Supporting Information

Cancer Nutritional-Immunotherapy with NIR-II Laser Controlled ATP Release Based on Material Repurposing Strategy

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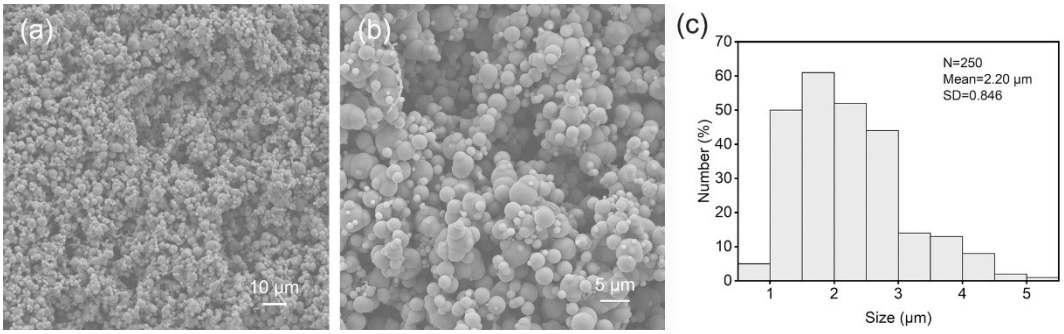

Figure S1. (a), (b) SEM images of CIP at different magnification. (c) The particle size of CIP determined from Figure S1b.

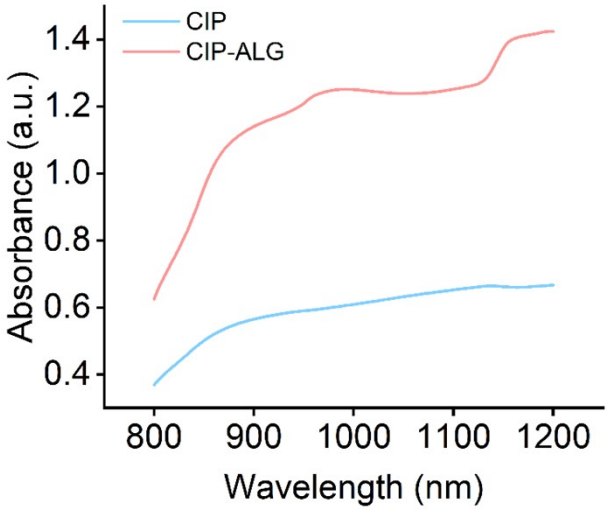

Figure S2. UV-vis-NIR spectrum of CIP and CIP-ALG.

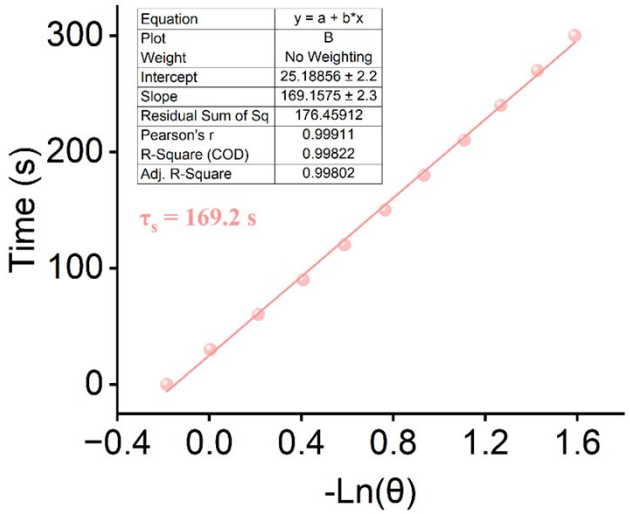

Figure S3. The curves of time constants obtained from Figure 1j.

