Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting Information

Albumin-polymer conjugate nanoparticles and their interactions with prostate cancer cells in 2D and 3D culture: Degradable *vs* non-degradable polymers

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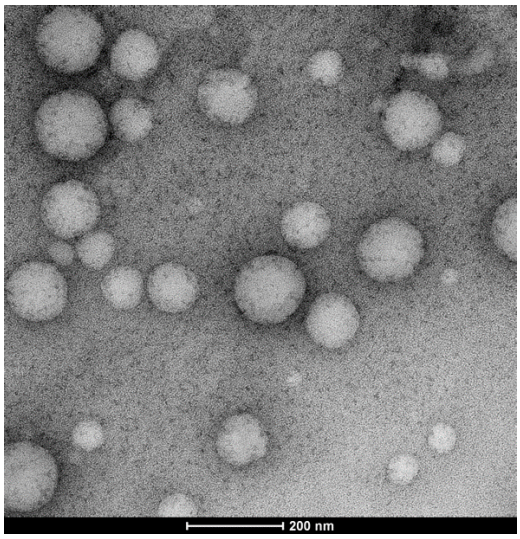

Sample name	Hydrodynamic diameter (nm)	PDI
BSA-PMMA nanoparticle	147±11	0.35

Figure S1: *TEM image and the DLS information of BSA-PMMA nanoparticles.*

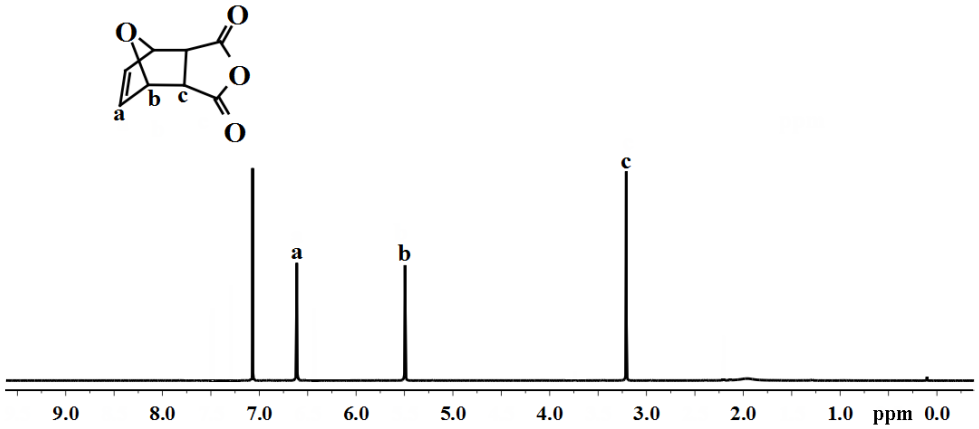

Figure S2: *^{1}H NMR spectrum of 4,10-dioxatricyclo[5.2.1.0^{2,6}]dec-8-ene-3,5-dione (**1**) in $CDCl_3$.*

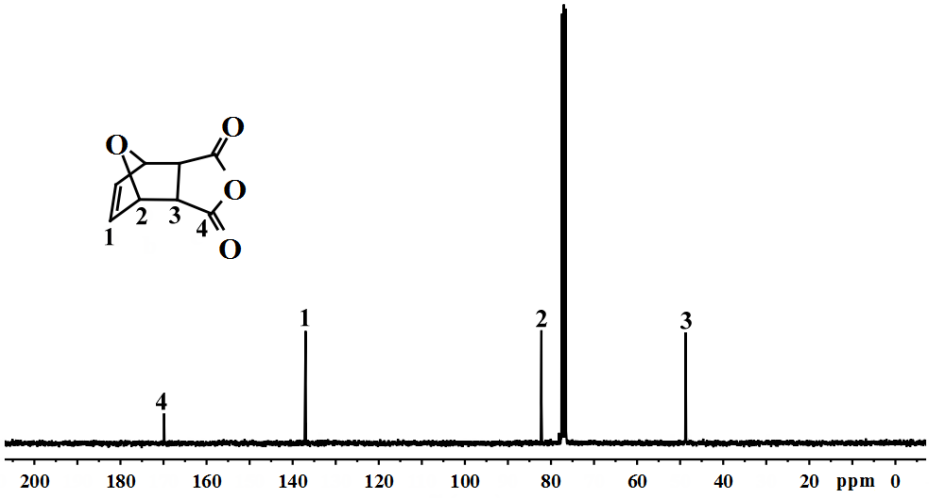

Figure S3: *^{13}C NMR spectrum of 4,10-dioxatricyclo[5.2.1.0^{2,6}]dec-8-ene-3,5-dione (**1**) in $CDCl_3$.*

