Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

Self-carried Curcumin Nanoparticles for In vitro and In vivo Cancer Therapy with Real-time Monitoring of Drug Release

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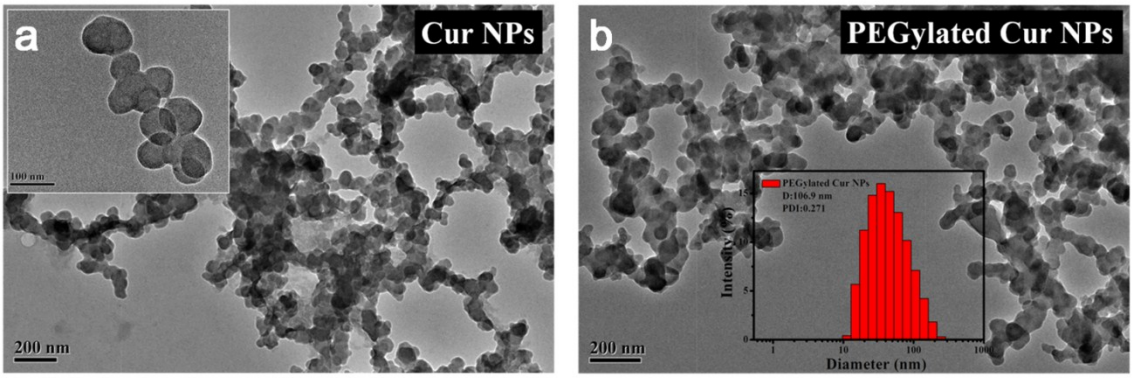

Fig. S1. TEM images of Cur NPs and PEGylated Cur NPs, inset in b is the DLS data of PEGylated Cur NPs (Diameter: 106.9 nm, PDI: 0.271).

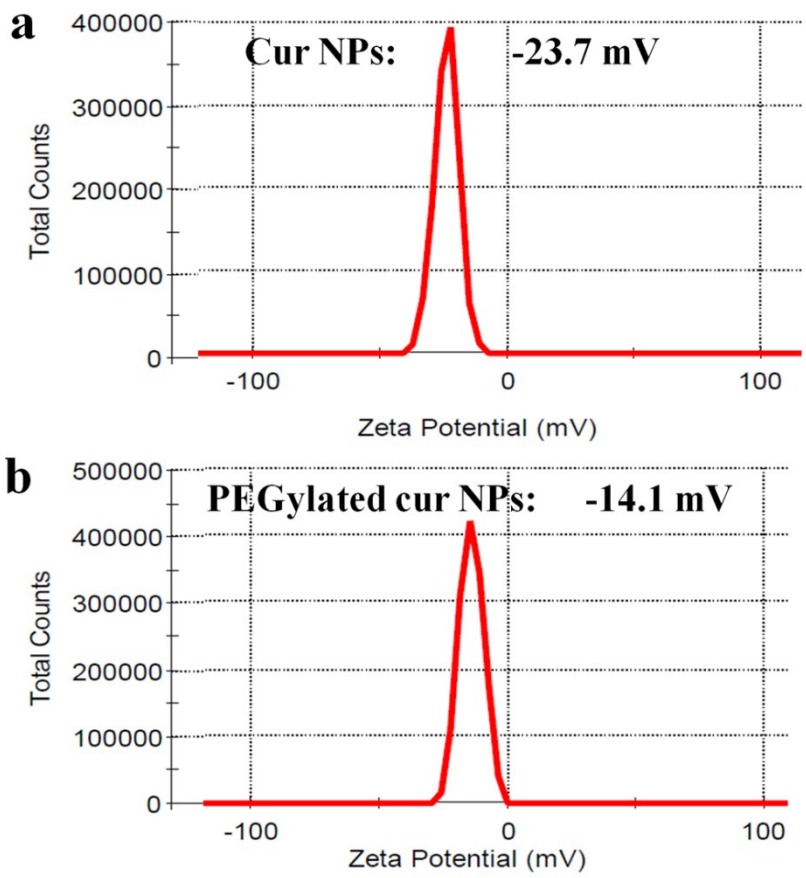

Fig. S2. Zeta potentials of (a) as-prepare Cur NPs and (b) PEGylated Cur NPs dispersed in deionized water both displaying negative charge.

