

## Electronic Supplementary Information

### **A peptide-decorated and curcumin-loaded mesoporous silica nanomedicine for effectively overcoming multidrug resistance in cancer cell**

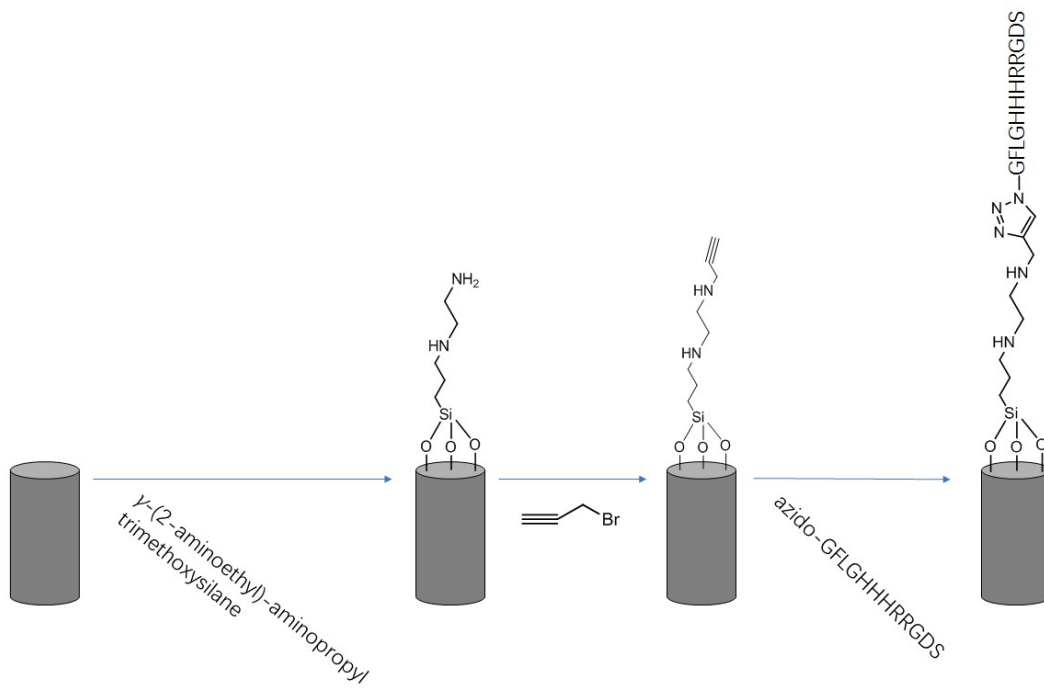
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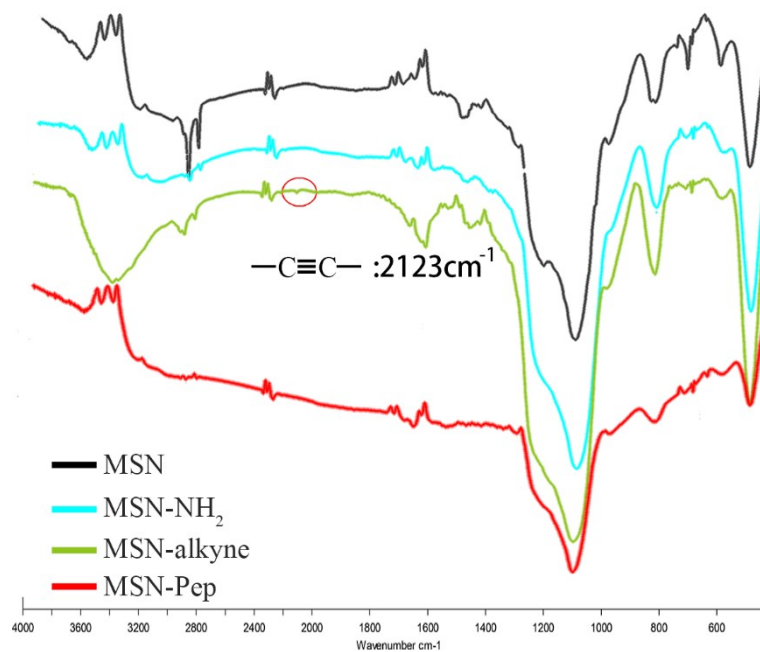
<sup>†</sup>Both authors contributed equally to this work.

