Supporting information

Intravenous injectable Metformin-Cu(II)-EGCG coordination polymer nanoparticles for electrothermal-enhanced dual-drug synergistic tumor therapy

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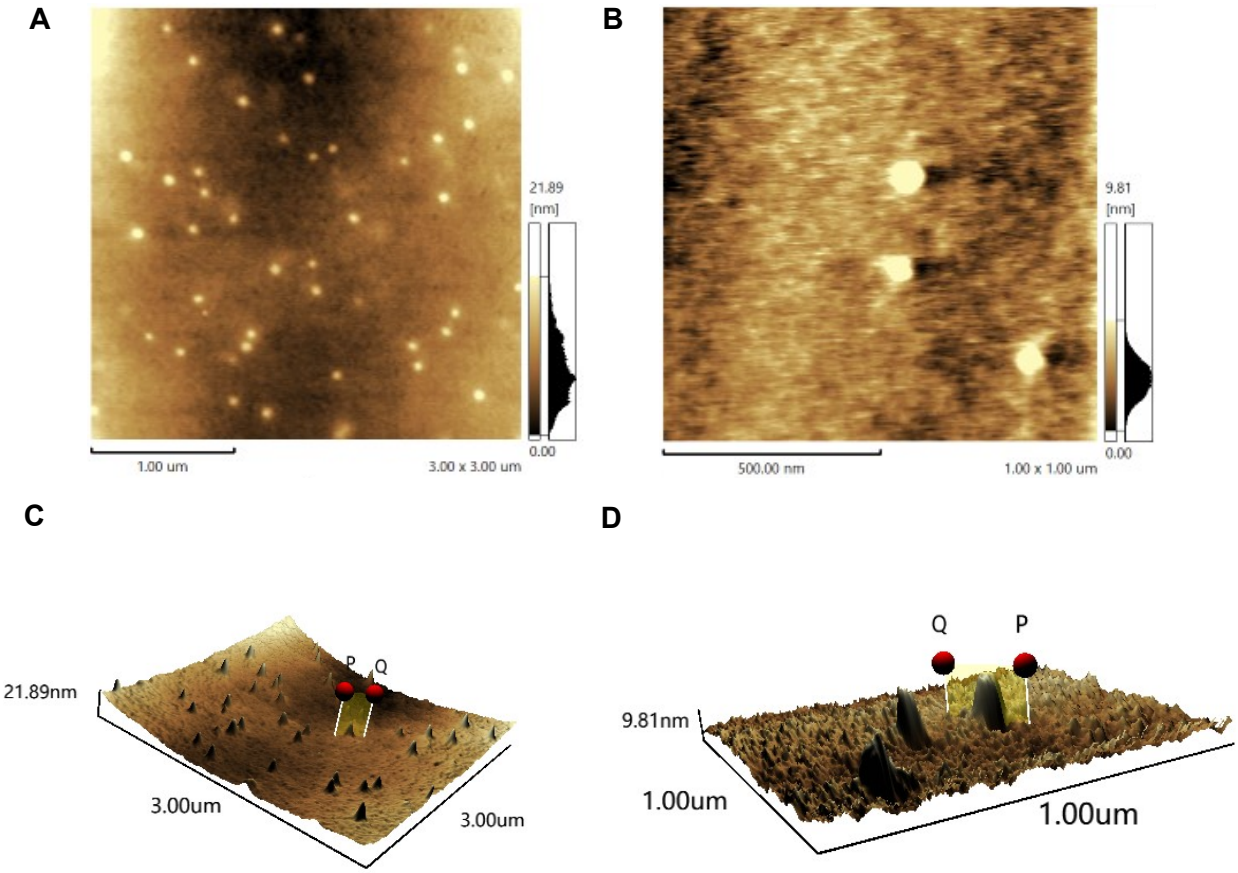

Fig.S1. AFM results of Metformin-Cu (II) -EGCG ICP NPs（Resolution: XY-0.2 nm; Z：0.01 nm）. (A) 2D images of AFM results of Metformin-Cu (II) -EGCG ICP NPs(3μm×3μm). (B) 2D images of AFM results of Metformin-Cu (II) -EGCG ICP NPs(1μm×1μm). (C) 3D images of AFM results of Metformin-Cu (II) -EGCG ICP NPs(3μm×3μm). (D) 3D images of AFM results of Metformin-Cu (II) -EGCG ICP NPs(1μm×1μm).

