

Supplementary Material

Chemical and photothermal synergistic antimicrobial treatment for enhanced wound healing based on light/pH responsive nanocomposites

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1. Lagergren's pseudo-first-order kinetic model (Eq (1)) and Ho's pseudo-second-order model (Eq (2))

$$\ln(q_e - q_t) = \ln(q_e) - k_1 t \quad (1)$$

$$\frac{t}{q_t} = \frac{1}{k_2 q_e^2} + \frac{t}{q_e} \quad (2)$$

where, in equation (1) and (2): q_e (mg/g) is equilibrium adsorption capacity; q_t (mg/g) is the drug loading at different time points; t (min) is the drug loading time; k_1 and k_2 are kinetic constants.

2. Langmuir model (Eq (3)) and Freundlich model (Eq (4))

$$\frac{C_e}{q_e} = \frac{C_e}{q_m} + \frac{1}{q_m K_L} \quad (3)$$

$$\ln q_e = \ln K_f + \frac{1}{n} \ln C_e \quad (4)$$

where, in equation (3) and (4): C_e (mg/L) is the mass concentration at the time of drug loading equilibrium; q_m (mg/g) is the drug load in the saturated state; q_e (mg/g) is the drug load at equilibrium; K_L (mg/L) is the dissociation constant; K_f (mL/g) is the Freundlich constant; $1/n$ is the Freundlich component factor.

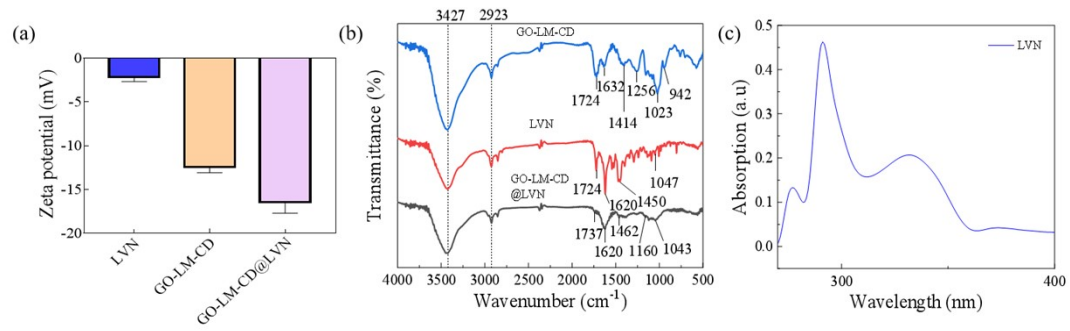


Figure S1. (a) The Zeta potential; (b) FTIR spectra of GO-LM-CD, LVN, GO-LM-CD@LVN; (c)

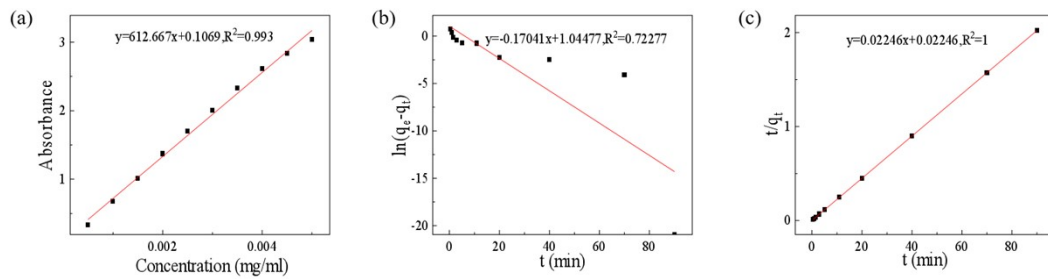


Figure S2. (a) Standard curve for LVN; (b) Line fitting with Lagergren's pseudo-first-order model; (c) Line fitting with Ho's pseudo-second-order model for adsorption kinetics.

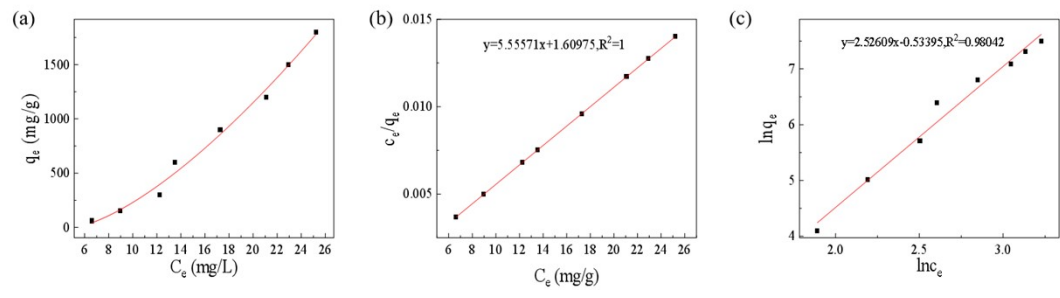


Figure S3. (a) Adsorption isotherms of GO-LM-CD on LVN; (b) Linear fitting of Langmuir adsorption of GO-LM-CD to LVN; (c) Freundlich adsorption of GO-LM-CD to LVN.

Table S1. The pharmacokinetic parameters of GO-LM-CD on LVN.