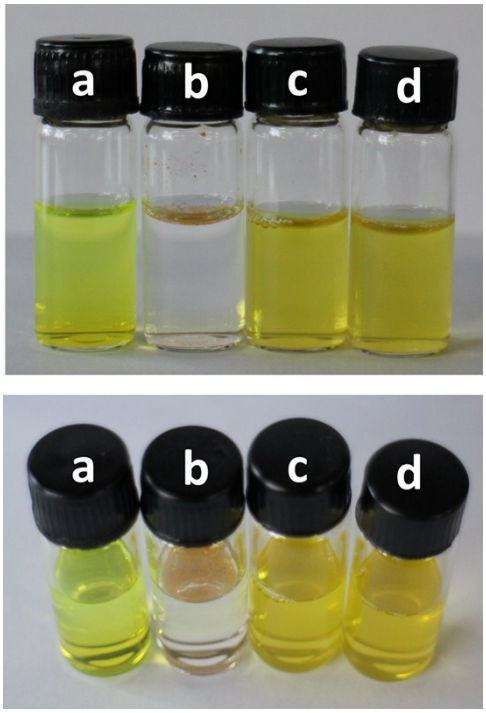

Fig. S3. Digital photographs of different samples including free Cur in THF (a), free Cur (b), Cur NPs (c) and PEGylated Cur NPs (d) dispersed in water respectively, which show a good dispersibility and better stability of NP than that of free drug in water.

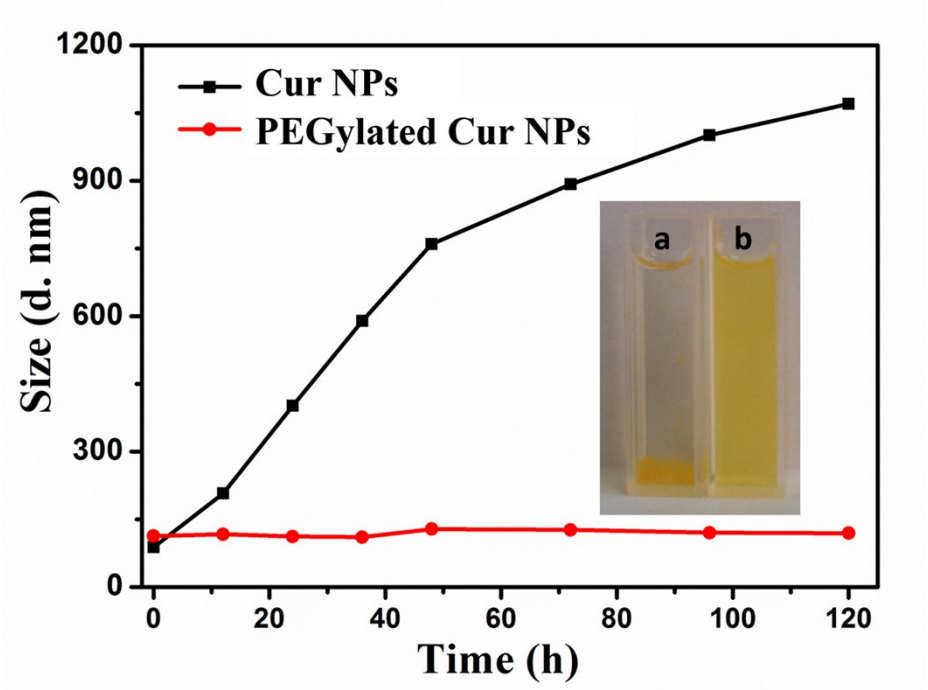

Fig. S4. Average particle sizes of the as-prepared Cur NPs and the PEGylated NPs dispersed in deionized water measured by DLS. Inset is digital image of the as-prepared Cur NPs (a) and the PEGylated Cur NPs (b) in water dispersions.

