Supplementary Information

Hybrid cell membranes camouflaging liposomes with payloads improves chemotherapy and photodynamic therapy of breast cancer

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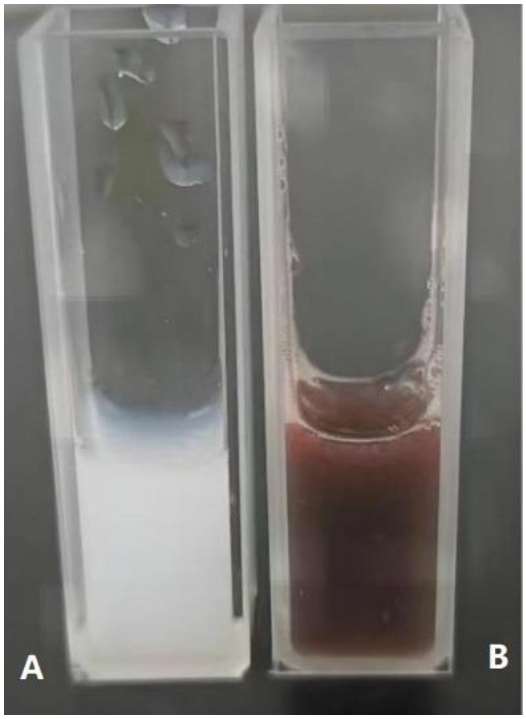
1. **Supplementary Information 1** Photo of the sample



Supplementary Figure Legend

Supplementary Figure 1 A. Suspension of liposomes. B. Suspension of Dox-IR 780@Lip@Ms

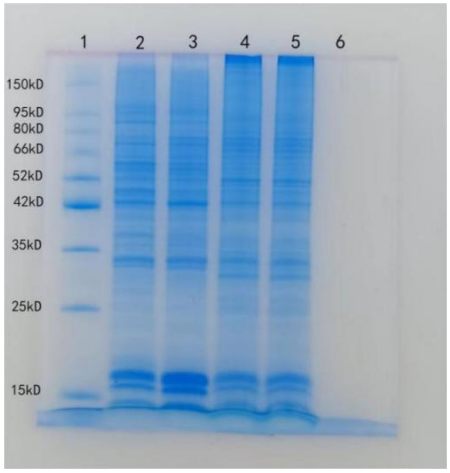
2. **Supplementary Information 2** Sizes of liposomes loaded with Dox and IR780 without and with hybrid cell membranes camouflaging

Dox-IR780@Lip		Dox-IR780@Lip@Ms	
Diameter	percentage(%)	Diameter	percentage(%)
0.34	0	0.34	0
0.38	0	0.38	0
0.43	0	0.43	0
0.49	0	0.49	0
0.55	0	0.55	0
0.62	0	0.62	0
0.7	0	0.7	0
0.8	0	0.8	0
0.9	0	0.9	0
1.02	0	1.02	0
1.15	0	1.15	0
1.3	0	1.3	0
1.47	0	1.47	0
1.66	0	1.66	0
1.87	0	1.87	0
2.11	0	2.11	0
2.39	0	2.39	0
2.7	0	2.7	0
3.05	0	3.05	0
3.45	0	3.45	0
3.89	0	3.89	0
4.4	0	4.4	0
4.97	0	4.97	0
5.61	0	5.61	0
6.34	0	6.34	0
7.17	0	7.17	0
8.1	0	8.1	0
9.15	0	9.15	0
10.34	0	10.34	0
11.68	0	11.68	0
13.2	0	13.2	0
14.91	0	14.91	0
16.84	0	16.84	0
19.03	0	19.03	0
21.5	0	21.5	0
24.29	0	24.29	0
27.45	0	27.45	0

