Electronic Supplementary Information

Glutathione-degradable polydopamine nanoparticles as a versatile platform for fabrication of advanced photosensitisers for anticancer therapy

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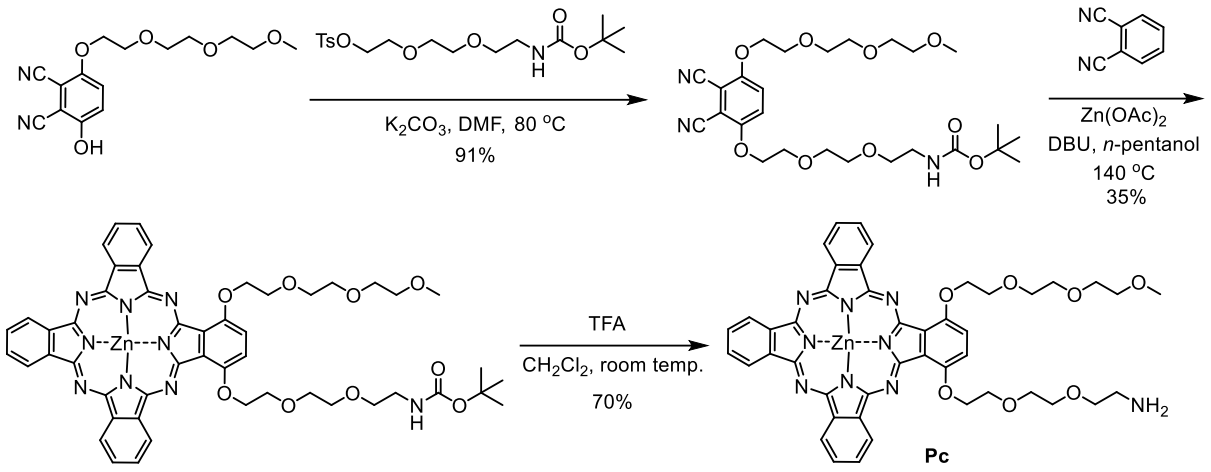

Scheme S1. Synthetic route for the preparation of **Pc**. DMF, *N*,*N*-dimethylformamide; DBU, 1,8-diazabicycloundec-7-ene; TFA, trifluoroacetic acid.

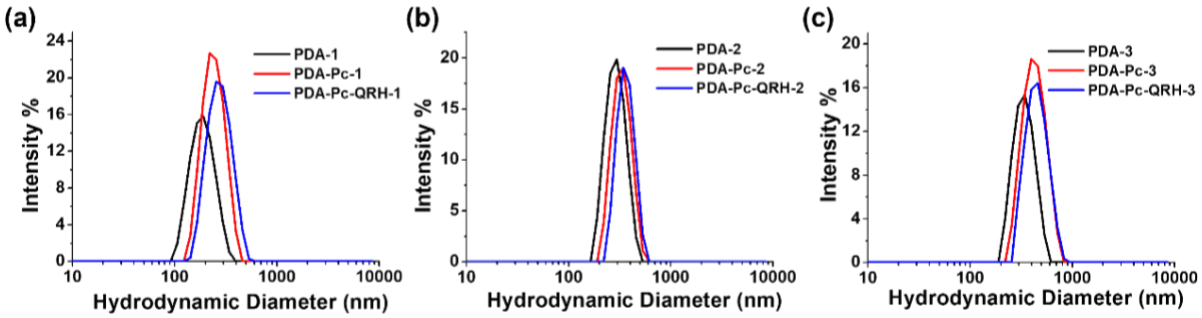

Fig. S1 Hydrodynamic diameter distribution of the PDA-based NPs in water measured by DLS.