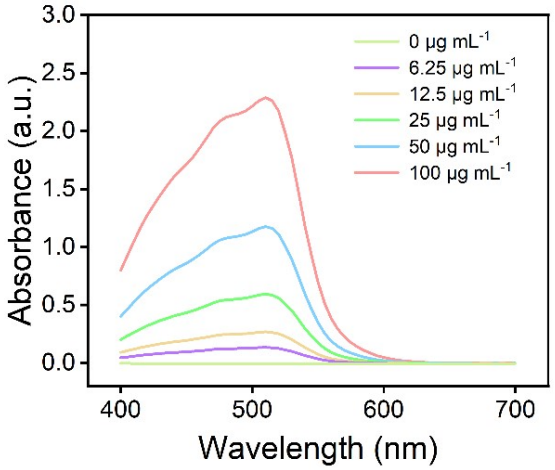

Figure S4. The standard curve of iron-phenanthroline complex determined by UV-vis spectrum.

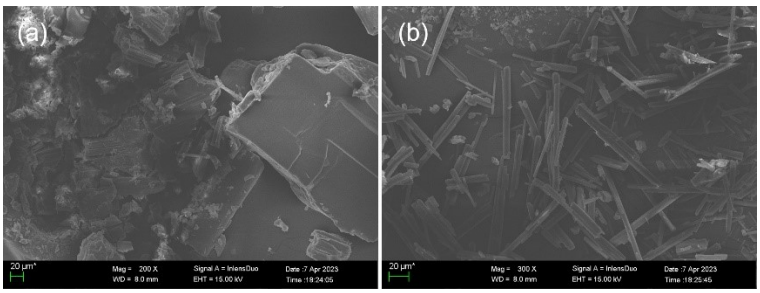

Figure S5. SEM images of ART (a) and DHA (b). Scale bar: 20 μm.

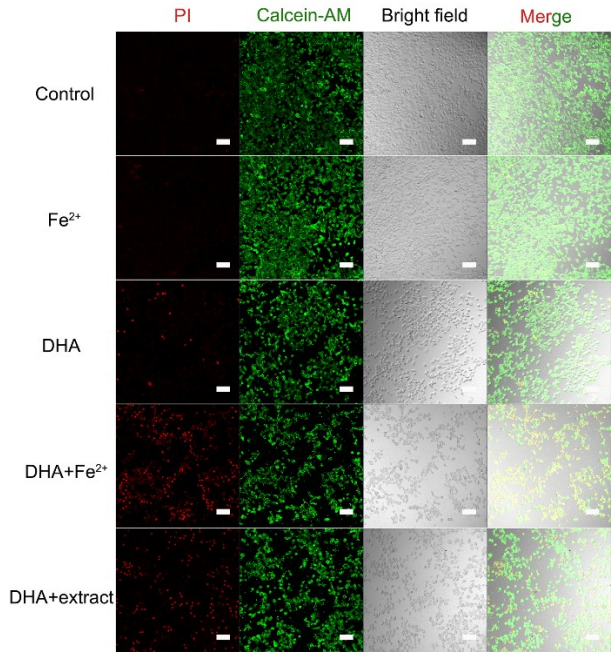

Figure S6. Calcein-AM/PI staining cells (green: alive, red: death) after different treatments (control, $FeSO_4$, DHA, DHA+Fe^{2+} and DHA+extract). Scale bar: 100 μm.

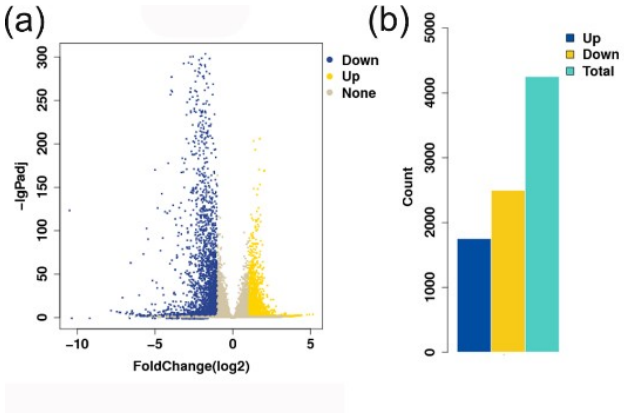

Figure S7. Venn diagram (a), the count of differentially expressed genes (b) between the control group and DHA+Extract group.

