

Supporting Information for

Injectable and Biodegradable Nano Photothermal DNA Hydrogel

Enhances Penetration and Efficacy of Tumor Therapy

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Supplementary Tables and Figures

SI Fig. 1

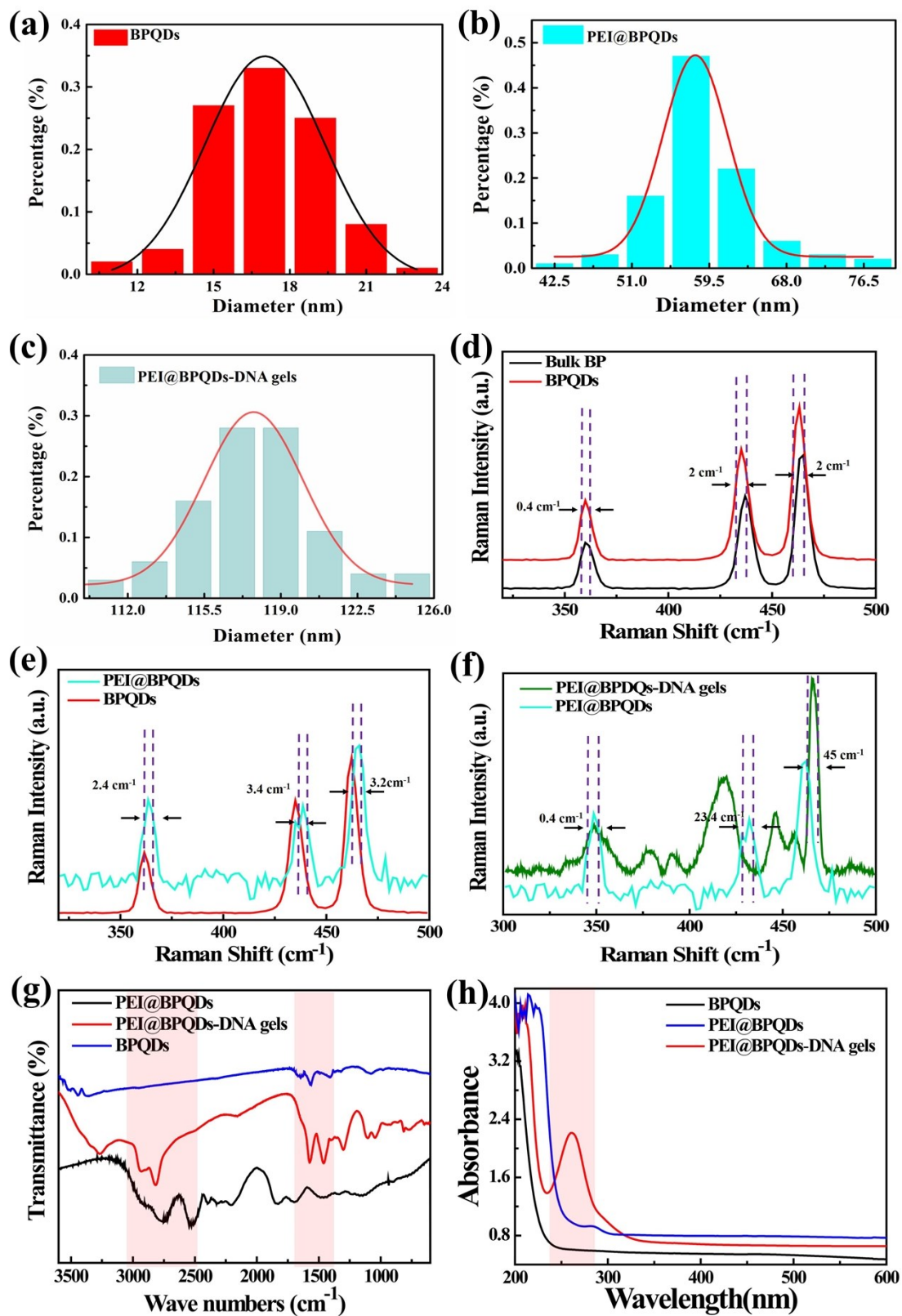
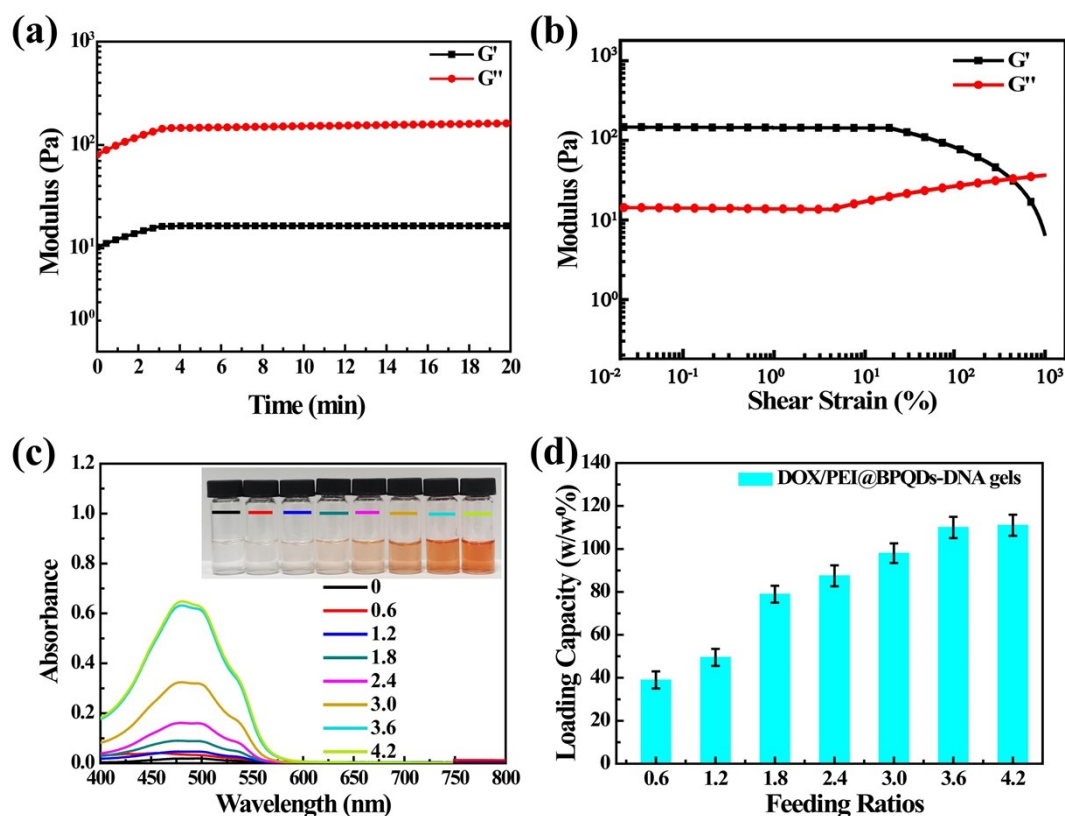