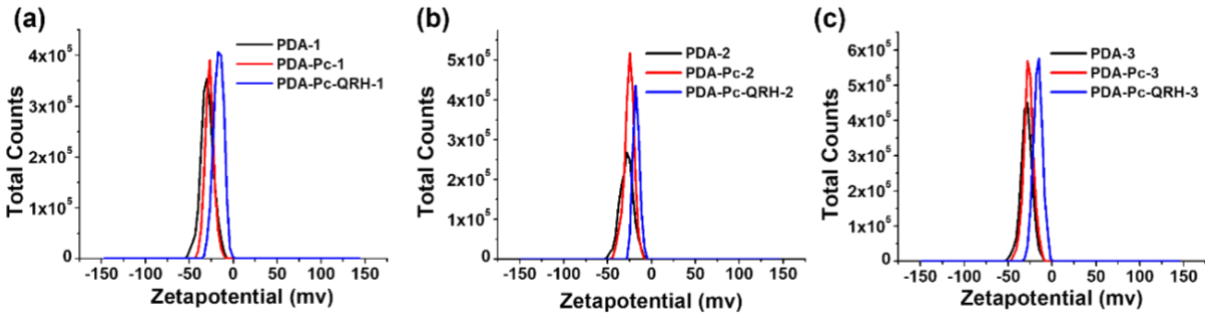

Fig. S2 Zeta potential distribution of the PDA-based NPs in water measured by DLS.

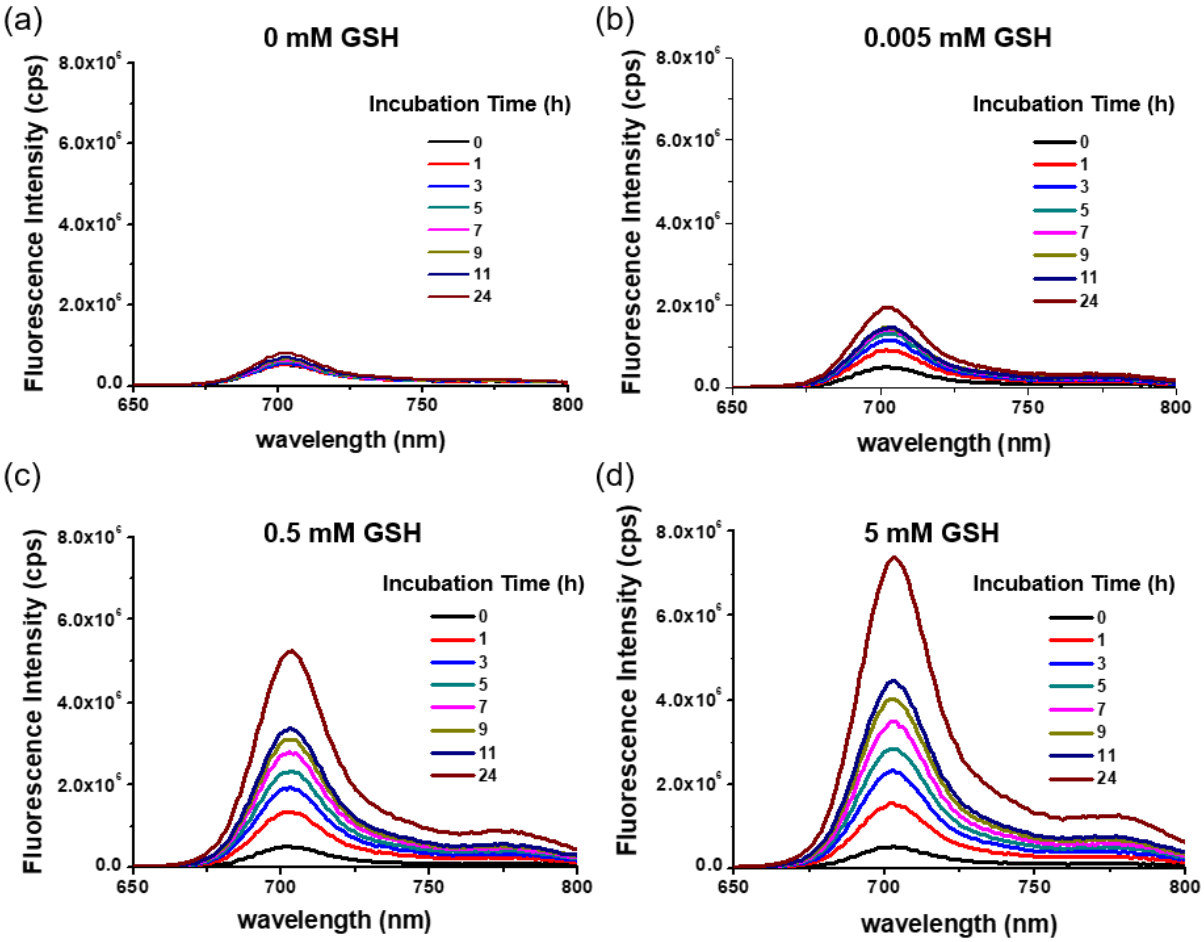

Fig. S3 Change in fluorescence spectrum (λ_{ex} = 610 nm) of PDA-Pc-QRH-1 ([Pc] = 2 μM) in PBS with 0.5% Tween 20 upon exposure to different concentrations of GSH (0, 0.005, 0.5 and 5 mM) at 37 ^{o}C over a period of 24 h.

