Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

In situ crosslinked smart polypeptide nanoparticles for multistage responsive tumor-targeted drug delivery

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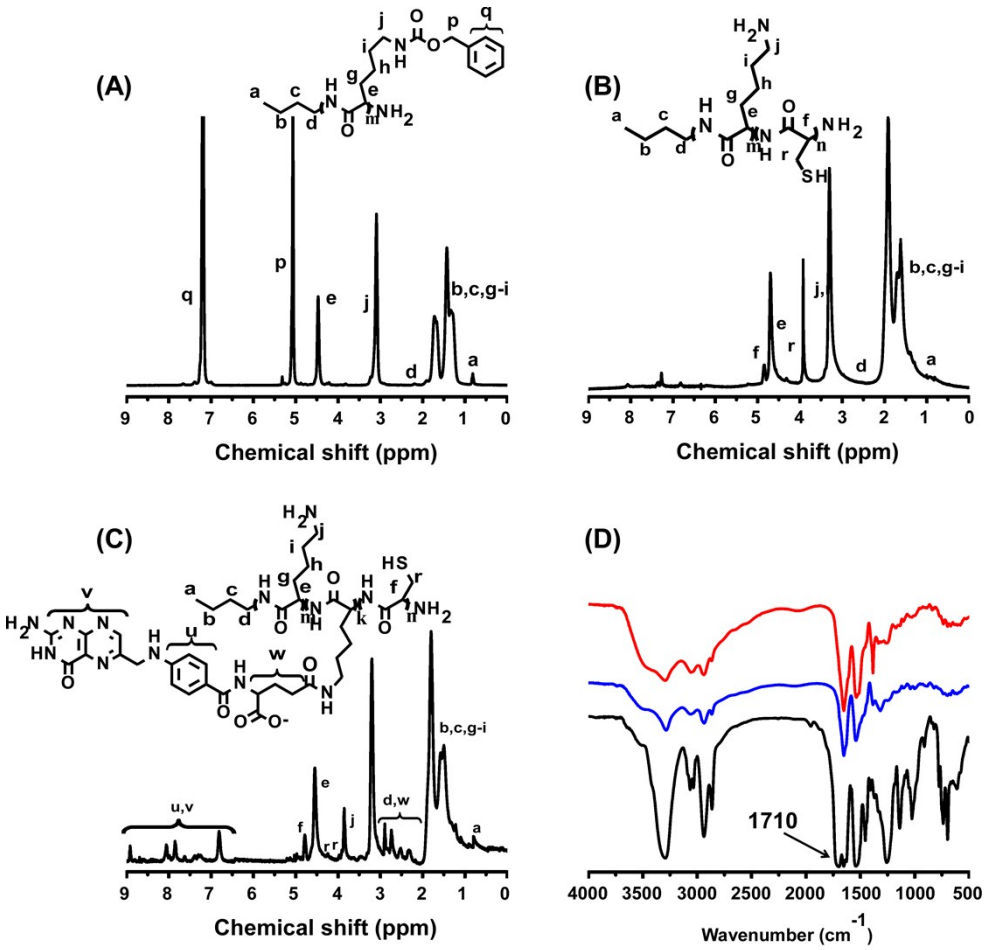

Fig S1. Characterizations of the copolymers. (A) ^{1}H NMR spectrum of PLLZ-b-PLCZ copolymers. (B) ^{1}H NMR spectrum of FA-PLL(DCA)-b-PLC copolymers. (C) ^{1}H NMR spectrum of FA-PLL-b-PLC copolymers. (D) FT-IR spectrum of PLLZ (black) PLL-b-PLC (blue) and FA-PLL-b-PLC (red) copolymers.

