

Highly Stable Docetaxel-Loaded Nanoparticles Based on Poly(D,L-lactide)-*b*-Poly(ethylene glycol) for Cancer Treatment: Preparation, Characterization, and In Vitro Cytotoxicity Studies

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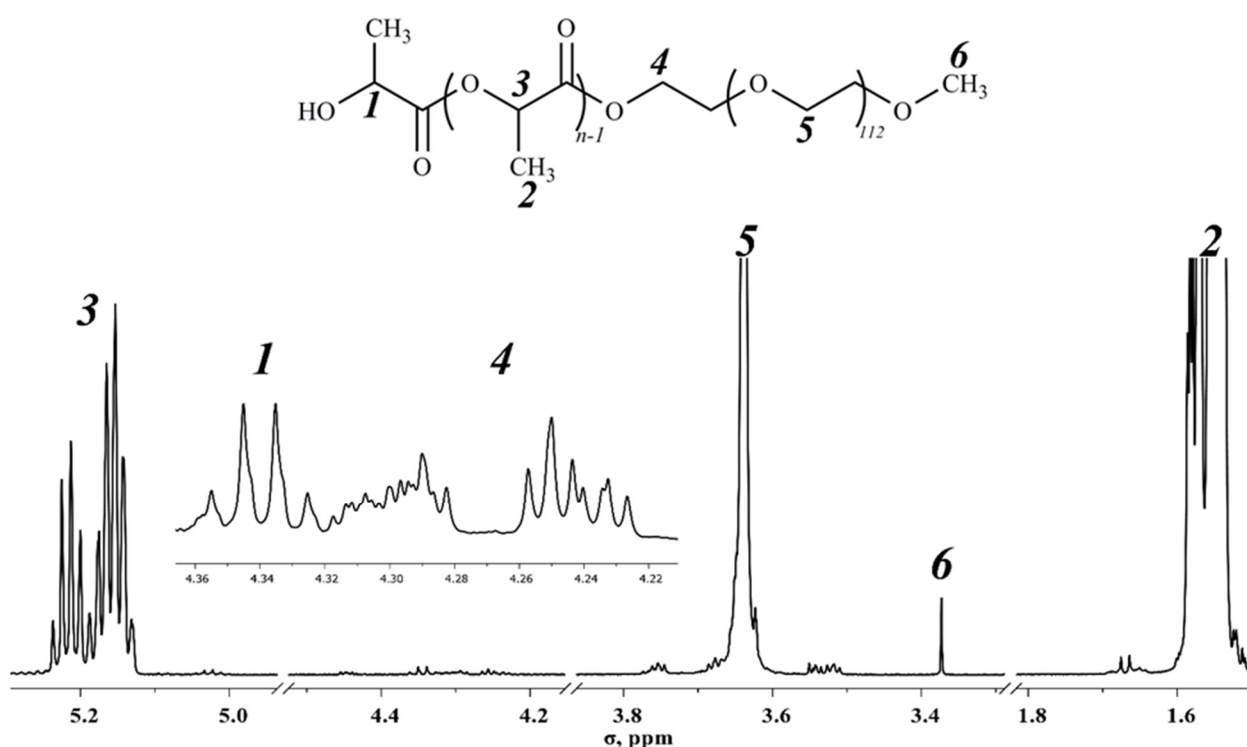


Figure S1. Representative ¹H NMR spectrum of P(D,L)LA₅₀-*b*-PEG₁₁₃ copolymer (CDCl₃, 300 MHz).