31.01	0	31.01	0
35.03	0	35.03	0
39.58	0	39.58	0
44.72	0	44.72	0
50.53	0	50.53	0
57.09	0	57.09	0
64.5	0	64.5	0
72.87	0.042	72.87	0
82.33	2.484	82.33	0.674
93.02	8.692	93.02	5.245
105.1	14.338	105.1	11.625
118.74	17.553	118.74	16.396
134.16	18.019	134.16	18.363
151.57	16.074	151.57	17.535
171.25	12.325	171.25	14.432
193.48	7.566	193.48	9.836
218.6	2.906	218.6	4.838
246.98	0	246.98	1.056
279.04	0	279.04	0
315.27	0	315.27	0
356.2	0	356.2	0
402.44	0	402.44	0
454.69	0	454.69	0
513.71	0	513.71	0
580.41	0	580.41	0
655.76	0	655.76	0
740.89	0	740.89	0
837.07	0	837.07	0
945.74	0	945.74	0
1068.52	0	1068.52	0
1207.24	0	1207.24	0
1363.97	0	1363.97	0
1541.04	0	1541.04	0
1741.1	0	1741.1	0
1967.14	0	1967.14	0
2222.51	0	2222.51	0
2511.05	0	2511.05	0
2837.04	0	2837.04	0
3205.35	0	3205.35	0
3621.48	0	3621.48	0
4091.63	0	4091.63	0
4622.81	0	4622.81	0
5222.96	0	5222.96	0
5901.02	0	5901.02	0

6667.1	0	6667.1	0
7532.65	0	7532.65	0
8510.56	0	8510.56	0
9615.42	0	9615.42	0

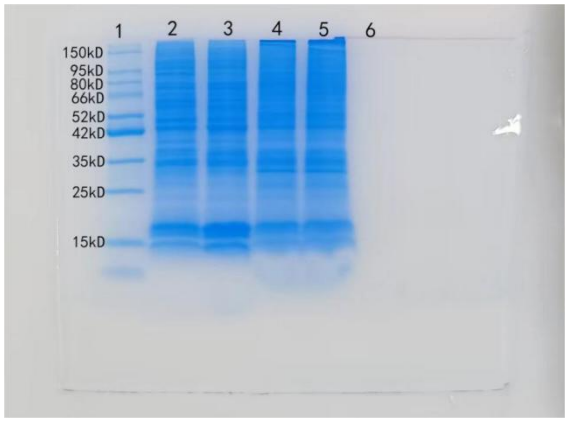
3. **Supplementary Information 3** Electrophoresis 1



Supplementary Figure Legend

Supplementary Figure 2 SDS-PAGE Protein analysis [1. Protein Marker (10-150kD, non-pre-dyed); 2. RAW264.7 cell membrane; 3. 4T1 cell membrane; 4. 4T1-RAW hybrid membrane; 5. Dox-IR780@Lip@Ms; 6. Dox-IR780@Lip]

3.Supplementary Information 3 Electrophoresis 2



Supplementary Figure Legend

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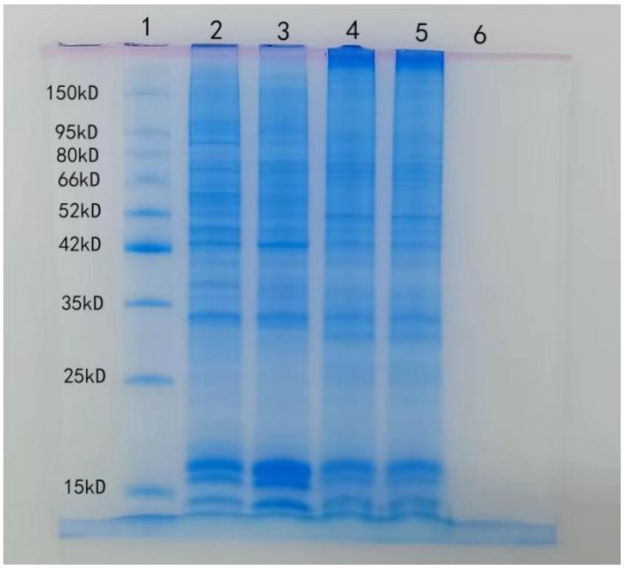
SDS-PAGE Protein analysis [1. Protein Marker (10-150kD, non-pre-dyed); 2. RAW264.7 cell membrane; 3. 4T1 cell membrane; 4. 4T1-RAW hybrid membrane; 5. Dox-IR780@Lip@Ms; 6. Dox-IR780@Lip]

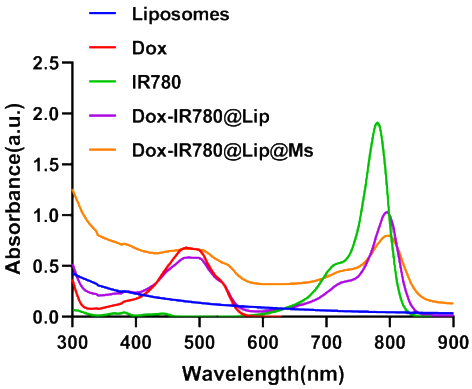
3.Supplementary Information 3 Electrophoresis 3



