## Supplementary information

## Charge Reversal Hairpin Peptides Modified Synergy Therapeutic Nanoplatforms for Tumor Specific Drug Shuttling

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**Fig. S1** Analysis of drug loading of  $GCP_{DOX}$ . (a) UV spectra of the free drugs obtained by different amounts of DOX under the condition that GO is fixed at 1mg. (b) Standard

curve measured by ultraviolet spectrophotometry at 480 nm with various concentration of DOX (5 to 125  $\mu$ g/mL).



Fig. S2 Study of the storage stability of  $GCP_{DOX}$ . The change in the particle size and PDI of  $GCP_{DOX}$  nanoparticles at 4 °C for 30 d.



Fig. S3 Study of the serum stability of  $GCP_{DOX}$ . (a)The change in the particle size and PDI of  $GCP_{DOX}$  nanoparticles at 10% FBS for 24 h. (b)The change in the entrapment efficiency of  $GCP_{DOX}$  nanoparticles at 10% FBS for 24 h.



Fig. S4 Cellular uptake of  $GP_{DOX}$  nanoparticles by 4T1 cells during the predetermined time intervals at pH 7.4. Nuclei (blue) were stained with DAPI, and DOX was shown in red.



Fig. S5 In vivo safety profile. Body weight change of the study groups (n=8).