### Scheme S1. Preparation of MSN-Pep

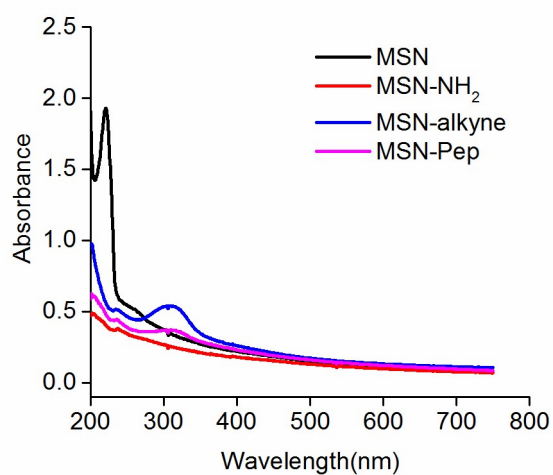


**Table S1.** Zeta potentials of different nanocarriers in PBS

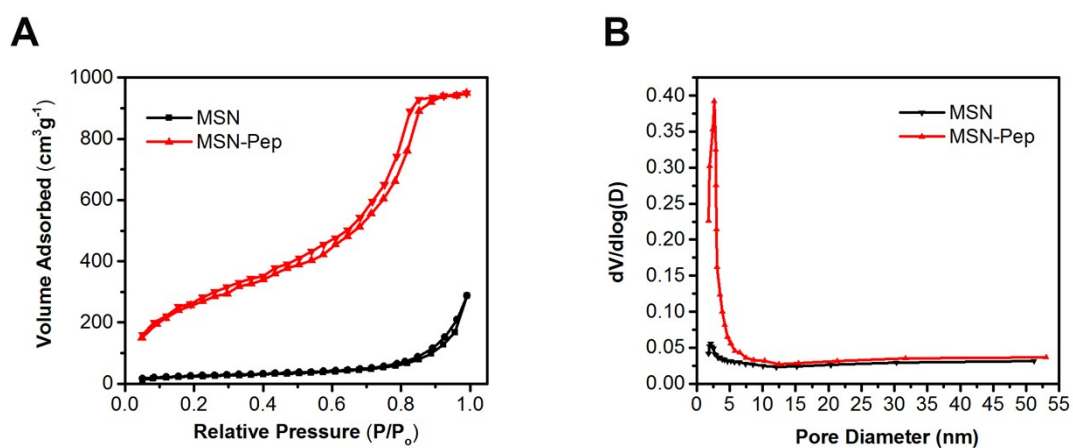
Sample	zeta potential (mV)
MSN-41	-18.42
MSN-NH <sub>2</sub>	21.15
MSN-alkyne	2.12
MSN-Pep	12.43
DOX/CUR@MSN-Pep	12.05



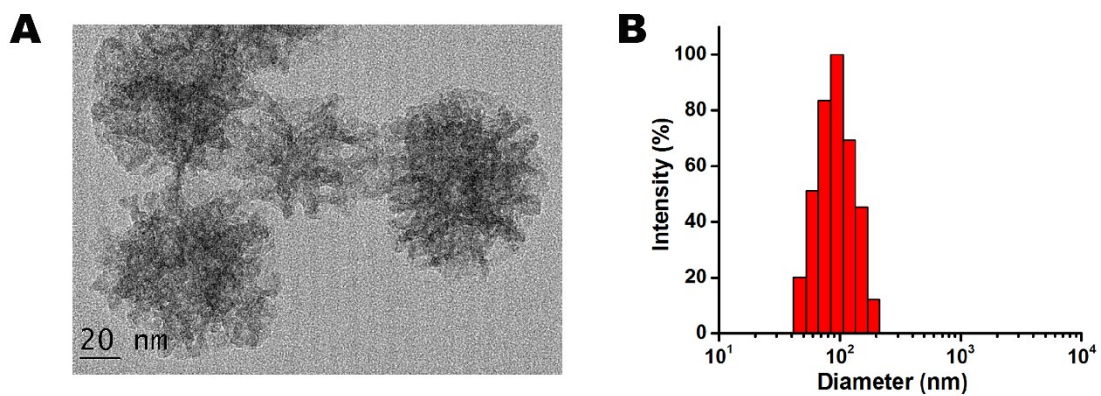
**Figure S1.** FT-IR spectra of MSN, MSNs-NH<sub>2</sub>, MSNs-alkyne, and MSN-Pep.