Supplementary Figure Legend

Supplementary Figure 4 SDS-PAGE Protein analysis [1. Protein Marker (10-150kD, non-pre-dyed); 2. RAW264.7 cell membrane; 3. 4T1 cell membrane; 4. 4T1-RAW hybrid membrane; 5. Dox-IR780@Lip@Ms; 6. Dox-IR780@Lip]

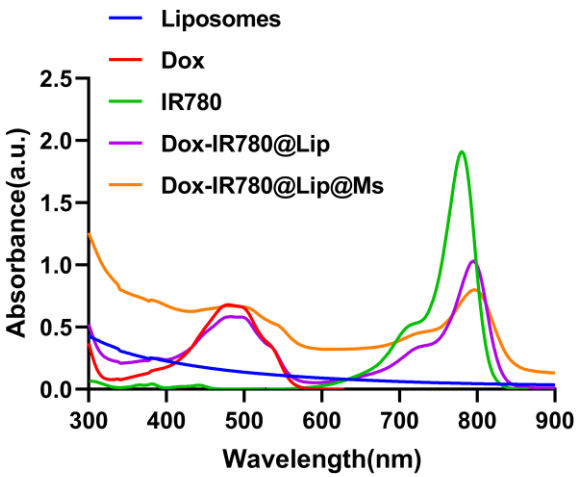
4. **Supplementary Information 4** UV-vis spectra 1



Supplementary Figure Legend

Supplementary Figure 5 UV-vis spectra of blank liposomes, Dox, IR780, Dox-IR780@Lip, and Dox-IR780@Lip@Ms.

4.Supplementary Information 4 UV-vis spectra 2



Supplementary Figure Legend

Supplementary Figure 6 UV-vis spectra of blank liposomes, Dox, IR780, Dox-IR780@Lip, and Dox-IR780@Lip@Ms.

5. **Supplementary Information 5** Wound healing assay

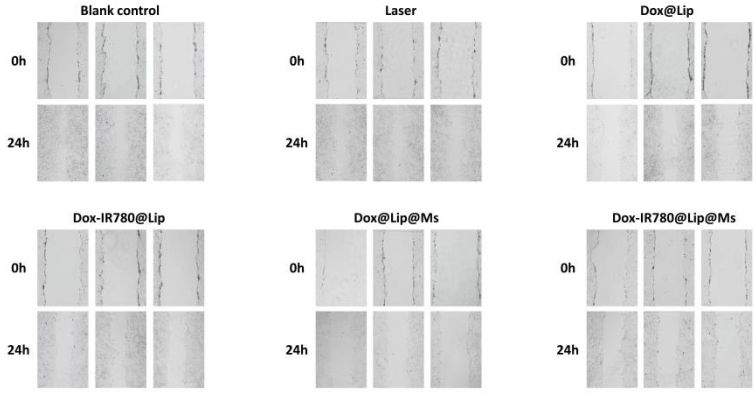


Figure 7a Wound Healing Assay

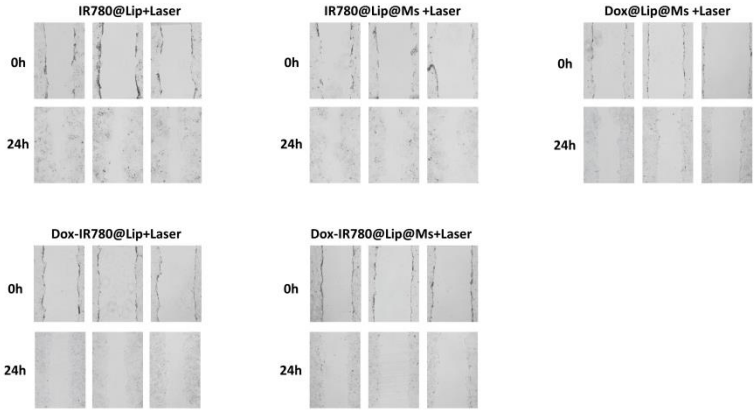
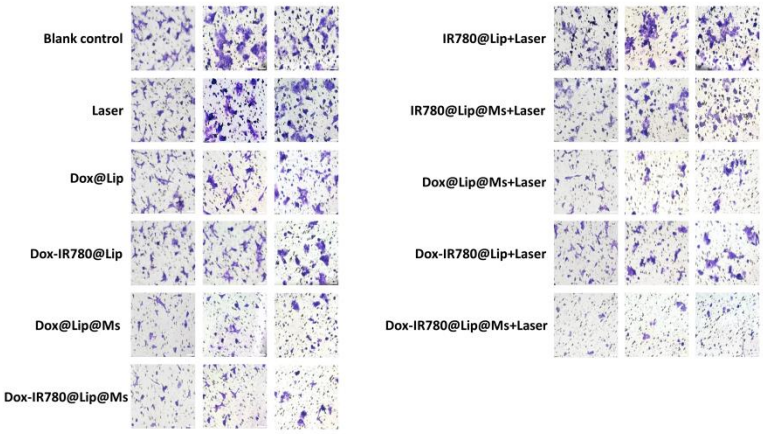


