

1 All-purpose nanostrategy based on dose
2 deposition enhancement, cell cycle arrest,
3 DNA damage and ROS production as prostate
4 cancer radiosensitizer for potential clinical
5 translation

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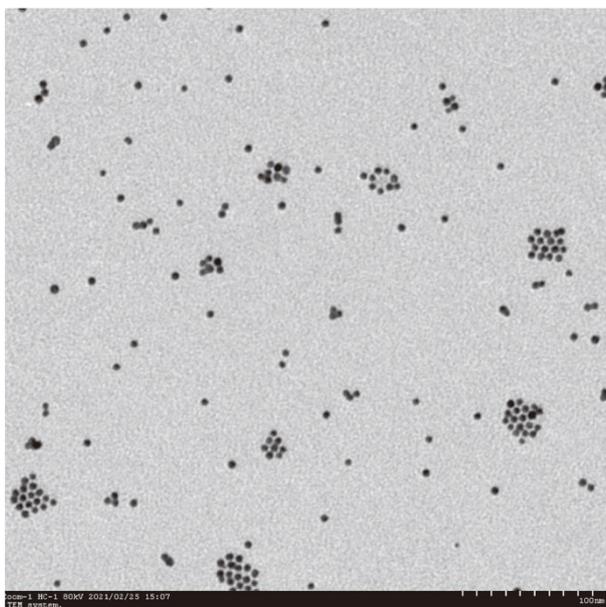
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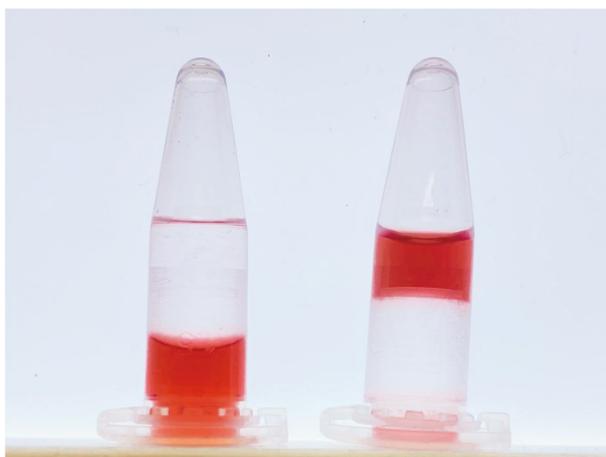
22 **Synthesis of Au core**

23 0.25 mmol of gold chloride trihydrate ($\text{HAuCl}_4 \cdot 3\text{H}_2\text{O}$) was dissolved in the mixture
24 solution of hexane (10 mL) and oleylamine (10 mL) in a four-necked flask. The system
25 was stirred at 5°C under argon atmosphere. Then, 0.25 mmol of borane-tert-butylamine
26 complex was dissolved in the mixture solution of hexane (1 mL) and oleylamine (1 mL)
27 and added into the system. The mixture was stirred for 2h at 5°C before acetone was
28 added to collect AuNPs via centrifugation at 10000 rpm for 8 min. The products were
29 washed for 3 times by ethanol and finally re-dispersed in hexane for future use. TEM
30 image shows the uniform size of Au NPs.



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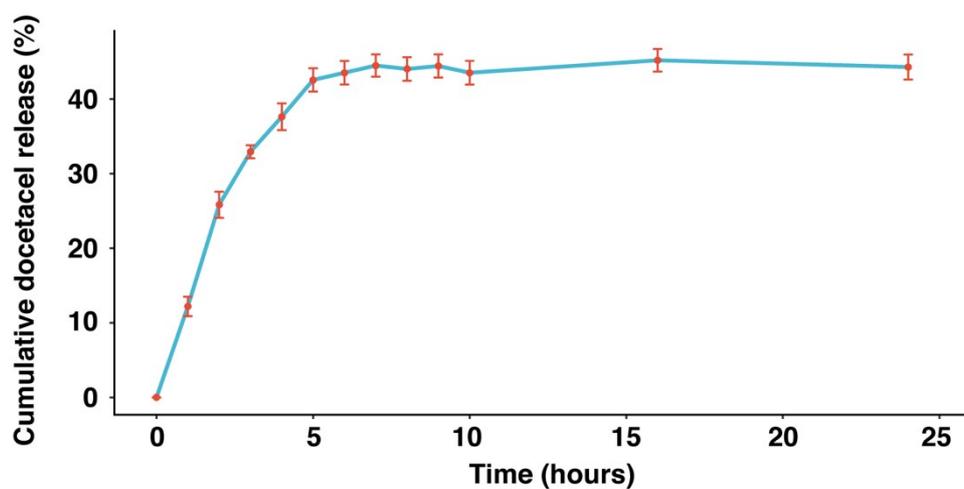
32 **Figure S1.** TEM imaging of 5nm naked Au nanospheres