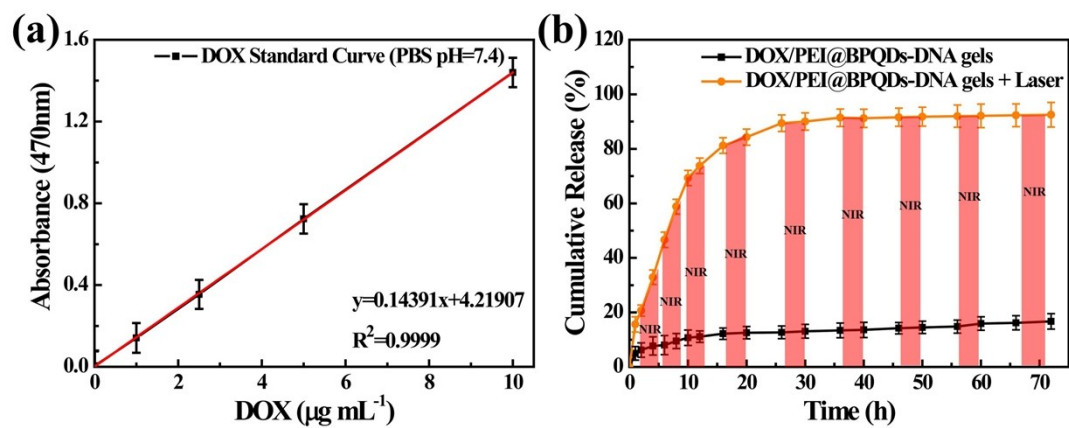
Fig. S1 The physical properties of the BPQD nanoparticles. **a** The size of the BPQD nanoparticles. **b** The Raman spectra different sizes of PEI@BPQDs (55 – 60 nm). **c** The Raman spectra and size of microcosmic PEI@BPQDs-DNA particle (110 – 120 nm) are 110 – 120 nm and shows the of PEI@BPQDs. **d** The FTIR spectra of the PEI@BPQDs. **e** The UV spectra of PEI@BPQDs. **f** The absorbance potential of the nano materials under irradiation of different wavelength.