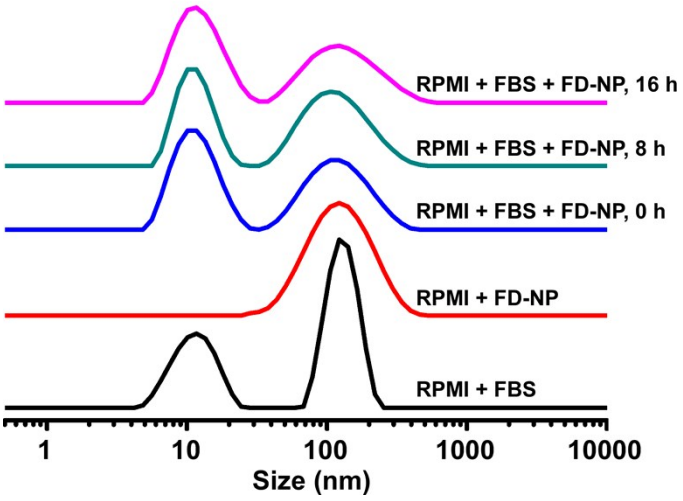

Fig S2. Size distribution of FD-NP determined by DLS. The nanoparticles were incubated at 37 °C with RPMI 1640 culture medium at pH 7.4

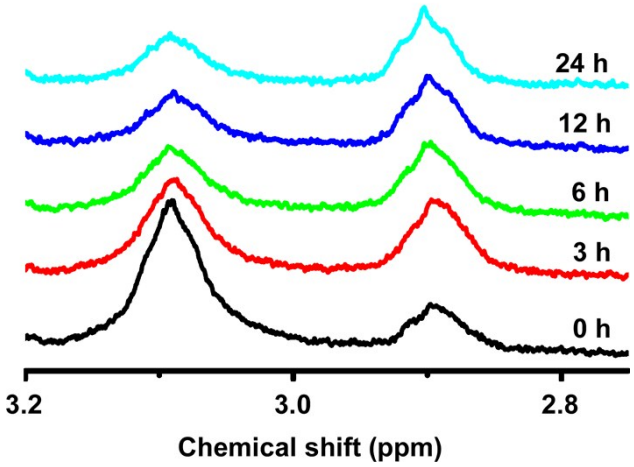

Fig S3. Hydrolysis of FD-NP at pH 7.4 detected by ^{1}H NMR.