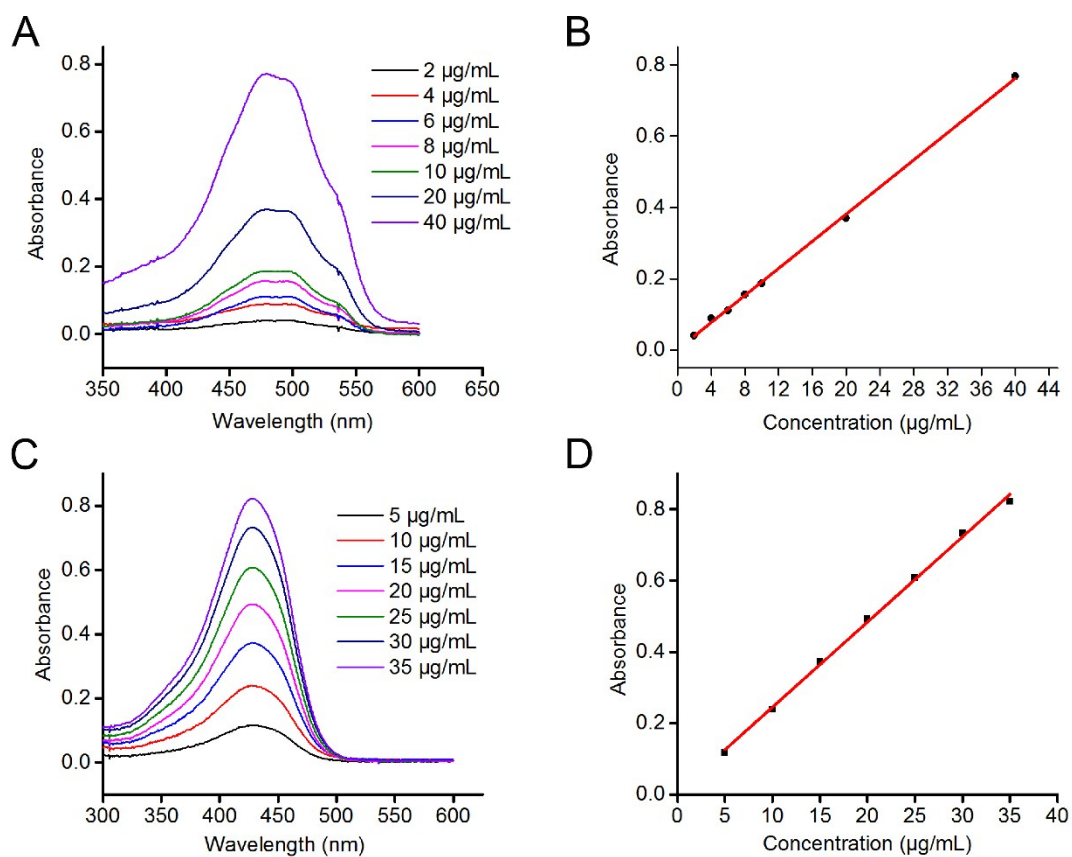
**Figure S2.** UV-VIS absorption spectra of MSNs, MSNs-NH<sub>2</sub>, MSNs-alkyne, and MSN-Pep.