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34 **Figure S2.** The amphipathy of Au-DUPA NPs. (a) Au -DUPA NPs were dissolved in
35 dichlormethane, the supernate was water. (b) Au -DUPA NPs dissolved in water, the
36 subnatant is dichlormethane.

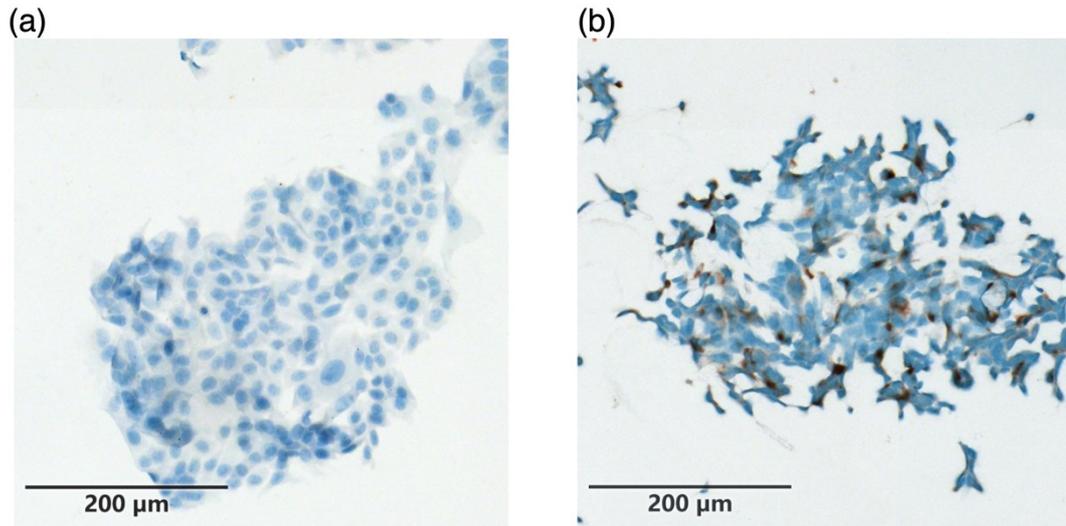
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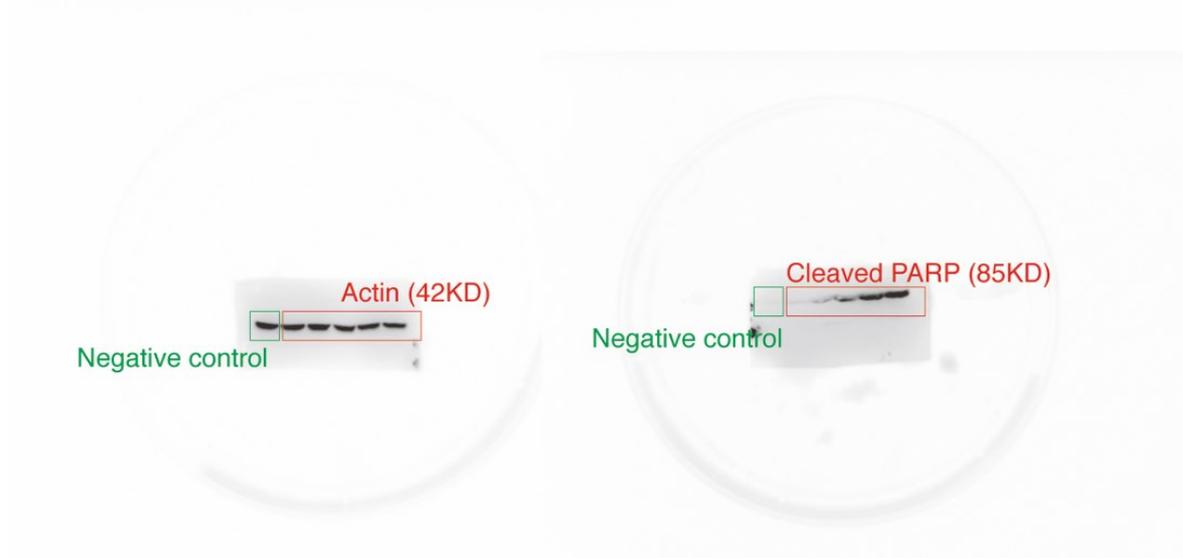
39 **Figure S3.** Cumulative DTX release from Au@DTX-DUPA NPs at the indicated times
40 (Solvent: Hank's Balanced Salt Solution [HBSS]; temperature = 37 °C; pH=7.4).

