

Table.1S The orthogonal analysis of 4 factors with 3 levels for optimal SLN-TD

Number	Factors with 3 levels				Characteristics				
	A	B	C	D	MD (nm)	ZP (mV)	PDI	EE (%)	LC(%)
1	A ₁	B ₁	C ₁	D ₁	345.5±8.9	38.97±1.20	0.087±0.006	58.69±1.44	8.02±0.51
2	A ₁	B ₂	C ₂	D ₂	454.1±6.8	33.73±0.74	0.241±0.016	64.31±2.46	6.89±0.72
3	A ₁	B ₃	C ₃	D ₃	513.1±9.6	38.00±0.91	0.072±0.008	72.02±2.15	7.08±0.66
4	A ₂	B ₁	C ₂	D ₃	509.7±8.7	34.83±0.90	0.098±0.006	70.04±1.39	4.67±0.28
5	A ₂	B ₂	C ₃	D ₁	386.2±5.4	37.93±0.82	0.174±0.011	61.90±1.00	4.28±0.15
6	A ₂	B ₃	C ₁	D ₂	388.1±6.2	40.33±1.01	0.109±0.007	75.66±1.81	6.54±0.59
7	A ₃	B ₁	C ₃	D ₂	363.3±4.5	42.17±0.70	0.127±0.011	65.10±1.88	3.92±0.32
8	A ₃	B ₂	C ₁	D ₃	436.9±5.3	40.93±0.12	0.203±0.014	55.33±1.89	2.30±0.16
9	A ₃	B ₃	C ₂	D ₁	357.2±6.5	40.87±0.87	0.166±0.009	61.38±0.76	3.04±0.09

Note: A, the ratio of SLN to TD; A₁, 1:3; A₂, 1:5; A₃, 1:7; B, the temperature; B₁, 110 °C; B₂, 120 °C; B₃, 130 °C; C, the concentration of PVA%; C₁, 1%; C₂, 2%; C₃, 3%; D, the volume of PVA; D₁, 9 mL; D₂, 12 mL; D₃, 15 mL.

Table.2S The physicochemical characteristics of further optimal SLN-TD

Conditions	EE(%)	LC(%)	ZP(mV)	MD(nm)	PDI
100 °C+4%PVA ^a	82.23±0.45	7.36±0.18	37.83±0.95	322.63±1.51	0.49±0.01
100 °C+5%PVA	72.45±0.20	4.29±0.04	43.10±1.18	553.80±7.40	0.24±0.10
140 °C+4%PVA	82.87±0.68	5.92±0.07	44.97±0.42	460.43±26.19	0.29±0.01
140 °C+5%PVA	82.77±0.38	4.64±0.09	48.03±1.47	534.43±24.82	0.30±0.05

Note: ^a, the optimal SLN-TD preparation.

Table 3S Scoring criteria of clinical symptoms of S.aureus infection in mice.

Clinical Symptom Scoring Criteria for Mouse Staphylococcus aureus Infection.	
Clinical symptoms	Score
Normal activity and feeding	0
Reluctant to move; Cannot turn over	0.5
Huddled together, weight loss, depressed spirit	1
Purulent discharge from the eyes, dilated pupils, and slight body tremors.	1.5
Severe purulent discharge from the eyes, diarrhea, and lack of appetite	2
Severe weakness and lethargy.	2.5
Unable to open eyes, trembling and convulsions, and severely ruffled fur on the back.	3
Slowed heart rate and weakness in the limbs	3.5
Near death or death.	4

Table 4S Score table of S.aureus infection model in mice (mean $\pm$ standard deviation, n = 6)

Time(h)	0	1 $\times$ 10 ⁹ CFU/mL	5 $\times$ 10 ⁸ CFU/mL	2 $\times$ 10 ⁸ CFU/mL
0	0	0	0	0
2	0	0.5 $\pm$ 0.32	0.25 $\pm$ 0.27	0.17 $\pm$ 0.26
4	0	1.25 $\pm$ 0.69	0.67 $\pm$ 0.52	0.33 $\pm$ 0.26
6	0	2.5 $\pm$ 0.71	1.75 $\pm$ 0.27	0.92 $\pm$ 0.58
8	0	2.83 $\pm$ 0.68	2.25 $\pm$ 0.69	1.5 $\pm$ 0.45
10	0	3.50 $\pm$ 0.45	2.92 $\pm$ 0.8	1.92 $\pm$ 0.49
12	0	3.75 $\pm$ 0.42	3.17 $\pm$ 0.68	2.5 $\pm$ 0.89
24	0	4	3.42 $\pm$ 0.66	2.92 $\pm$ 0.92
36	0	4	3.42 $\pm$ 0.66	2.92 $\pm$ 0.92
48	0	4	3.50 $\pm$ 0.55	3.17 $\pm$ 0.82
72	0	4	3.58 $\pm$ 0.49	3.17 $\pm$ 0.82

Table 5S Rating table of mouse treatment model (mean $\pm$ standard deviation, n = 6)

Time(h)	Inf.	TD-Treated	SLN-TD-Treated
0	0	0	0
2	0.5 $\pm$ 0.32	0.58 $\pm$ 0.38	0.5 $\pm$ 0.32
4	1.25 $\pm$ 0.69	1.17 $\pm$ 0.26	1.00
6	2.5 $\pm$ 0.71	1.25 $\pm$ 0.27	1.25 $\pm$ 0.42
8	2.83 $\pm$ 0.68	1.50 $\pm$ 0.45	1.25 $\pm$ 0.27
10	3.50 $\pm$ 0.45	1.58 $\pm$ 0.49	1.25 $\pm$ 0.27
12	3.75 $\pm$ 0.42	1.75 $\pm$ 0.42	1.17 $\pm$ 0.26
24	4	1.83 $\pm$ 0.26	1.08 $\pm$ 0.2
36	4	2.08 $\pm$ 0.2	0.92 $\pm$ 0.38
48	4	2.25 $\pm$ 0.27	0.75 $\pm$ 0.27
72	4	2.33 $\pm$ 0.41	0.67 $\pm$ 0.26
96	4	2.42 $\pm$ 0.38	0.58 $\pm$ 0.2