Supplementary Information

Thermal responsive fluorescent block copolymer for intracellular temperature sensing

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Experimental Methods

The PDI of the micelles size

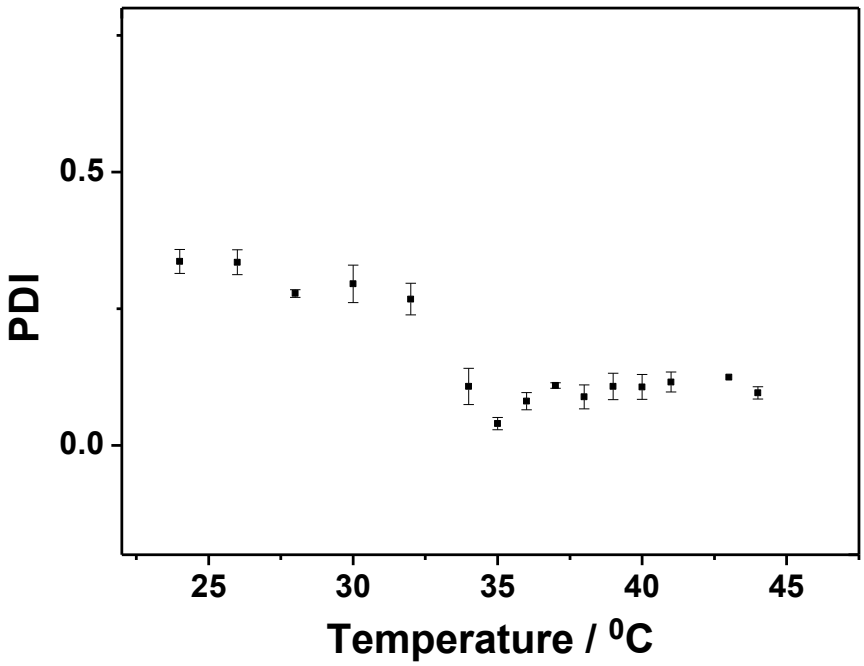

Fig. S1 The PDI of the micelles size at temperature ranging from 24 ˚C to 44 ˚C.

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Diameter assay

The micelles sizes varying with the pH (4.0-9.5) of the solution were investigated [1]. The self-assembled block copolymer samples were mixed with buffer solution at different pH value (1:1, v/v).

