Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supporting Information

Synthesis and Self-Assembly of the Amphiphilic Homopolymers Poly(4-hydroxystyrene) and Poly(4-(4-bromophenyloxy)styrene)

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Process for Au nanoparticle synthesis

The formation of gold nanoparticle suspensions in polymer vesicles was conducted by first introducing $HAuCl_4$ into the polymer vesicles solutions (mole ratio of phenolic OH:Au^{+++} is 1.00:0.25) for several hours before reducing the gold in solution by reaction with hydrazine.The presence of gold nanoparticles was confirmed by UV-vis spectrophotometry measurements showing strong absorbance corresponding to the known absorbance band of gold nanoparticles between 540 nm and 600 nm.

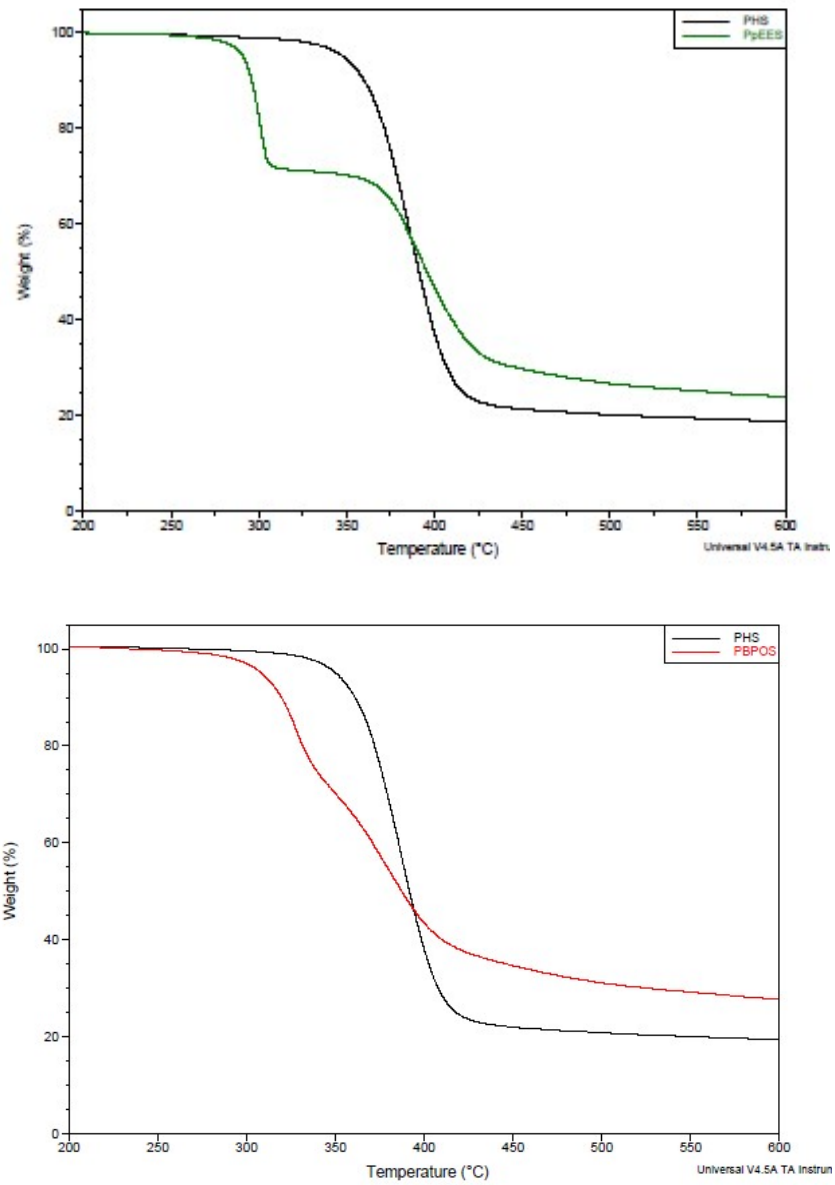

Fig. S1 TGA thermal decomposing curves of PpEES vs. PHS (top) and PBPOS vs PHS (bottom).