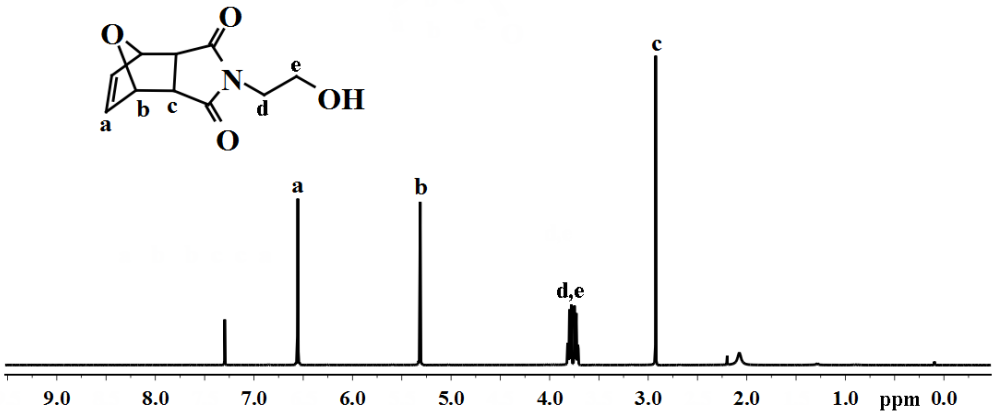

Figure S4: *^{1}H NMR spectrum of 4-(2-hydroxyethyl)-10-oxa-4-azatricyclo[5.2.1.0^{2,6}]dec-8-ene-3,5- dione (**2**) in $CDCl_3$.*

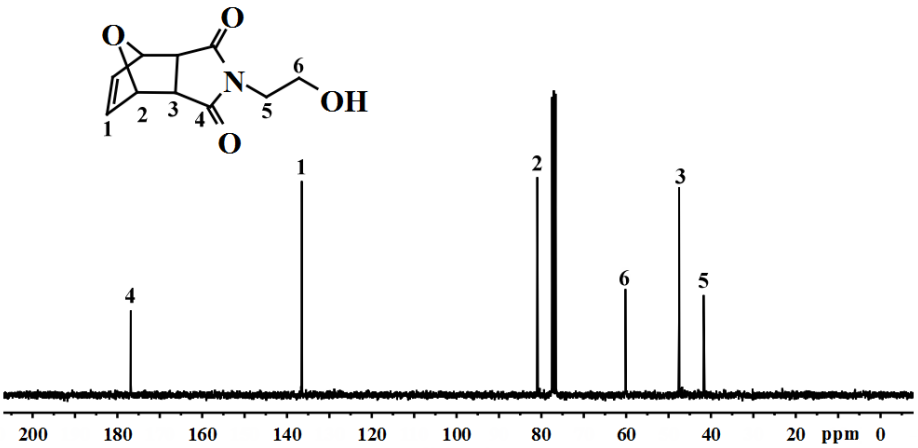

Figure S5: *^{13}C NMR spectrum of 4-(2-hydroxyethyl)-10-oxa-4-azatricyclo[5.2.1.0^{2,6}]dec-8-ene-3,5- dione (2) in $CDCl_3$.*

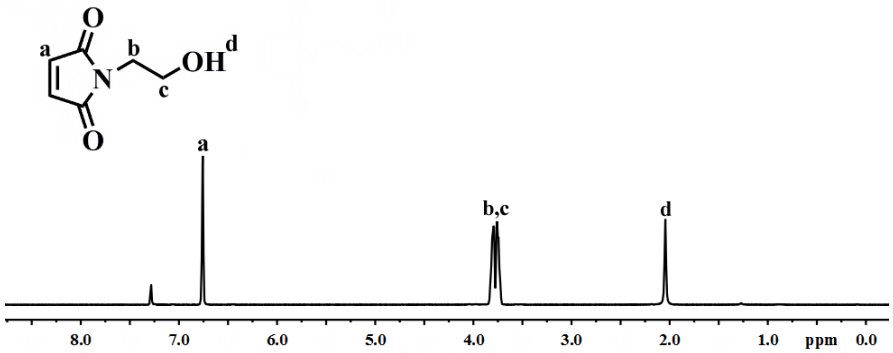

Figure S6: *^{1}H NMR spectrum of 1-(2-hydroxyethyl)-1H-pyrrole-2,5-dione (**3**) in $CDCl_3$.*