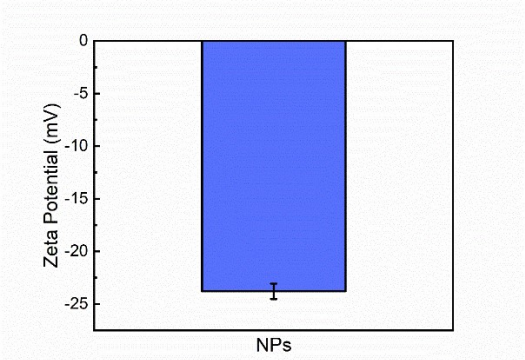

Fig.S2. Zeta potential results of Metformin-Cu(II)-EGCG ICP NPs (n = 3).

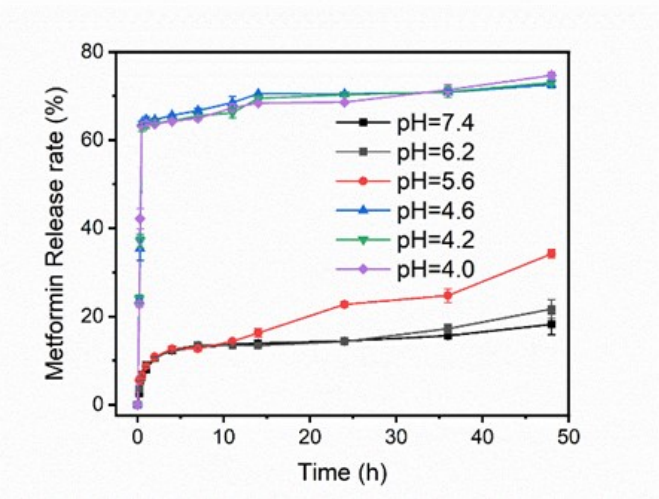

Fig.S3. Metformin release rate under different pH values (n = 3).

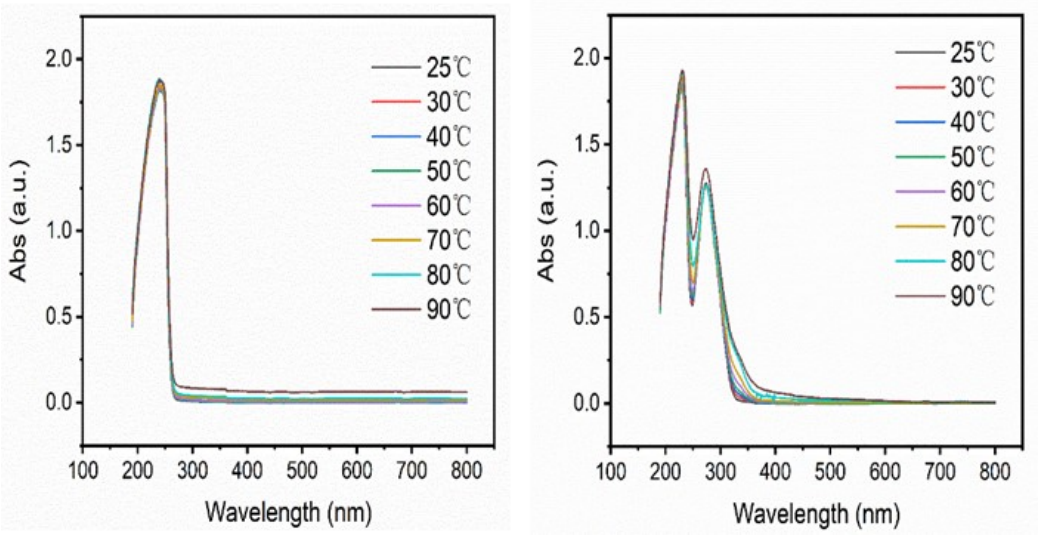

Fig.S4. Temperature stability of Free Metformin and EGCG.

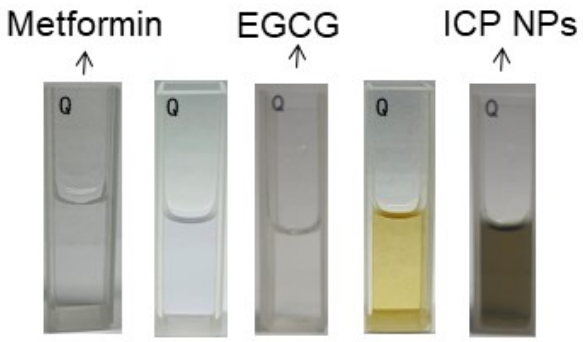

Fig.S5. Photographs of Metformin, Metformin-Cu(II), EGCG, EGCG- Cu(II), Metformin-Cu(II)-EGCG ICP NPs (from left to right).