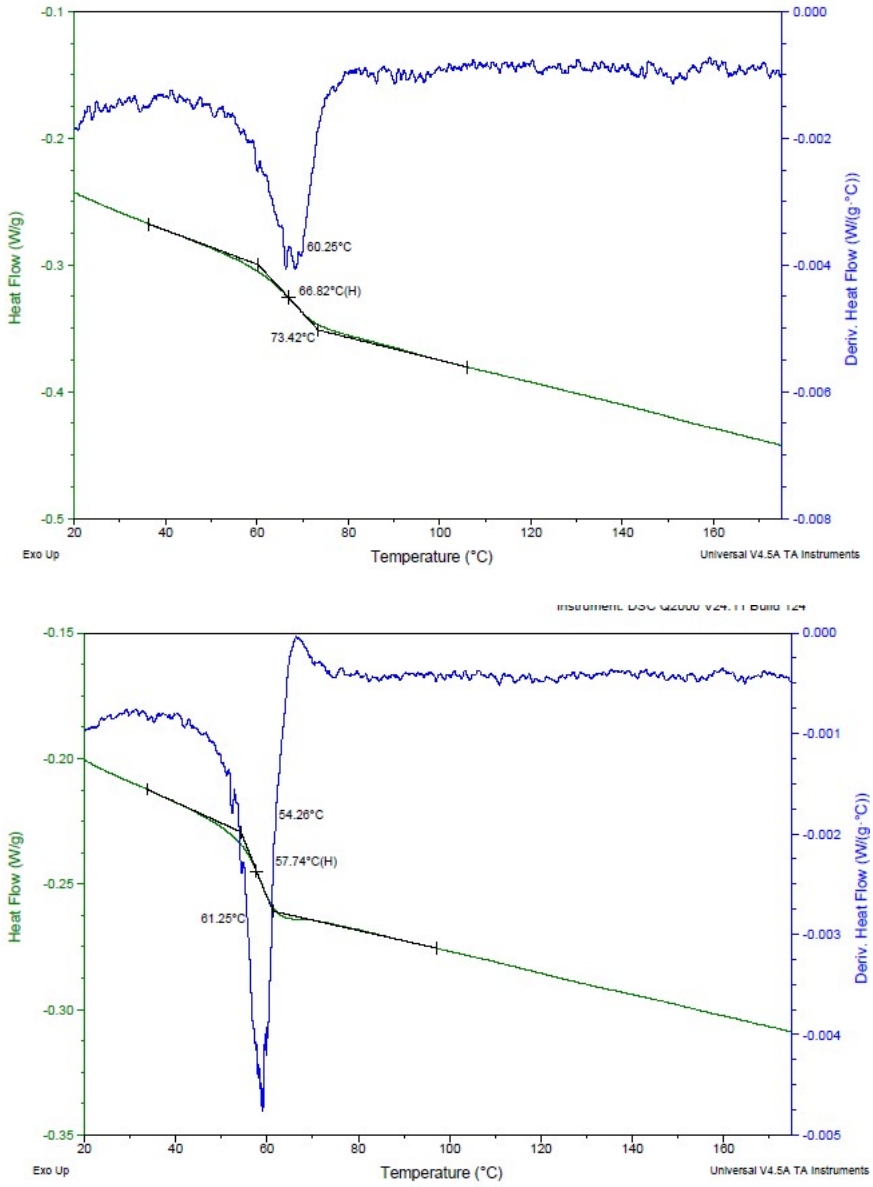

Fig. S2 DSC curves of poly(4-(4-bromophenyloxy)styrene)