Figure 7b Wound Healing Assay 2

Supplementary Figure Legend

Supplementary Figure 7 The wound healing effects (closure) of 4T1 cells after different treatments.

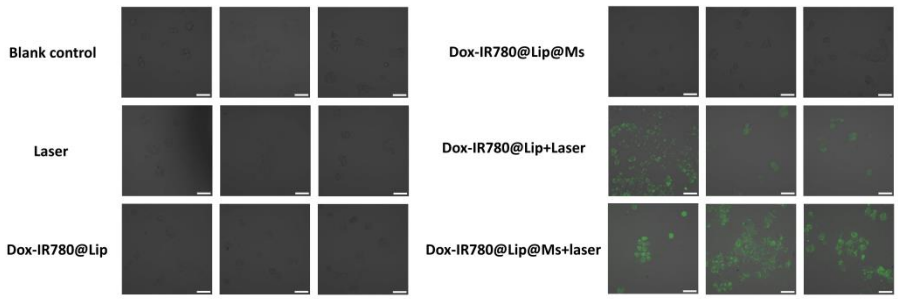
6. **Supplementary Information 6** Transwell assay



Supplementary Figure Legend

Supplementary Figure 8 The invasion ability of 4T1cells treated with different materials with and without laser irradiation.

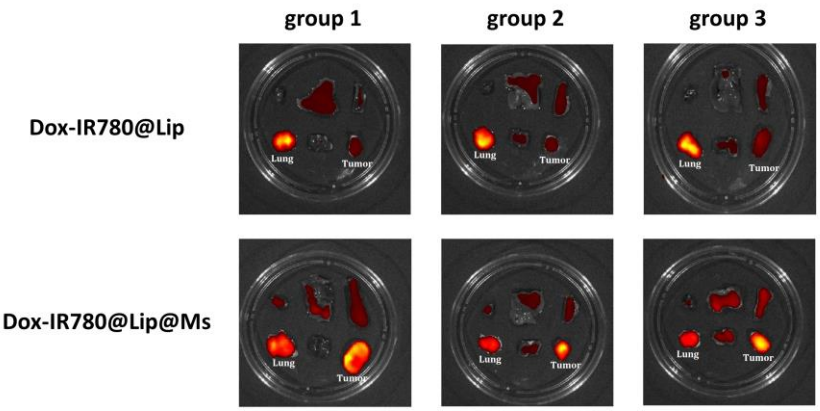
7. Supplementary Information 7 Fluorescence intensity of $^1O_2$



Supplementary Figure Legend

Supplementary Figure 9 Fluorescence intensity of $^1O_2$ in 4T1 cells treated using different materials with and without laser irradiation.

