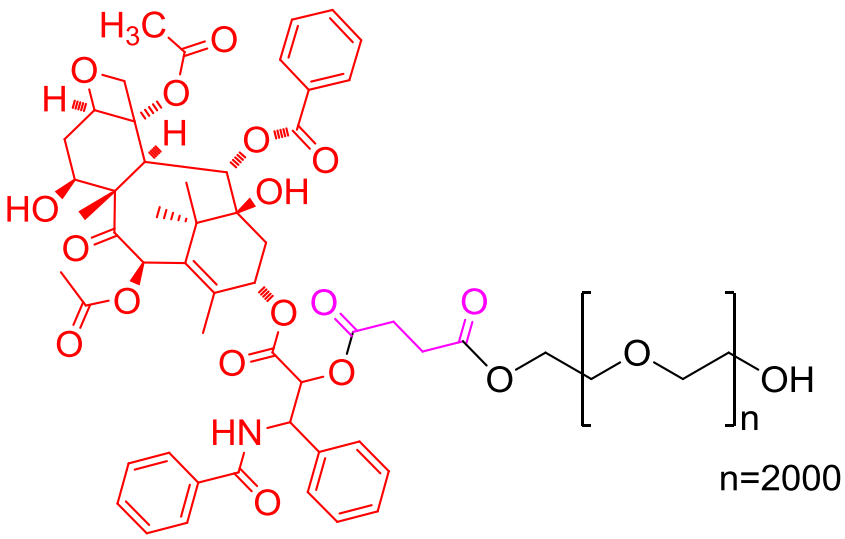
Supporting Information

Materials and general methods:

Chemicals and animals: Taxol was purchased from Baoman Biotechnology (Shanghai), Succinic acid was come from sigma. PLGA-PEG-PLGA was obtained from Jinan Daigang Biomaterial Co., Ltd. Chemical reagents and solvents were used as received from commercial sources. Commercially available reagents and solvents were used without further purification, unless noted otherwise. Balb/c mice were purchased from Academy of Military Medical Science (Beijing, China) and maintained in specific pathogen-free conditions in the animal facility at the Nankai University, Tianjin, China. All mice were used at 6-8 week old.

General methods: Moldi-TOF spectrometric analyses were performed at the LCQ-Advantage System. TEM was performed at the Tecnai G2 F20 system, operating at 100 kV. Rheology test was done on an AR 1500ex (TA instrument) system, 40 mm parallel plates was used during the experiment at the gap of 500 μm.



Scheme S-1: Chemical structure of PEGylated Taxol

Hydrogelator synthesis and characterizations:

Preparation of Taxol-SA-PEG (1): 200 mg (104.8μmol) of Taxol-SA dissolved in 20 mL of anhydrous methylene chloride at room temperature, to this solution at 0 °C were added 98.4 μL DIPC, 27.2 mg

DMAP and 482 mg PEG_{2000}. After being stirred for 10 minutes, the reaction mixture was allowed to warm to room temperature and stirred for another 24 hs, the solution was washed with 0.1 N HCl, dried, and evaporated under reduced pressure to yield a white solid which was recrystallized from 2-propanol (86.2%).