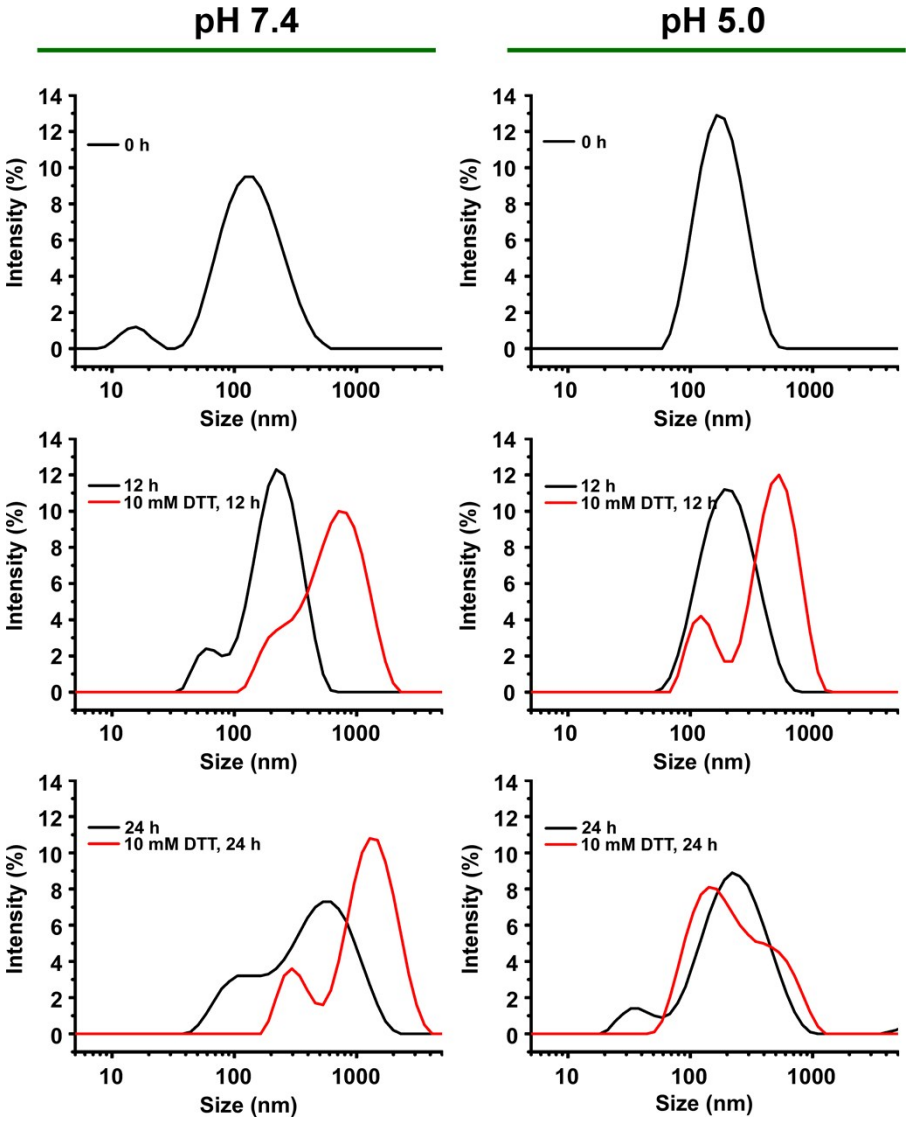

Fig S4. Redox and pH-induced size distribution changes of FD-NP in time followed by DLS.

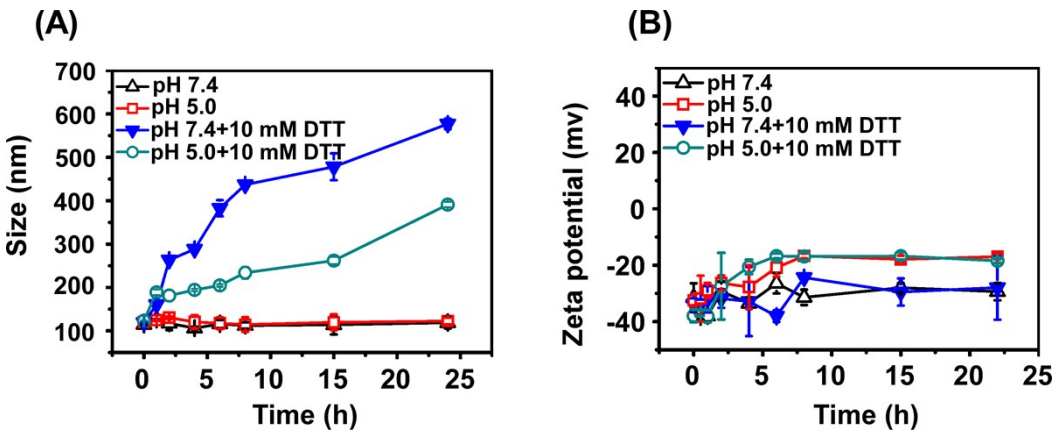

Fig S5. Redox and pH-induced size and zeta potential changes of FS-NP. (A) Z-average size analyses. (B) Zeta potential changes. FS-NPs were incubated at 37 °C ± 10 mM DTT at pH 7.4 and 5.0. Data are shown as mean ± SD (n = 3).