Lagergren's pseudo-first-order kinetic model			Ho's pseudo-second-order kinetic model		
q_e (mg/g)	k_1 (h^{-1})	R^2	q_e (mg/g)	k_2 ($g(mg \cdot h)^{-1}$)	R^2
2.8427	0.1704	0.7228	44.5236	0.4169	1.0000

Table S2. Related parameters of Langmuir isotherm and Freundlich isotherm adsorption models for LVN by GO-LM-CD.

Langmuir isotherm Model			Freundlich isotherm Model		
q_m (mg/g)	K_L (mg/mL)	R^2	n	K_f (mL/g)	R^2
0.1780	3.4513	1.0000	0.39586	-0.18782	0.98042

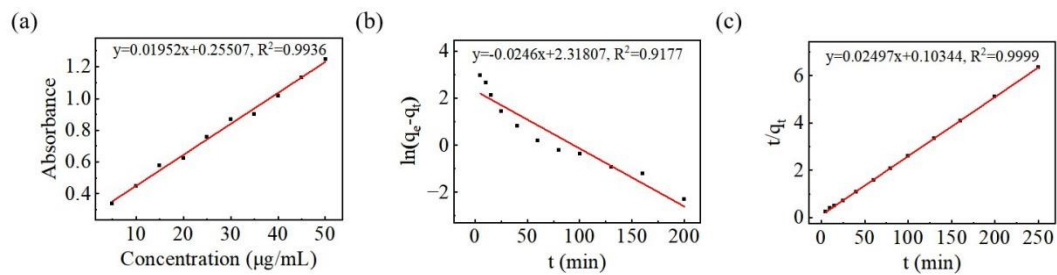


Figure S4. (a) Standard curve for OXY; (b) Line fitting with Lagergren's pseudo-first-order model; (c) Line fitting with Ho's pseudo-second-order model for adsorption kinetics.

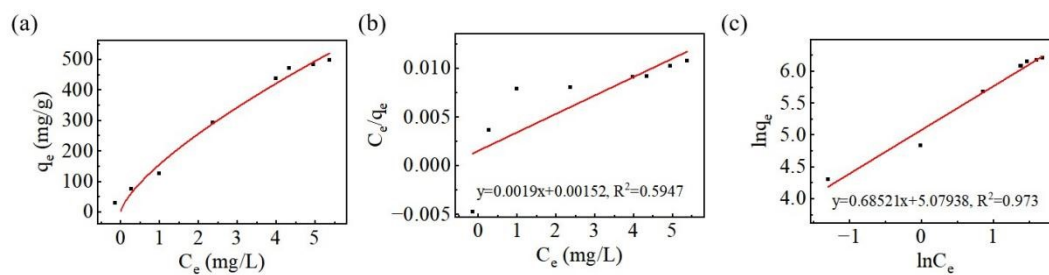


Figure S5. (a) Adsorption isotherms of GO-LM-CD on OXY; (b) Linear fitting of Langmuir adsorption of GO-LM-CD to OXY; (c) Freundlich adsorption of GO-LM-CD to OXY.

Table S3. The pharmacokinetic parameters of GO-LM-CD on OXY.

Lagergren's pseudo-first-order kinetic model			Ho's pseudo-second-order kinetic model		
q_e (mg/g)	k_1 (h^{-1})	R^2	q_e (mg/g)	k_2 ($g(mg \cdot h)^{-1}$)	R^2
10.1561	0.0246	0.9177	40.0481	0.0060	0.9999

Table S4. Related parameters of Langmuir isotherm and Freundlich isotherm adsorption models for OXY by GO-LM-CD.

Langmuir isotherm Model			Freundlich isotherm Model		
q_m (mg/g)	K_L (mg/mL)	R^2	n	K_f (mL/g)	R^2
526.3158	1.2500	0.5947	1.4594	160.6744	0.9730

Table S5. Scoring criteria for skin anaphylaxis.

cutaneous reaction		score
erythema	edema	
no erythema	no edema	0
mild erythema, barely visible	mild edema, barely visible	1
moderate erythema, clearly visible	moderate edema, clearly visible	2
heavy erythema	heavy edema (skin uplift of about 1 mm and clear outline)	3
severe erythema (amaranth) to slight eschar formation	severe edema (skin uplift of about 1 mm above or blisters or rupture)	4

Table S6. Evaluation criteria for skin sensitization.

sensitization rate (%)	edema	allergy reaction intensity
0-8	I	weak sensitization
9-28	II	mild sensitization
29-64	III	moderate sensitization
65-80	IV	strong sensitization
81-100	V	very strong sensitization

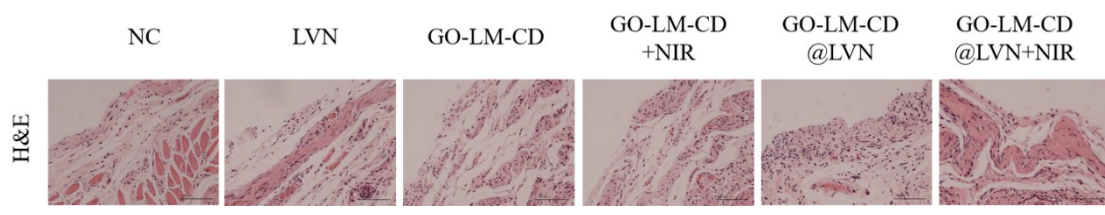


Figure S6. H&E staining images of mice tissues were taken on the 14th day (Scale bar: 50 μm)