

Supporting Information

The Preparation, Determination of a Flexible Complex Liposome Co-Loaded with Cabazitaxel and β -Elemene, and Animal Pharmacodynamics on Paclitaxel-Resistant Lung Adenocarcinoma

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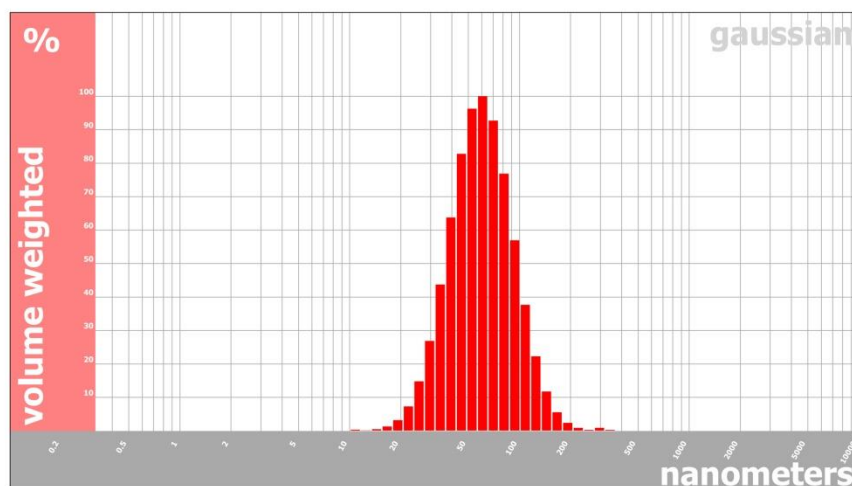
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Particle Size Analysis



Particle Sizing System NICOMP

Serial Number

1808303

cabazitaxel-beta-elemene liposome - Lot: 2018111701

Custom Recipe

Sample Date 2019/4/18

Refractive Index 1.333

Viscosity 0.933 cP

Particle Type Solid

Cell Type Square

Measurement Date 2019/4/18 13:14 UTC+08:00

Channel Width 13 μ sec (auto)

Temperature 23 $^{\circ}$ C

Intensity Set Point 300 KHz

First Channel Used 2

Analysis Results - Gaussian Distribution

	Intensity	Volume	Number		
Mean Diameter	108.08	65.04	36.41	Run Time	0:05:03
St.Dev.	46.26	27.84	15.58	Chi²	15.755
CV %	42.80%	42.80%	42.80%	Baseline Adj.	0.000
PI	0.18	0.18	0.18	Decay	2.487
				Fit Error	5.991
				Residual	5.439
Cumulative Results	Intensity	Volume	Number	Minimun Diameter	10 nm
25% of distribution <	73.79	44.42	25.14	Plot Size	45
50% of distribution <	98.53	59.31	33.40	Smoothing	3
75% of distribution <	131.57	79.18	44.49	Plot Range	100
80% of distribution <	141.34	85.06	47.78		
90% of distribution <	170.66	102.71	57.66		
99% of distribution <	266.96	160.67	90.10		

Printed:

2019/4/18 13:15 UTC+08:00 - zyy

Measured:

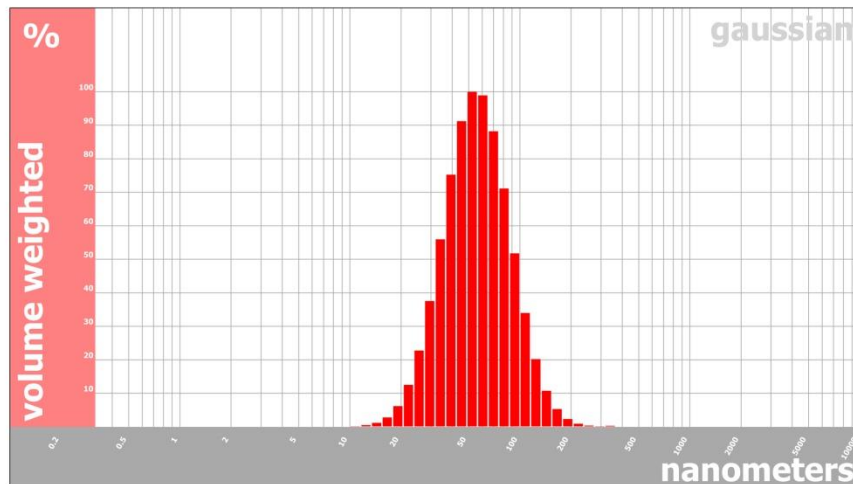
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Approved:

2019/4/18 13:14 UTC+08:00 - zzw

Figure S1. The particle size and distribution of the complex liposome (1)

Particle Size Analysis



Particle Sizing System NICOMP

Serial Number

1808303

cabazitaxel-beta-elemene liposome - Lot: 2018111701

Custom Recipe

Sample Date 2019/4/18

Refractive Index 1.333

Viscosity 0.933 cP

Particle Type Solid

Cell Type Square

Measurement Date 2019/4/18 13:23 UTC+08:00

Channel Width 12 μ sec (auto)

Temperature 23 $^{\circ}$ C

Intensity Set Point 300 KHz

First Channel Used 2

Analysis Results - Gaussian Distribution

	Intensity	Volume	Number		
Mean Diameter	107.62	61.35	32.55	Run Time	0:05:03
St.Dev.	48.32	27.55	14.61	Chi²	23.420
CV %	44.90%	44.90%	44.90%	Baseline Adj.	0.000
PI	0.20	0.20	0.20	Decay	2.307
				Fit Error	7.519
				Residual	0.000
Cumulative Results	Intensity	Volume	Number	Minimun Diameter	10 nm
25% of distribution <	71.77	40.94	22.34	Plot Size	45
50% of distribution <	97.21	55.43	29.86	Smoothing	3
75% of distribution <	131.66	75.07	40.21	Plot Range	100
80% of distribution <	141.93	80.92	43.31		
90% of distribution <	172.98	98.62	52.69		
99% of distribution <	276.60	157.70	84.05		

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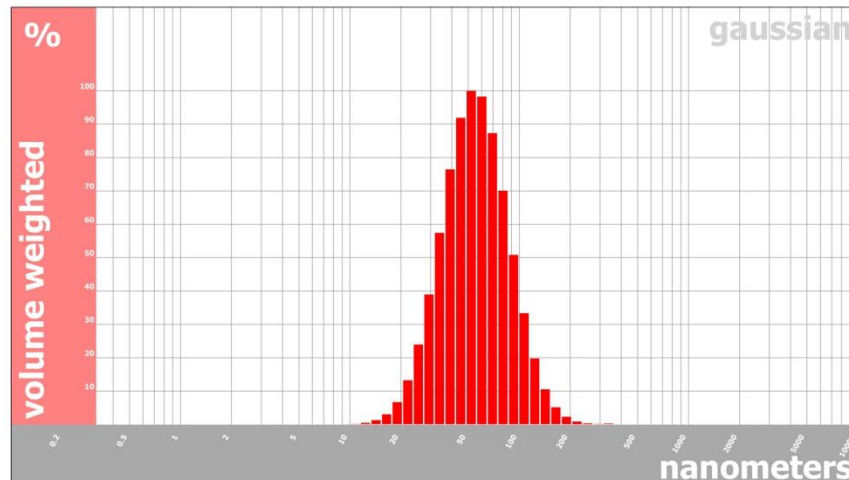
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Approved:

2019/4/18 13:23 UTC+08:00 - zzw

Figure S2. The particle size and distribution of the complex liposome (2)

