Supporting Information

Thermogel Loaded with Low-Dose Paclitaxel as a Facile Coating to Alleviate Periprosthetic Fibrous Capsule Formation

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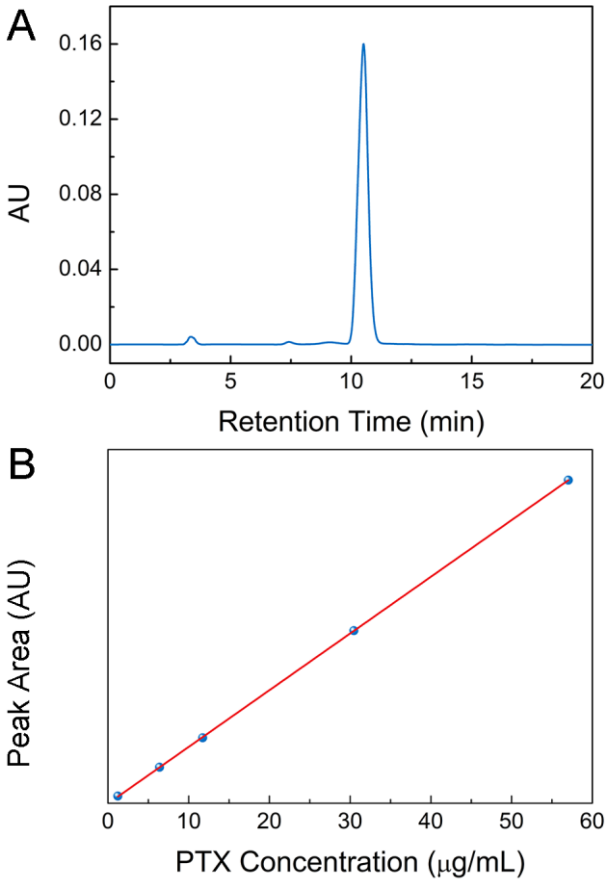


Figure S1. (A) HPLC chromatogram of the PTX. The mobile phase was 50% acetonitrile and 50% water and the retention time of PTX was 10.2 min. (B) The linear fitting of the drug concentration of the PTX versus the peak area of UV absorption. The correlation coefficient was 0.99998.