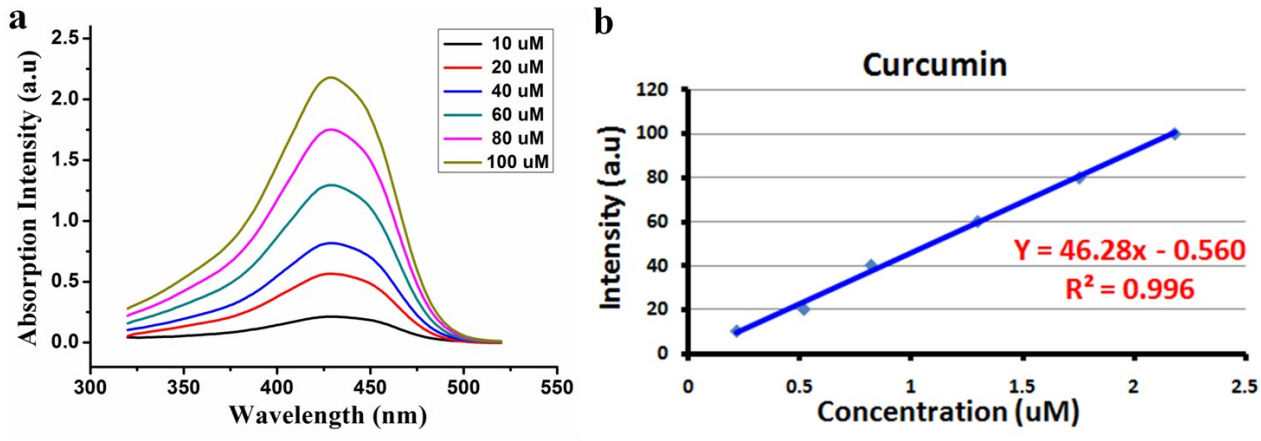

Fig. S5. The absorption spectra of Cur of different concentrations; b. The absorbance of Cur molecules at 428 nm (from a mixture of THF and water (v/v = 1:1)) as a function of Cur concentration.

