Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supporting Information

Multifunctional Adenine-Functionalized Supramolecular Micelles for Highly Selective and Effective Cancer Chemotherapy

Fasih Bintang Ilhami,[a,b] Shan-You Huang,[a] Jem-Kun Chen,[d] Chen-Yu Kao,[b] and Chih-Chia Cheng[a,c]**

a. Graduate Institute of Applied Science and Technology, National Taiwan University of Science and Technology, Taipei 10607, Taiwan. E-mail: cccheng@mail.ntust.edu.tw
b. Graduate Institute of Biomedical Engineering, National Taiwan University of Science and Technology, Taipei 10607, Taiwan. E-mail: ckao@mail.ntust.edu.tw
c. Advanced Membrane Materials Research Center, National Taiwan University of Science and Technology, Taipei 10607, Taiwan.
d. Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei 10607, Taiwan.

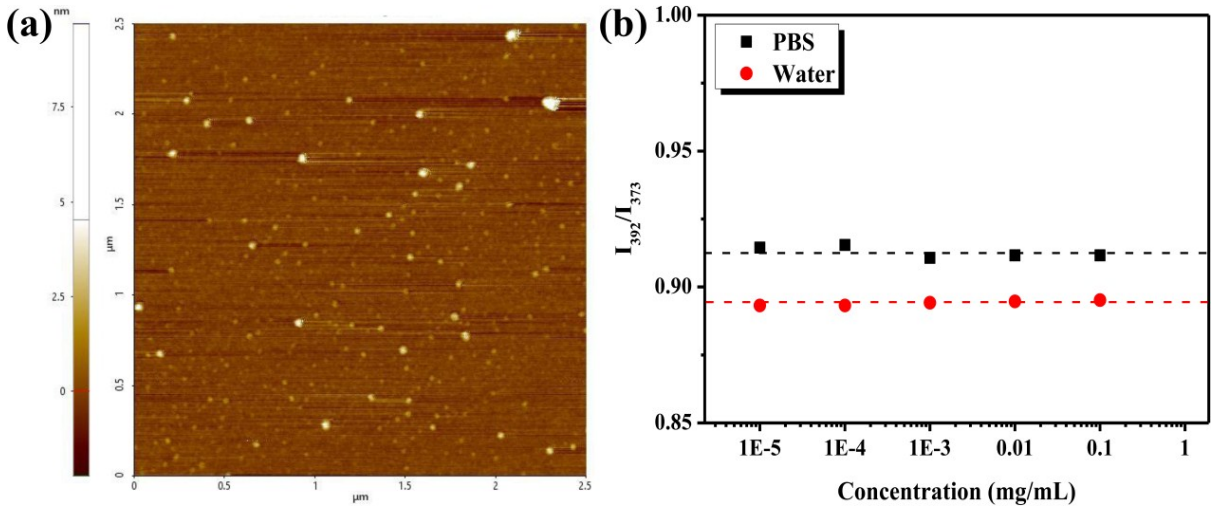

Fig. S1: (a) AFM images of thin films of A-PPG spin-coated from water. **(b)** CMC determination of PPG diacrylate solutions in PBS and water**.**

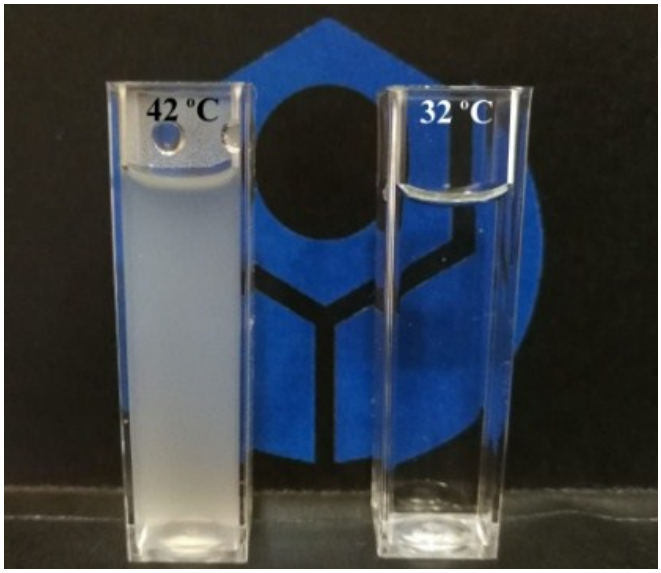

Fig. S2: Thermoreversible LCST behavior illustrating the phase transition of 2 mg/mL A-PPG micelle PBS solution between 32 °C and 42 °C.