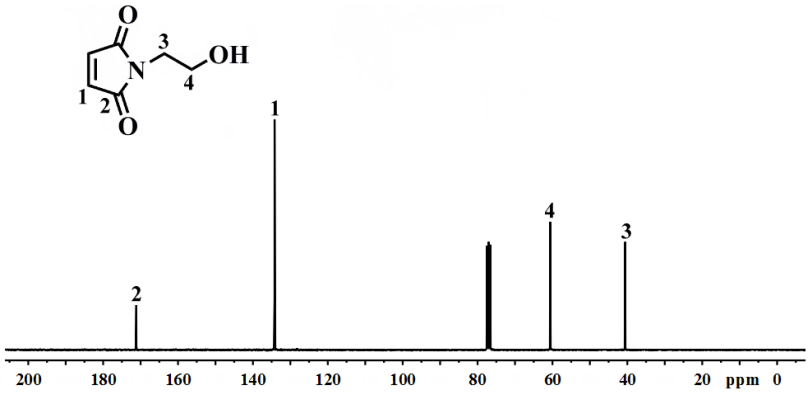

Figure S7: *^{13}C NMR spectrum of 1-(2-hydroxyethyl)-1H-pyrrole-2,5-dione (**3**) in $CDCl_3$.*

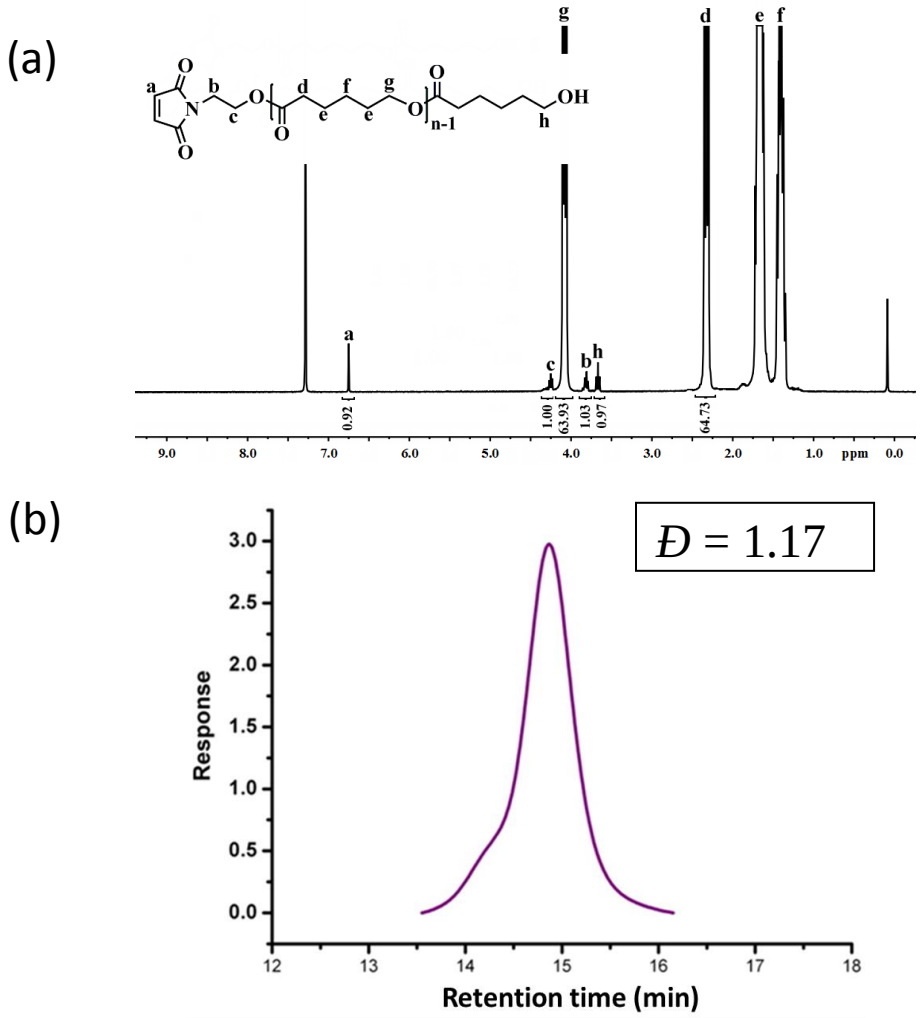

Figure S8: *(a) ^{1}H NMR ($CDCl_3$) spectra of MI-PCL and (b) GPC curve.*

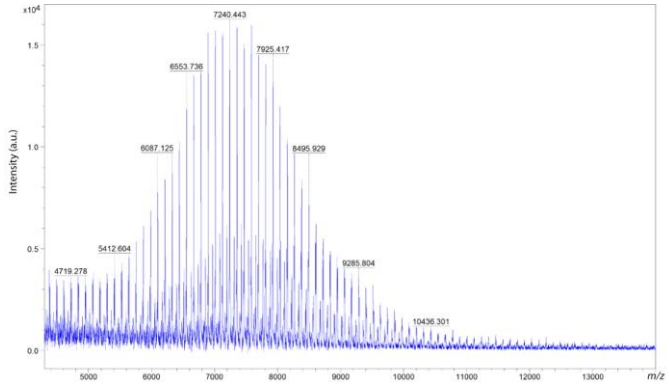

Figure S9: *The MALDI-TOF spectrum of PCL. 2,5-Dihydroxybenzoic acid (DHB) (20 mg/mL in 70:30 acetonitrile:0.1% tetrafluoroacetic acid) was used as the matrix.*

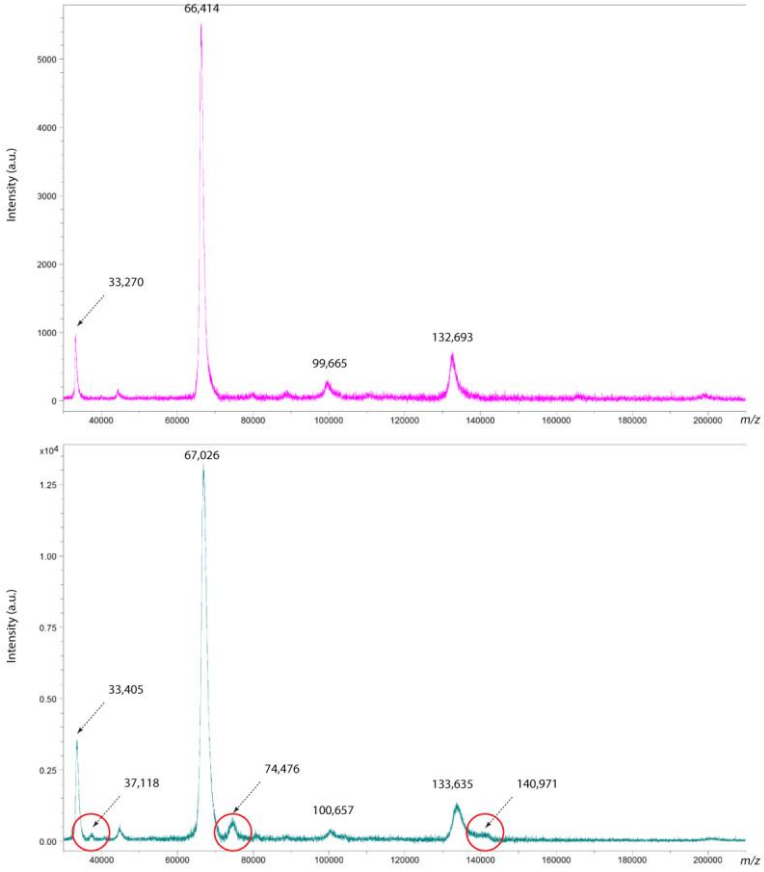

Figure S10: *MALDI-TOF spectra of BSA (top) and the BSA-PCL conjugate mixture (bottom). 2,5-Dihydroxybenzoic acid (DHB) (20 mg/mL in 70:30 acetonitrile:0.1% tetrafluoroacetic acid) was used as the matrix. The peaks of the conjugates have been marked with red circles.*

Table S1. *The particle size of the BSA-PCL micelles with deferent treatment.*

Sample Name	Particle size (d. nm)	PDI
BSA-PCL micelle blank	111.23	0.20
BSA-PCL micelle blank 5 days	108.49	0.19
BSA-PCL micelle blank with trypsin	>1000	1
BSA-PCL micelle blank with pancreatin	0	0