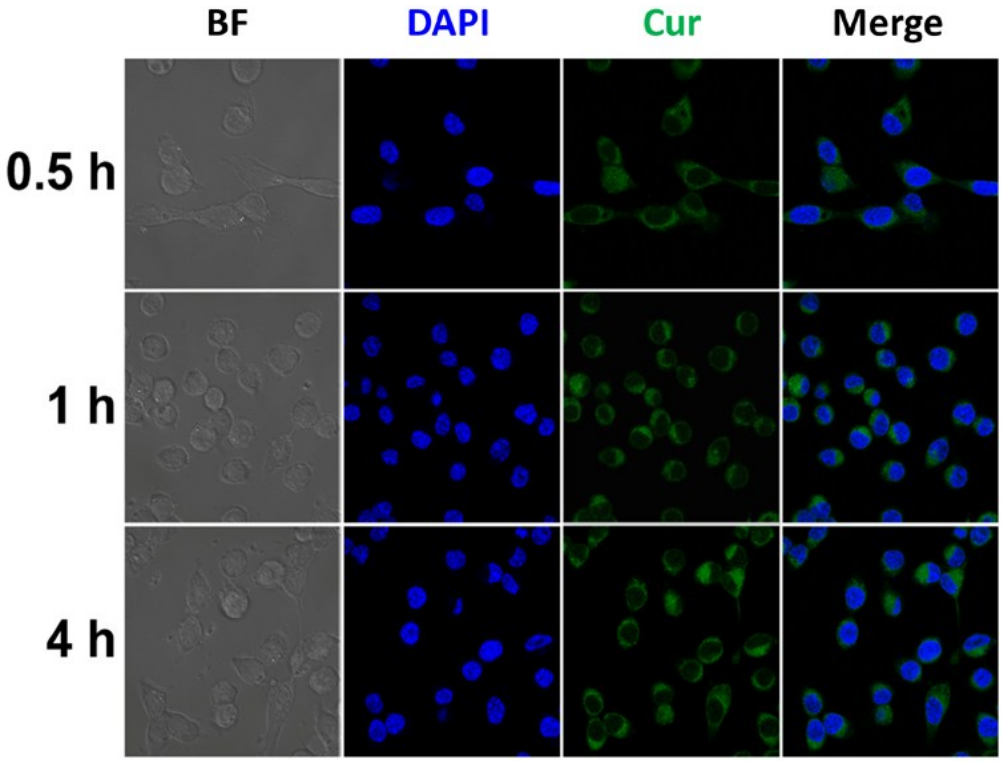

Fig. S6. Confocal microscopy images of CT-26 cells treated with PEGylated Cur NPs. The cells were incubated with PBS containing NPs (5 μM), and then the images were obtained at each time point (0, 1, and 4 h). Cell images were obtained using excitation at 405 nm and 488nm respectively

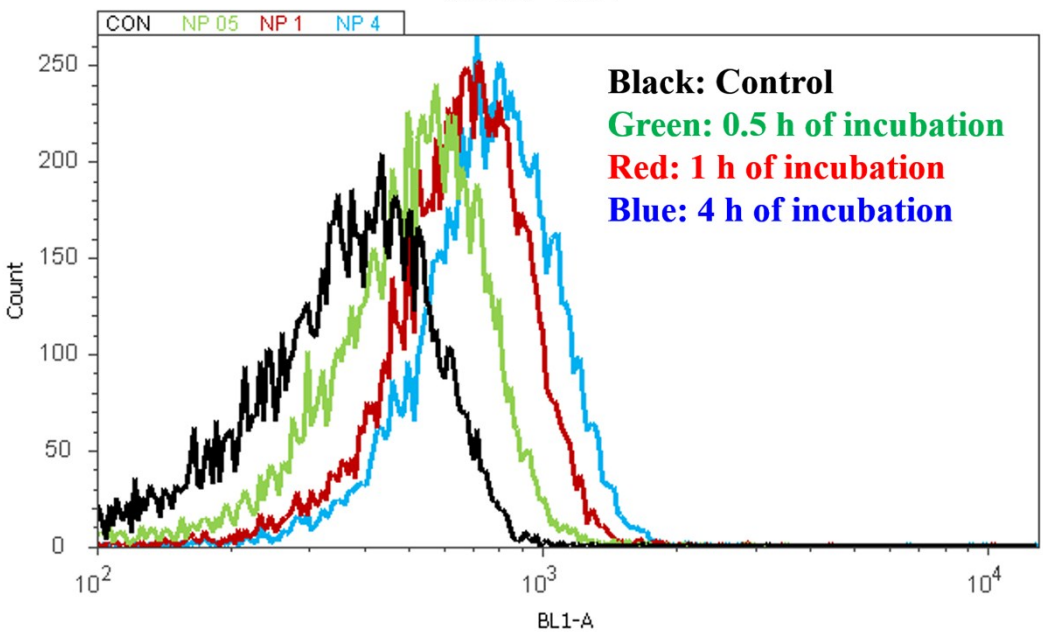

Fig. S7. Flow cytometric analyses of CT-26 cells after incubation with PEGylated Cur NPs for different durations.