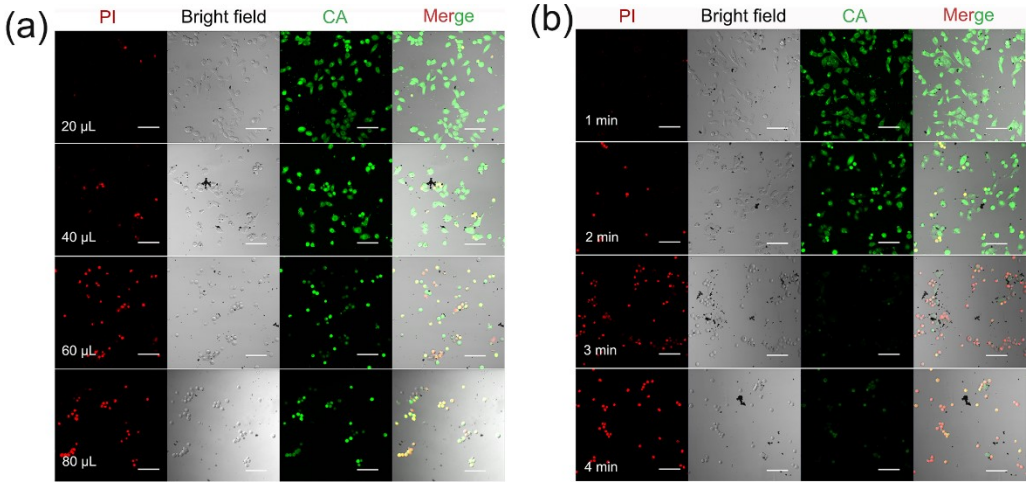

Figure S8. (a) Calcein-AM/PI staining cells treated with different volume of CIP-ALG under NIR-II irradiation. (b) Calcein-AM/PI staining cells treated with different irradiation time (1064 nm laser, 1, 2, 3 and 4 min). Scale bar: 100 μm.

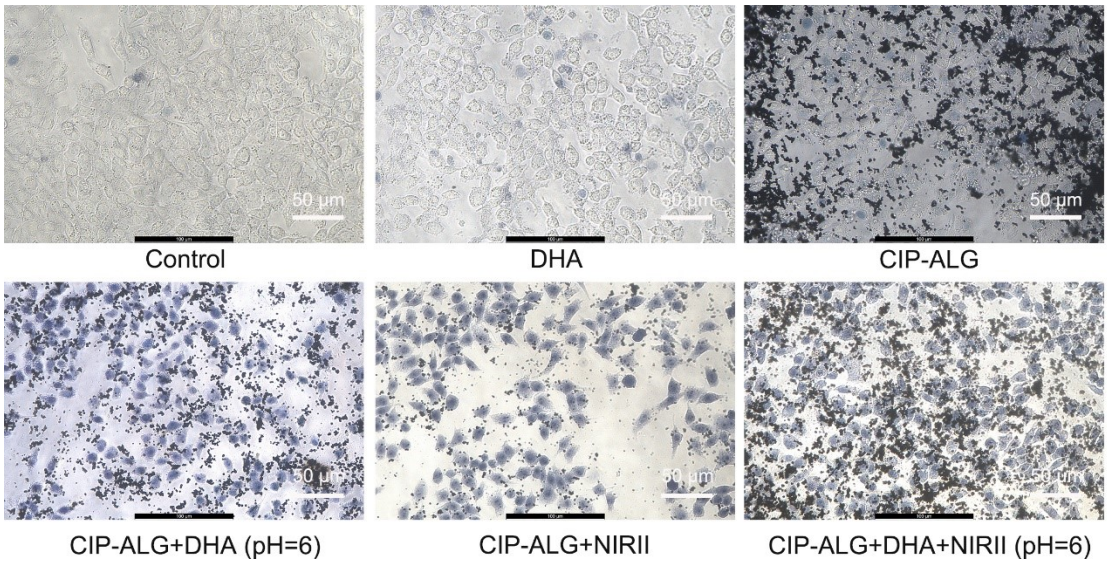

Figure S9. Trypan blue-staining 4T1 cells after different treatments (control, DHA, CIP-ALG, CIP-ALG+DHA and pH 6, CIP-ALG+NIR-II, CIP-ALG+DHA+NIR-II and pH 6). Scale bar: 50 μm.

