Supplementary Information (SI) for Journal of Materials Chemistry B. This journal is © The Royal Society of Chemistry 2025



Fig. S1 The synthetic route of PSP/CPT



Fig. S2 <sup>1</sup>H NMR spectrum of PSP/CPT



Fig. S3 The hemolysis rate of red blood cells (pH = 7.4) after different concentrations of SPN solution were incubated with red blood cells. Data were shown as mean  $\pm$ 

1.0 min 1.5 min 0 min 3.0 min 2.0 min 2.5 min 150 \*\*\*\* Cell viability (%) ns ns 100 50 0 1.0 1.5 2.0 2.5 3.0 Ultrasonic power (W/cm<sup>2</sup>)

standard deviation (n = 3).

Fig. S4 Cell viability at different ultrasonic condition. Data were shown as mean  $\pm$  standard deviation (n = 3).



Fig. S5 Each group's changes in tumor volume, from left to right was PBS, CPT, SPN, US, SPN+US group.



Fig. S6 H&E staining plots of major organs (heart, liver, spleen, lung and kidney) after different treatments in each group of hormonal mice (G1: PBS, G2: CPT, G3:

SPN, G4: US, G5: SPN+US, scale bar =  $100 \mu m$ ).



Fig. S7 Blood biochemical indexes in liver and spleen. Data were shown as mean  $\pm$  standard deviation (n = 3).