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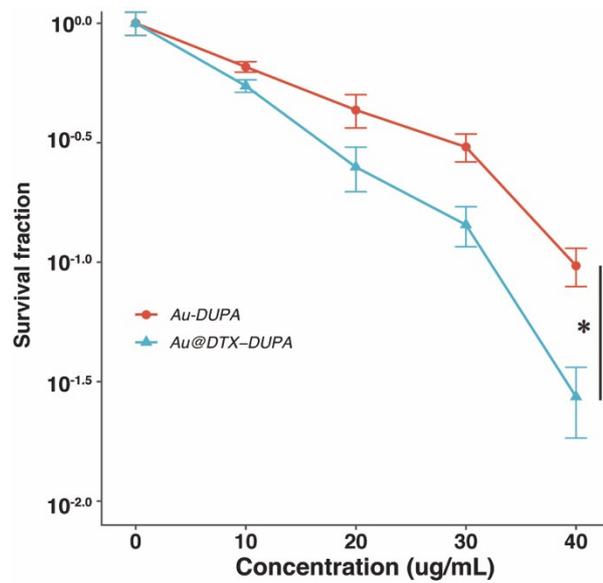
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43 **Figure S4.** Immunohistochemical validation of prostate specific membrane antigen
44 (PSMA) expression in (a) PC3 cell line; (b) 22RV1 cell line. Brown stain represents
45 the expression of PSMA.