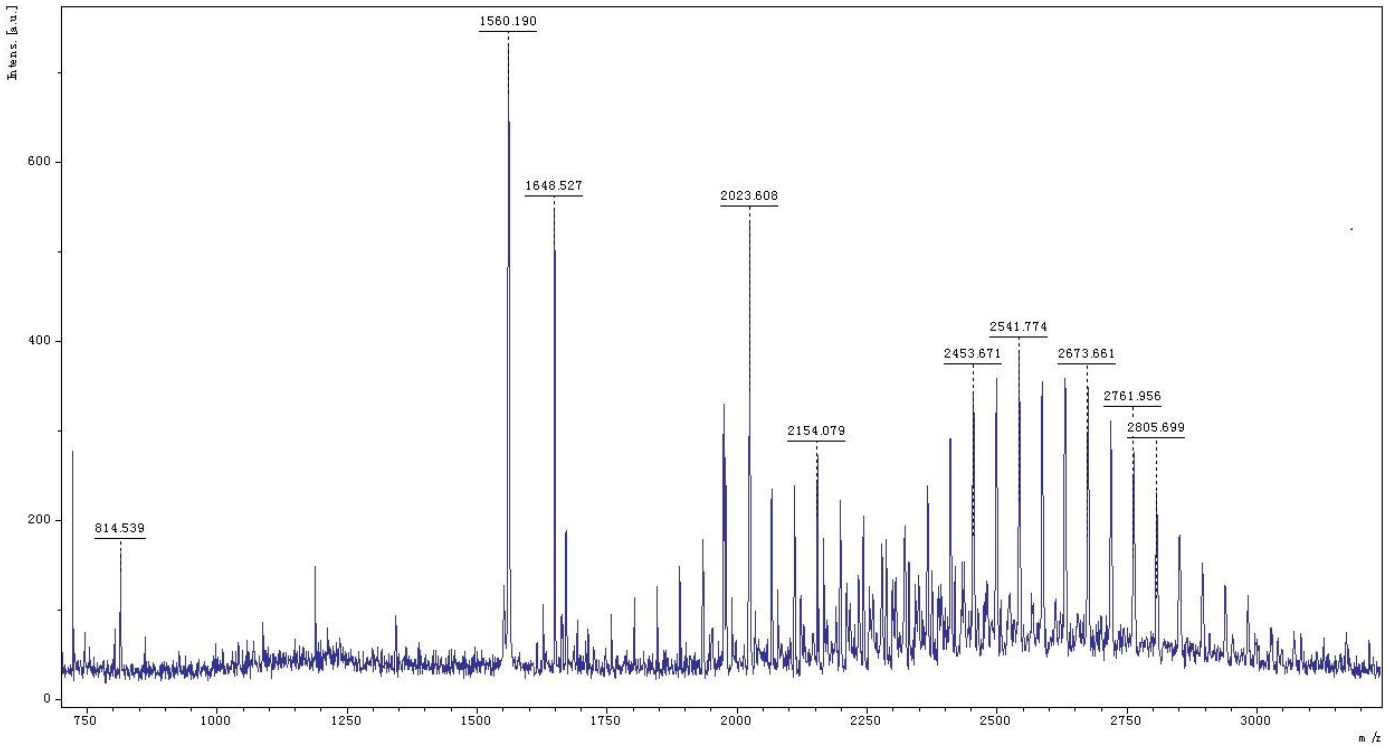


Figure S-1: Moldi-TOF of PEGylated Taxol

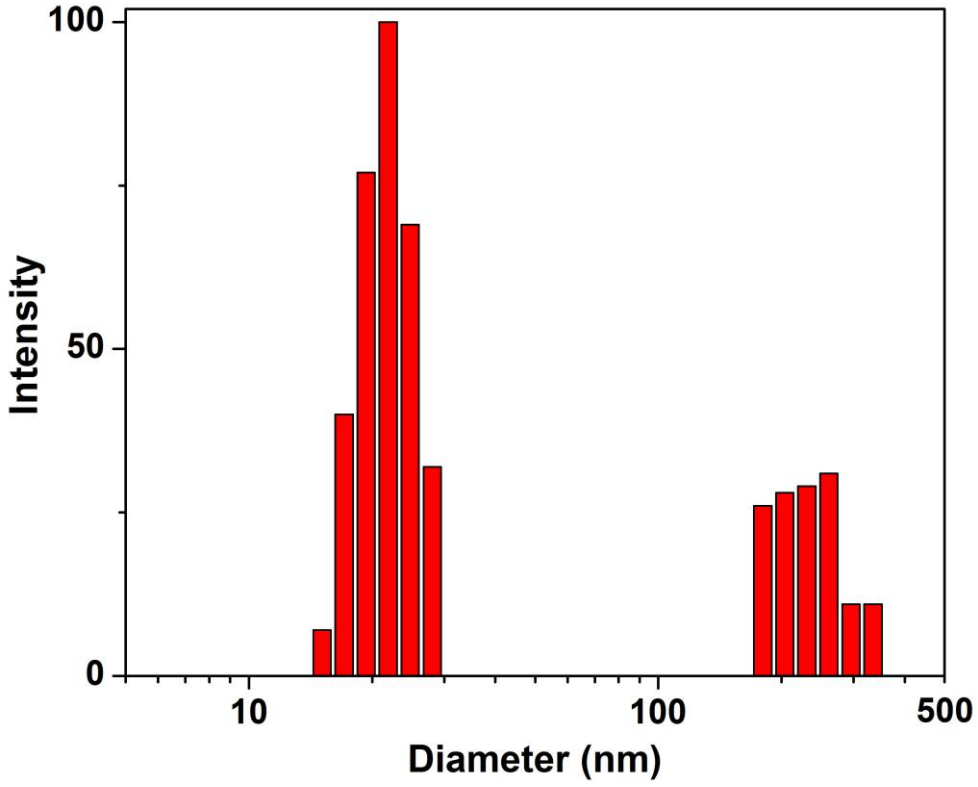


Figure S-2: Dynamic light scattering (DLS) of nanogel

***In Vivo* Evaluation of Antitumor Activity:** 4T1-luciferase cells were maintained in our lab. Female Balb/c mice were inoculated with $2*10^5$ 4T1-luciferase cells in the mammary fat pad. Tumor growth was monitored every other day. Tumor volume was calculated by the formula: length*width*(Length+Width)/2. When tumors size reached about 45 mm^3, mice were randomly divided into different treatment groups. Mice weight was monitored after receiving treatment and presented as relative weight (%).