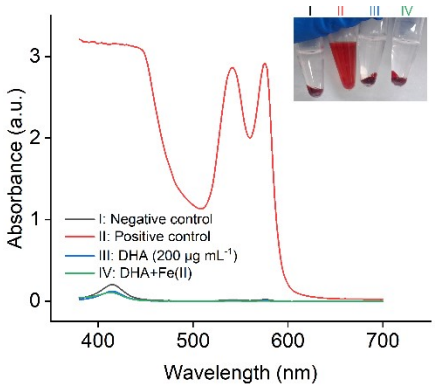

Figure S10. TUV-vis spectrum of erythrocyte supernatant after different treatments (PBS as negative control, DI water as positive control, DHA and DHA/$FeSO_4$), the insert was the digital photo of erythrocyte supernatant after centrifugal (2000 rpm, 3 min).

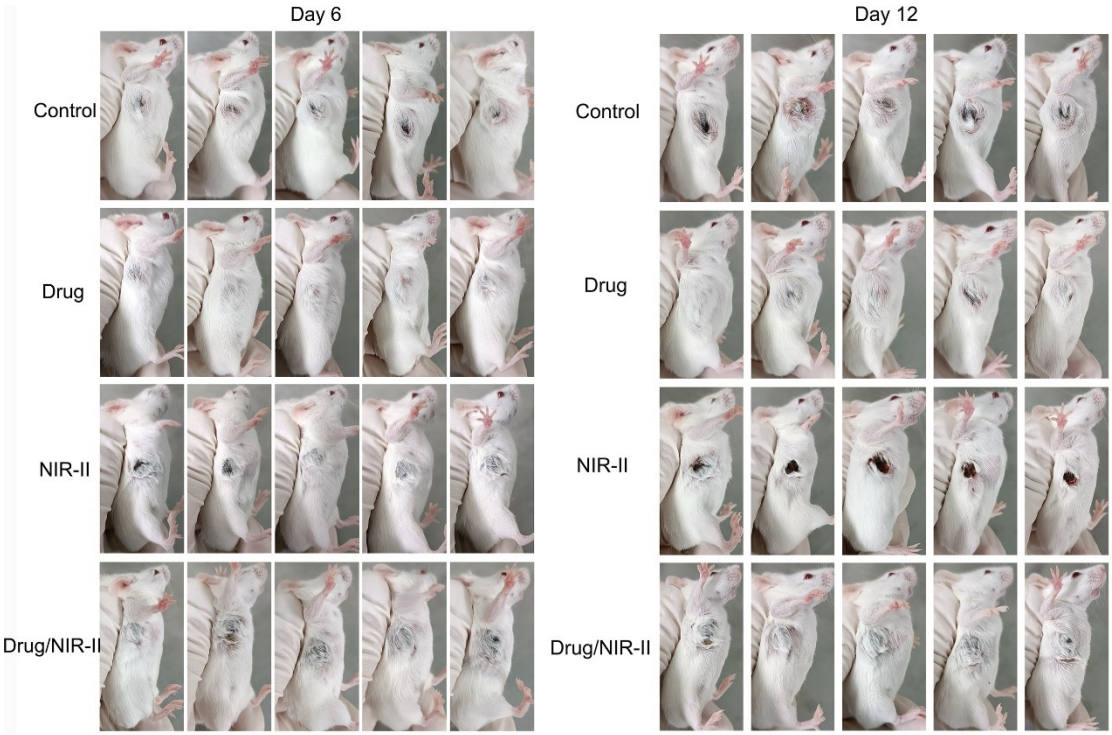

Figure S11. Digital photos of the tumor in each mouse on day 6 and 12.