SI Fig. 2



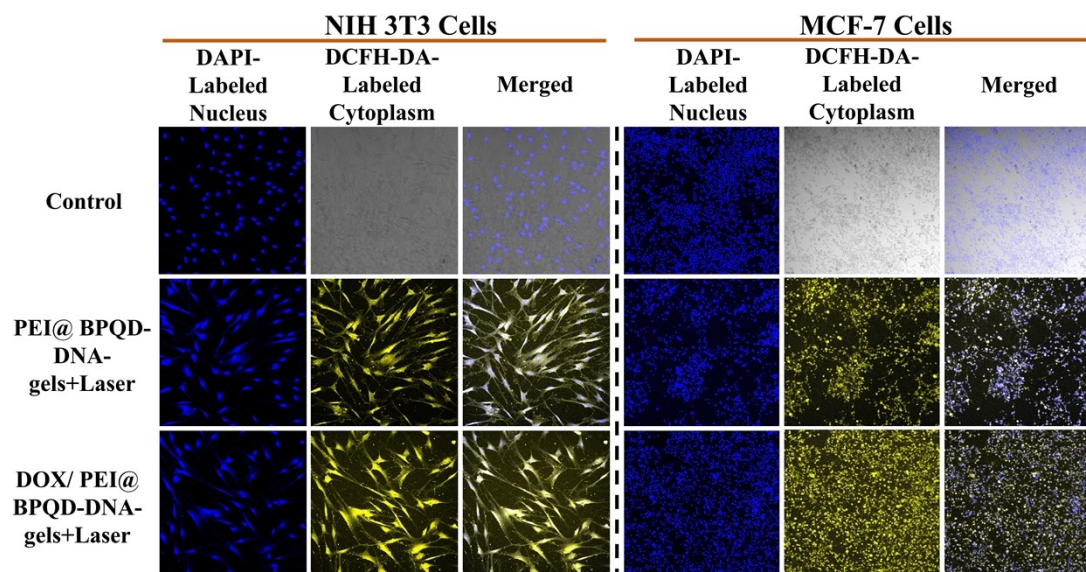
SI Fig. 2 **a** Storage modulus (G') and loss modulus (G'') as functions of time for PEI@BPQDs-DNA gels. **b** Representative strain sweep with G' and G'' shows the shear yield of dynamic-hydrogel with increasing strain. **c** Viscosity measurement of the PEI@BPQDs-DNA gels. **e** UV-vis-NIR spectra of PEI@BPQDs-DNA gels at different DOX/PEI@BPQDs-DNA gels feeding ratios after the removal of excess free DOX. **f** DOX loading capacities on PEI@BPQDs-DNA gels (w/w%) with increasing DOX/PEI@BPQDs-DNA gels feeding ratios.