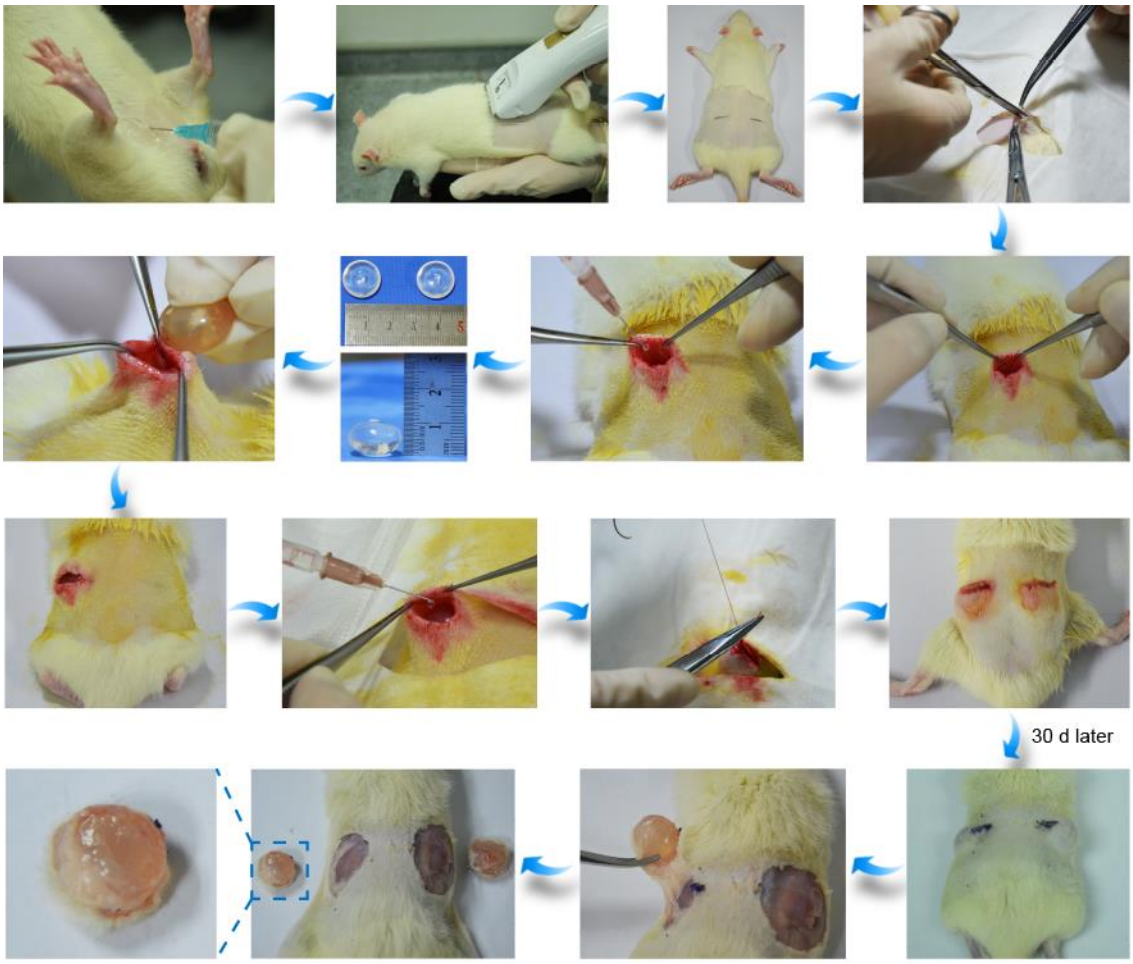
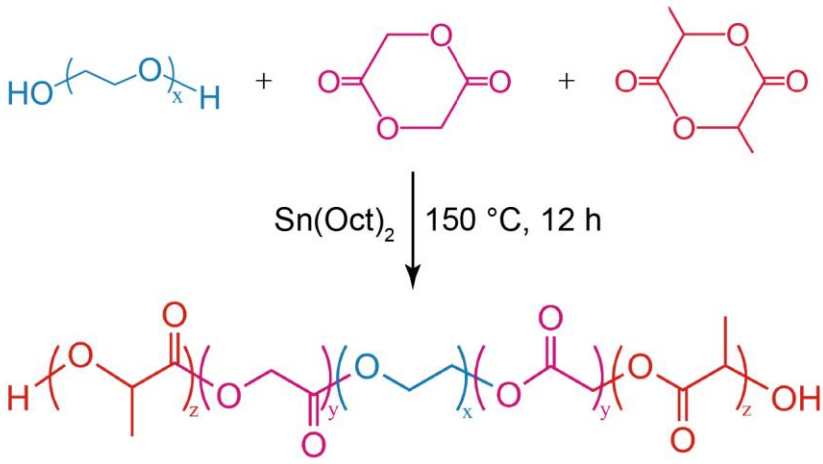


Figure S2. In vivo experimental procedures to investigate the capsular formation around silicone implants with an SD rat model.



Scheme S1. Synthetic procedure of the PLGA-PEG-PLGA triblock copolymer.

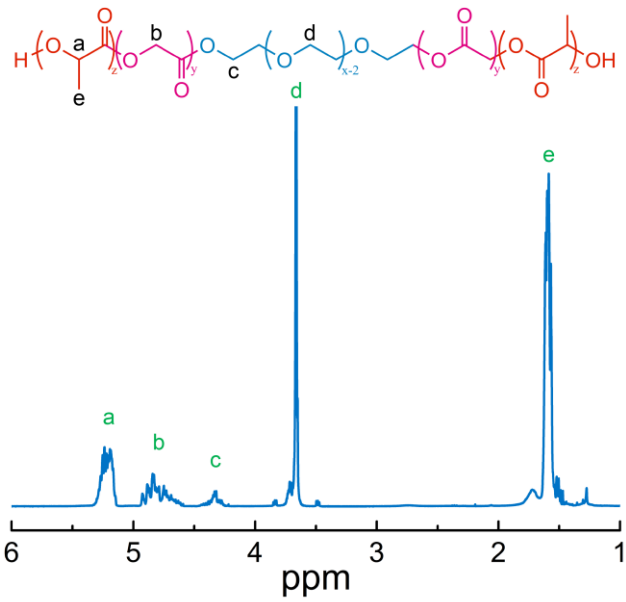


Figure S3. ^{1}H NMR spectrum of the PLGA-PEG-PLGA triblock copolymer in $CDCl_3$.