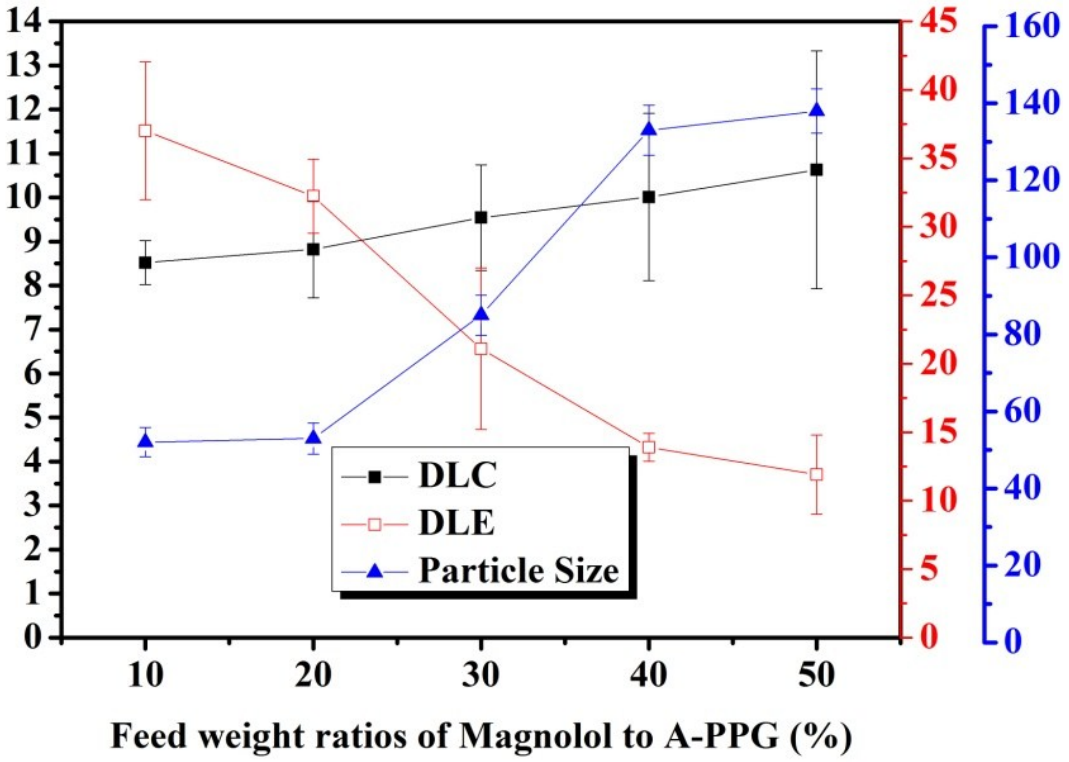

Fig. S3: Correlations between the particle size and drug-loading content (DLC) and drug-loading efficiency (DLE) of Magnolol-loaded A-PPG micelles.