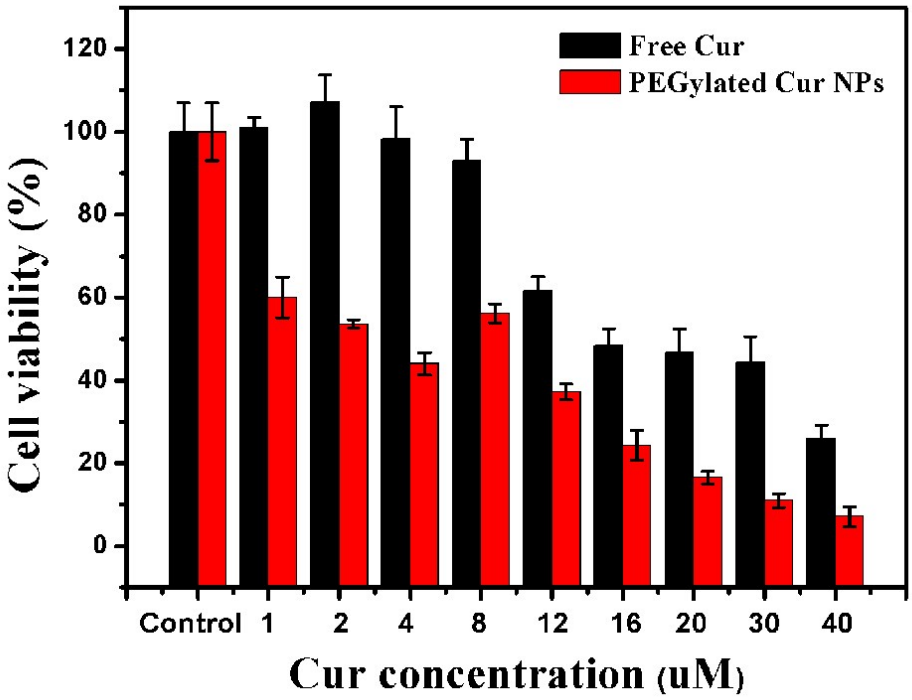

Fig. S8. Cell viability of free Cur and PEGylated Cur NPs in CT-26 cell line after 48 hours of incubation. Data represent mean values ± standard deviation, n =5.