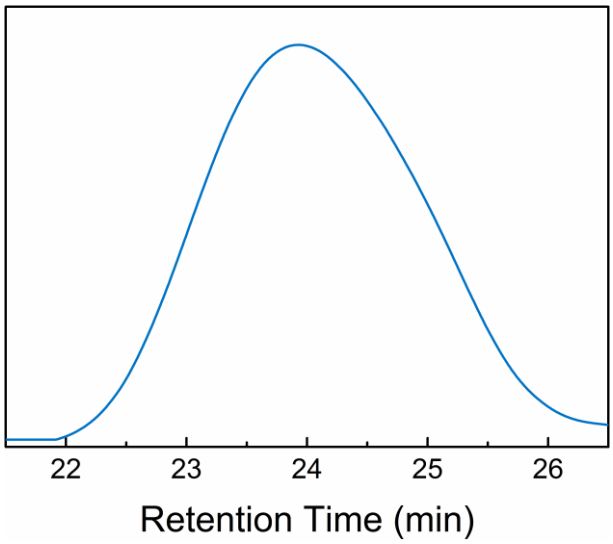


Figure S4. GPC trace of the synthesized PLGA-PEG-PLGA triblock copolymer.

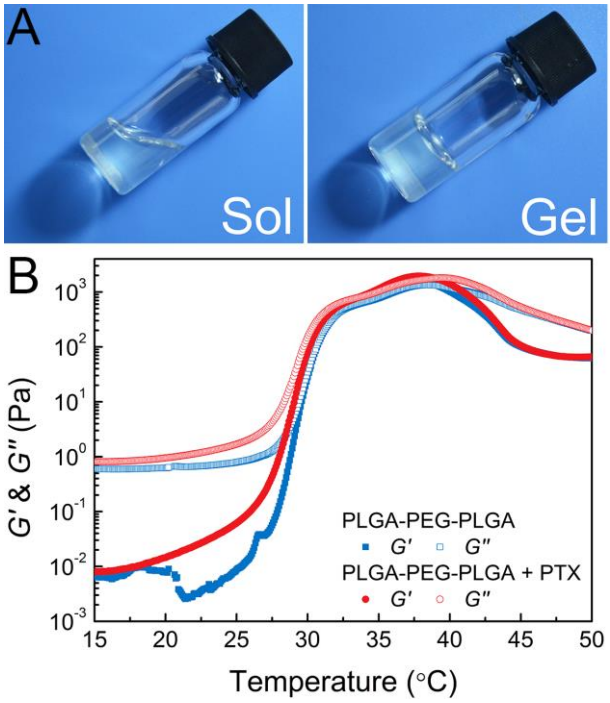


Figure S5. (A) Photographs of the PLGA-PEG-PLGA triblock copolymers in NS (25 wt %) containing 40 μg/mL PTX exhibiting sol (22 ºC) and gel states (37 ºC). (B) Storage modulus G' and loss modulus G'' of the PLGA-PEG-PLGA triblock copolymers in NS (25 wt %) with or without PTX as a function of temperature. Heating rate of 0.5 ºC/min and oscillatory frequency ω of 10 rad/s. The drug loading amount was 40 μg/mL.

