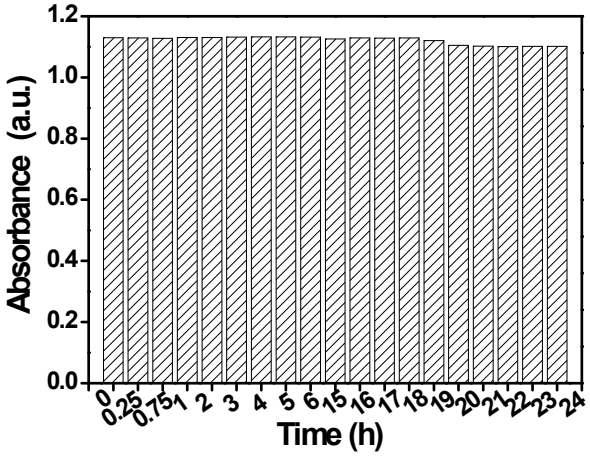

Fig. S3. Time dependent UV-Visible absorbance of PSMNPs (0.1 mg/ml) suspension indicating their aqueous stability.

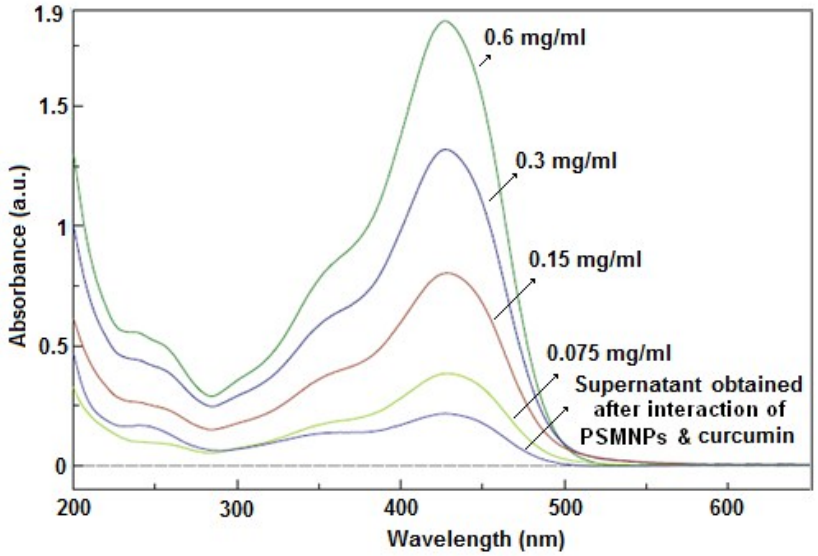

Fig. S4. UV-visible absorbance plots of pure curcumin in methanol-water (1:2) medium and supernatant solution obtained after magnetic separation of curcumin loaded PSMNPs (For drug loading experiment, 1 ml methanolic solution of curcumin (5 mg/ml) was interacted with 2 ml aqueous solution of PSMNPs (5 mg/ml) for 16 h under vortex). The concentration of supernatant drug solution was calculated using the slope of the stand plot (absorbance vs. concentration) obtained from the known concentrations of curcumin.

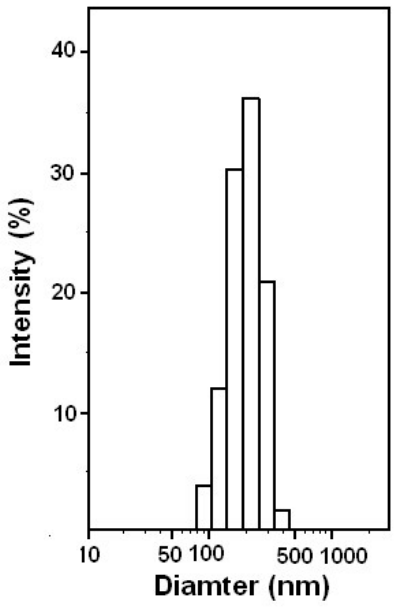

Fig. S5. Size distribution of CUR-PSMNPs in aqueous medium as obtained from DLS analysis.

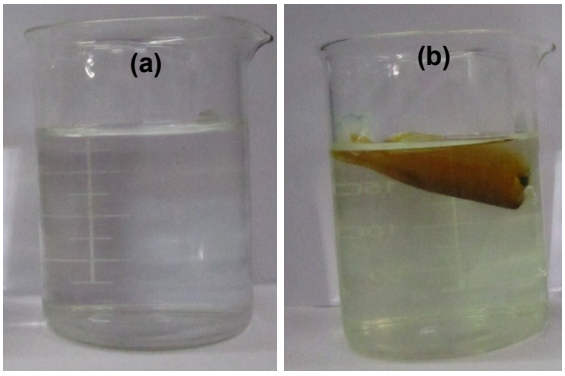

Fig. S6. Photograph depicting the release of curcumin form CUR-PSMNPs at pH 5: (a) before drug release experiment and (a) after drug release study. The colour of sink medium changes from colourless to intense yellow after drug release experiment.

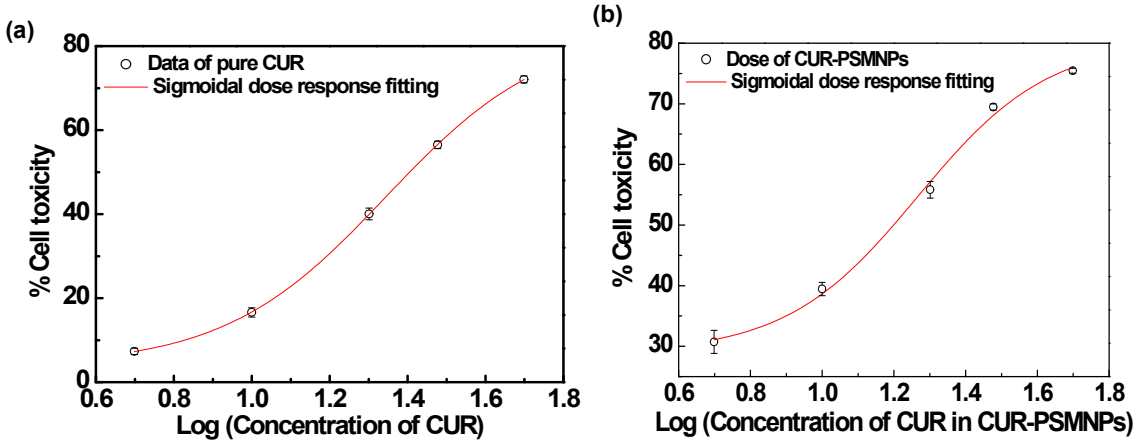

Fig. S7. Sigmoidal-dose response fitting graphs of (a) CUR and (b) CUR-PSMNPs for determining IC_{50} value. The results are presented as mean ± SEM, n = 3.

Table S1. Protein interaction of PSMNPs with BSA by zeta-potential measurements.

Time (min)	Zeta-potential (mV) of PSMNPs (0.02 mg/ml) upon interacting with BSA (0.025 mg/ml) in 0.01M PBS
0	-22.8
60	-22.3
120	-23.1