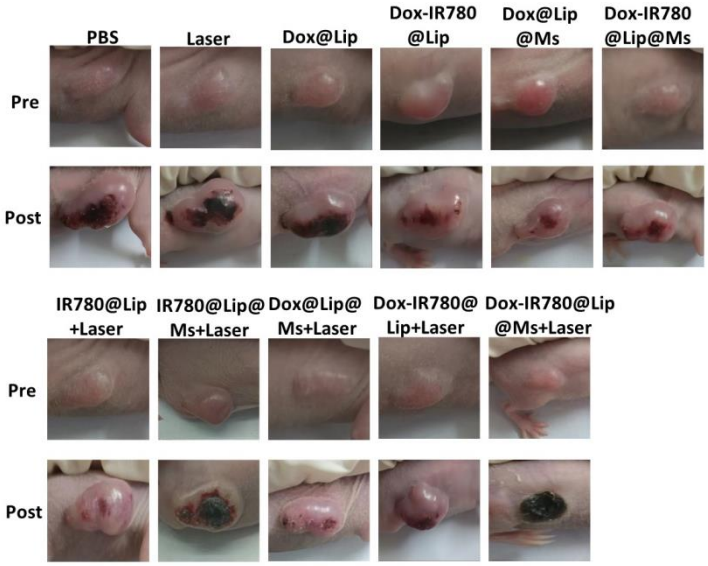
8. **Supplementary Information 8** Fluorescence of isolated organs and tumors



Supplementary Figure Legend

Supplementary Figure 10 Fluorescence of isolated organs and tumors administrated intravenously with Dox-IR780@Lip and Dox-IR780@Lip@Ms, respectively. The fluorescence signal of the tumors in the mice administered with Dox-IR780@Lip@Ms was significantly higher than that in the mice administered with Dox-IR780@Lip, and the fluorescence signal of the lungs in the mice administered with Dox-IR780@Lip was significantly higher than that in the mice administered with Dox-IR780@Lip@Ms (all $P<0.01$).

9. **Supplementary Information 9** Photos of murine tumors after different treatments



Supplementary Figure Legend

Supplementary Figure 11 Photos of nude mice bearing xenograft tumors of breast cancer 4 T1 cells after different treatments, with and without laser irradiation.

10. **Supplementary Information 10** Measurements of Tumor Volume

Day 9			Day 11			Day 12		
Long axis(mm)	Short axis(mm)	Volume(mm^3)	Long axis(mm)	Short axis(mm)	Volume(mm^3)	Long axis(mm)	Short axis(mm)	Volume(mm^3)
15	11.8	1044.3	17.9	12.4	1376.152	18.4	13.6	1701.632
15.5	12.9	1289.6775	15.9	13.5	1448.8875	16.2	13.5	1476.225
16.5	10.9	980.1825	16.9	11.6	1137.032	17.4	11.9	1232.007
16.4	11.2	1028.608	17.2	12.1	1259.126	17.9	12.8	1466.368
17.9	10.9	1063.3495	18.8	11.8	1308.856	19.1	12.3	1444.8195
16.7	10.9	992.0635	17.9	11.7	1225.1655	18.3	12.1	1339.6515
15.7	10.6	882.026	17.1	11.2	1072.512	18.3	11.6	1231.224
14.7	10.5	810.3375	15.3	11.6	1029.384	15.5	12	1116
14.1	10.9	837.6105	15.1	11	913.55	15.1	11.1	930.2355
16.7	10.5	920.5875	17.9	11	1082.95	17.9	11.6	1204.312
16.4	9.9	803.682	17	10.2	884.34	17.4	10.6	977.532
16.8	9.7	790.356	16.8	10.4	908.544	17	10.6	955.06
14.3	9.5	645.2875	15.1	9.7	710.3795	16.1	10.1	821.1805
13.7	8.5	494.9125	13.2	8.5	476.85	13.2	8.6	488.136
15	8.2	504.3	15.1	8.5	545.4875	15.1	8.6	558.398
14.8	9.3	640.026	15	9.5	676.875	15.5	10	775
15.7	8.6	580.586	16.2	9.3	700.569	16.5	9.4	728.97
16.6	8.3	571.787	16.9	8.6	624.962	16.9	8.7	639.5805
14.6	8.6	539.908	15.2	8.9	601.996	15.6	9.1	645.918
11.7	8.7	442.7865	12.1	9.1	501.0005	12	9.2	507.84
12.1	9.8	581.042	13.3	9.9	651.7665	13.4	10.6	752.812
15.5	9.7	729.1975	16.4	10.2	853.128	17	10.5	937.125
14.1	9.6	649.728	16.3	10.3	864.6335	16.4	10.6	921.352
14.6	9.3	631.377	15.3	10.1	780.3765	15.5	10.1	790.5775
10.3	8	329.6	9	6.9	214.245	7	6.9	166.635
10.6	8	339.2	10.2	7.6	294.576	9.4	7.6	271.472
8.9	8.2	299.218	8.8	7.8	267.696	8.2	7.5	230.625