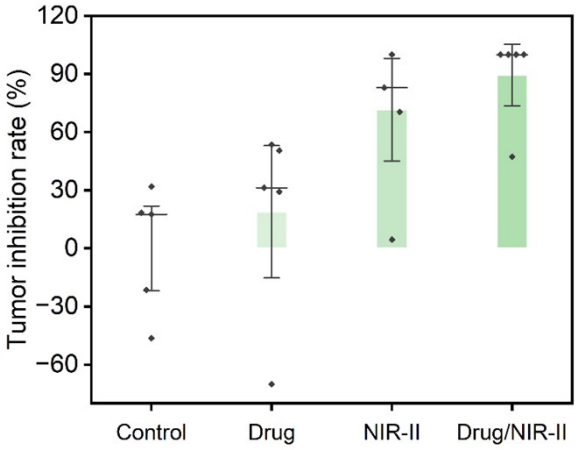

Figure S12. Tumor inhibition rate in different groups.

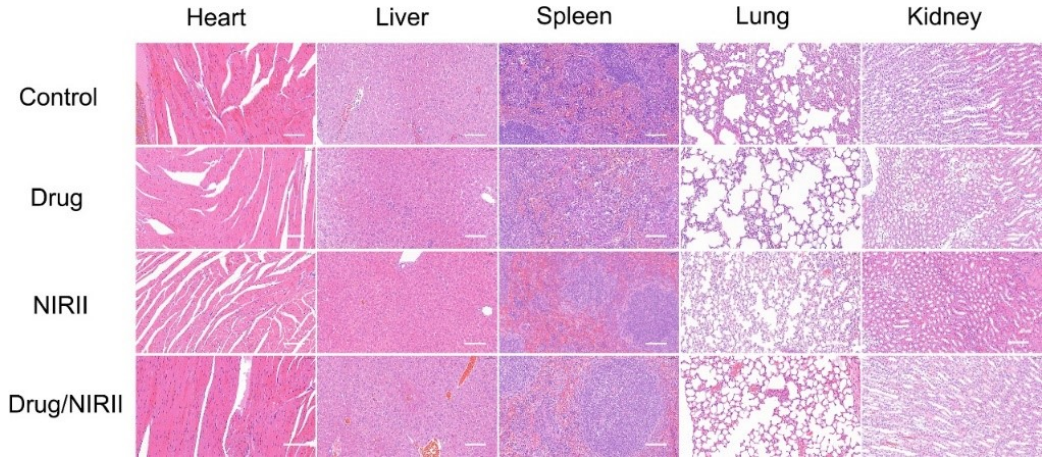

Figure S13. H&E staining major organs (heart, liver, spleen, lung and kidney) in different groups (control, drug, NIR-II and drug/NIR-II). Scale bar: 100 μm.