Particle Size Analysis



Particle Sizing System NICOMP

Serial Number

1808303

cabazitaxel-beta-elemene liposome - Lot: 2018111701

Custom Recipe

Sample Date 2019/4/18

Refractive Index 1.333

Viscosity 0.933 cP

Particle Type Solid

Cell Type Square

Measurement Date 2019/4/18 13:31 UTC+08:00

Channel Width 12 μ sec (auto)

Temperature 23 $^{\circ}$ C

Intensity Set Point 300 KHz

First Channel Used 2

Analysis Results - Gaussian Distribution

	Intensity	Volume	Number		
Mean Diameter	106.93	60.48	31.89	Run Time	0:05:02
St.Dev.	48.33	27.34	14.41	Chi²	15.661
CV %	45.20%	45.20%	45.20%	Baseline Adj.	0.000
PI	0.20	0.20	0.20	Decay	2.323
				Fit Error	5.652
				Residual	18.254
Cumulative Results	Intensity	Volume	Number	Minimum Diameter	10 nm
25% of distribution <	71.10	40.24	21.89	Plot Size	45
50% of distribution <	96.47	54.58	29.27	Smoothing	3
75% of distribution <	130.89	74.05	39.47	Plot Range	100
80% of distribution <	141.17	79.87	42.52		
90% of distribution <	172.26	97.45	51.78		
99% of distribution <	276.23	156.26	82.81		

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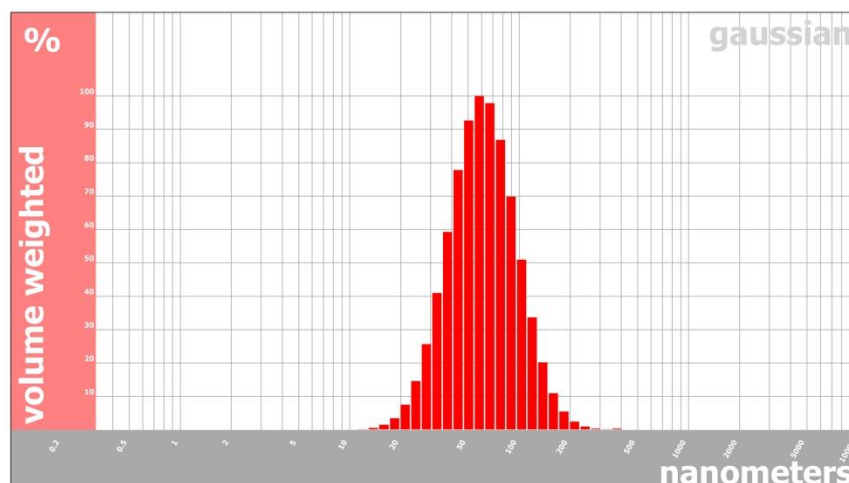
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Approved:

2019/4/18 13:31 UTC+08:00 - zzw

Figure S3. The particle size and distribution of the complex liposome (3)

Particle Size Analysis



Particle Sizing System NICOMP

Serial Number

1808303

beta-elemene liposome - Lot: 2018110801

Custom Recipe

Sample Date 2019/4/18

Refractive Index 1.333

Viscosity 0.933 cP

Particle Type Solid

Cell Type Square

Measurement Date 2019/4/18 12:31 UTC+08:00

Channel Width 13 μ sec (auto)

Temperature 23 $^{\circ}$ C

Intensity Set Point 300 KHz

First Channel Used 2

Analysis Results - Gaussian Distribution

	Intensity	Volume	Number
Mean Diameter	119.31	67.22	34.40
St.Dev.	54.76	30.85	15.79
CV %	45.90%	45.90%	45.90%
PI	0.21	0.21	0.21

Cumulative Results	Intensity	Volume	Number
25% of distribution <	78.69	44.37	23.64
50% of distribution <	107.29	60.47	31.64
75% of distribution <	146.27	82.43	42.78
80% of distribution <	157.95	89.01	46.14
90% of distribution <	193.33	108.94	56.33
99% of distribution <	312.34	175.99	90.67