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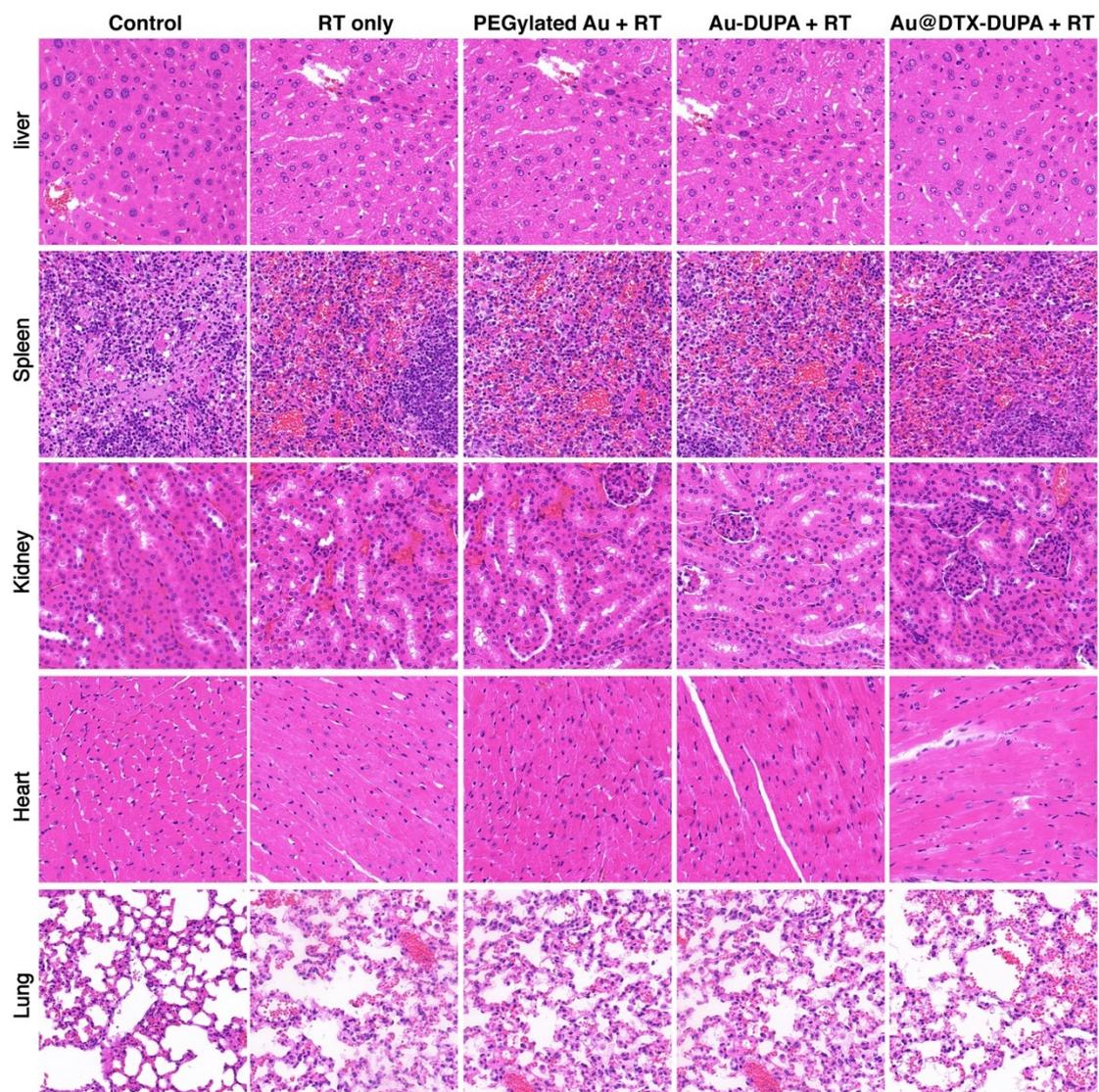
47 **Figure S5.** The uncropped and unprocessed image of the full gel and blot.



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49 **Figure S6.** Survival curves of 22RV1 cells incubated with Au-DUPA NPs or
 50 Au@DOC-DUPA NPs at various concentrations under 4 Gy electron irradiation. Data
 51 are represented as mean \pm SD (n=5), * P < 0.05.