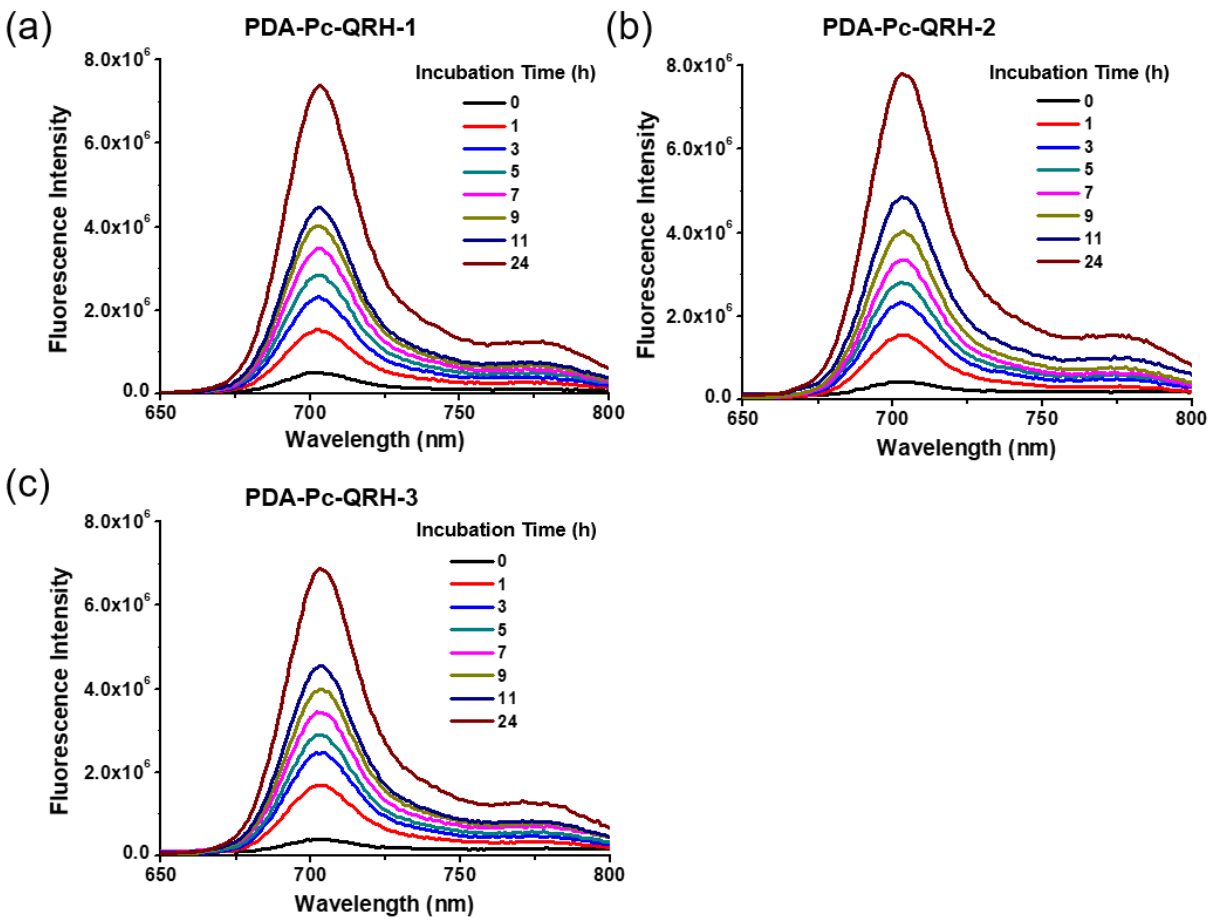

Fig. S4 Change in fluorescence spectra (λ_{ex} = 610 nm) of different batches of PDA-Pc-QRH ([Pc] = 2 μM) in PBS with 0.5% Tween 20 upon exposure to 5 mM GSH at 37 ºC over a period of 24 h.