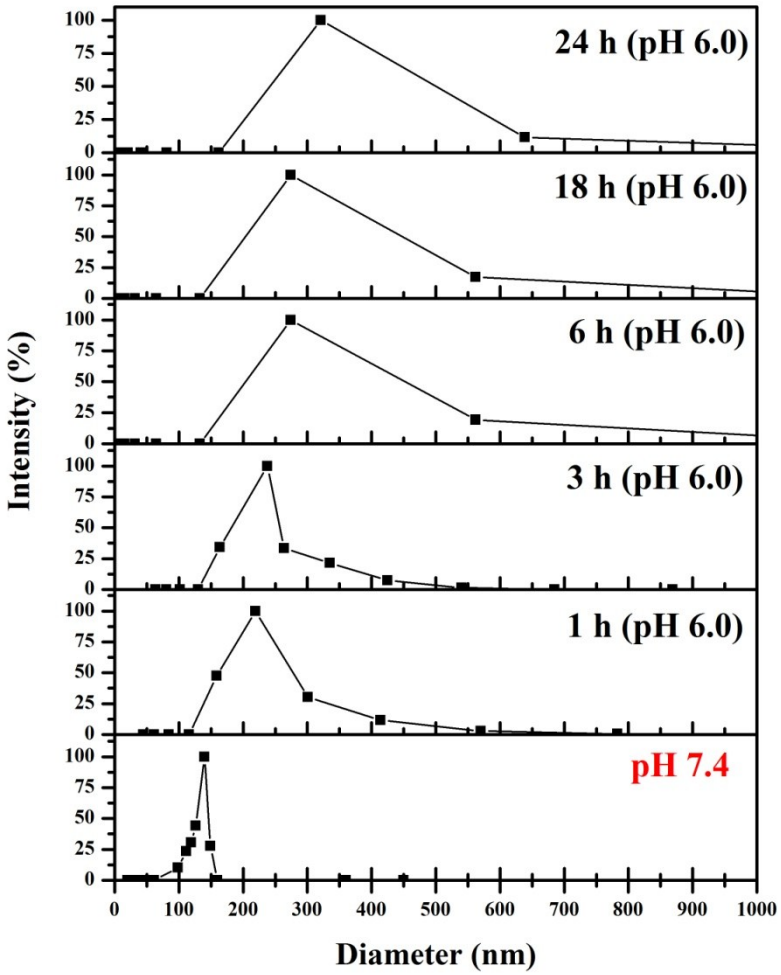

Fig. S4: Particle size distribution of Magnolol-loaded A-PPG micelles over time at pH 6.0 and 25 °C.

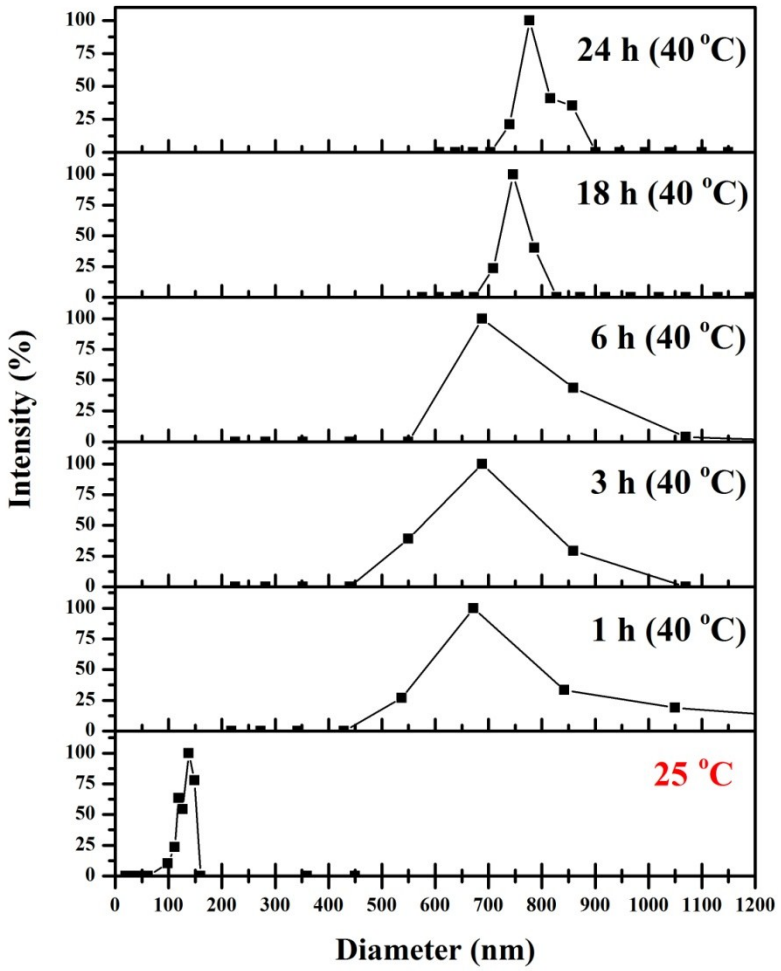

Fig. S5: Particle size distribution of Magnolol-loaded A-PPG micelles over time at pH 7.4 and 40 °C.

As shown in Figs. S4 and S5, the particle size distribution analysis of DLS data reveals that Magnolol-loaded A-PPG micelles exhibited high responsiveness to temperature and pH changes in buffer solution. When the pH and temperature were changed to 6.0 and 40 °C, respectively, the sizes of Magnolol-loaded micelles were found to increase gradually over time, from 125 nm to 850 nm. The increase in particle size could possibly be attributed to gradual release of Magnolol into the surrounding buffer, causing formation of progressively large Magnolol aggregates due to the poor solubility of Magnolol in buffer medium. These observations further confirm that the Magnolol-loaded A-PPG micelles have significant potential to control the rate of drug release in response to small changes in their environment such as temperature and pH.