SI Fig. 3



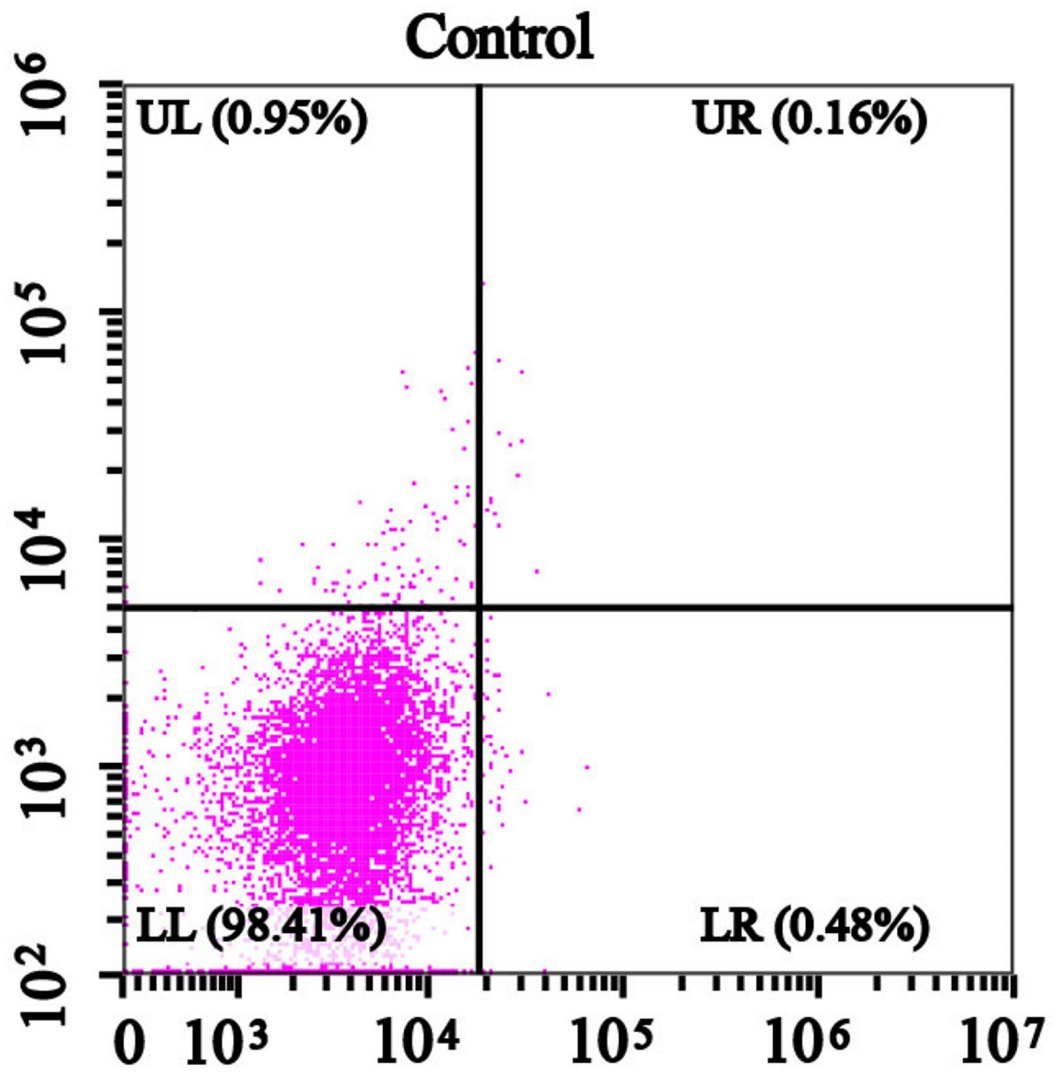
SI Fig. 3 **a** Schematic diagram illustrating DOX standard curve in the PBS. **b** Schematic diagram illustrating release DOX at 808 nm laser (0.5 W cm^{-2}) in real time.

SI Fig. 4



SI Fig. 4 Schematic diagram illustrating NIH 3T3 and MCF-7 cell of ROS was detected using H₂DCFH-DA as ROS probe.