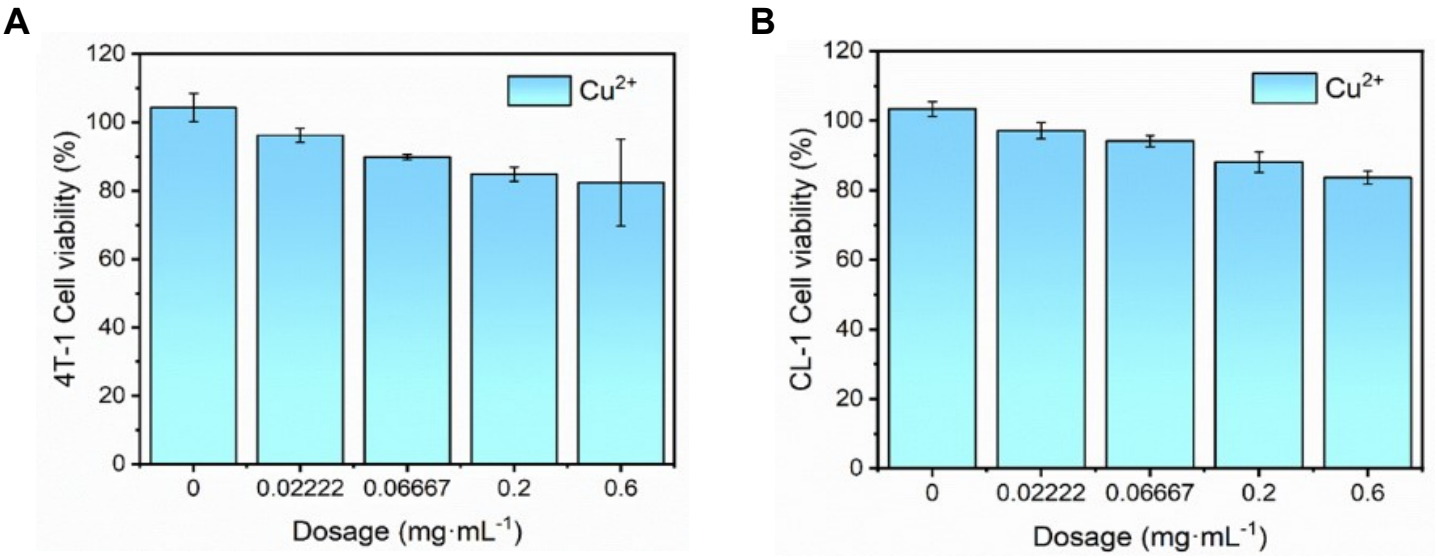

Fig.S6. (A)Viability of 4T-1 cells with different dosages of Cu2+. (B) Viability of CL-1 cells with different dosages of Cu^{2+}.

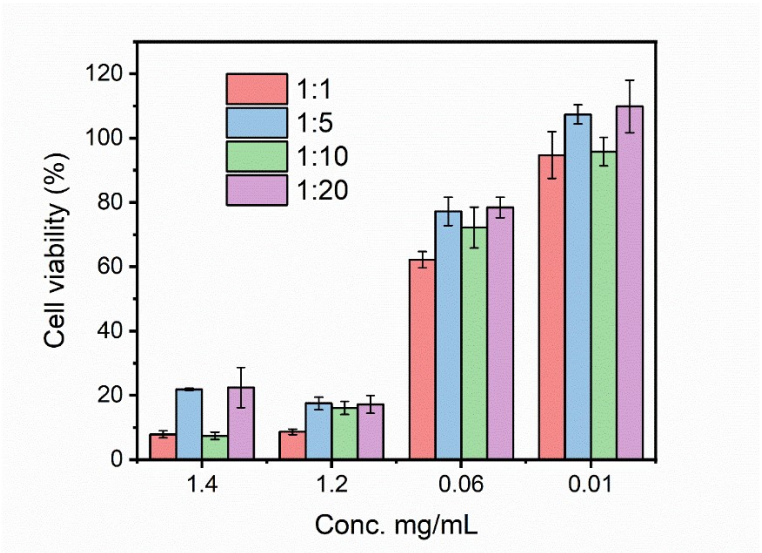

Fig.S7. Optimization of the synergistic therapeutic strategy mediated by Metformin-Cu(II)-EGCG ICP NPs.