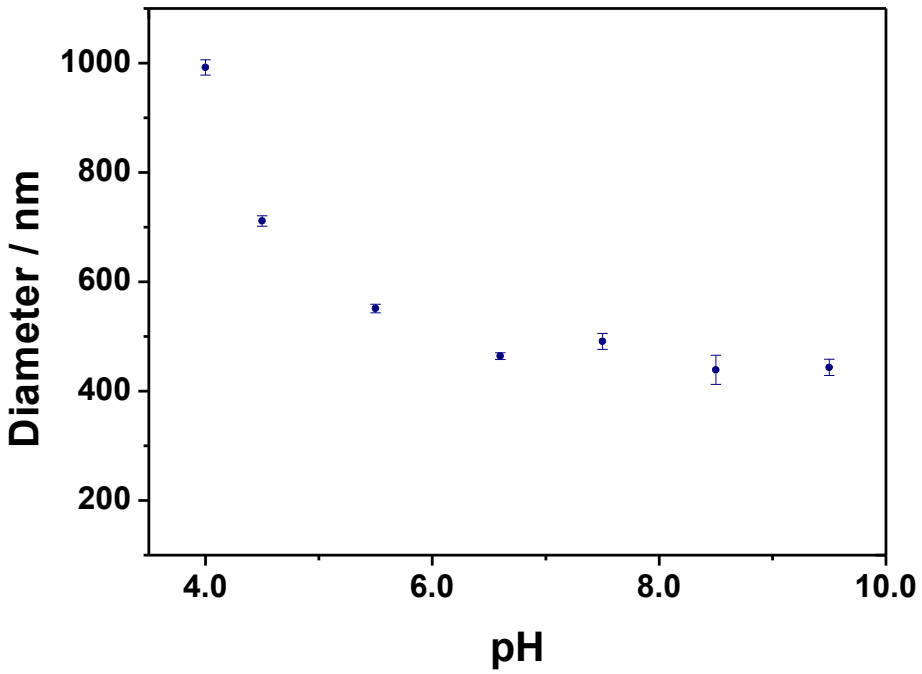

Fig. S2. The variation of the block copolymer (1.0 mg/mL) particle size with pH at 44 ºC, as examined by DLS measurements.

Hydrolysis Experiments

The complete hydrolysis of the block copolymer was determined by the same method as mentioned in reference [2]: when the pH remained constant, the block copolymer was hydrolyzed completely. The self-assembled block copolymer samples were mixed with buffer solution at different pH value (1:1, v/v) and stirred at the required temperature. The hydrolysis of the block copolymer was detected by monitoring the pH change. The pH variations were directly measured by a pH meter (pHS-3C, Leici, Shanghai).

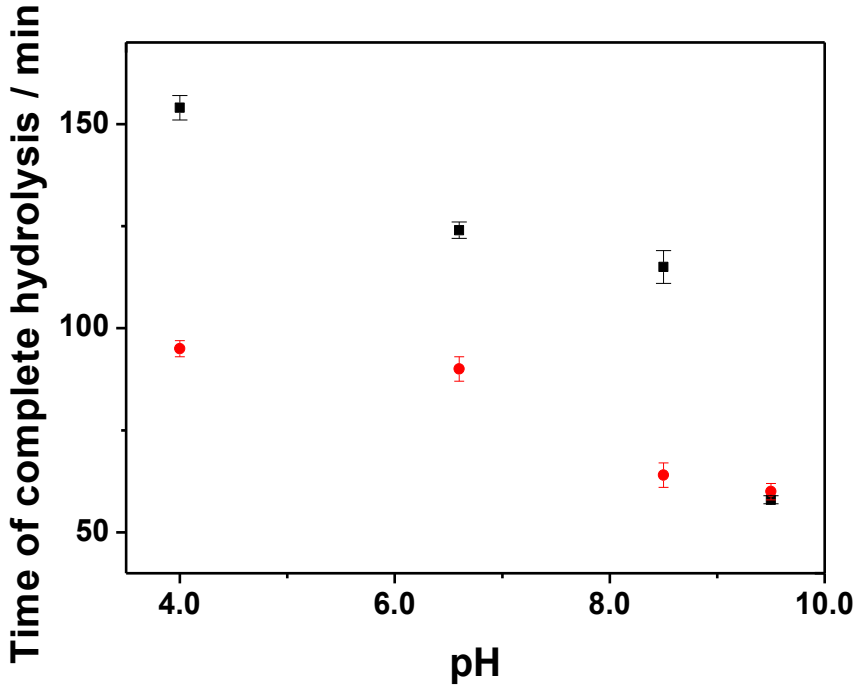

Fig. S3. Effect of the buffer pH on the hydrolysis of the block copolymer (1.0 mg/mL) at 24 ºC (■) and 44 ºC (●).