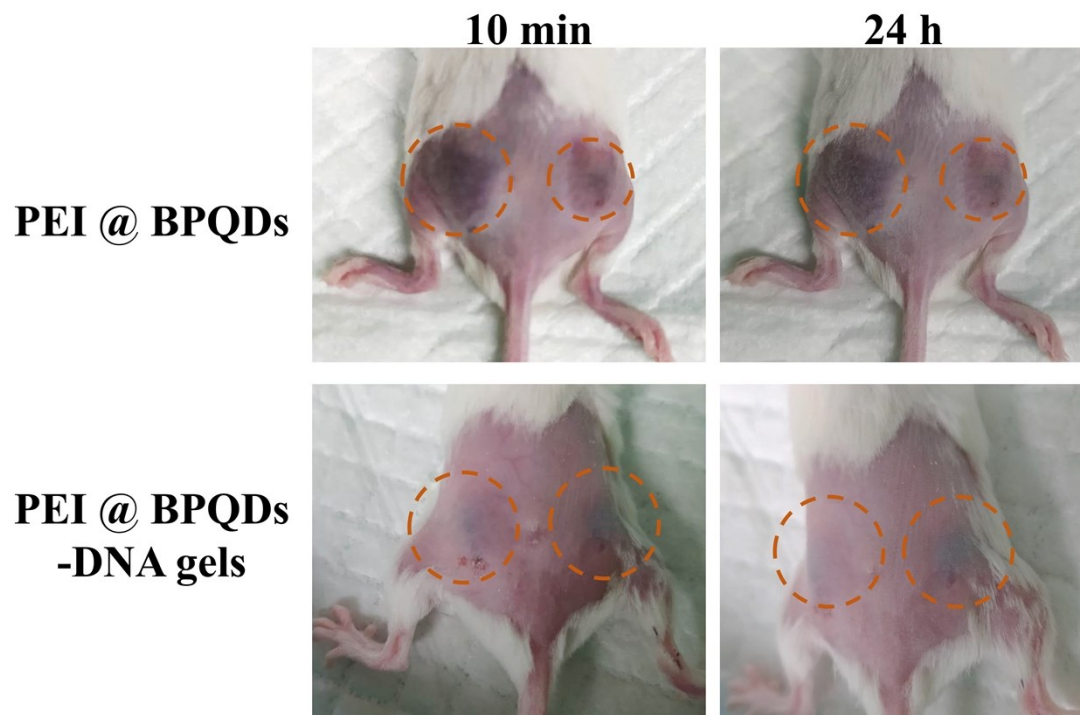
SI Fig. 5



SI Fig. 5 Schematic diagram illustrating control of cell apoptosis was detected using