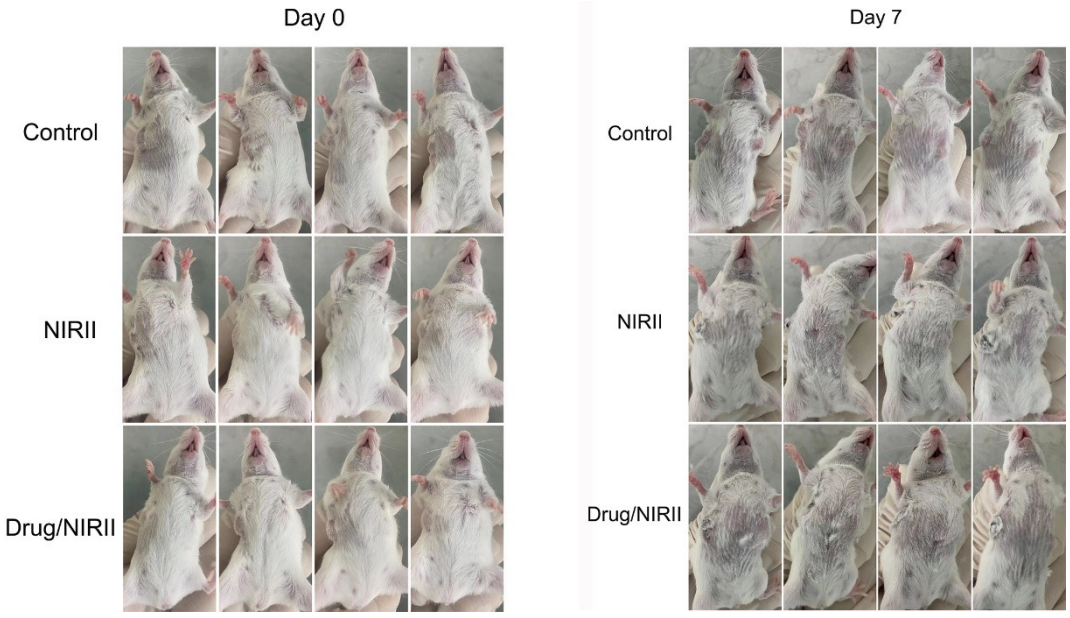

Figure S14. Digital photos of bilateral tumor in each mouse on day 0 and 7.

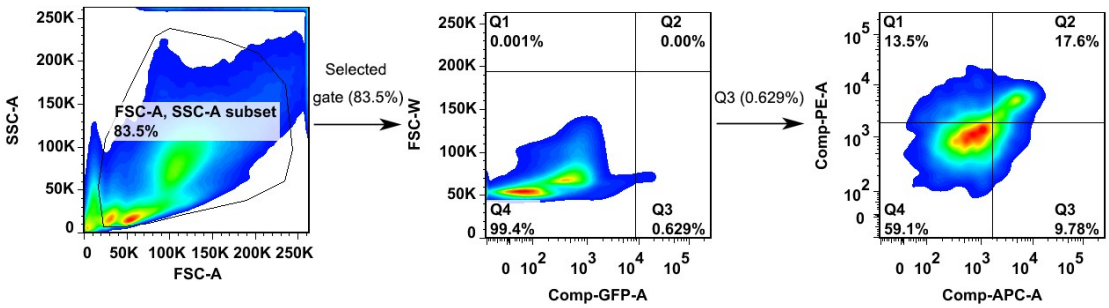

Figure S15. Flow cytometry analysis of the loop gate sequence for DC.

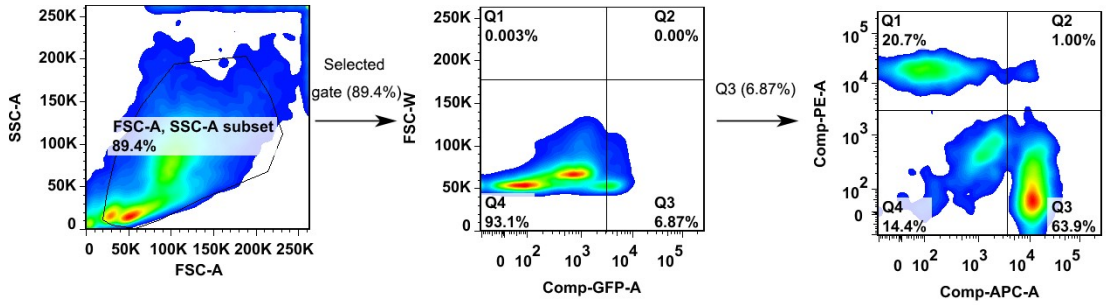

Figure S16. Flow cytometry analysis of the loop gate sequence for T cells.

