Supporting Information

Targeted Drug Release System Based on pH-Responsive PAA-POSS Nanoparticles

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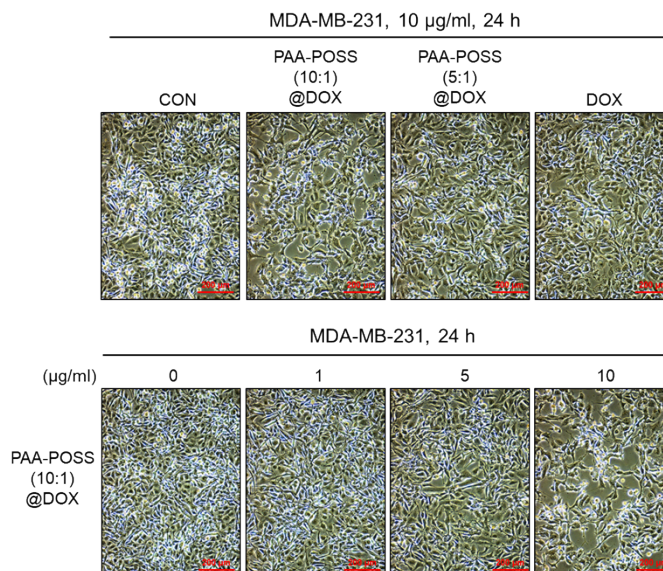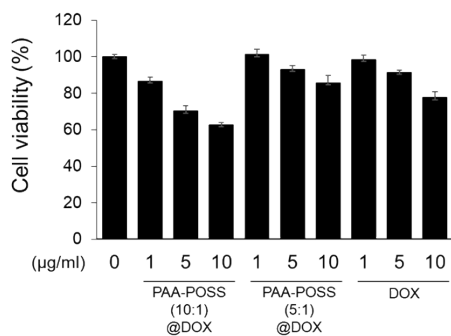
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S1. MDA-MB-231 cell viability and morphology after treatment of PAA-POSS(10:1)@DOX, PAA-POSS(10:5)@DOX, DOX