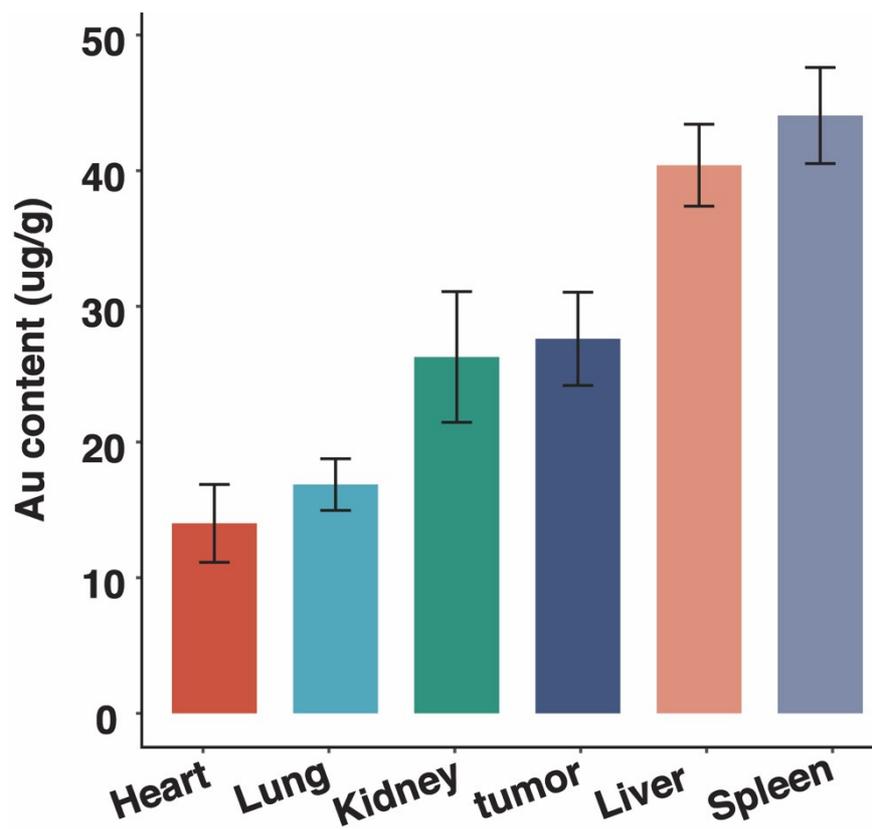
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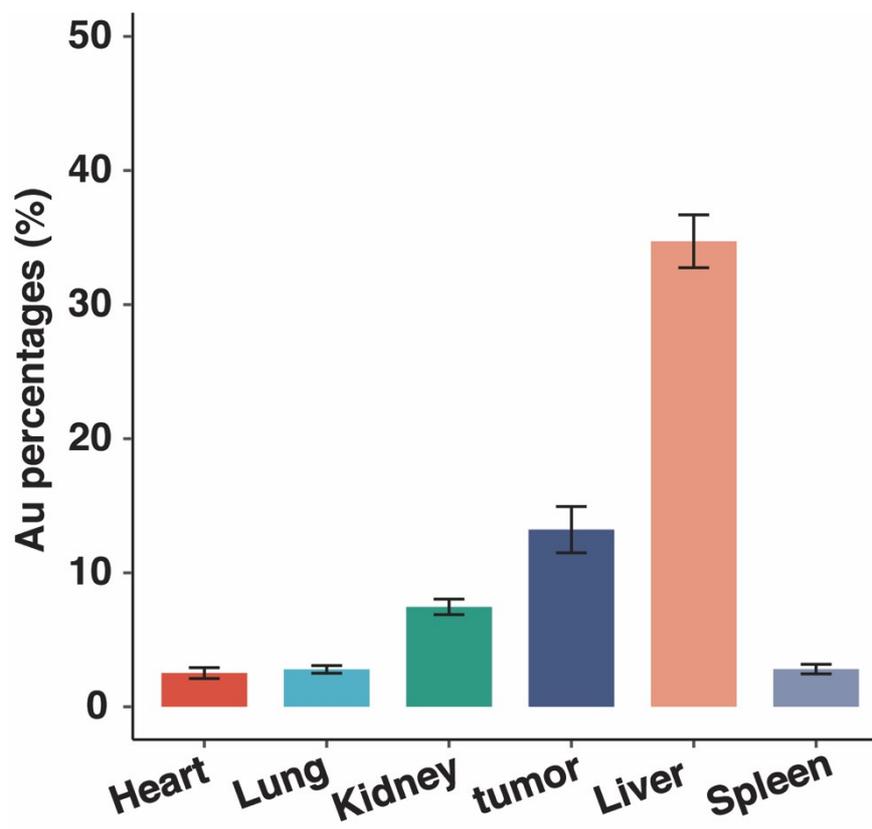
54 **Figure S7.** H&E staining slices of liver, spleen, kidney, heart, and lung, at the 14th day
 55 following various treatments. Neither prominent damage nor inflammation were
 56 observed.

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59 **Figure S8.** The Au content of main viscus and tumor at 24 h after injection of
60 Au@DTX-DUPA NPs. Data are represented as mean \pm SD (n=3).



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62 **Figure S9.** The Au percentages of main viscus and tumor at 24 h after injection of
63 Au@DTX-DUPA NPs. Data are represented as mean \pm SD (n=3).