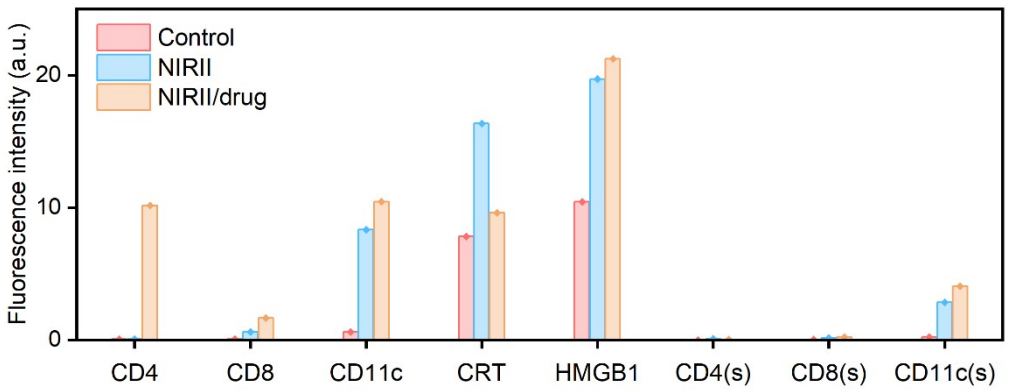

Figure S17. Fluorescence quantitative analysis for Figure 6 determined by Image J software.

Table S1. Inorganic NIR-II photothermal agents[1].

PTT agents	Wavelength (nm)	Power (W cm^{-2})	PCE (%)	Cancer type	Dose (mg kg^{-1})	Mouse strain
9T-Graphene QDs	1070	1.0	33.45	4T1	10, i.v.	Balb/c
1N-Doping CDs	1064	0.6	81.3	4T1	5, i.v.	Balb/c nude
Bi@C NPs	1064	1.0	43.2	HeLa	3.2, i.v.	Kunming
MOF-derived CNPs	1064	1.0	50.6	MCF-7	—	Balb/c nude
H-SiO_x NPs	1064	0.6	48.6	4T1	4 (Si), i.v.	Balb/c
MnO_x@silicene-BSA	1064	1.5	21.8	4T1	20, i.v.	Balb/c nude
NIR-II-CD/BP hybrids	808/1064	0.2/0.6	49.5/28.4	HeLa	6, i.v.	Balb/c nude
CuS–Au heterostructures	1064	1.0	36.5	4T1	0.3, i.v.	Balb/c nude
Pt spirals	1120	1.2	52.5	U14	0.66, i.v.	Kunming
Au–Au nanocoral	1060	0.8	67.2	HeLa	0.3, i.v.	Balb/c nude
AuPBs	808/1064	0.33/1.0	88.6/80.8	4T1	20, i.v.	Ncr nude
Au_3Cu nanocrystals	808/1064	1.0/0.8	39.4/75.2	KB	20, i.v.	Balb/c nude
TA–Si–Au	1064	1.0	24.1	4T1	5, i.t.	Balb/c
Au NSs	785/1064	0.39/1.0	34.5/13.0	A549	—	—
Ti_2N QDs	808/1064	1.0	48.6/45.5	4T1/U87	20, i.v.	Balb/c
Nb_2C (MXene)	808/1064	1.0/1.0	36.4/45.6	U87/4T1	20, i.v.	Kunming
$TeO_2/(NH_4)_xWO_3$ nanoribbons	1064	1.0	43.6	MCF-7/A549	20, i.v.	Balb/c nude
V_2C QDs	1064	0.96	45.0	MCF-7	10, i.v.	Balb/c nude
Ni_9S_8 NP	808/1064	0.33/1.0	70.9/46.0	HeLa	2.4, i.v.	Balb/c nude
Ti_2O_3@HA	1064	0.8	50.2	HepG2	20, i.v.	Balb/c nude
CS–RuO_2 NPs	1064	1.0	52.5	MCF-7	2, i.t.	Balb/c nude
MoO_2 NPs	808/1064	0.33/1.0	52.9/55.6	A549	1, i.v.	Balb/c nude
$MoSi_2$ NPs	1064	1.5	34.4	HepG2	5, i.v.	Balb/c nude
WN nanosheets hydrogel	1064	1.0	29.5	4T1	—	—
EGaIn @SiO_2-RGD NPs	1064	1.5	22.43	U87	10, i.v.	Balb/c nude
Sb-Doped SnO_2 NPs	1064	1.0	48.3	HeLa	1, i.t.	Balb/c nude
SnSe–PVP nanorods	808/1064	1.5/1.5	37.3/20.3	4T1	40 (Se), i.v.	Balb/c

Reference

1. C. Xu and K. Pu, *Chemical Society Reviews*, 2021, **50**, 1111-1137.