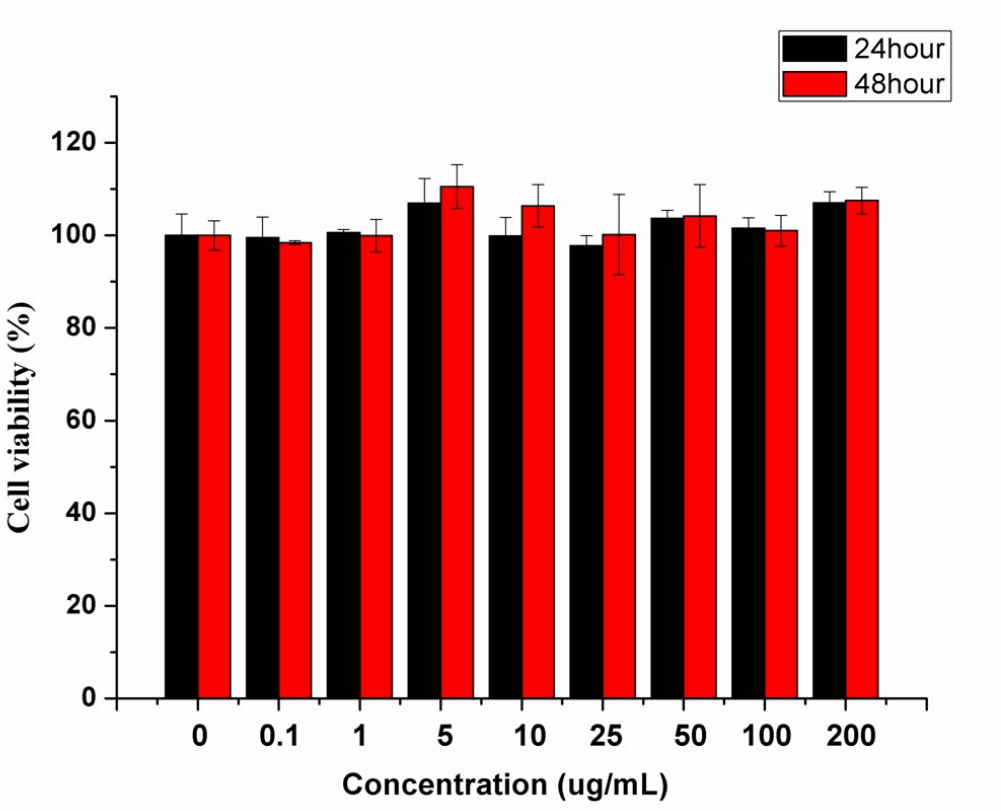

Fig. S9. Cell viability of C_{18}PMH-PEG in CT-26 cell line after 24 and 48 hours of incubation. Data represent mean values ± standard deviation, n =5.

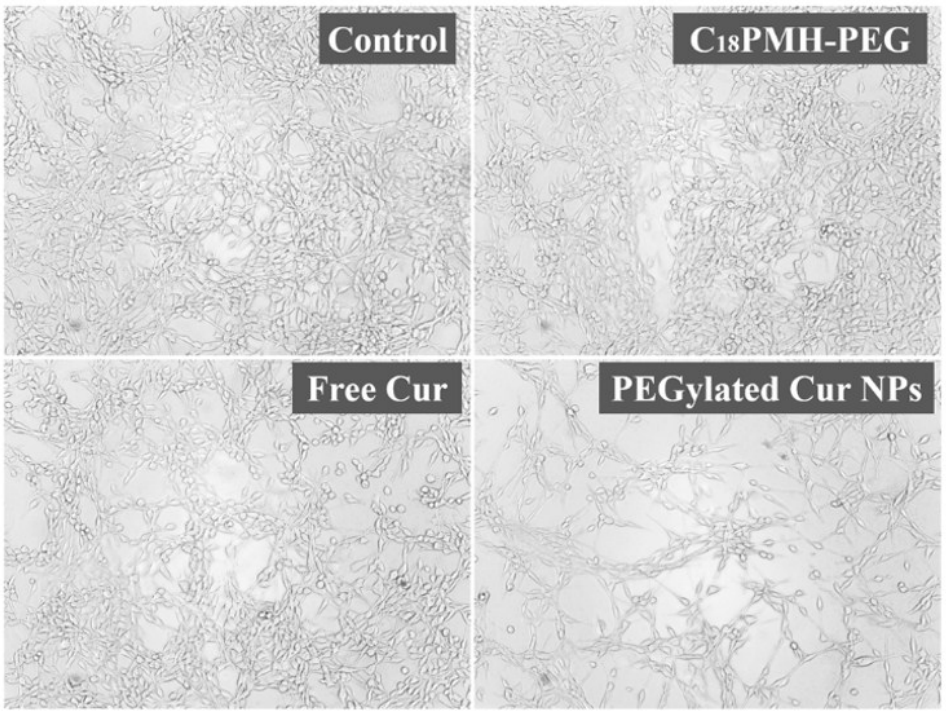

Fig. S10. Bright field of CT-26 cells after incubated with C_{18}PMH-PEG, Free Cur and PEGylated Cur NPs comparing to the control group.

