Supporting Information

Chemo-photodynamic combined gene therapy and dual-modal cancer imaging achieved by pH-responsive alginate/chitosan multilayers-modified magnetic mesoporous silica nanocomposites

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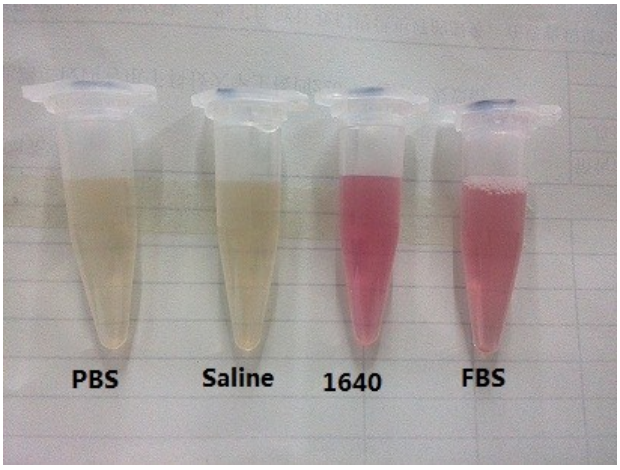

Figure S1. Photograph of the M-MSN/PEM nanoparticles dispersed in PBS buffer, saline, cell culture medium 1640 and FBS solution after 12-h storage.

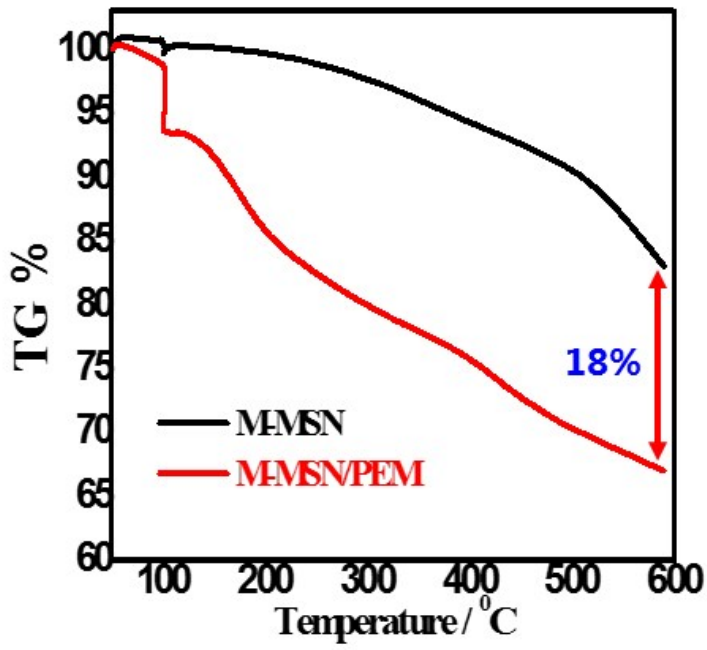

Figure S2. TGA curves of M-MSN and M-MSN/PEM nanoparticles.

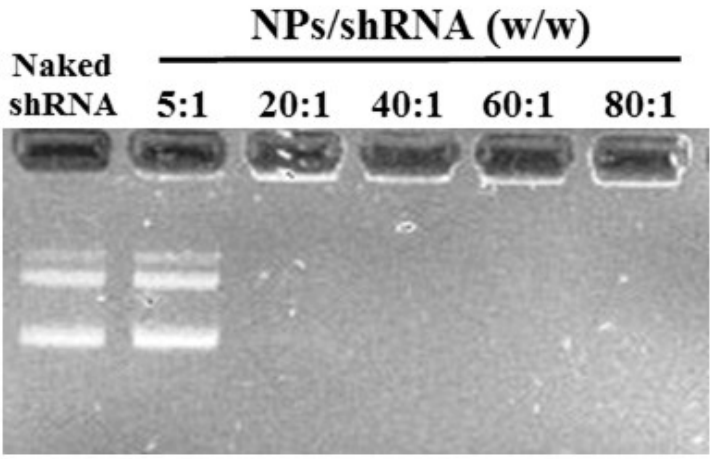

Figure S3. Binding efficiency determined by agarose gel electrophoresis. A series of weight ratios of M-MSN/PEM (NPs) to P-gp shRNA was loaded onto agarose gel. Electrophoresis was performed at a voltage of 100 V for 40 min in TBE buffer solution.

