Electronic Supplementary Material (ESI) for Polymer Chemistry.
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Supporting Information

Dual-stimuli sensitive keratin graft PHPMA as physiological trigger responsive drug carriers

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Determination of the critical micelle concentration (CMC) of copolymers

The critical micelle concentration (CMC) of K-*g*-PHPMA graft copolymers was estimated by fluorescence probe. Pyrene was used as the probe and the concentration of pyrene was kept at 5.0 $\times 10^{-7}$ mol L^{-1} in all the solutions with different K-*g*-PHPMA concentrations (1.0 $\times 10^{-6}$ – 1.0 mg mL^{-1}). Emission fluorescence spectra of the solutions excited at 393 nm were recorded on a Perkin Elmer LS 55 fluorescence spectrometer equipped with a 20 kW Xenon discharge lamp. The intensity ratio of the peak at 338 nm to 336 nm (I_{338} /I_{336}) in the excitation spectra reflects the polarity of the microenvironment around pyrene. The intensity ratio was plotted as a function of copolymer concentrations and the turn point was used as the CMC of the K-*g*-PHPMA graft copolymers.

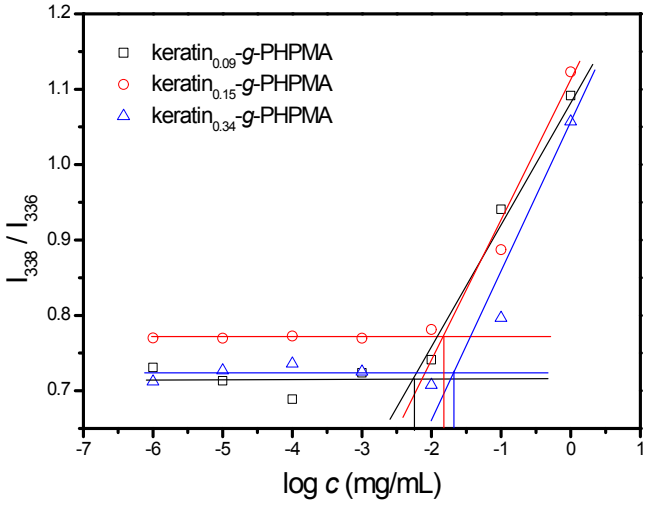

Fig. S1. CMC of K-*g*-PHPMA graft copolymers determined by pyrene.

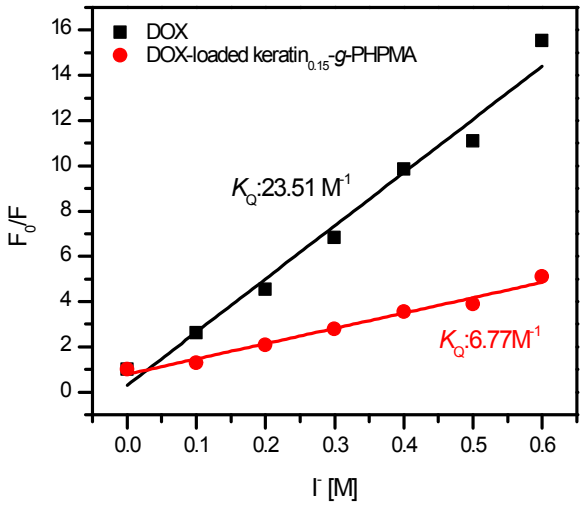

Fig. S2 Stern-Volmer plots of free DOX and DOX-loaded micelles prepared from $K_{0.15}$-g-PHPMA.

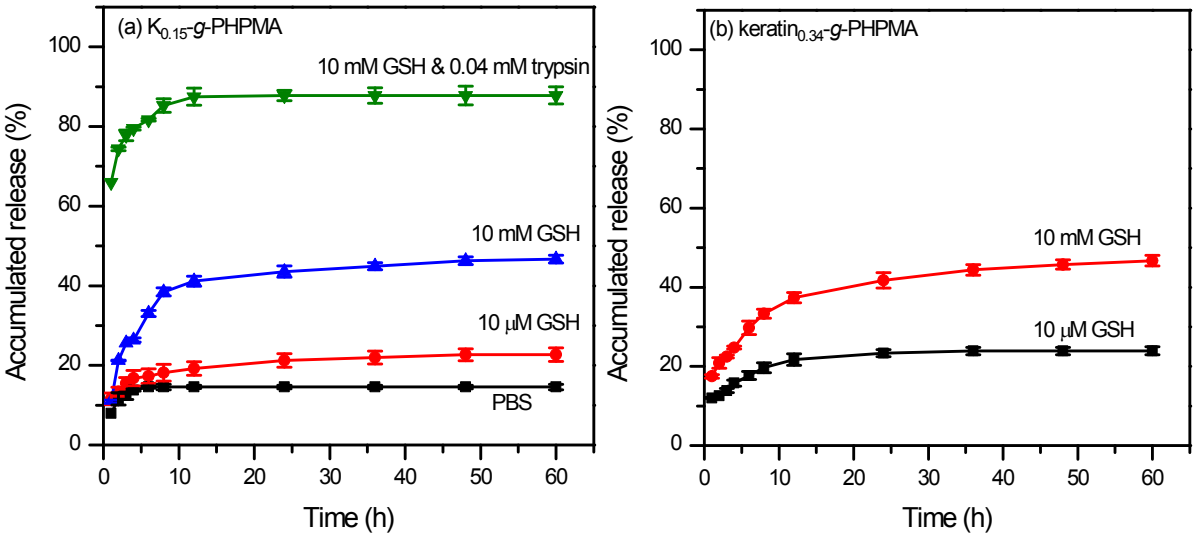

Fig. S3 The release profile of DOX from the micelles in pH 7.4 PBS buffer solutions as a function of time. $K_{0.15}$-g-PHPMA (a) and $K_{0.34}$-g-PHPMA micelles in denoted external conditions. Datas are presented as the average ± standard deviation (n = 3).