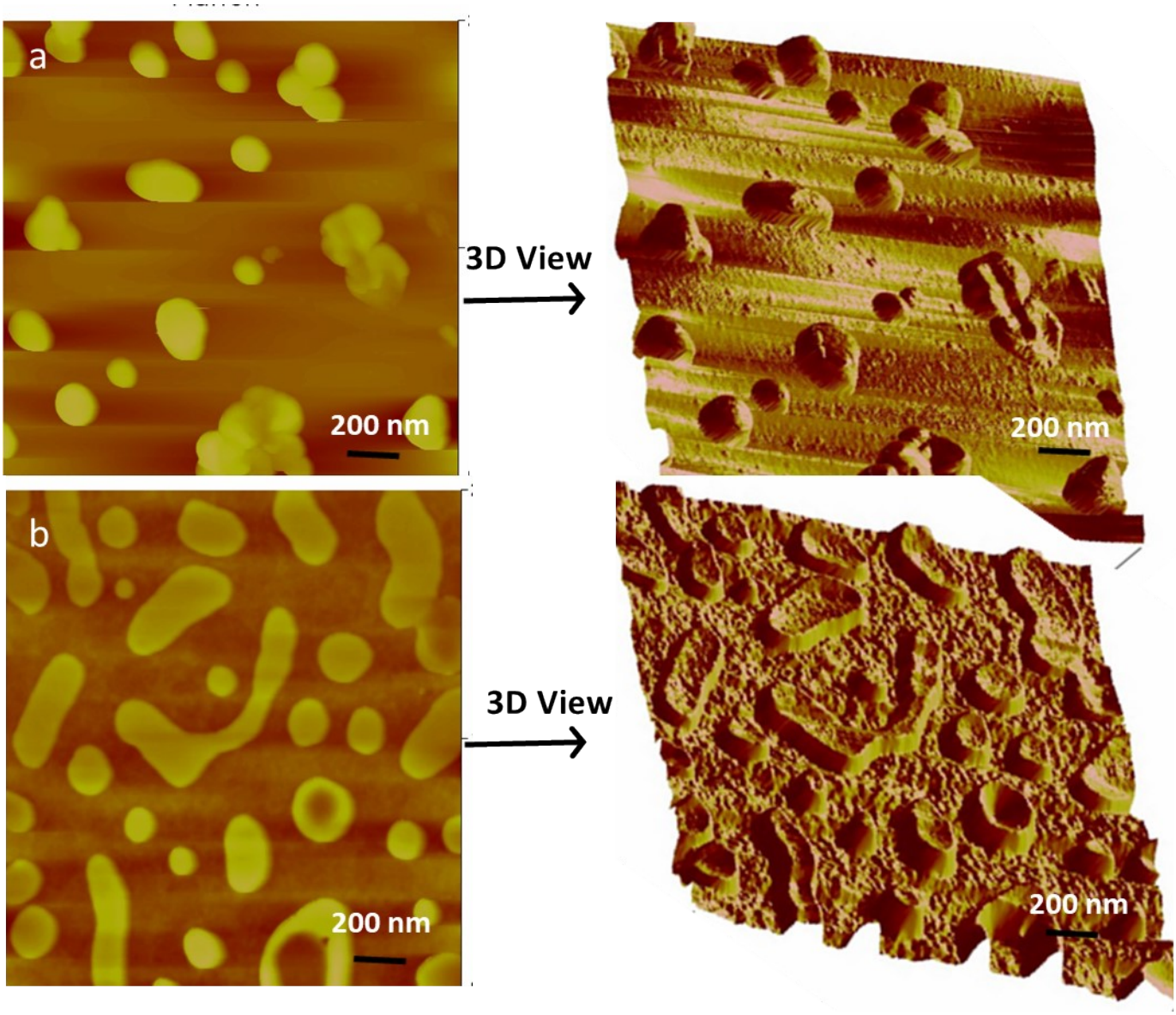

Fig. S3 Atomic force microscope height micrographs of poly (4-hydroxystyrene) (PHS), (Mn = 9400 g/mole, run 4 (Table 1) (a) in a mixed solvent of water: THF (70:30, v/v), and (b) in a mixed solvent of water: THF (50:50, v/v).