Run Time 0:05:02

Chi² 84.693

Baseline Adj. 0.000

Decay 2.253

Fit Error 17.458

Residual 11.261

Minimun Diameter 10 nm

Plot Size 45

Smoothing 3

Plot Range 100

Printed:

2019/4/18 12:37 UTC+08:00 - zyy

Measured:

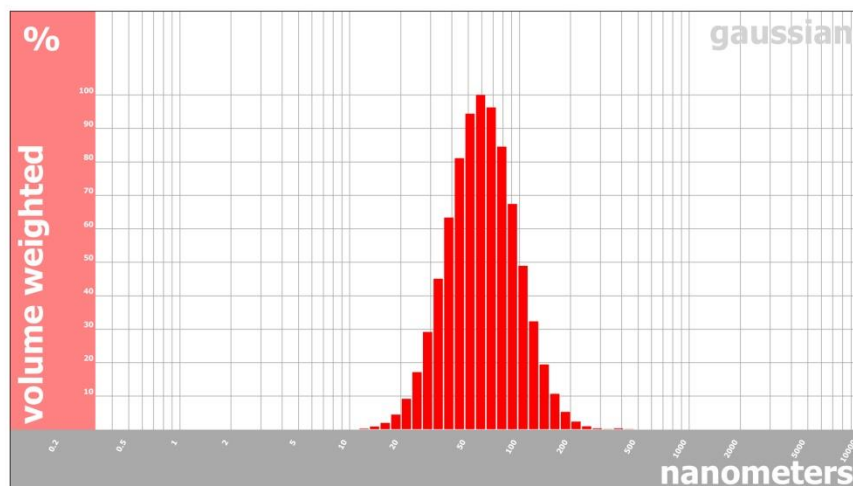
2019/4/18 12:31 UTC+08:00 - zyy

Approved:

2019/4/18 12:31 UTC+08:00 - zzw

Figure S4. The particle size and distribution of the β -elemene liposome (1)

Particle Size Analysis



Particle Sizing System NICOMP

Serial Number

1808303

beta-elemene liposome - Lot: 2018110801

Custom Recipe

Sample Date 2019/4/18

Refractive Index 1.333

Viscosity 0.933 cP

Particle Type Solid

Cell Type Square

Measurement Date 2019/4/18 12:46 UTC+08:00

Channel Width 13 μ sec (auto)

Temperature 23 $^{\circ}$ C

Intensity Set Point 300 KHz

First Channel Used 2

Analysis Results - Gaussian Distribution

	Intensity	Volume	Number
Mean Diameter	121.23	66.91	33.46
St.Dev.	56.73	31.32	15.66
CV %	46.80%	46.80%	46.80%
PI	0.22	0.22	0.22

Cumulative Results	Intensity	Volume	Number
25% of distribution <	79.17	43.75	23.09
50% of distribution <	108.58	59.97	30.89
75% of distribution <	148.90	82.22	41.90
80% of distribution <	161.01	88.91	45.23
90% of distribution <	197.83	109.23	55.38
99% of distribution <	322.50	178.05	89.84

Run Time 0:05:02

Chi² 90.537

Baseline Adj. 0.000

Decay 2.218

Fit Error 15.020

Residual 13.089

Minimum Diameter 10 nm

Plot Size 45

Smoothing 3

Plot Range 100

Printed:

2019/4/18 12:48 UTC+08:00 - zyy

Measured:

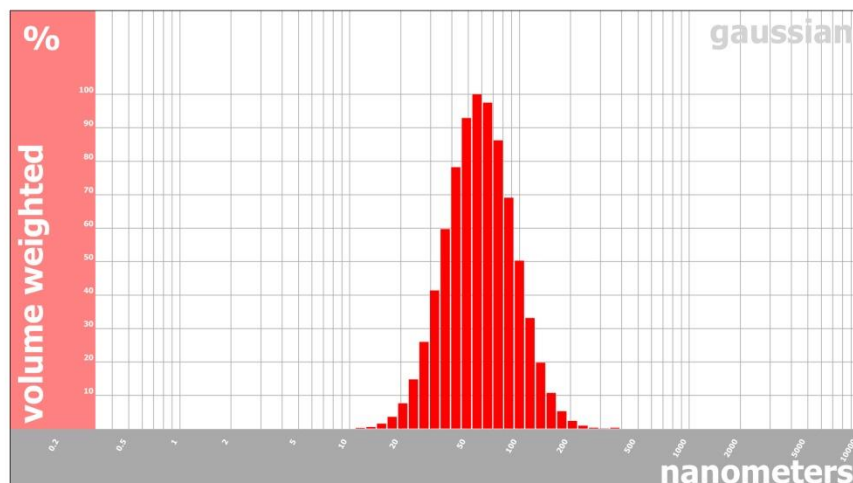
2019/4/18 12:46 UTC+08:00 - zyy

Approved:

2019/4/18 12:46 UTC+08:00 - zzw

Figure S5. The particle size and distribution of the β -elemene liposome (2)

Particle Size Analysis



Particle Sizing System NICOMP

Serial Number

1808303

beta-elemene liposome - Lot: 2018110801

Custom Recipe

Sample Date 2019/4/18

Refractive Index 1.333

Viscosity 0.933 cP

Particle Type Solid

Cell Type Square

Measurement Date 2019/4/18 13:05 UTC+08:00

Channel Width 13 μ sec (auto)

Temperature 23 $^{\circ}$ C

Intensity Set Point 300 KHz

First Channel Used 2

Analysis Results - Gaussian Distribution

	Intensity	Volume	Number
Mean Diameter	115.45	64.75	33.28
St.Dev.	52.99	29.72	15.28
CV %	45.90%	45.90%	45.90%
PI	0.21	0.21	0.21

Cumulative Results	Intensity	Volume	Number
25% of distribution <	76.16	42.75	22.88
50% of distribution <	103.83	58.25	30.61
75% of distribution <	141.54	79.40	41.39
80% of distribution <	152.84	85.74	44.64
90% of distribution <	187.06	104.93	54.49
99% of distribution <	302.15	169.48	87.71

Run Time 0:05:02

Chi² 77.978

Baseline Adj. 0.000

Decay 2.330

Fit Error 17.560

Residual 10.814

Minimun Diameter 10 nm

Plot Size 45

Smoothing 3

Plot Range 100

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2019/4/18 13:06 UTC+08:00 - zyy

Measured:

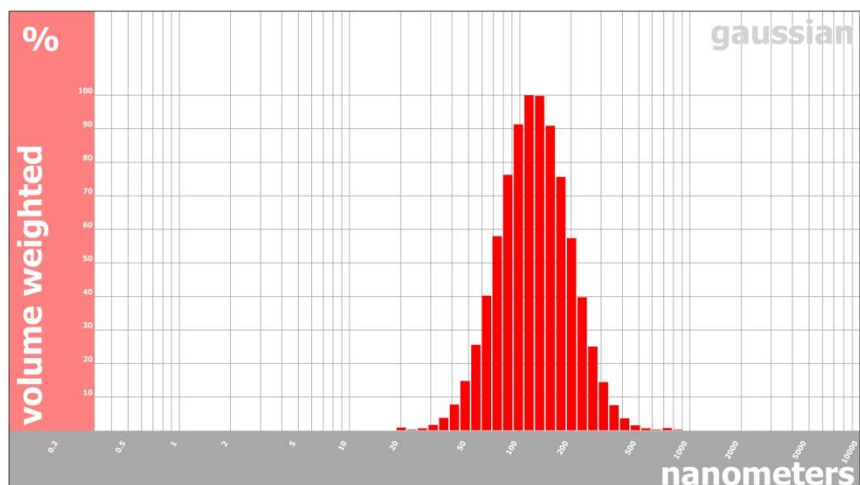
2019/4/18 13:05 UTC+08:00 - zyy

Approved:

2019/4/18 13:05 UTC+08:00 - zzw

Figure S6. The particle size and distribution of the β -elemene liposome (3)

Particle Size Analysis



Particle Sizing System NICOMP

Serial Number

1808303

cabazitaxel liposome - Lot: 2018111401

Custom Recipe

Sample Date 2019/4/18

Refractive Index 1.333

Viscosity 0.933 cP

Particle Type Solid

Cell Type Square

Measurement Date 2019/4/18 14:11 UTC+08:00

Channel Width 24 μ sec (auto)

Temperature 23 $^{\circ}$ C

Intensity Set Point 300 KHz

First Channel Used 2

Analysis Results - Gaussian Distribution

	Intensity	Volume	Number
Mean Diameter	201.29	135.87	55.06
St.Dev.	95.61	64.54	26.15
CV %	47.50%	47.50%	47.50%
PI	0.23	0.23	0.23

Cumulative Results	Intensity	Volume	Number
25% of distribution <	130.38	88.03	37.94
50% of distribution <	179.67	121.30	50.86
75% of distribution <	247.59	167.14	69.22
80% of distribution <	268.07	180.96	74.80
90% of distribution <	330.42	223.04	91.83
99% of distribution <	542.70	366.33	150.02

Run Time	0:05:03
Chi ²	37.911
Baseline Adj.	0.000
Decay	2.465
Fit Error	2.593
Residual	9.659

Minimun Diameter	10 nm
Plot Size	45
Smoothing	3
Plot Range	100

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Measured:

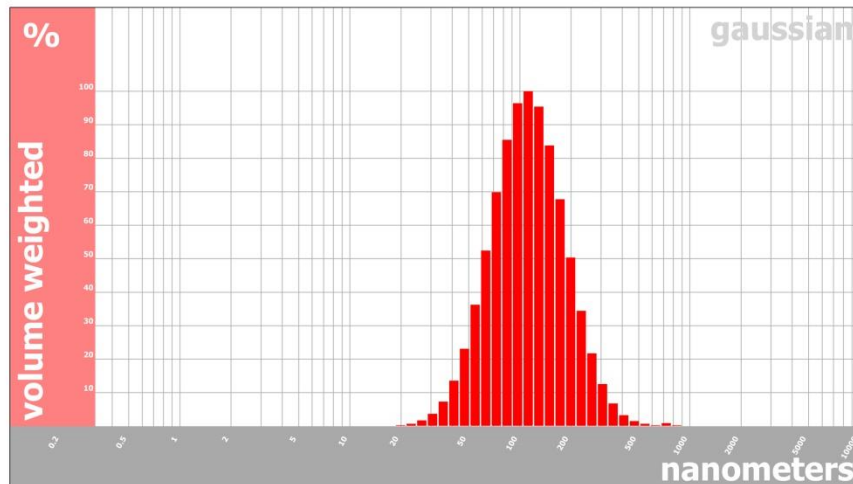
2019/4/18 14:11 UTC+08:00 - zyy

Approved:

2019/4/18 14:11 UTC+08:00 - zzw

Figure S7. The particle size and distribution of the cabazitaxel liposome (1)

Particle Size Analysis



Particle Sizing System NICOMP

Serial Number

1808303

cabazitaxel liposome - Lot: 2018111401

Custom Recipe

Sample Date 2019/4/18

Refractive Index 1.333

Viscosity 0.933 cP

Particle Type Solid

Cell Type Square

Measurement Date 2019/4/18 14:21 UTC+08:00

Channel Width 23 μ sec (auto)