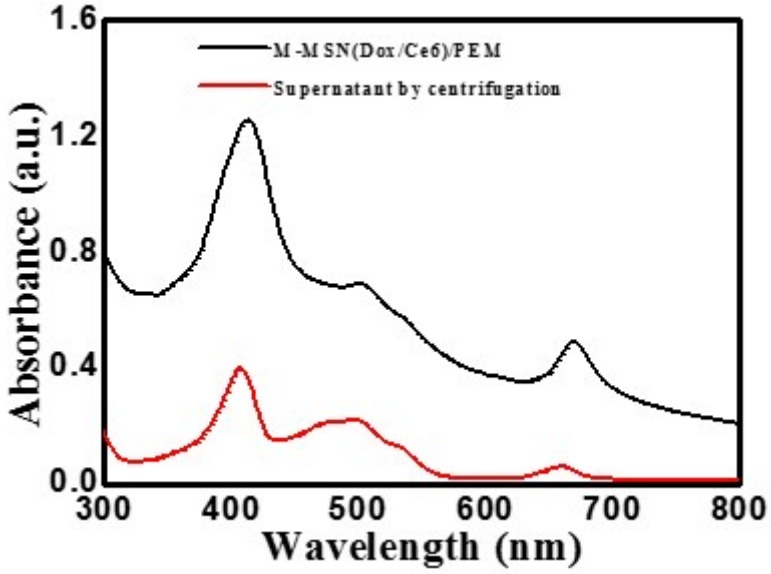

Figure S4. UV-Vis absorbance spectra of M-MSN(Dox/Ce6)/PEM nanoparticles dispersed in Milli-Q water (pH 7.0) and its supernatant.

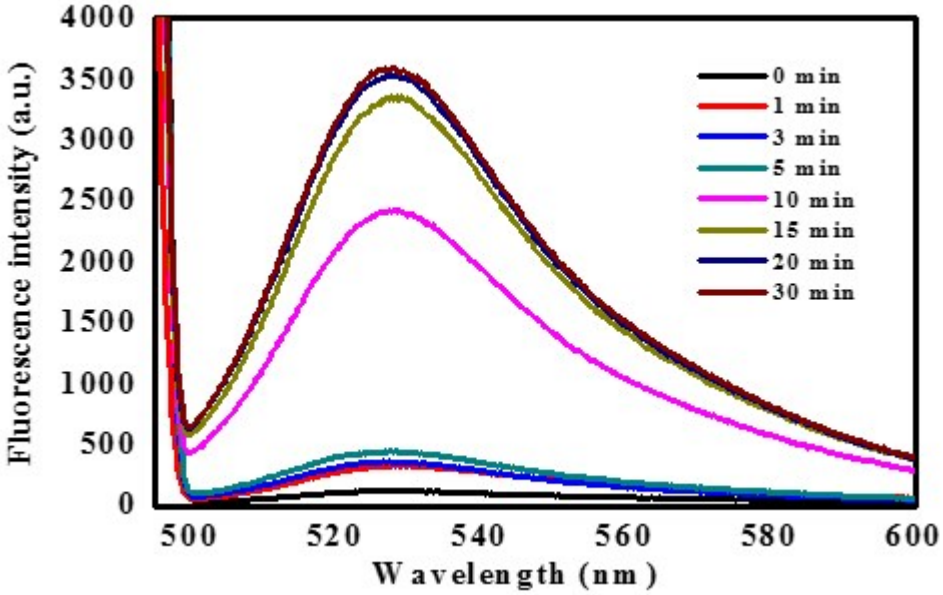

Figure S5. Fluorescence emission spectra of singlet oxygen sensor green (SOSG) in the solution with the increase of light irradiation time (660 nm, 2 W/cm^2).

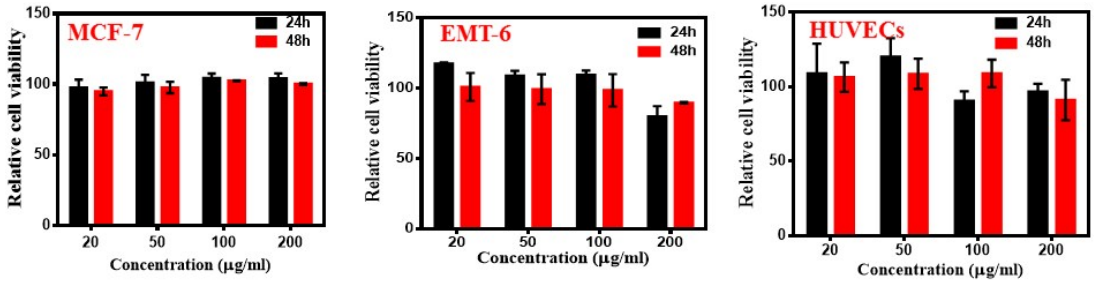

Figure S6. Relative cell viabilities (%) of MCF-7, EMT-6 and endothelial cells (HUVECs) after incubation with various concentrations of M-MSN/PEM nanoparticles.