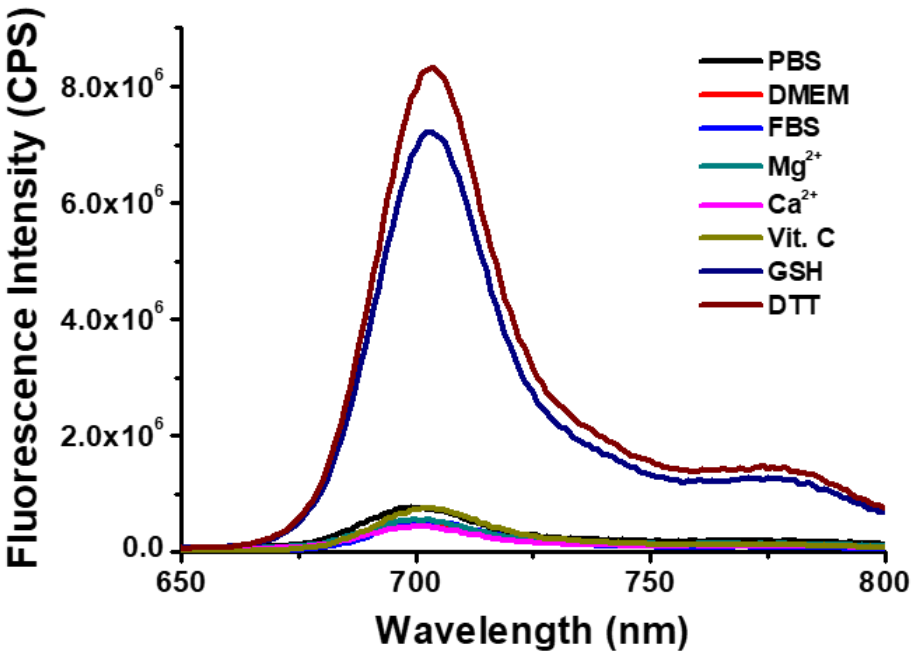

Fig. S5 Fluorescence spectra (λ_{ex} = 610 nm) of PDA-Pc-QRH-1 in PBS with 0.5% Tween 20, DMEM or FBS recorded after 24 h at 37 ºC and after treatment with different species at a concentration of 1 mM in PBS with 0.5% Tween 20 at 37 ºC for 24 h.

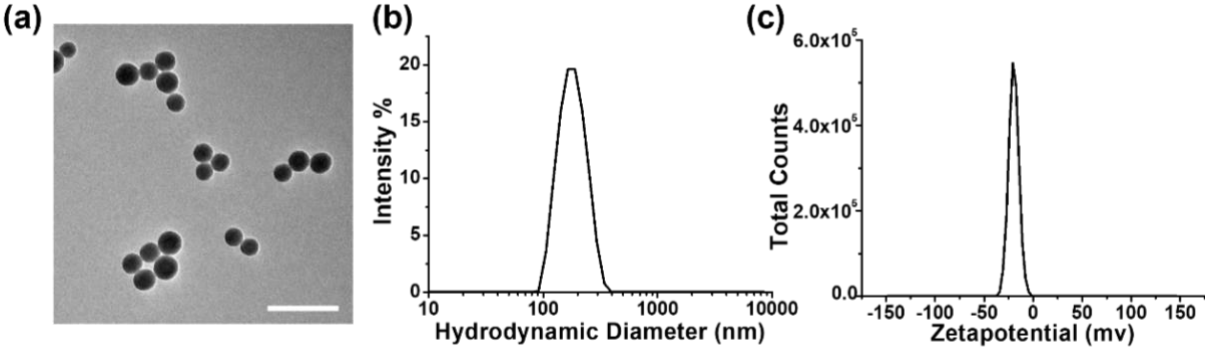

Fig. S6 (a) TEM image of PDA-QRH-1. Scale bar: 500 nm. (b) Hydrodynamic diameter distribution and (c) zeta potential distribution of PDA-QRH-1 in water measured by DLS.