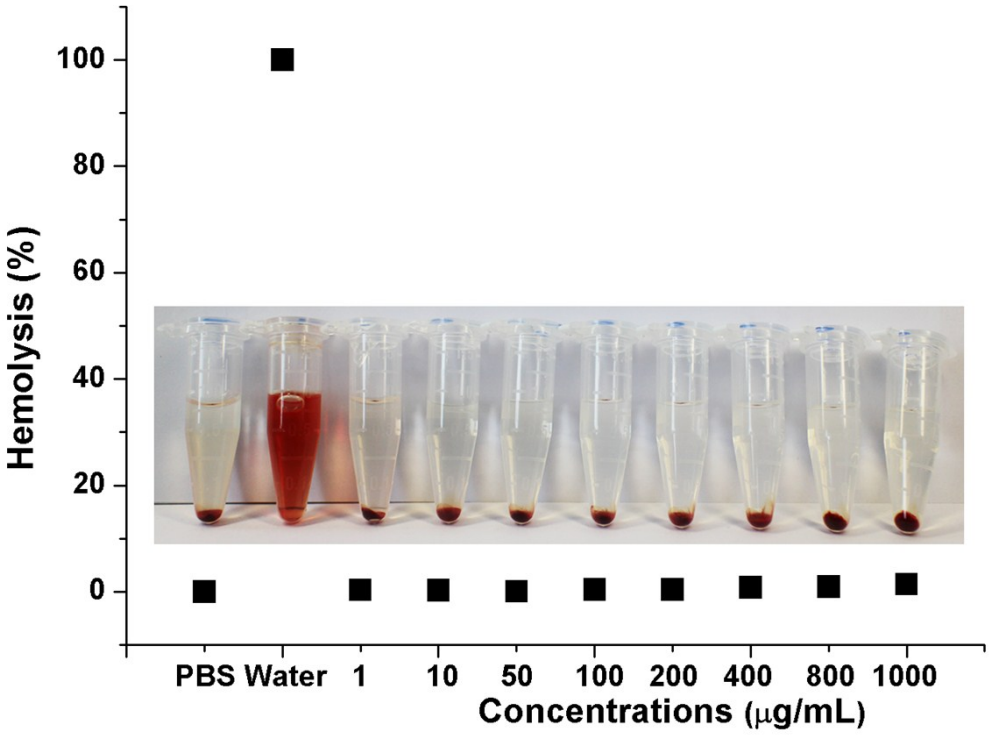

Fig. S11. Hemolysis assay of the PEGylated Cur NPs

Year	Journal	Cur loading capacity (%)	Carrier	Ref.
2015	Our work	78.5	Self-carried NPs	Our work
2009	*Chem. Eur. J.*	30	Porous silica matrix	1
2011	*Carbohydrate Polymers*	4.4	Dextran sulphate-chitosan NPs	2
2011	*Nanoscale*	12.95 ±0.15	Polymeric micelles	3
2011	*Biomaterials*	11.2	Hybrid nanogels	4
2011	*J. Mater. Chem.*	35	Mesoporous hollow silica particles	5
2012	*Acta Pharmacologica Sinica*	0.7	PLGA nanoparticles	6
2012	*Carbohydrate Polymers*	4.1 ± 0.3	Chitosan/PCL nanoparticle	7
2012	*Mol. Pharmaceutics*	10	Solid Lipid NPs	8
2013	*Mol. Pharmaceutics*	0.93 ± 0.02	Polymeric NPs	9
2013	*Journal of Controlled Release*	7.2 ± 0.2	Polypeptide-curcumin conjugates	10
2013	*Biomacromolecules*	8	PLGA nanoparticles	11
2013	*J. Mater. Chem. B*	8	Polymeric micelles	12
2013	*Biomaterials*	14.85 ±0.14	Polymeric micelles	13
2013	*Adv. Healthcare Mater.*	25 -60	Albumin NPs	14
2014	*J. Mater. Chem. B*	25.7 \ 29	Mesoporous silica NPs	15
2014	*Biomaterials*	16.1	MPEG-PLA-PAE copolymers	16
2014	*J. Mater. Chem. B*	0.31	SeNPs	17
2014	*ACS Nano*	5	N-palmitoyl chitosan NPs	18
2015	*J. Mater. Chem. B*	0.675	Gold nanoparticles	19
2015	*Chem. Commun.*	5.7 ± 1.4	Polymeric nanoparticles	20
2015	*Adv. Funct. Mater.*	2.8	Spherical polymeric nanoconstructs	21

Table S1. Comparison of drug loading content (wt. %) between our self-carried Cur NPs and other carrier-based drug delivery system for Cur-based cancer therapy

References

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