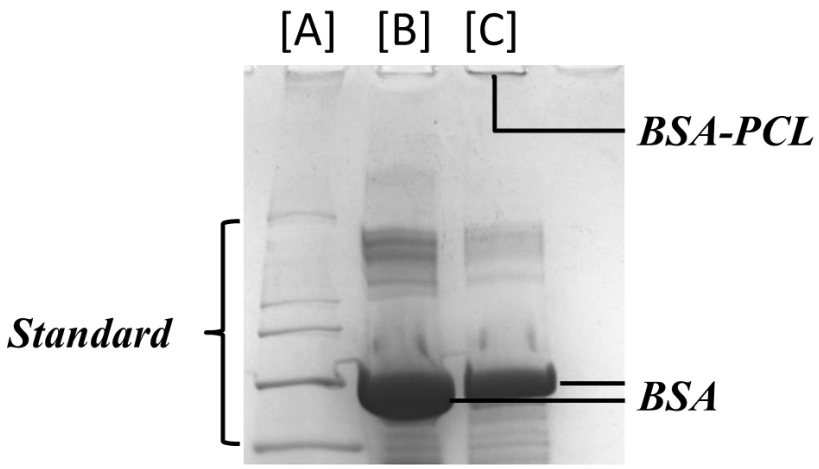

Figure S11: *SDS-PAGE traces of the conjugation of BSA and PCL (molar ratio= 1:1). Lane [A]: protein standard. [B]: Initial BSA. [C]: BSA-PCL micelle. The amphiphilicity of the BSA-PCL conjugates prevents the diffusion of the final product, which is only visible in the well. Comparing the intensity of the BSA residual band in Lane [C] with the initial BSA band in Lane [B], around 50 % of BSA has been conjugated to the maleimide PCL.*

Table S2. *Final concentrations of inhibitors used for the cytotoxicity assay.*

Inhibitor	Final concentrations
Chorprozamine hydrochloride	10 µg/mL
Filipin	10 µg/mL
Amiloride	50 µM
NaN_3/Deoxyglucose	5 mM/5 mM

Table S3. *Summary of inhibitor targets and mechanisms of action.*

Inhibitor	Targeted Pathway	Mechanism of Action
Chlorpromazine	Clathrin	Prevention of coated pit formation
Filipin	Lipid Raft/Caveolae	Binding to cholesterol causing sequestration
Amiloride	Macropinocytosis	Na+/H+ Exchanger inhibition
NaN_3	Receptor mediated	ATP depletion