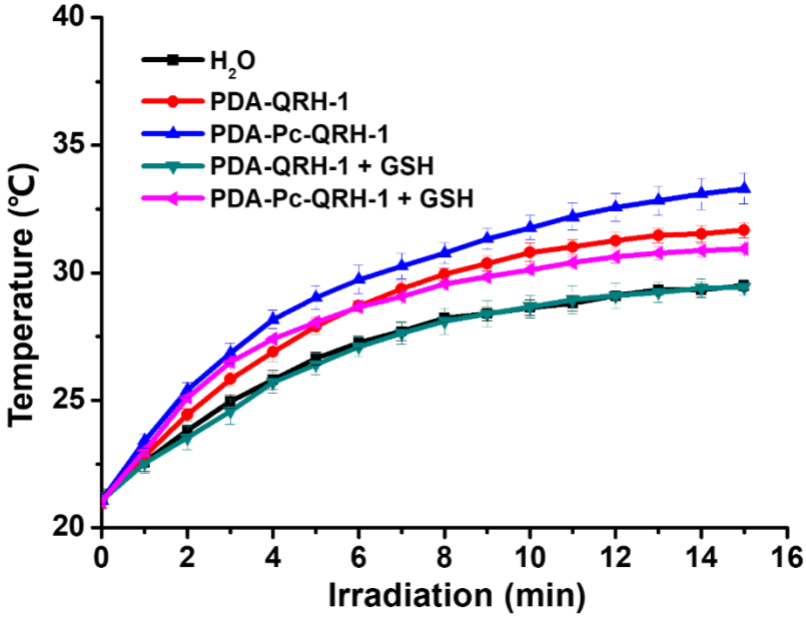

Fig. S7 Photothermal effect of PDA-QRH-1 and PDA-Pc-QRH-1 ([Pc] = 10 μM) (both with 44 μg PDA) in deionised water (1 mL), with and without pre-treatment with GSH (5 mM) at ambient temperature for 12 h, under laser irradiation (675 nm, 0.1 W, 40 mW cm^{-2}) over a period of 15 min. Data are reported as the mean ± SD of three independent measurements.

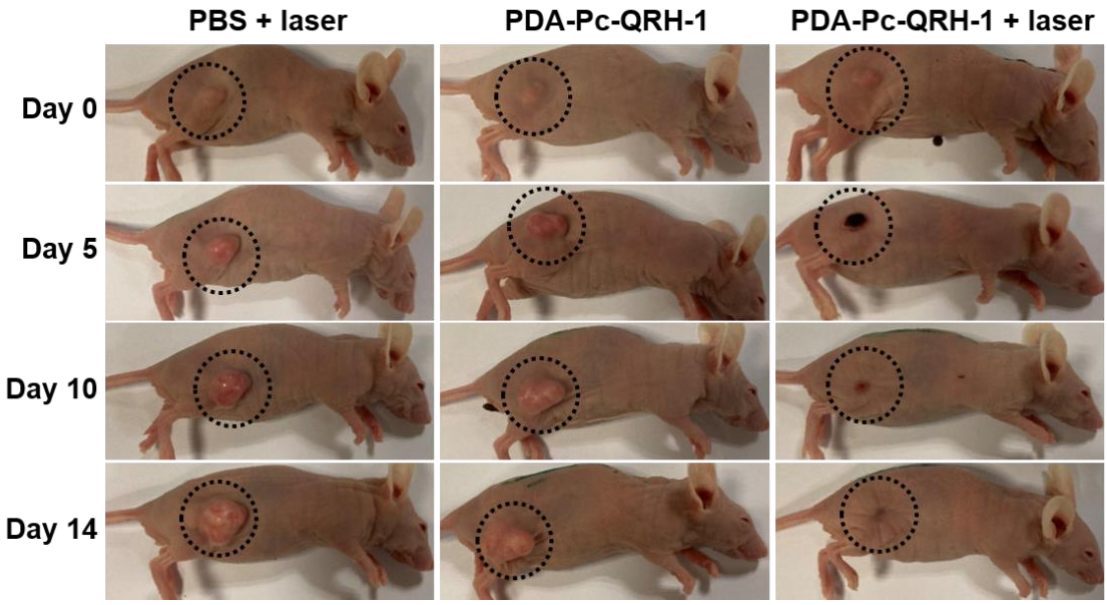

Fig. S8 Photographic images of tumour-bearing nude mice before and after the treatment with an intravenous dose of PDA-Pc-QRH-1 in PBS ([Pc] = 10 μM, 200 μL) with or without subsequent laser irradiation (675 nm, 20 J cm^{-2}). The tumours are indicated by black circles. The time point given on left of each row indicates the duration after laser irradiation.