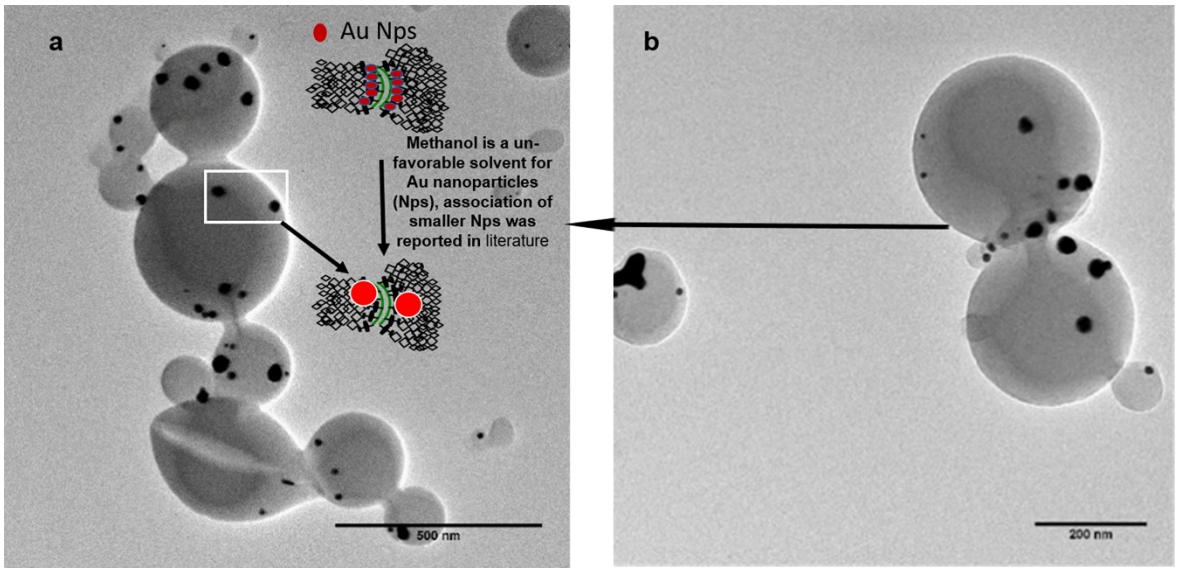

Fig. S4 TEM Images of poly(4-hydroxystyrene) in the 70:30 mixed solvent of water and methanol (v/v) with gold nanoparticles.

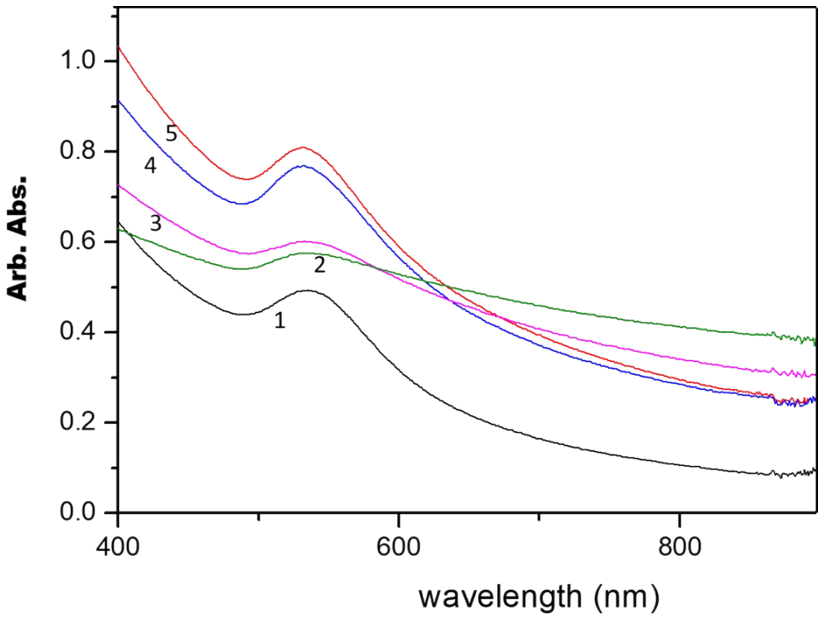

Fig. S5 UV-vis spectra of gold nanoparticle colloid suspensions with molar ratios of PHS to Au precursor ranging from 1.0:0.1 (spectra 1), 1.0:0.2 (spectra 2), 1.0:0.3 (spectra 3), 1.0:0.4 (spectra 4), and 1.0:0.5 (spectra 5), in mixed solvent of water and methanol (70:30 v/v).

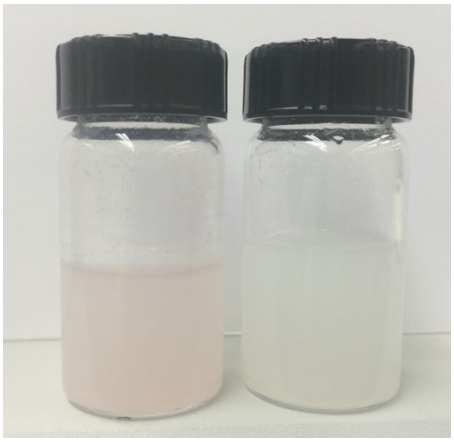

Fig. S6 Solution of PHS in DI water with Doxorubicin encapsulated (left), solution of PHS without Doxorubicin (right).