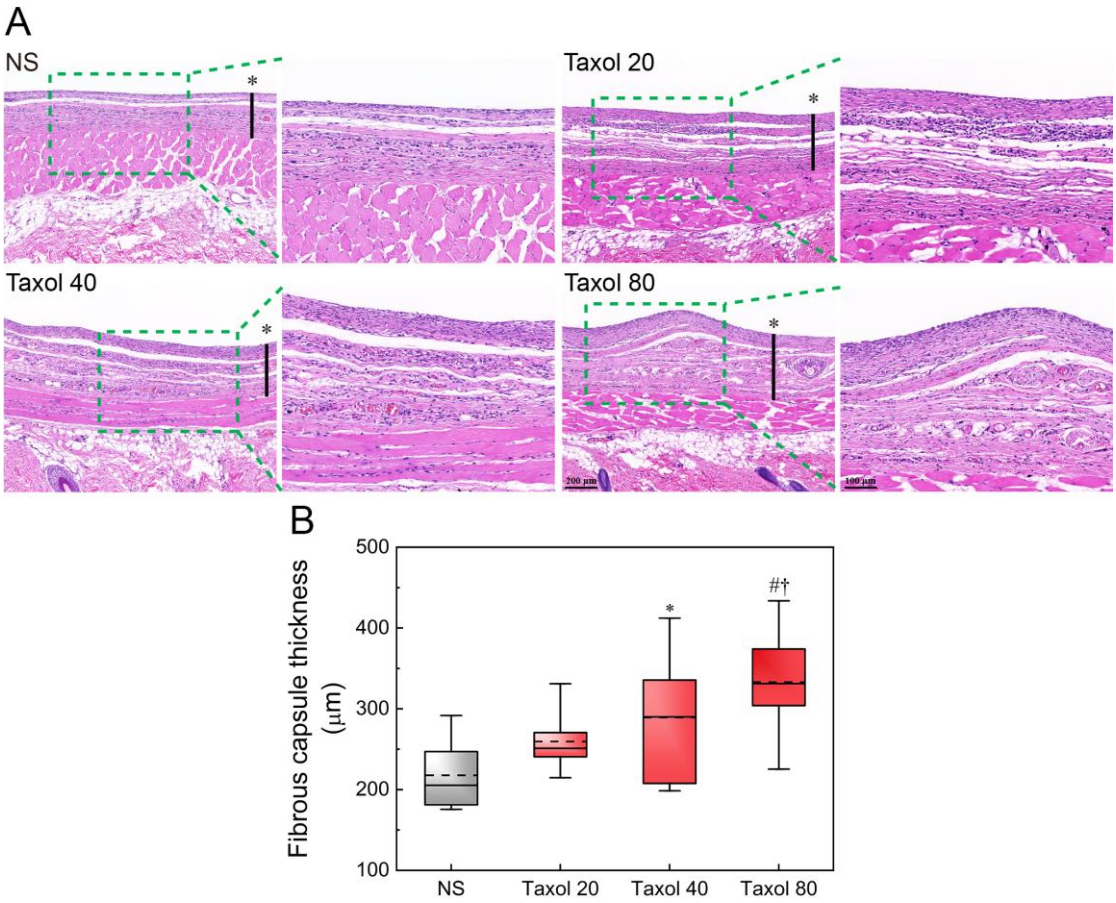


Figure S6. (A) Representative histological images using H&E staining of the capsule biopsy specimens taken from the NS (the control) and the Taxol 20, 40, and 80 (the PTX solutions containing 20, 40, and 80 μg/mL PTX) after 30 days from implantation in the rats. The asterisks (*) mark the site of the silicone implants and the black bars denote the fibrous capsule. (B) Box-whisker plot of the fibrous capsule thickness around the implants (n = 10): minimum, 25th percentile, median (solid line), mean (dashed line), 75th percentile and maximum. NS: the control, Taxol 20, 40, and 80: 20, 40, and 80 μg/mL PTX solutions diluted from the Taxol solution. ANOVA $^{*}p < 0.05$ vs NS, $^{\#}p < 0.05$ vs NS, $^{\dagger}p < 0.05$ vs Taxol 20.