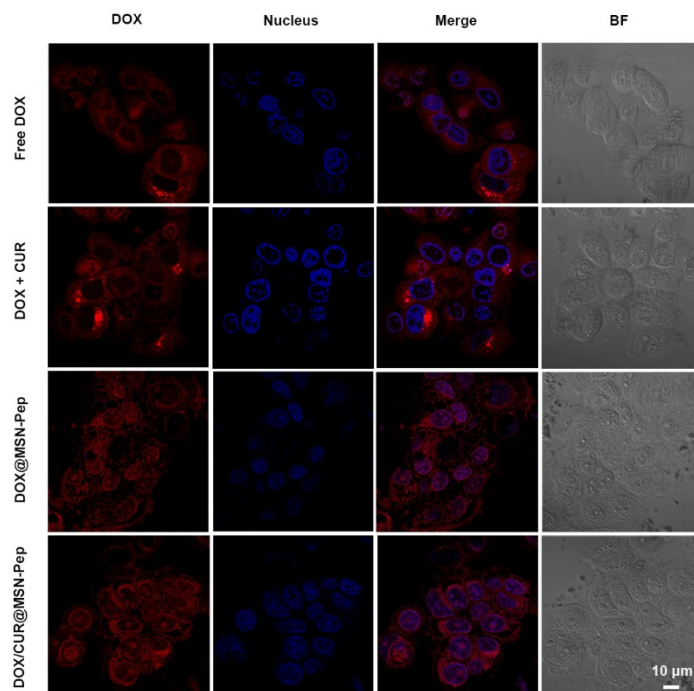
**Figure S3.** BET nitrogen adsorption/desorption isotherms (A) and BJH pore size distribution (B) of MSN and MSN-Pep.



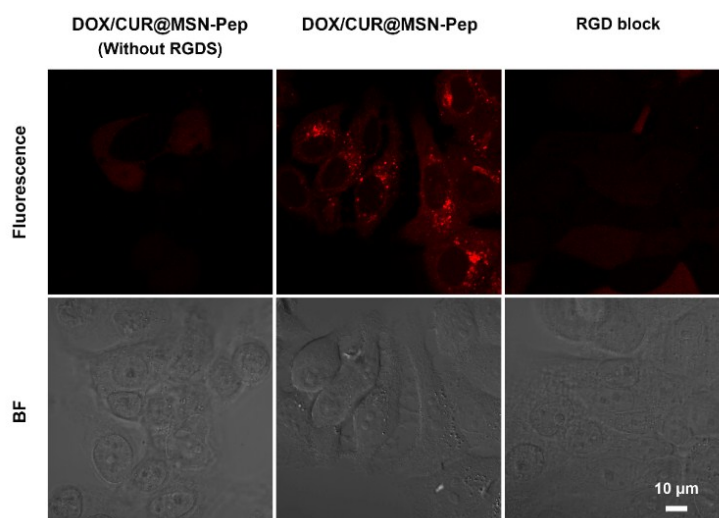
**Figure S4.** (A) TEM image of blank MSN. Scale bar: 20 nm. (B) Size distribution of blank MSN measured by DLS.