with different amount 1, 5, 10 μg/ml for 1 day and treated MDA-MB-231 cells morphology. Scale bar = 200 μm
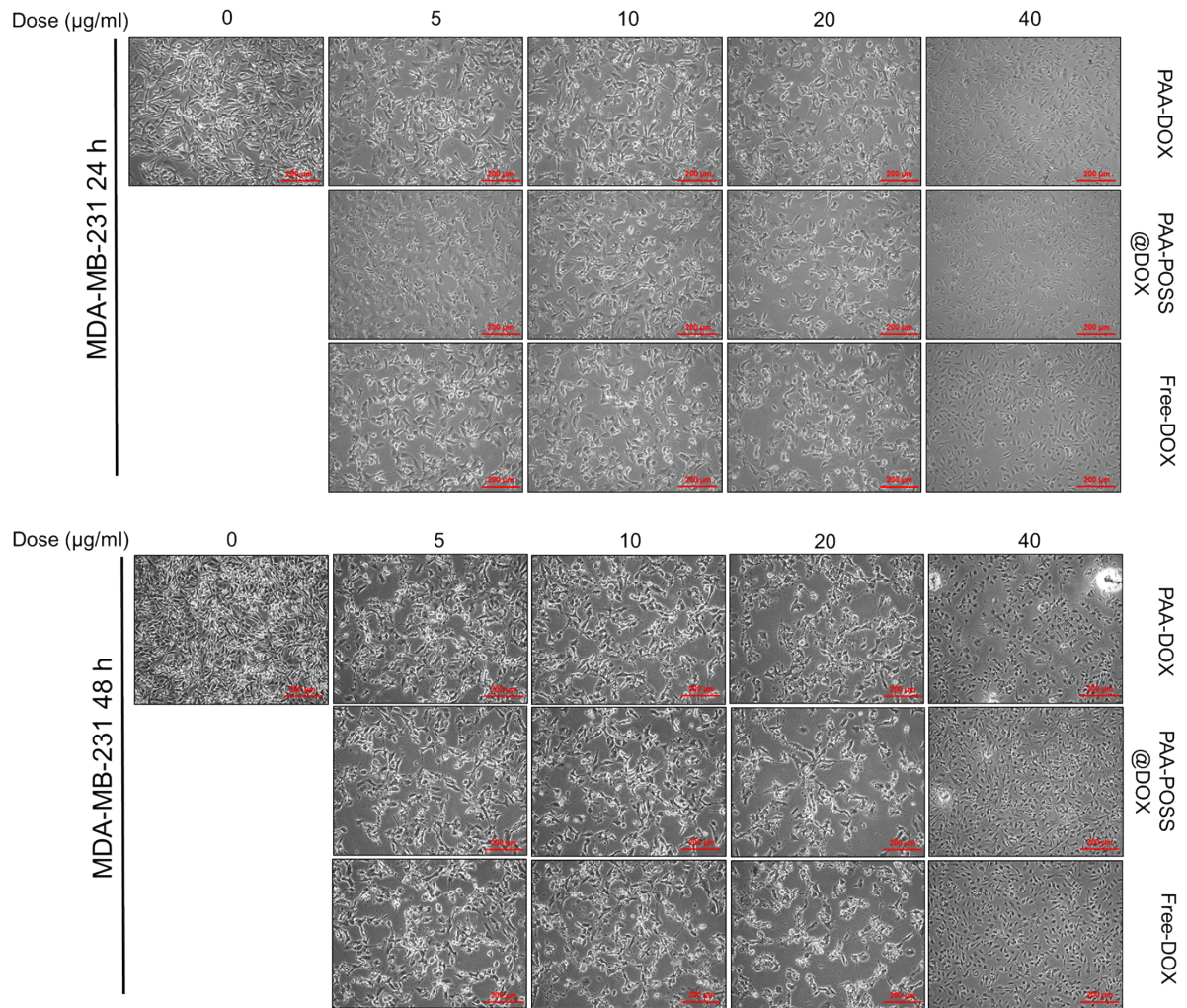
S2. MDA-MB-231 cells were treated with different concentrations (0-40μg/ml) of PAA@DOX, PAA-POSS@DOX and free DOX for 24 and 48 h. Cell morphology was determined using a microscope. Scale bar = 200 μm