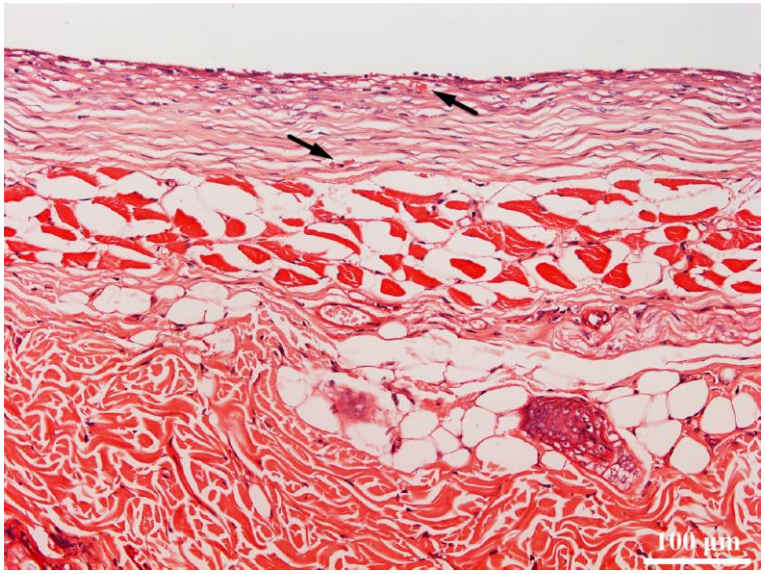


Figure S7. Evaluation of the vascularity of the fibrous capsule around the implants. The black arrows indicate the location of the blood vessels.