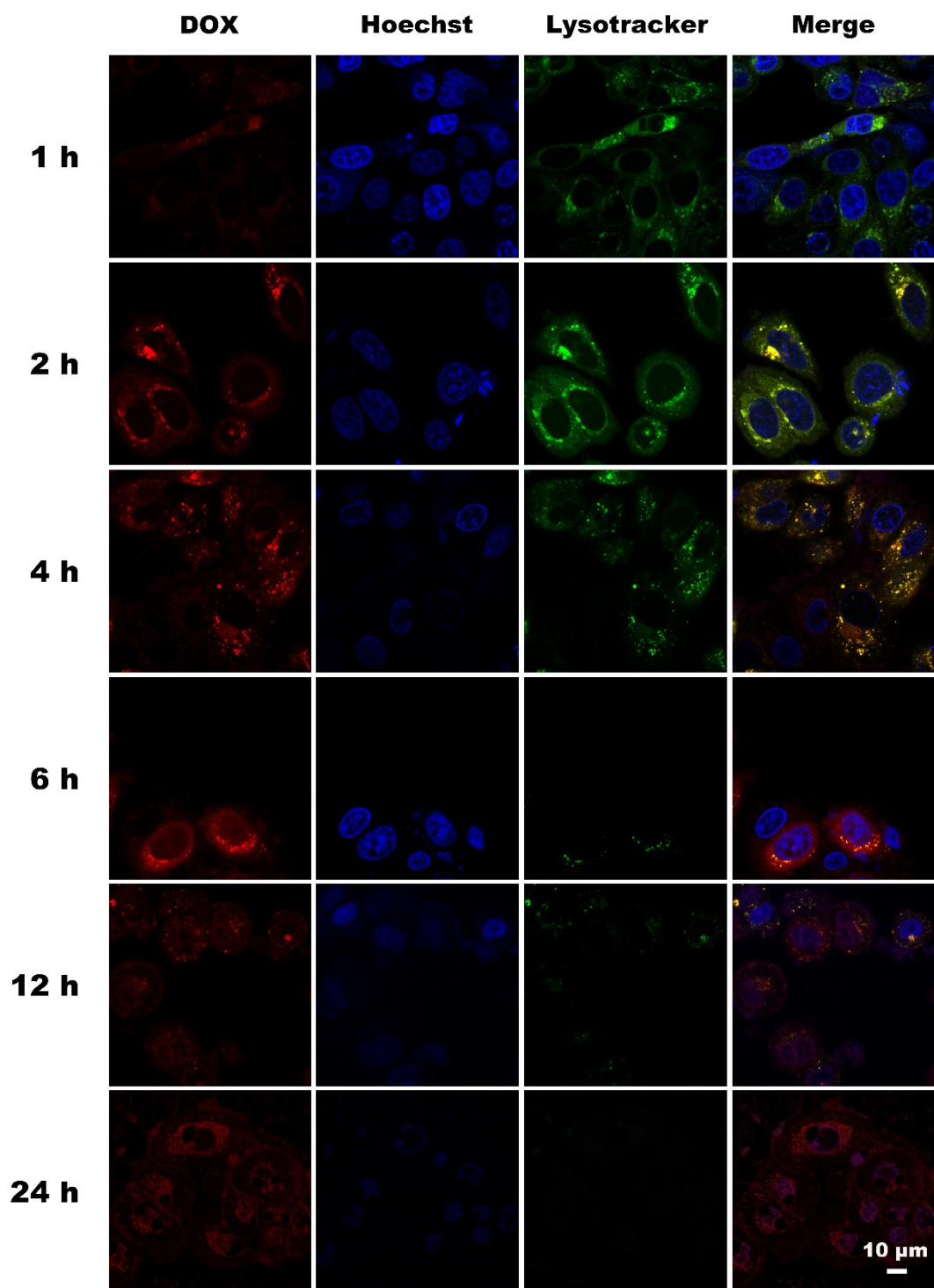
**Figure S5.** (A) The absorption spectra of DOX with different concentrations. (B) The standard curve of DOX absorbance value at 488 nm. The obtained standard curve is  $y=0.01902x+0.00106$  (y: absorbance value at 488 nm; x: concentration of DOX,  $R^2=0.99879$ ). (C) The absorption spectra of CUR with different concentrations. (D) The standard curve of CUR absorbance value at 425 nm. The obtained standard curve is  $y=0.02389x+0.00586$  (y: absorbance value at 425 nm; x: concentration of DOX,  $R^2=0.99767$ ).



**Figure S6.** Confocal fluorescence images of MCF-7 cells incubated with free DOX, DOX+CUR, DOX@MSN-Pep and DOX/CUR@MSN-Pep for 4 h. Scale bar: 10  $\mu$ m.

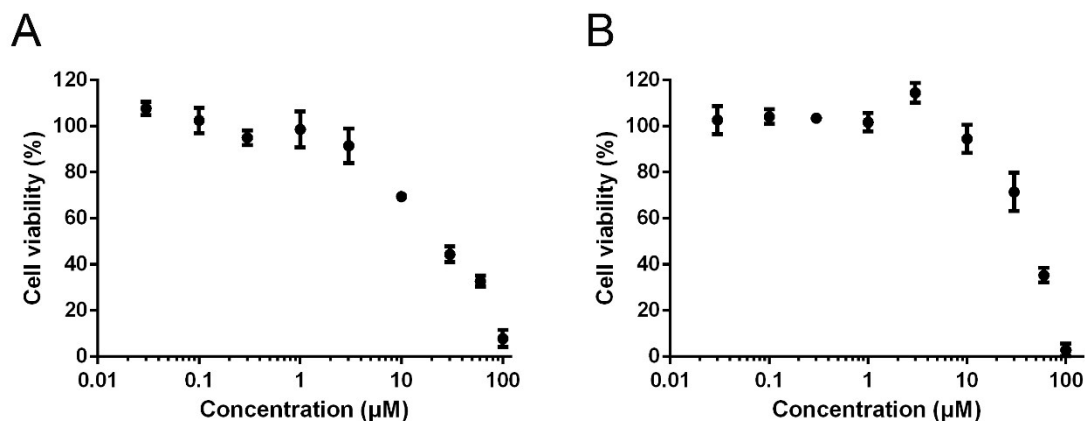


**Figure S7.** Confocal fluorescence images of MCF-7/ADR cells incubated with DOX/CUR@MSN-Pep (without RGDS), DOX/CUR@MSN-Pep for 4 h and the block group pretreated with excessive free RGD, followed by incubation with DOX/CUR@MSN-Pep for 4 h. Scale bar: 10  $\mu$ m.