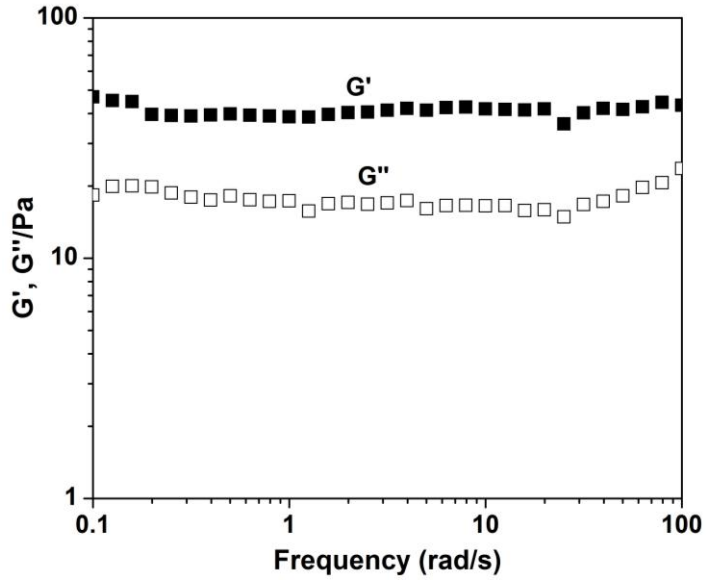


Figure S-3: Dynamic frequency sweep at the strain of 1.0 % and at 37℃

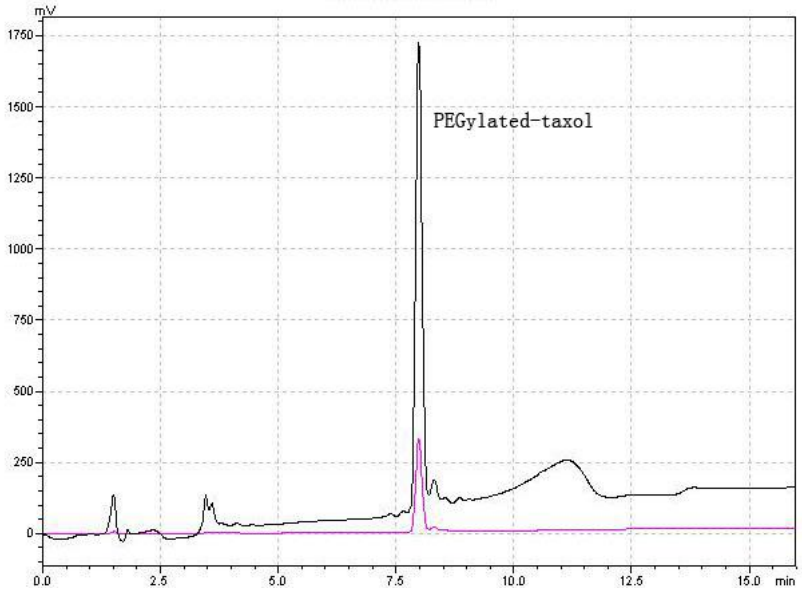


Figure S-4: LC-MS spectrum of nanogel after 48 hs incubation at 37 ℃

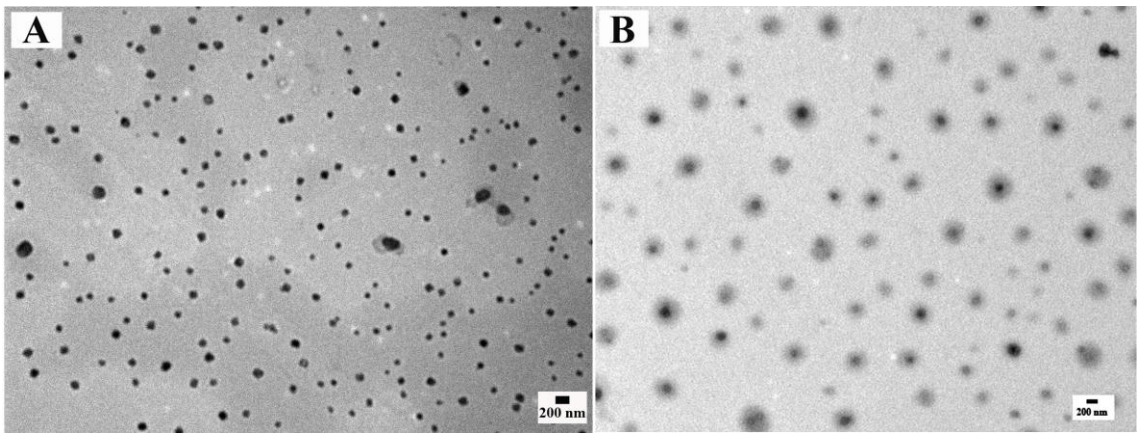


Fig. S-5. TEM images of A) solution of PLGA-PEG-PLGA at the concentration of 20 wt% and B) solution of PEGylated Taxol at the concentration of 20 wt %