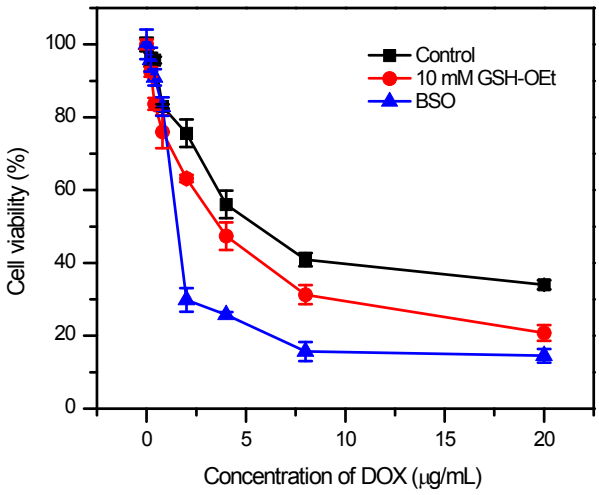

Fig. S4 Relative cell viability of MCF-7 cells against DOX-loaded $K_{0.15}$-*g*-PHPMA micellar solution after cultured for 48 h. The cell viability was determined by MTT assay. The concentration of DOX was calculated by the DOX loaded in the micelles. MCF-7 cells incubated in micellar solutions were used as the control. Each point is the mean of four independent measurements.

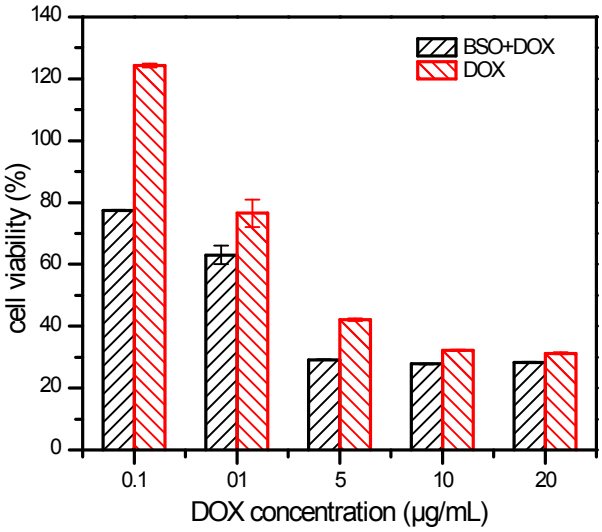

Fig. S5 Relative cell viability of MCF-7 cells against DOX and BSO (1.0 mM) + DOX after cultured for 48 h. The cell viability was determined by MTT assay. Each point is the mean of four independent measurements.

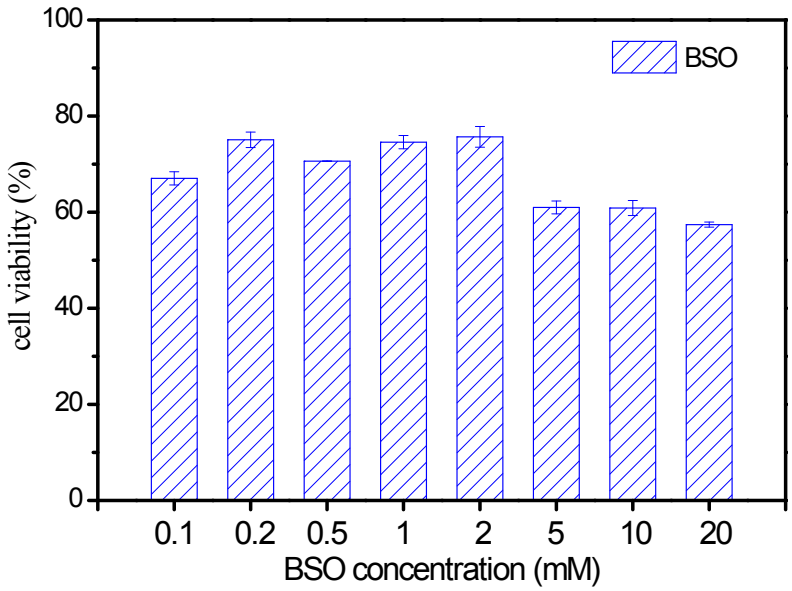

Fig. S6 Relative cell viability of MCF-7 cells against BSO after cultured for 48 h with different concentrations. The cell viability was determined by MTT assay. Each point is the mean of four independent measurements.