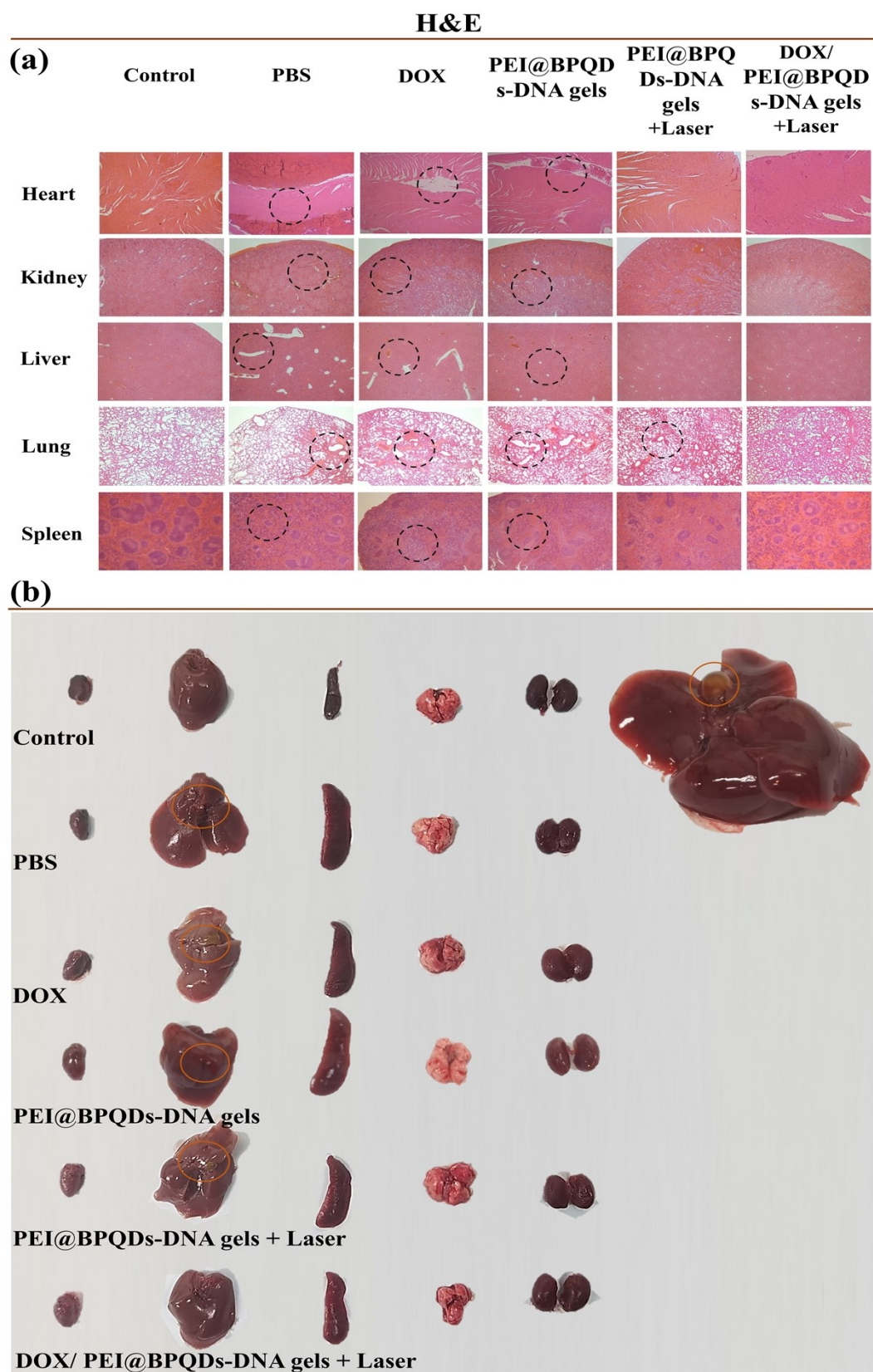
Annexin V-PE/7AAD kit.

SI Fig. 6



SI Fig. 6 Schematic diagram illustrating PEI@BPQDs-DNA gels injections and stability

SI Fig. 7



SI Fig. 7 a Schematic diagram illustrating the vital organs of the mice were acquired

and stained with H&E. **b** Schematic diagram illustrating diagrams of various organs.

Tables

Table S1. Sequence of X-DNA^a

Strand	End segment	Main body segment
X ₀₁	5'-p-ACGT ^a	ACGTCGACCGATGAATAGCGGTCAGATCCGTACCTACTCG-3'
X ₀₂	5'-p-ACGT	ACGTCGAGTAGGTACGGATCTGCGTATTGCGAACGACTCG-3'
X ₀₃	5'-p-ACGT	ACGTCGAGTCGTTGCAATACGGCTGTACGTATGGTCTCG-3'
X ₀₄	5'-p-(GT) ₄ ^b	CGAGACCATACGTACAGCACCGCTATTCATCGGTCG-3'

^a 5'-p represents the phosphorylated 5' end of oligonucleotide.

^b GT=K represents the degenerate primer.

Table S2. PCR Oligonucleotide Hybridizations Protocol

Cycle number	Denaturation	First annealing	Cooling incubation	Second annealing
1	95 °C (2 min)		65 °C (5 min)	
2		60 °C (2 min)		
3				60 °C (0.5 min)

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L.P. Z., W.P., and M.D.H. share co-first authorship. L.P.Z., W.P., and M.D.H. designed the experiments and coordinated the work; L.P.Z., Y.S.L., and H.A. integrated and refined the experimental date; L.P.Z., W.P., M.D.H. and Q.C.L. contributed to complete animal experiments; L.P.Z., W.P., M.D.H., Y.S.L., H.A., and Q.C.L. writing of the manuscript and in the preparation of the original draft. P.X.Z., and Y.Q.W. contributed to writing, reviewing, and editing of the manuscript. Y.Q.W. supervised.

Notes

The authors declare no competing financial interest.

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