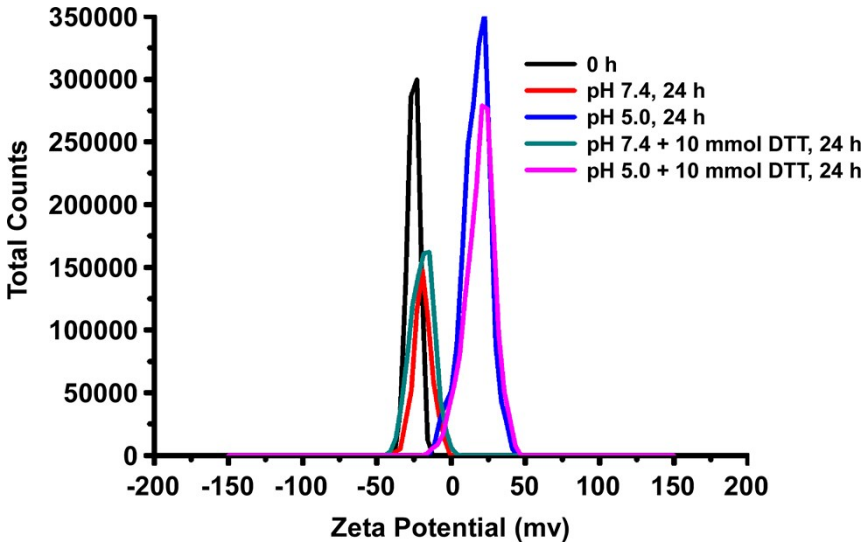

Fig S6. Redox and pH-induced zeta potential distribution changes of FD-NPs measured by Nano-ZS ZEN3600.

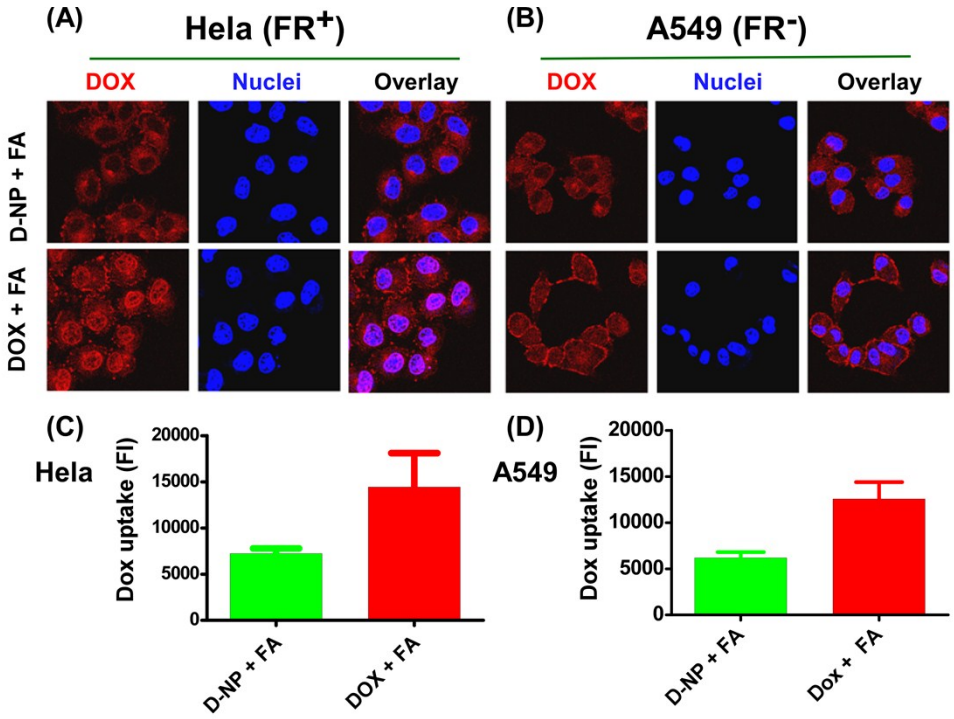

Fig S7. The intracellular localization and cellular uptake of nanoparticles by Hela and A549 cells. The cells were incubated with DOX-loaded D-NP and free DOX (10 μg/mL) + FA (100 μg/mL). The intracellular localization of DOX in (A) Hela and (B) A549 cells were recorded at 0.5 h using CLSM. The cellular uptake of DOX in (C) Hela and (D) A549 cells was determined at 0.5 h by measuring DOX positive cells using flow cytometry. Total fluorescence intensity (FI) = % of positive cells × mean fluorescence intensity. Cells were labeled with hoechst to identify nuclei (Blue). Magnification: × 63. Bars shown are mean ± SE (n = 4).