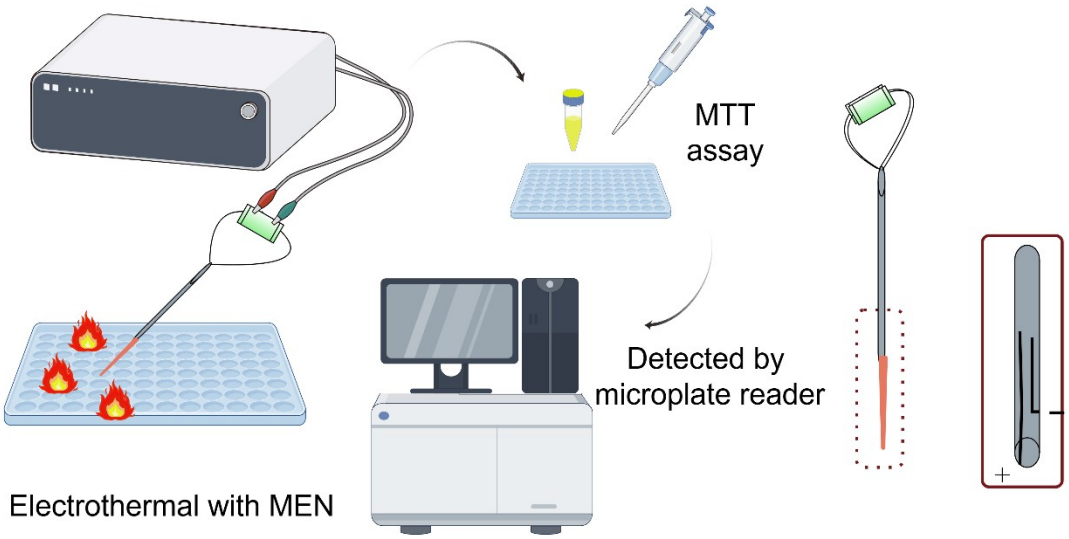

Fig.S8. Schematic diagram of micro-electrothermal needle (MEN) in cell experiments.