Incubation time of the block copolymer

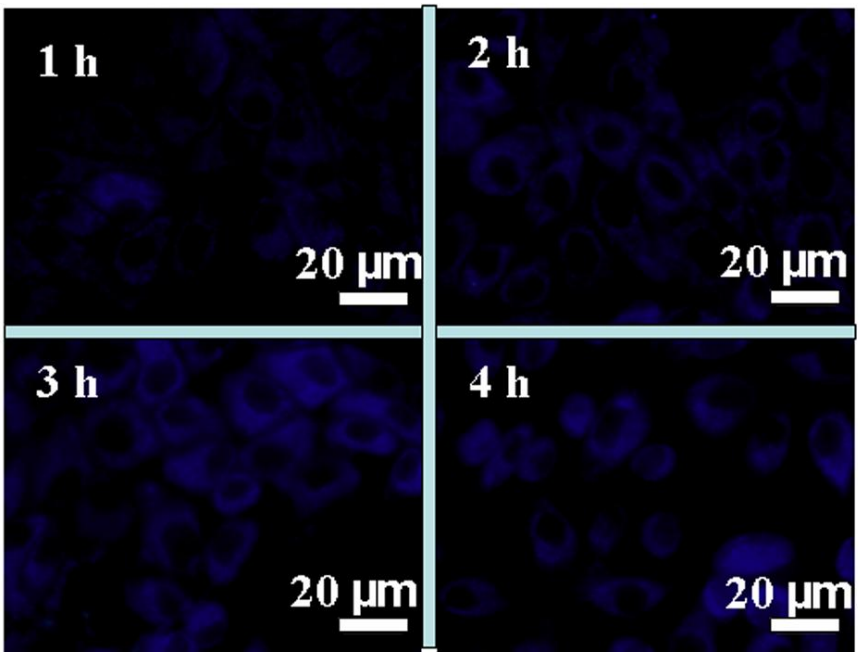

Fig. S4 MDCK cells were imaged at different incubation time.

Cell cytotoxicity assays

In order to evaluate the biocompatibility of the block copolymer, a commercial kit (CCK-8 Kit), which can produce soluble purple formazan in the presence of viable cells, was used for the cyctotocity assay [3, 4]. The cells (1×10^4 cells/well) were plated in the 96-well plates in 5% CO_2 atmosphere at 37 ^oC for 12 h. Then different concentration of block copolymer (0.3 mg/mL, 0.6 mg/mL and 1.0 mg/mL) were dissolved in the serum-free medium and incubated with the cells for 3 h. The cells were washed with PBS for three times and incubated in serum-free medium with 10 % CCK-8 solution for 2 h. The optical absorbance of the cells was measured at 450 nm by a microplate reader (Model SpectraMax M5). Control experiment was done by detecting the growth culture medium without the block copolymer.

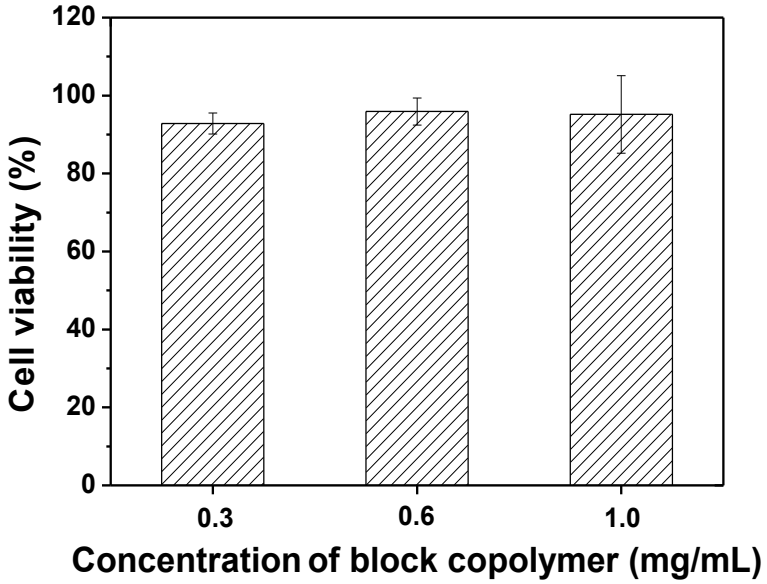

Fig. S5 Viability of MDCK cells after treatment in the presence of different concentration block copolymer. Each data bar represents an average of three parallels, and error bars indicate one standard deviation from the mean.

References

[1] Y. T. Li, B. S. Lokitz, C. L. McCormick, *Angew. Chem. Int. Ed.* 2006, **45**, 5792.

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