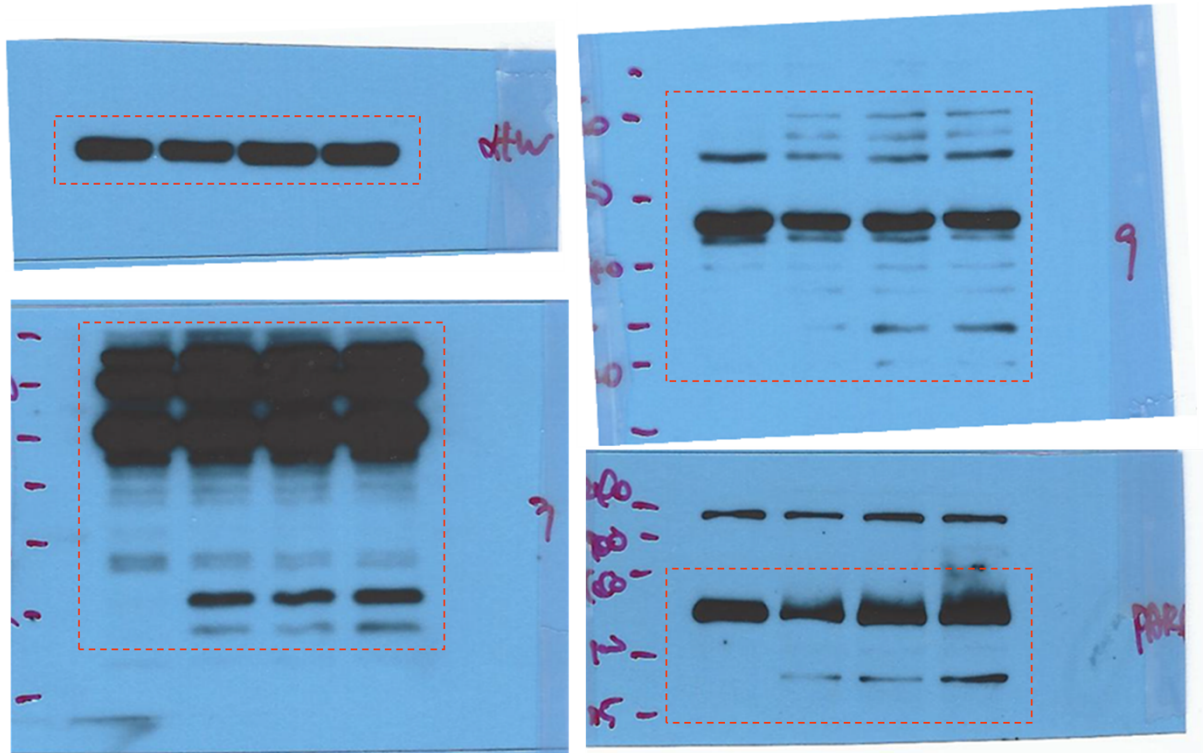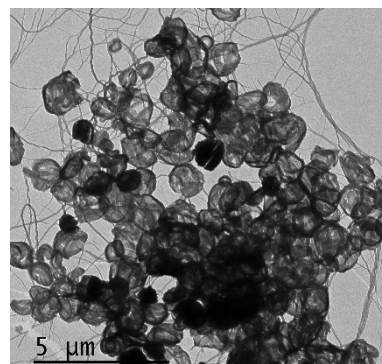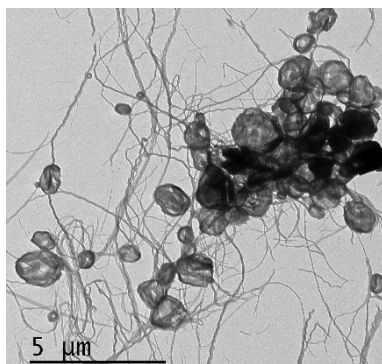
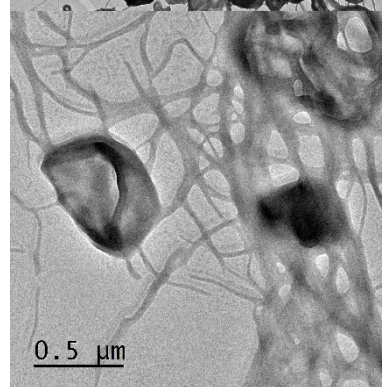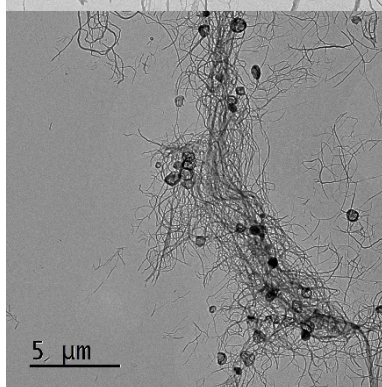**S3.** Full-length blots in figure 5c. The red dotted lines are the main figures.
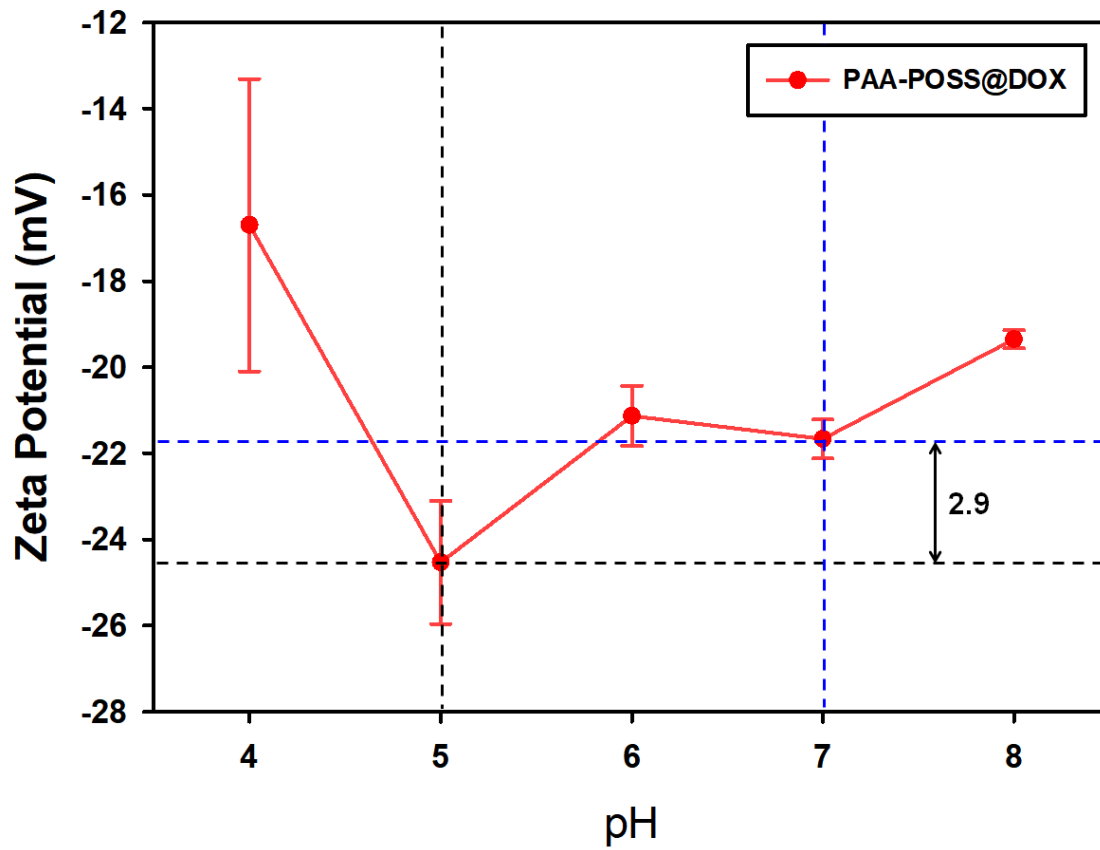
S4. Variation of zeta potential(mV) with the change in pH values for PAA-POSS@DOX.