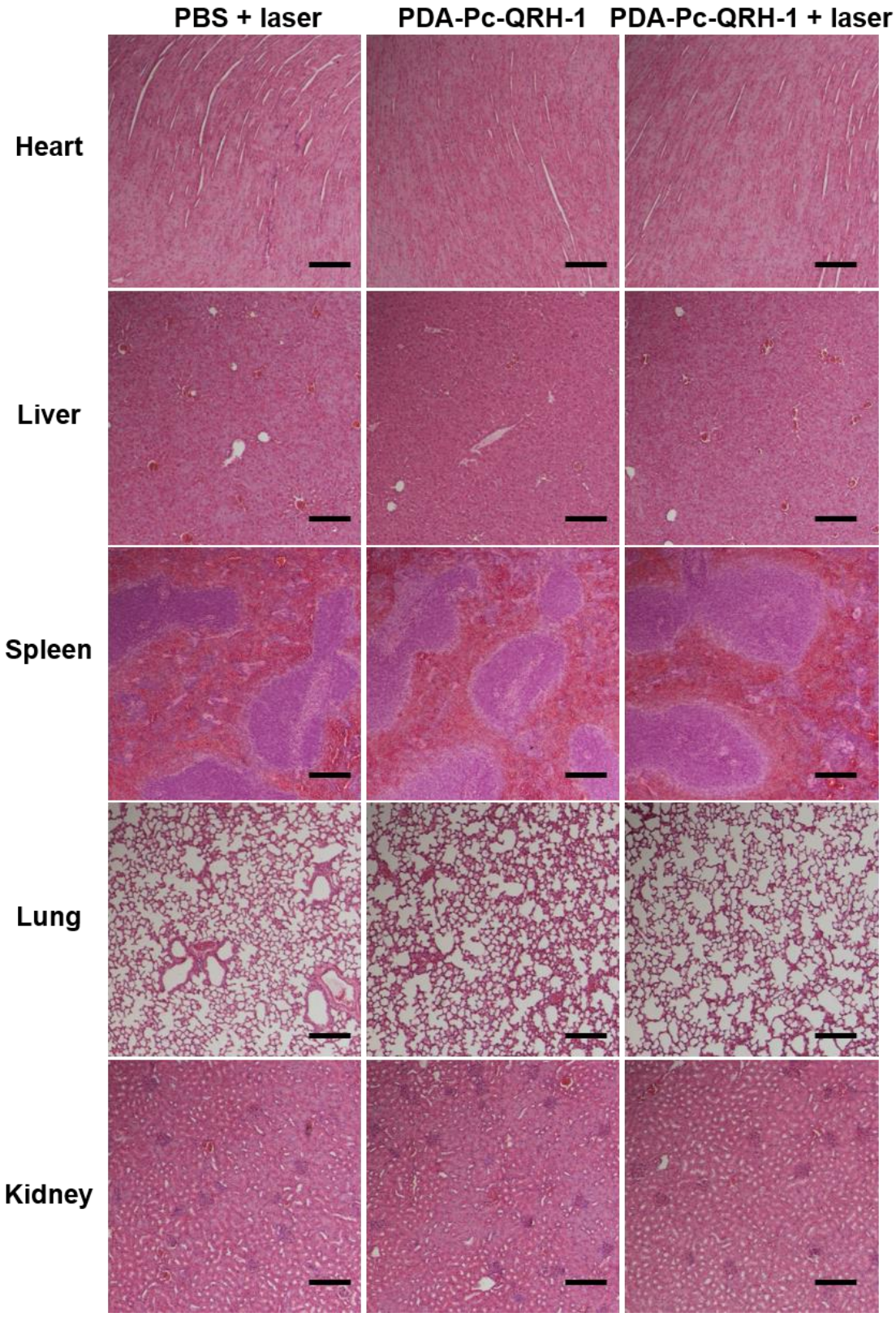

Fig. S9 Histological images indicate the structural integrity of major internal organs that were dissected from the tumour-bearing mice after different treatments. Scale bar: 200 μm.