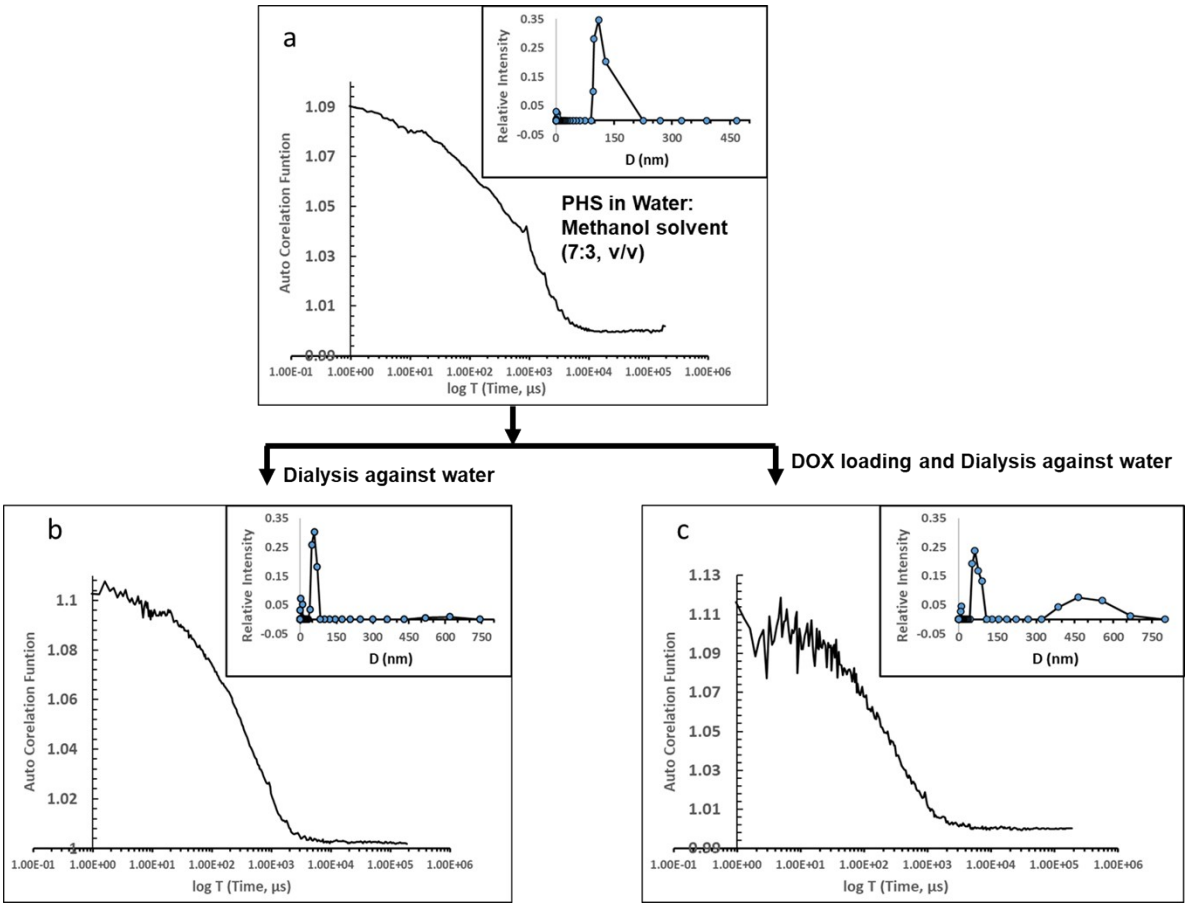

Fig. S7 Dynamic light scattering (DLS) autocorrelation and size distribution of poly(4-hydrodoxy styrene) vesicles in (a) water: methanol (70:30, v/v) without dialysis, (b) after dialysis with water, and (c) doxorubicin loaded vesicles after dialysis with water.