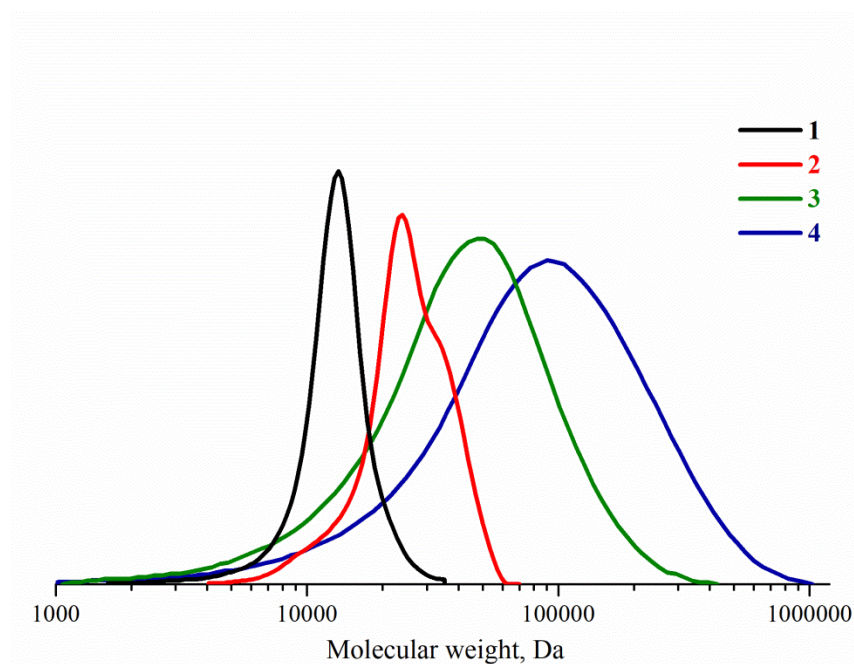


Figure S2. Chromatograms of the synthesized block copolymers: 1 – P(D,L)LA₅₀-*b*-PEG₁₁₃, 2 – P(D,L)LA₁₈₀-*b*-PEG₁₁₃, 3 – P(D,L)LA₆₈₀-*b*-PEG₁₁₃, 4 – P(D,L)LA₁₂₃₀-*b*-PEG₁₁₃.

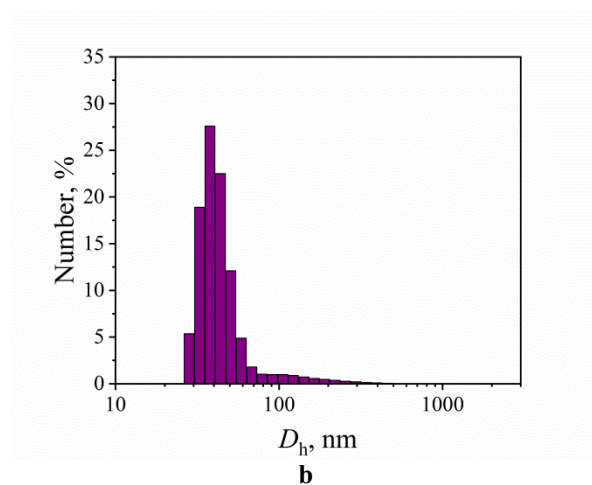
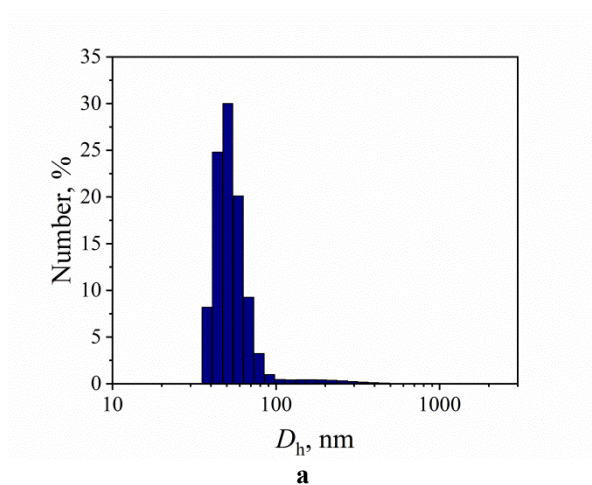


Figure S3. DLS number size distribution curves for diluted aqueous suspensions with concentration of 0.1 g/L based on (a) P(D,L)LA₅₀-*b*-PEG₁₁₃ and (b) P(D,L)LA₁₈₀-*b*-PEG₁₁₃ copolymers.