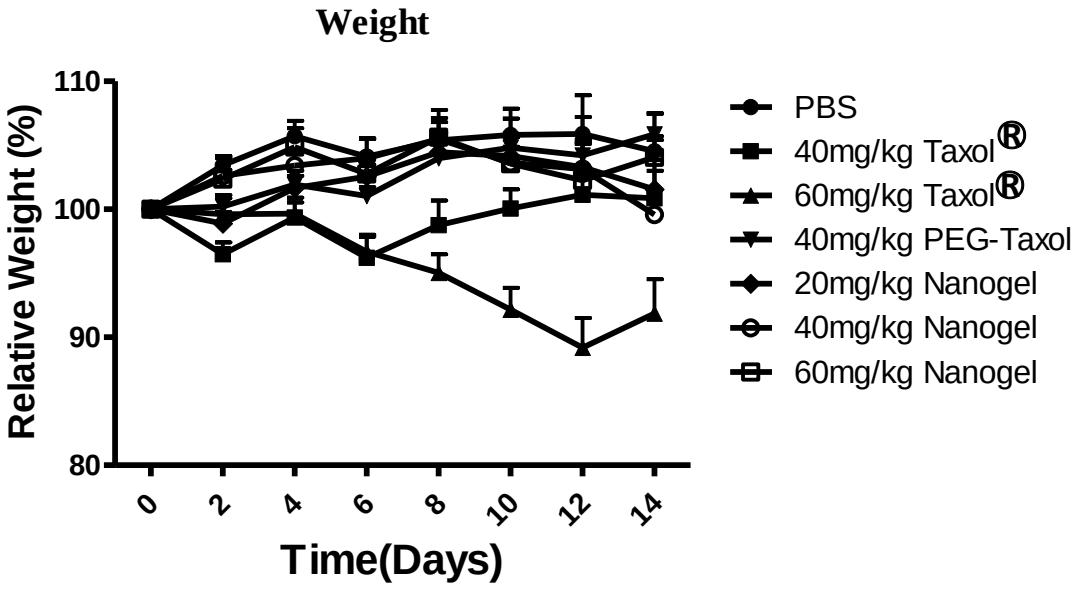


***Figure S-6*:** Relative mouse weight over the time period of the treatments of xenografted breast tumor

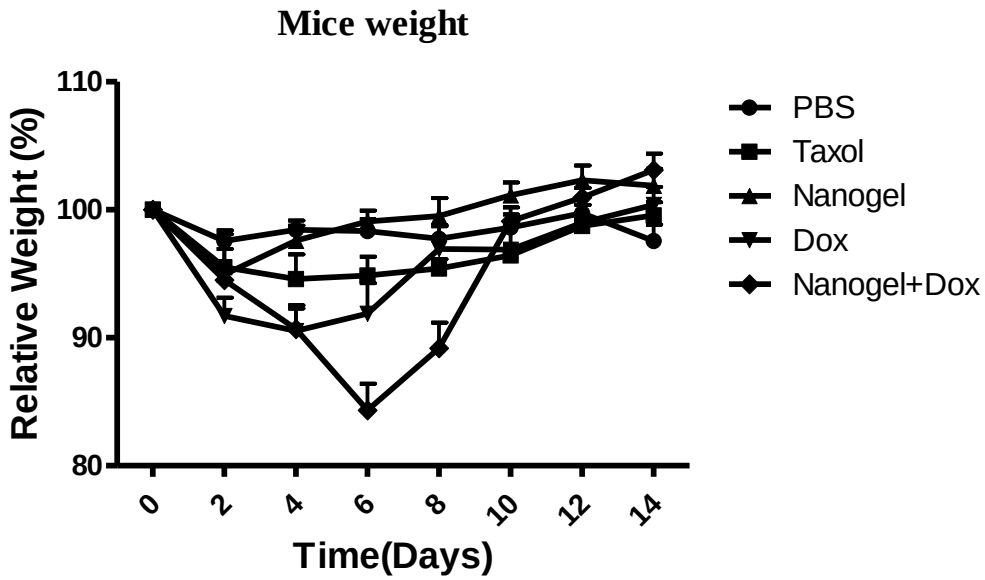


***Figure S-7*:** Relative mouse weight over the time period of the treatments of xenografted breast tumor

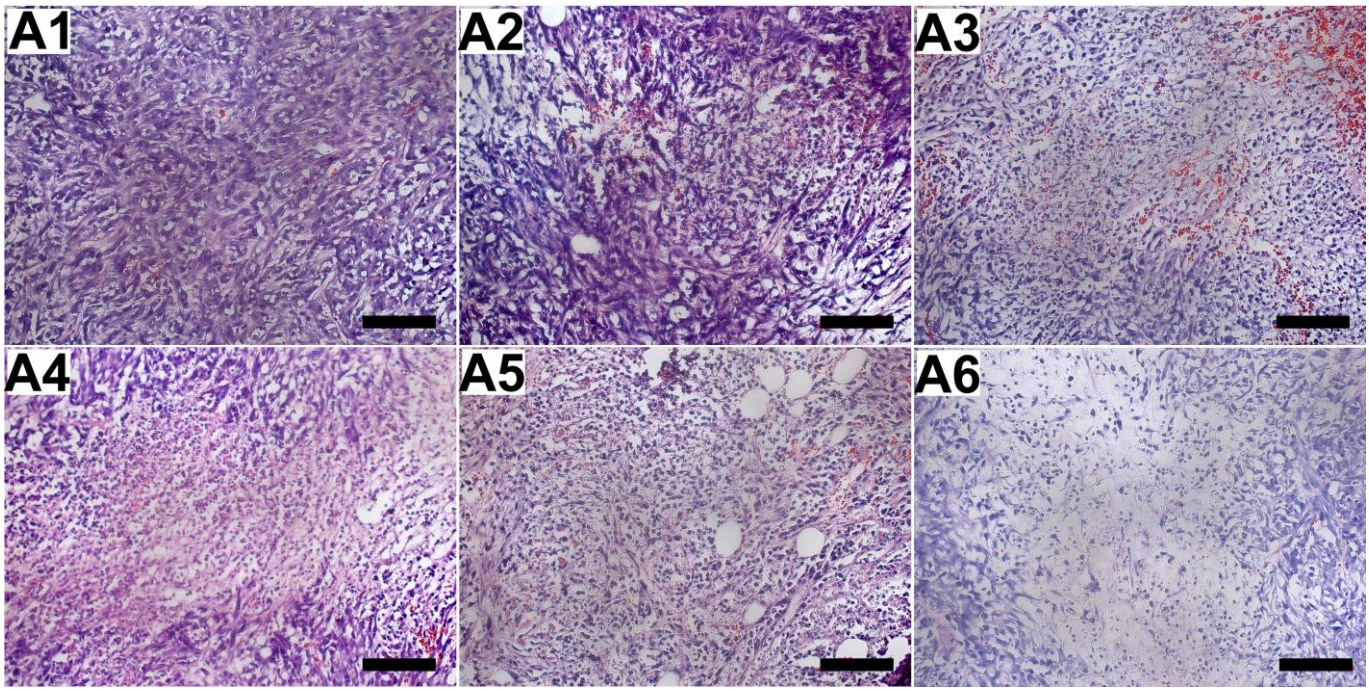


***Figure S-8*:** Histological analyses of breast tumors 10 days after treatment. A1-A6) H&E staining of breast tumor sections from different treatment groups. A1, PBS vesicle; A2, 20 mg/kg Taxol; A3, 20mg/kg PEG-taxol; A4, 4 mg/kg Dox; A5, 20 mg/kg nanogel; A6, 20 mg/kg nanogel loaded with 4 mg/kg Dox; Scale bars represent 100 μm.