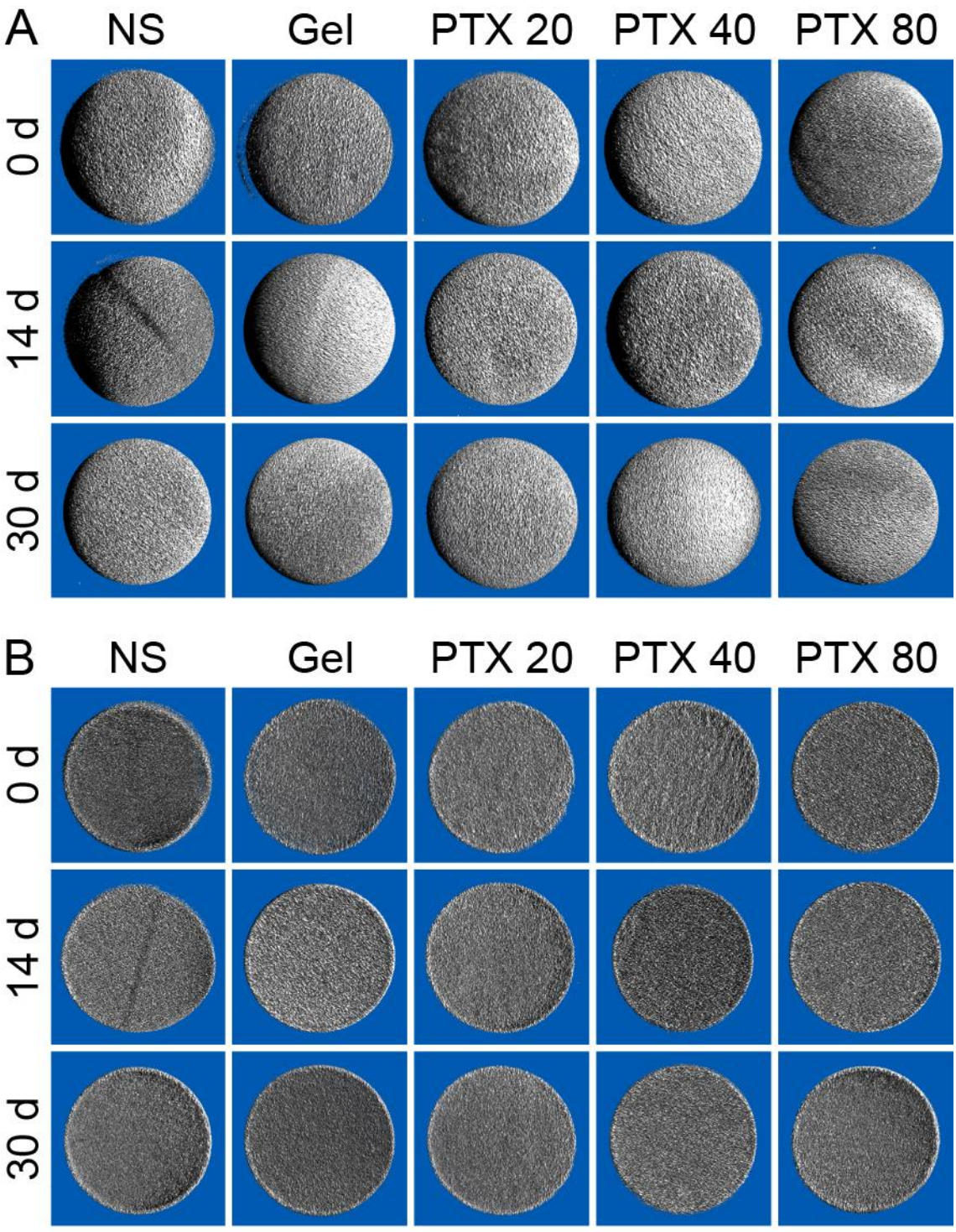


Figure S8. In vivo micro-CT images of the implants in the rats at the indicated time points. Representative images of (A) the implants and (B) the transverse sections of the implants. The images tracked the same rat of each group as a function of time.

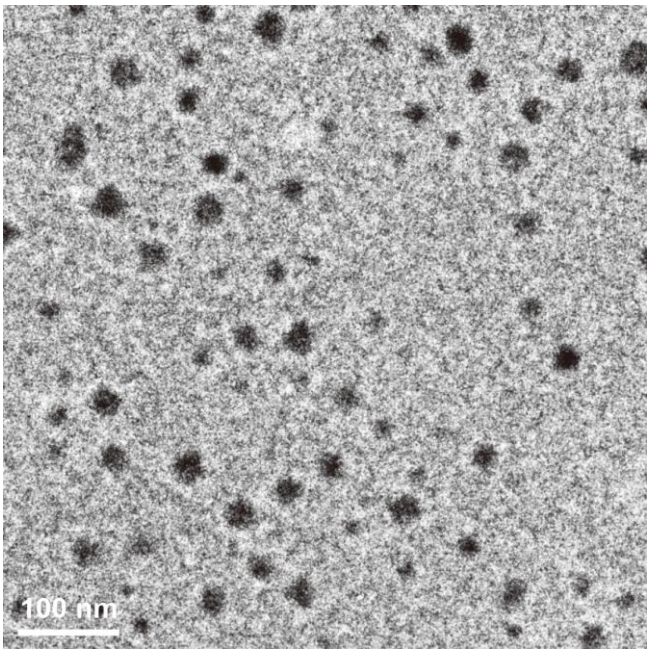


Figure S9. TEM image showing the formation of micelles of the PLGA-PEG-PLGA triblock copolymers in NS. The polymer concentration was 1 wt %.

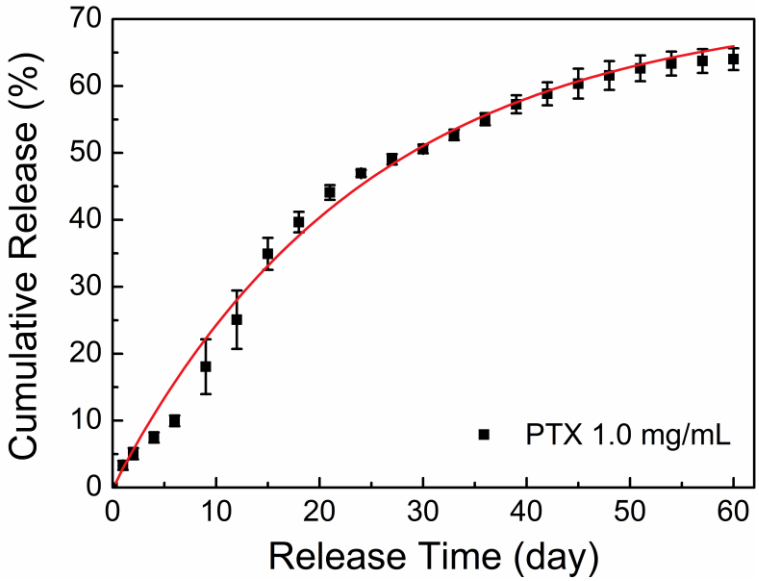


Figure S10. In vitro release profile of the PTX from the PLGA-PEG-PLGA thermogel in PBS at 37 ºC. The polymer concentration was 25 wt %. The results are presented as mean ± SD (n = 3). The release profile is fitted via the first-order equation with a correlation coefficient of 0.990.