PAA@DOX NPs

PAA-POSS@DOX NPs

S5. TEM image of PAA-POSS@DOX NPs and PAA@DOX NPs

Experimental

Zeta potential (ζ)

The zeta potential was measured to determine the variation in the stability of PAA-POSS@DOX at different pH. The zeta potential measurement was carried out on a ELSZ-2000S (Otsuka, Japan) equipment with the samples dispersed in distilled water where the pH was controlled with 0.1N HCl and 0.1N NaOH. Zeta-potential is difficult to measure directly, and the usual route is to acquire this data indirectly from the measurement of the electrophoretic mobility (particle velocity divided by the electric field strength) under an applied electrical field according to Henry's equation

$$\frac{U}{E} = \frac{2\varepsilon\zeta F(kn)}{3\eta}$$

where, U/E is the electrophoretic mobility (m^2 s^{-1} V^{-1}), ζ is the zeta-potential (V), ε is the solvent dielectric permittivity (or constant) (kg m V^{-2} s^{-2}), η is the viscosity (kg m^{-1} s^{-1}), particle size to the Debye length, $1/\kappa$. Thus, $\kappa a \gg 1$ indicates that the particle radius (a) is large compared to $1/\kappa$ ($1/\kappa$ is ~10 nm for 1 mM aqueous salt solutions).