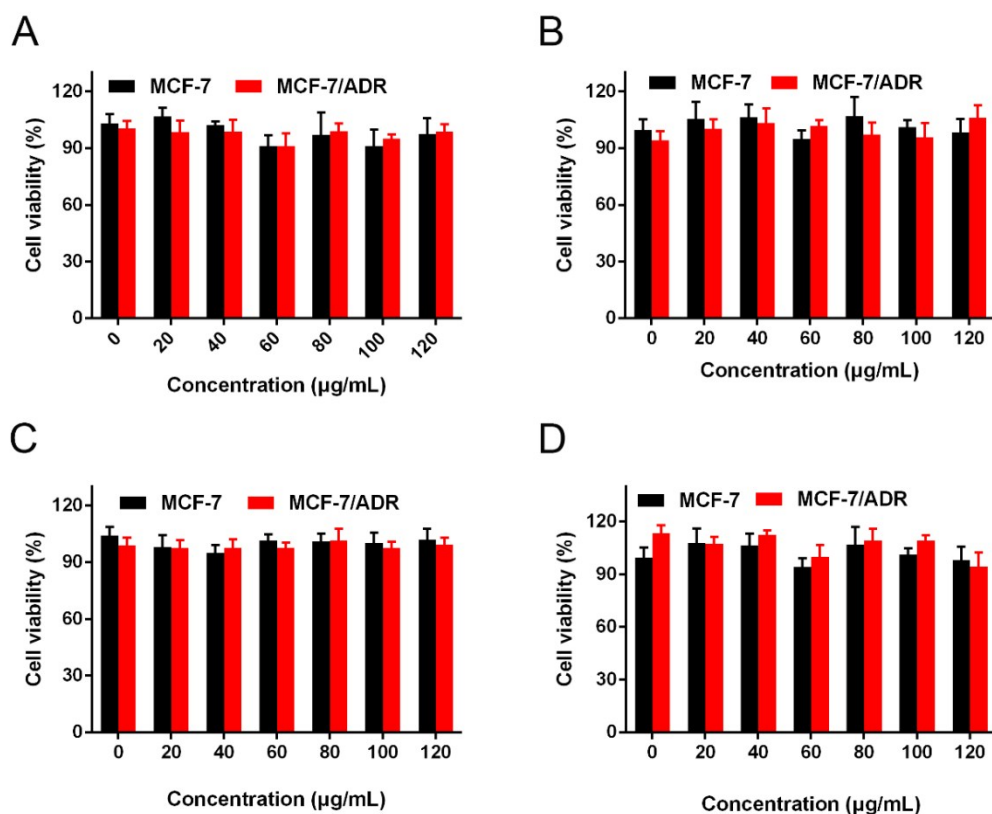


**Figure S8.** Confocal fluorescence images of MCF-7/ADR cells stained with LysoTracker Deep Red (green) and Hoechst 33342 (blue) after cells were incubated DOX/CUR@MSN-Pep for 1, 2, 4, 6, 12 and 24 h, respectively. Scale bar: 10  $\mu\text{m}$ .





**Figure S9.** MTT assays of MCF-7 (A) and MCF-7/ADR (B) cells after incubation with CUR. The IC<sub>50</sub> values for MCF-7 and MCF-7/ADR cells are measured to be 22.93 µM and 41.68 µM, respectively. Data are means ± SD (n = 5).



**Figure S10.** MTT assays of MCF-7 and MCF-7/ADR cells after exposure to (A) blank MSN, (B) MSN-NH<sub>2</sub>, (C) MSNs-alkyne and (D) MSN-Pep nanocarrier at various concentrations. Data are means ± SD (n = 5).