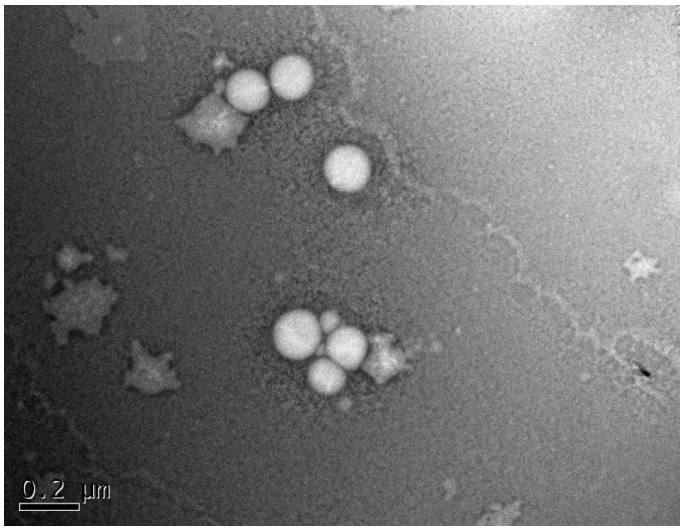

Figure S12: *TEM image of the Nile red loaded BSA-PCL micelles.*

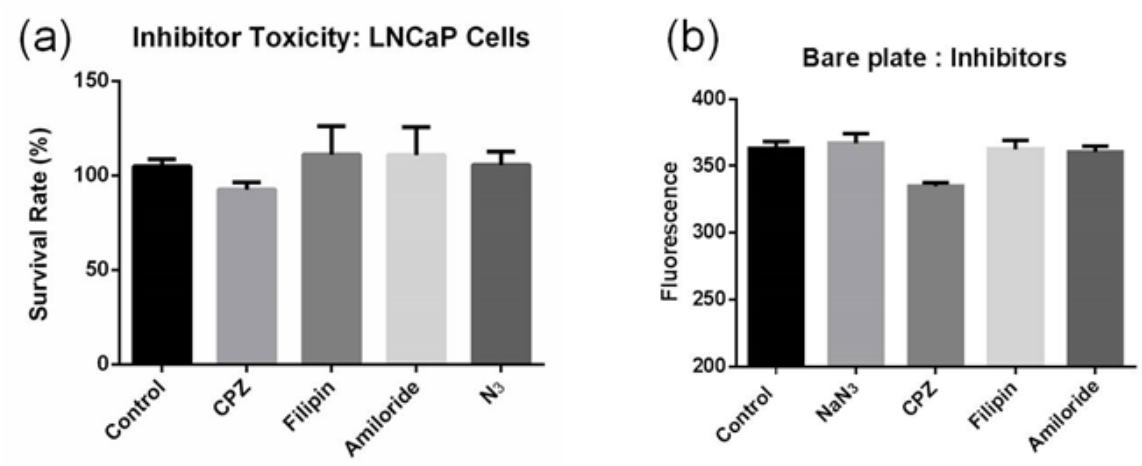

Figure S13: *(a) Cytotoxicity test of all the four inhibitors. (b) The influence of the inhibitors on the fluorescence of the BSA-PCL micelle without cells. Data represent means ± S.D., n=4.*

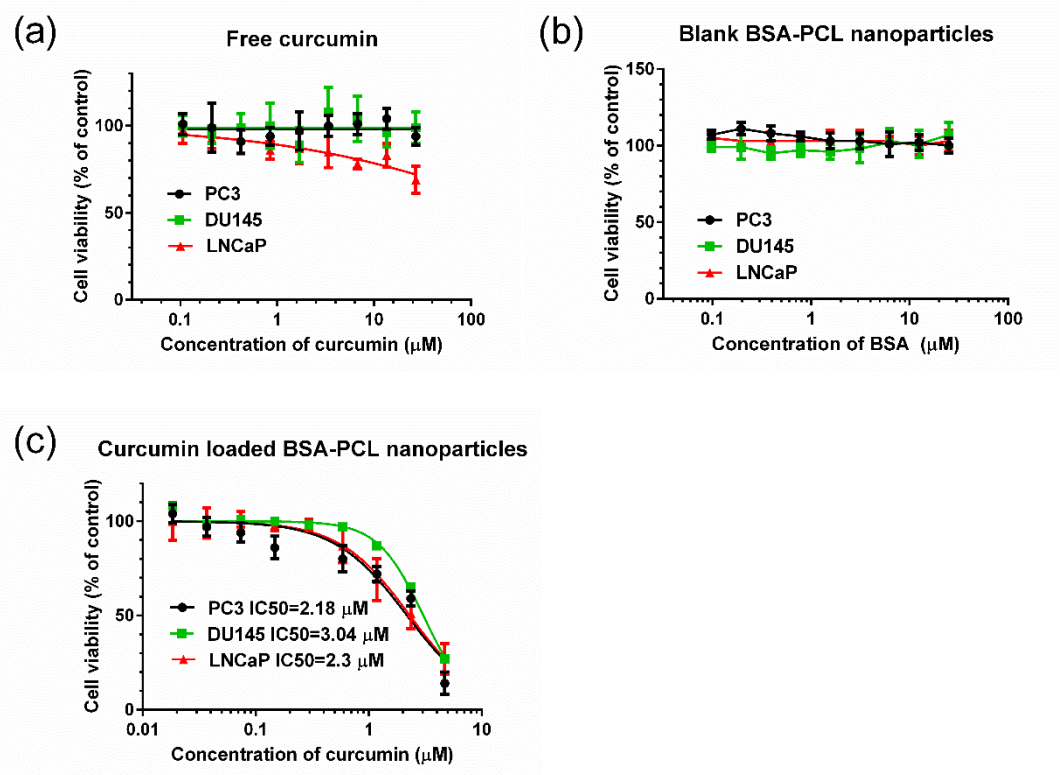

Figure S14. *Cytotoxicity assays of (a) free curcumin, (b) blank BSA-PCL nanoparticles and (c) curcumin loaded BSA-PCL nanoparticles against prostate carcinoma cell lines (PC3, DU145 and LNCaP) for 48 h. The mean±standard deviations are shown.*