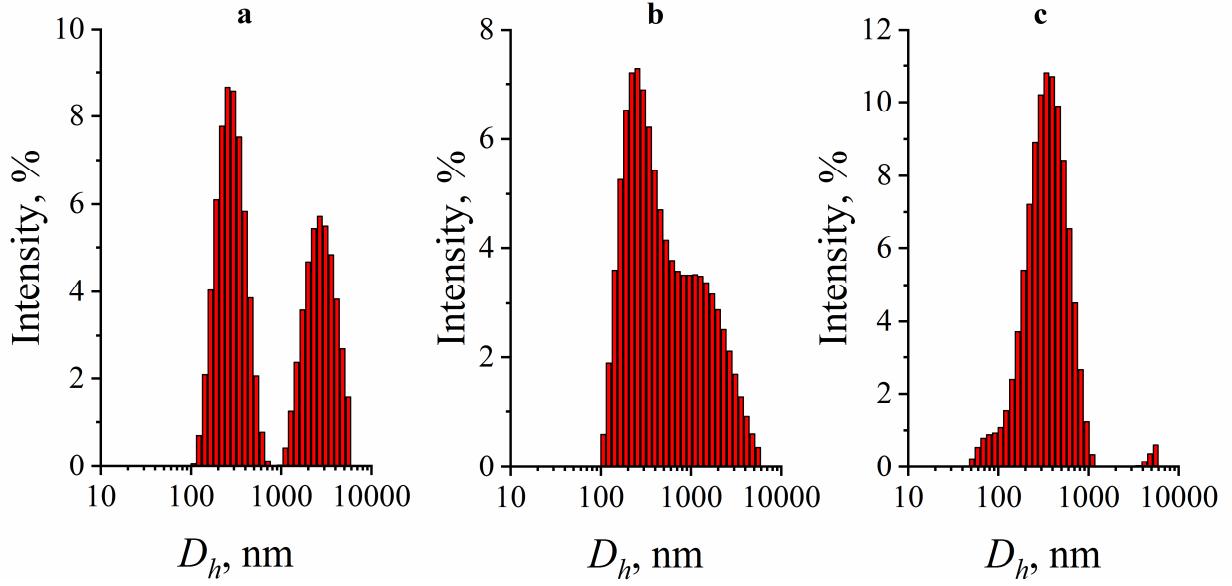


Figure S4. DLS intensity size distribution curves for aqueous suspensions of docetaxel-loaded P(D,L)LA₁₂₃₀-*b*-PEG₁₁₃ nanoparticles after freeze-drying with D(-)-mannitol and following reconstitution. The ratio of lyoprotectant:NPs was (a) 1:4, (b) 1:1 and (c) 2.5:1.

Evaluation of parameters of P(D,L)LA_n-*b*-PEG₁₁₃ nanoparticles. The values of core-corona interface area (s_{int}) of the P(D,L)LA_n-*b*-PEG₁₁₃ nanoparticles (NPs) were calculated from the diameter of poly(D,L-lactide) P(D,L)LA core (D) evaluated from TEM according to the following equation:

$$s_{int} = \frac{3}{\rho \cdot (D/2)},$$

where $\rho = 1.25 \text{ g/cm}^3$ is the bulk density of PLA.

The values of tethering density of hydrophilic PEG chains (σ) on the P(D,L)LA core surface of the P(D,L)LA_n-*b*-PEG₁₁₃ NPs were calculated according to the equation:

$$\sigma = \frac{1}{s_{int}} = \frac{N_{agg}}{4\pi(D/2)^2},$$

where s_{int} is the P(D,L)LA core area corresponding to one PEG chain, N_{agg} is the aggregation number of NP.

The values of N_{agg} of the P(D,L)LA_n-*b*-PEG₁₁₃ NPs were calculated according to the following equation:

$$N_{agg} = \frac{(D/2)^3 4\pi N_A \rho}{3M_0 N_{P(D,L)LA} 10^{-21}},$$

where N_A is the Avogadro constant, M_0 is the molecular weight of lactide monomer unit, $N_{P(D,L)LA}$ is the polymerization degree of the P(D,L)LA block.