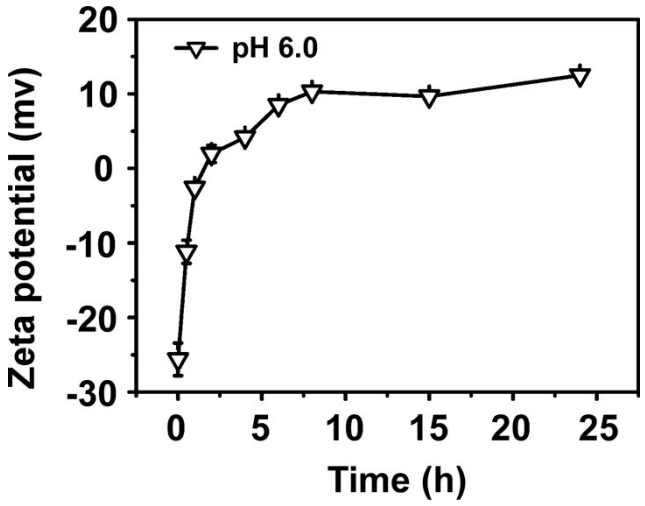

Fig S8. The zeta potential changes of FD-NP at pH 6.0. Data are shown as mean ± SD (n = 3).

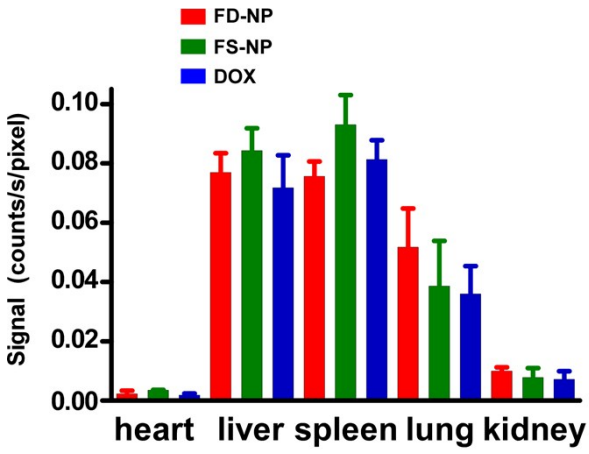

Fig S9. Fluorescence signals of Dir in excised organs at 48 h. Tumor-bearing mice were i.v. injected with Dir + DOX loaded nanoparticles (FD-NP, FS-NP) and Dir + DOX respectively. Bars shown are mean±SE (n = 3).

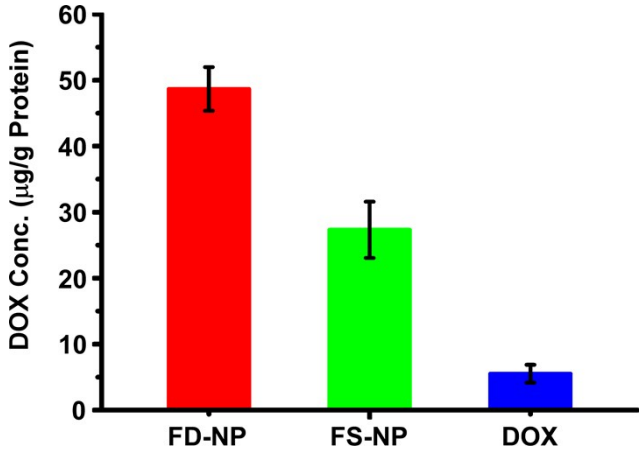

Fig S10. The amount of DOX in tumor tissues was quantified by fluorescence spectrophotometer at 48 h after iv administration of Dir + DOX loaded nanoparticles (FD-NP, FS-NP) and Dir + DOX respectively (DOX: 10 μg/mouse). Bars shown are mean ± SE.