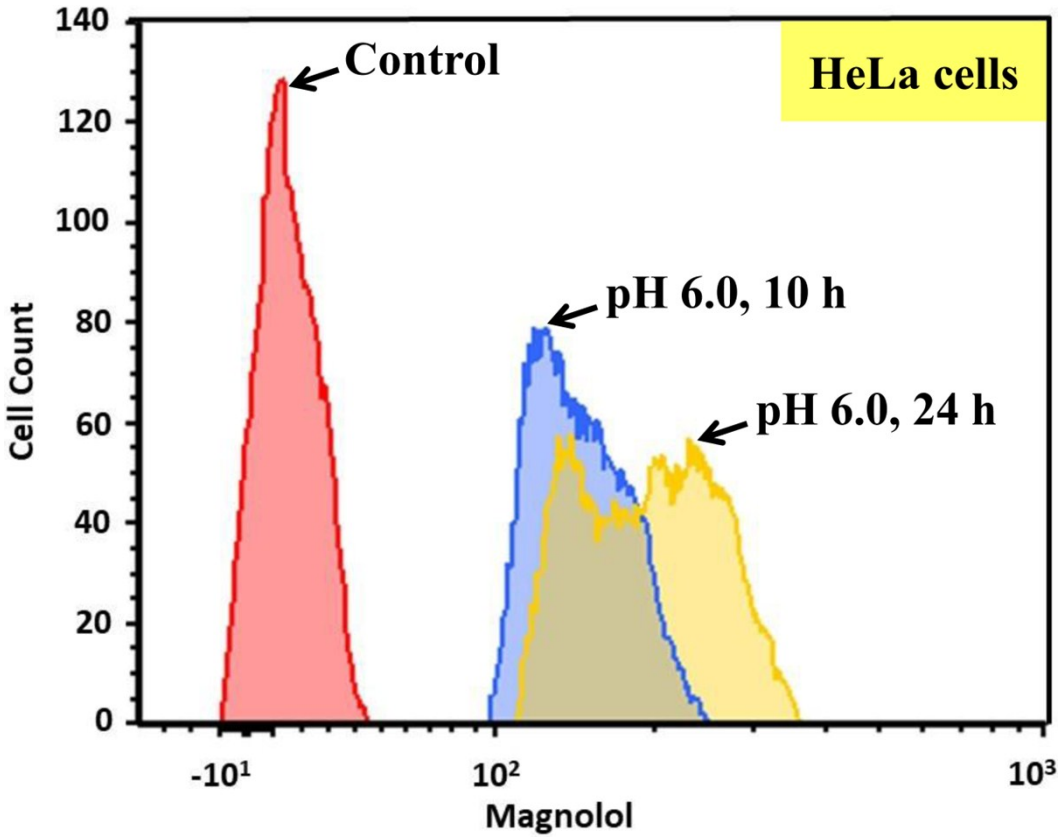

Fig. S6: Flow cytometric analysis of cellular uptake efficiency for Magnolol-loaded A-PPG micelles in HeLa cells at pH 6.0.

Table S1: Particle size, zeta potential, drug-loading content (DLC) and drug-loading efficiency (DLE) of Magnolol-loaded A-PPG micelles

Magnolol-loaded sample[a]	Magnolol:A-PPG (weight ratio)	Diameter ± SD (nm)	Zeta potential ± SD (mv)	DLC ± SD (%)[b]	DLE ± SD (%)[c]
A-PPG/Magnolol	0.25 : 2	52 ± 3.8	25.29 ± 3.29	8.52 ± 0.5	37 ± 5.03
A-PPG /Magnolol	0.3 : 2	53 ± 4.05	27.82 ± 3.80	8.82 ± 1.1	32.24 ± 2.7
A-PPG/Magnolol	0.5 : 2	85 ± 5.2	23.69 ± 6.86	9.54 ± 1.2	21.1 ± 5.9
A-PPG /Magnolol	0.8 : 2	133 ± 6.5	21.29 ± 4.40	10.01 ± 1.9	13.9 ± 1.02
A-PPG /Magnolol	1 : 2	138 ± 5.7	20.07 ± 8.87	10.63 ± 2.7	11.9 ± 2.29

[a] The micelle concentration in the initial PBS solution was 2 mg/mL. Measurements were performed in PBS (pH 7.4); particle size was measured by DLS.

[b] DLC = drug loading content.

[c] DLE = drug loading efficiency.