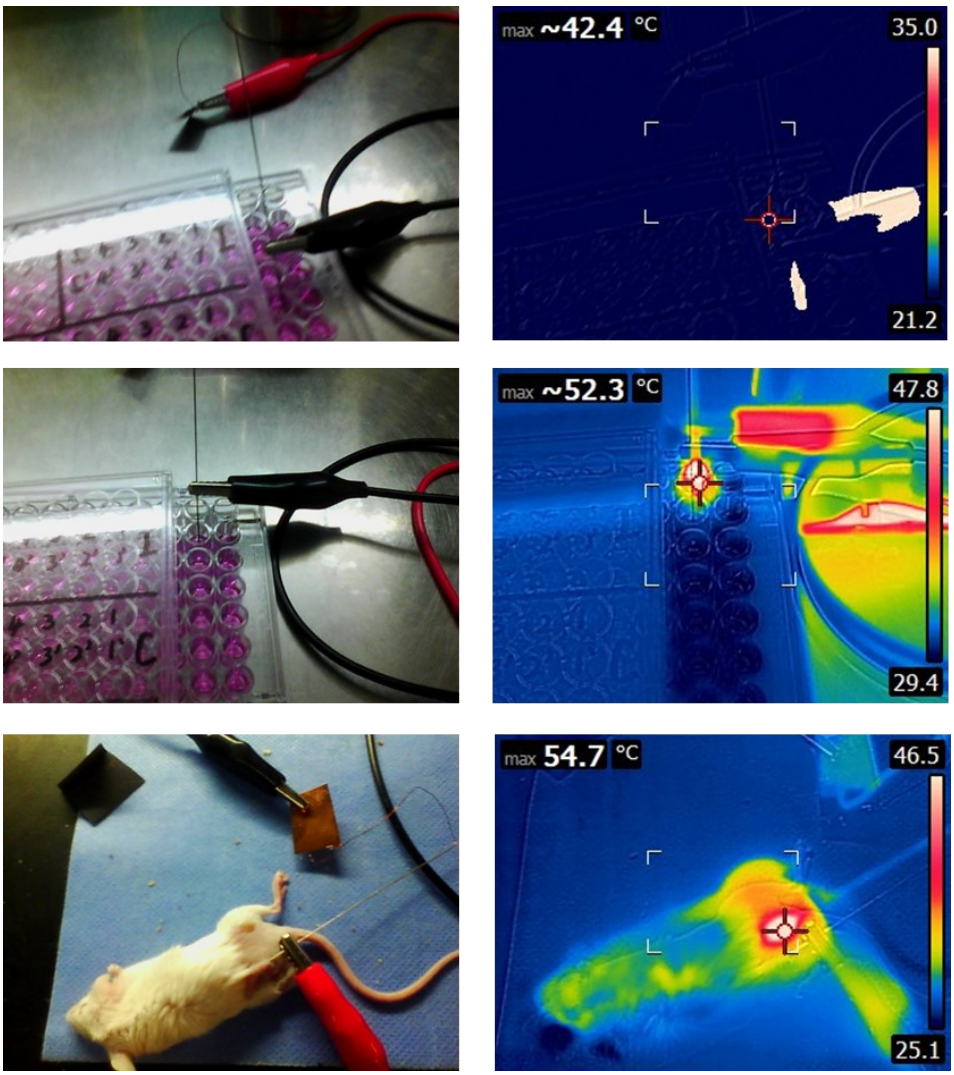

Fig.S9. Infrared thermal images in cell and animal experiments.

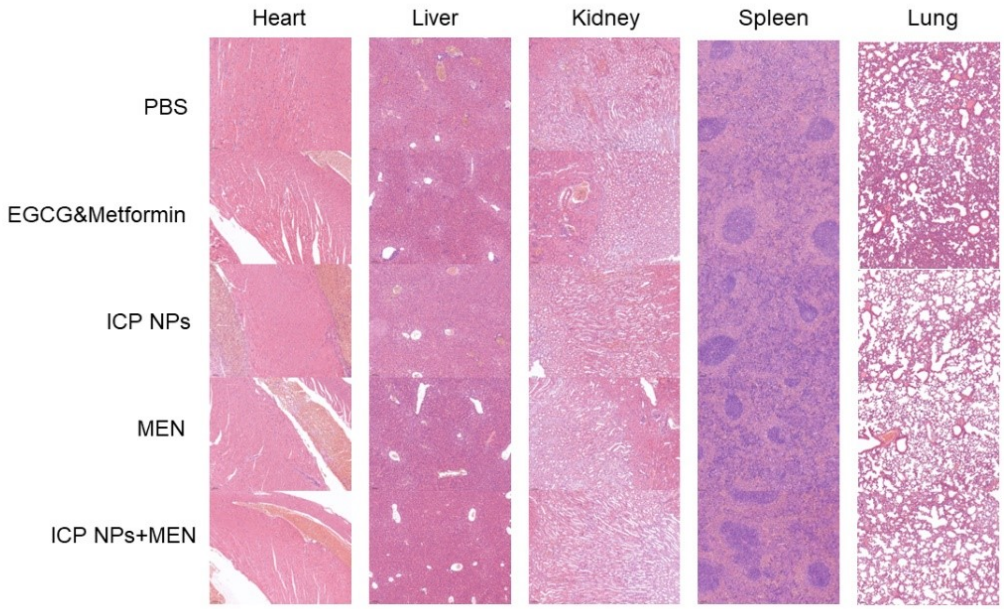

Fig.S10. Histological analysis after different treatments (Heart, Liver, Kidney, Spleen, and Lung). Drug group:1) PBS, 2) free EGCG and Metformin, 3) Metformin-Cu(II)-EGCG ICP NPs, 4) MEN, and 5) Metformin-Cu(II)-EGCG ICP NPs+MEN.

Fig.S11. Pictures of mice during the treatment process.

Table.S1. The binding energy of different samples

Sample	E_b / eV								
	O 1s		N 1s			Cu 2p			
						Cu 2p 3/2		Cu 2p 1/2	
$CuCl_2$						935.05		954.77	
EGCG	530.10	531.70							
Metformin			397.56	398.63	406.10				
Metformin-Cu(II)-EGCG ICP NPs	531.11	532.80	398.74	400.27	406.00	934.48	935.51	952.47	954.98

Table.S2. Death status of different groups of mice in acute toxicity experiments

Group	Number of animals	Number of deaths (pieces)	Survival count	Mortality rate (%)	Survival rate (%)
EGCG（30mg · kg^{-1}）	8	0	8	0	100
Metformin（100 mg · kg^{-1}）	8	0	8	0	100
EGCG & Metformin（30 mg · kg^{-1}）	8	0	8	0	100
Metformin-Cu (II)-EGCG ICP NPs（40 mg · kg^{-1}）	8	0	8	0	100
PBS	8	0	8	0	100