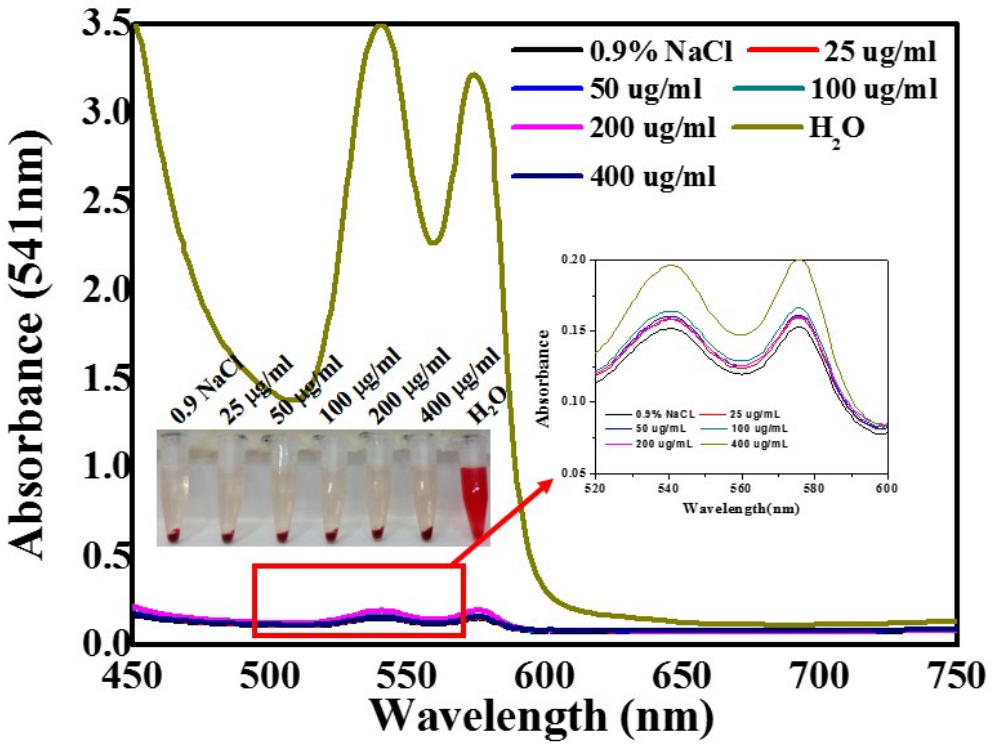

Figure S7. Hemolysis activity of M-MSN/PEM nanoparticles at concentrations ranging from 50 to 400 μg/mL, which were incubated with human red blood cells (RBCs) at 37°C for 2 h. The insets show the photographs of RBCs treated with M-MSN/PEM nanoparticles at different concentrations. 0.9% NaCl and distilled water were used as negative and positive controls, respectively.

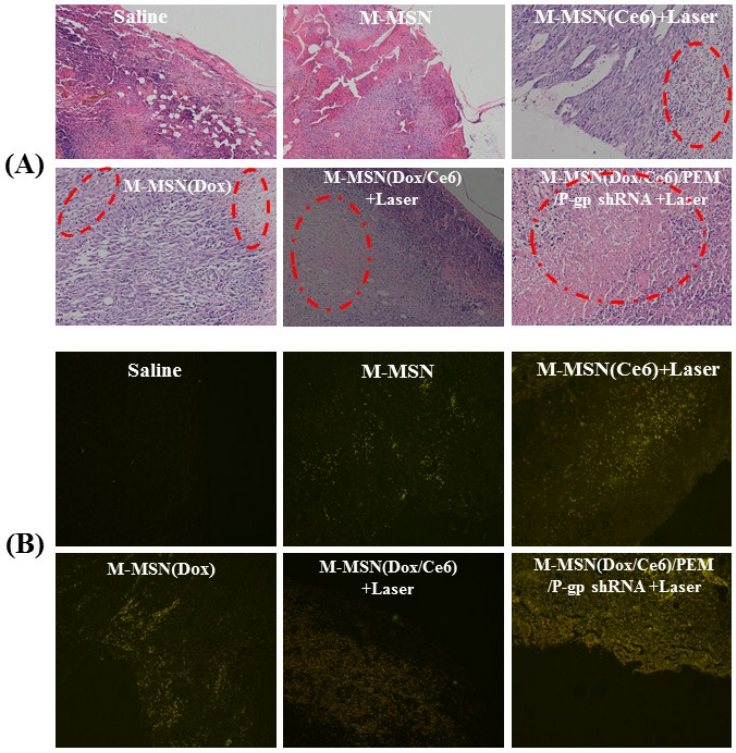

Figure S8. H&E staining (**A**) and TUNEL staining (**B**) of tumors at 18 days after injection of saline (control), M-MSN/PEM, M-MSN(Ce6)/PEM plus laser, M-MSN(Dox)/PEM, M-MSN(Dox/Ce6)/PEM plus laser or M-MSN(Ce6)/PEM/P-gp shRNA plus laser. The tumor cell necrosis (red circle regions) and apoptotic cells (light yellow) were evidently identified by H&E and TUNEL assays, respectively.