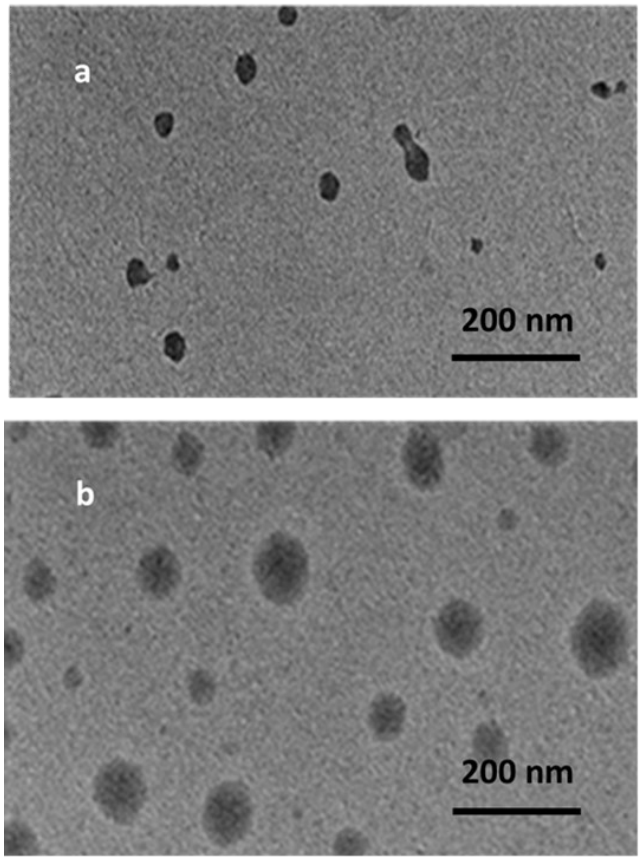

Fig. S8 TEM micrograph of poly(4-hydrodoxy styrene) vesicles (water : methanol: 70:30, v/v) after dialysis with water (a) without doxorubicin loaded vesicles and (b) doxorubicin loaded vesicles**.**

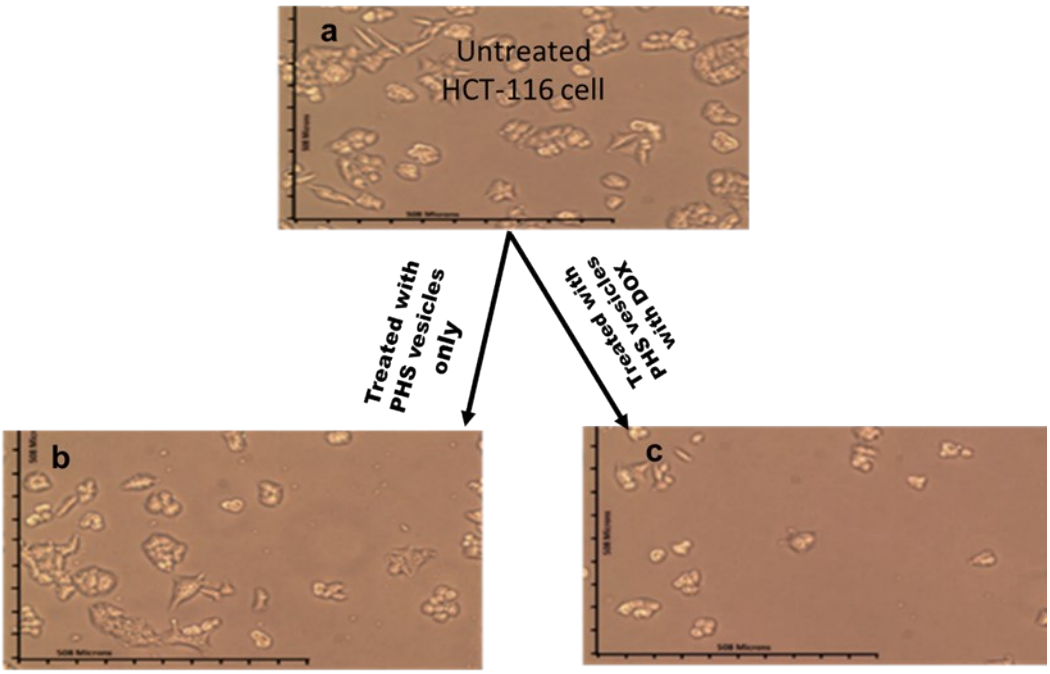

Fig. S9 Optical micrograph after 24 hours of (a) untreated cells, (b) empty PHS vesicle-treated cells, and (c) DOX-loaded PHS vesicle-treated cells.