Temperature 23 $^{\circ}$ C

Intensity Set Point 300 KHz

First Channel Used 2

Analysis Results - Gaussian Distribution

	Intensity	Volume	Number		
Mean Diameter	198.88	125.56	48.24	Run Time	0:05:04
St.Dev.	99.24	62.66	24.07	Chi ²	26.843
CV %	49.90%	49.90%	49.90%	Baseline Adj.	0.000
PI	0.25	0.25	0.25	Decay	2.390
				Fit Error	3.199
				Residual	19.693
Cumulative Results				Minimun Diameter	10 nm
25% of distribution <	125.35	79.21	34.21	Plot Size	45
50% of distribution <	175.50	110.85	45.54	Smoothing	3
75% of distribution <	245.71	155.18	62.26	Plot Range	100
80% of distribution <	267.08	168.67	67.41		
90% of distribution <	332.63	210.05	83.30		
99% of distribution <	559.93	353.55	138.71		

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Measured:

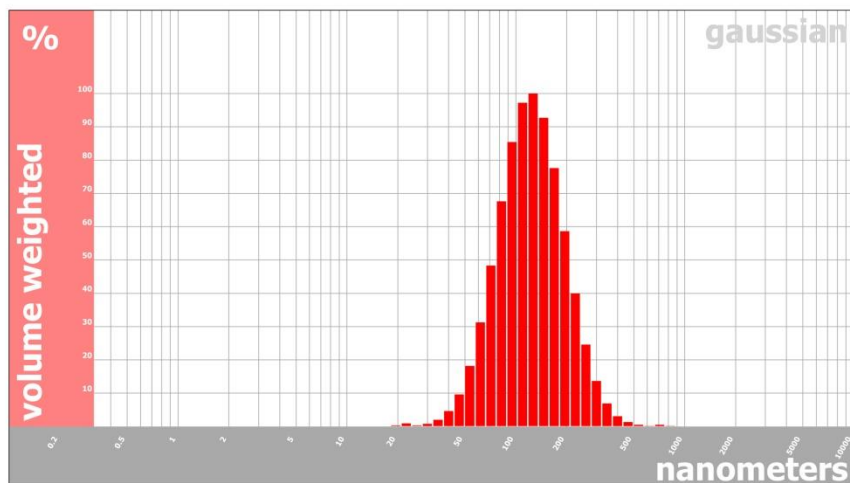
2019/4/18 14:21 UTC+08:00 - zyy

Approved:

2019/4/18 14:21 UTC+08:00 - zzw

Figure S8. The particle size and distribution of the cabazitaxel liposome (2)

Particle Size Analysis



Particle Sizing System NICOMP

Serial Number

1808303

cabazitaxel liposome - Lot: 2018111401

Custom Recipe

Sample Date 2019/4/18

Refractive Index 1.333

Viscosity 0.933 cP

Particle Type Solid

Cell Type Square

Measurement Date 2019/4/18 14:30 UTC+08:00

Channel Width 22 μ sec (auto)

Temperature 23 $^{\circ}$ C

Intensity Set Point 300 KHz

First Channel Used 2

Analysis Results - Gaussian Distribution

	Intensity	Volume	Number		
Mean Diameter	194.65	135.21	61.01	Run Time	0:05:03
St.Dev.	87.40	60.71	27.39	Chi²	12.689
CV %	44.90%	44.90%	44.90%	Baseline Adj.	0.000
PI	0.20	0.20	0.20	Decay	2.339
				Fit Error	4.279
				Residual	18.612
Cumulative Results	Intensity	Volume	Number	Minimum Diameter	10 nm
25% of distribution <	129.93	90.26	41.70	Plot Size	45
50% of distribution <	175.88	122.18	55.84	Smoothering	3
75% of distribution <	238.08	165.38	75.23	Plot Range	100
80% of distribution <	256.63	178.27	81.04		
90% of distribution <	312.66	217.18	98.58		
99% of distribution <	499.55	347.00	157.19		

Printed:

2019/4/18 14:31 UTC+08:00 - zyy

Measured:

2019/4/18 14:30 UTC+08:00 - zyy

Approved:

2019/4/18 14:30 UTC+08:00 - zzw

Figure S9. The particle size and distribution of the cabazitaxel liposome (3)

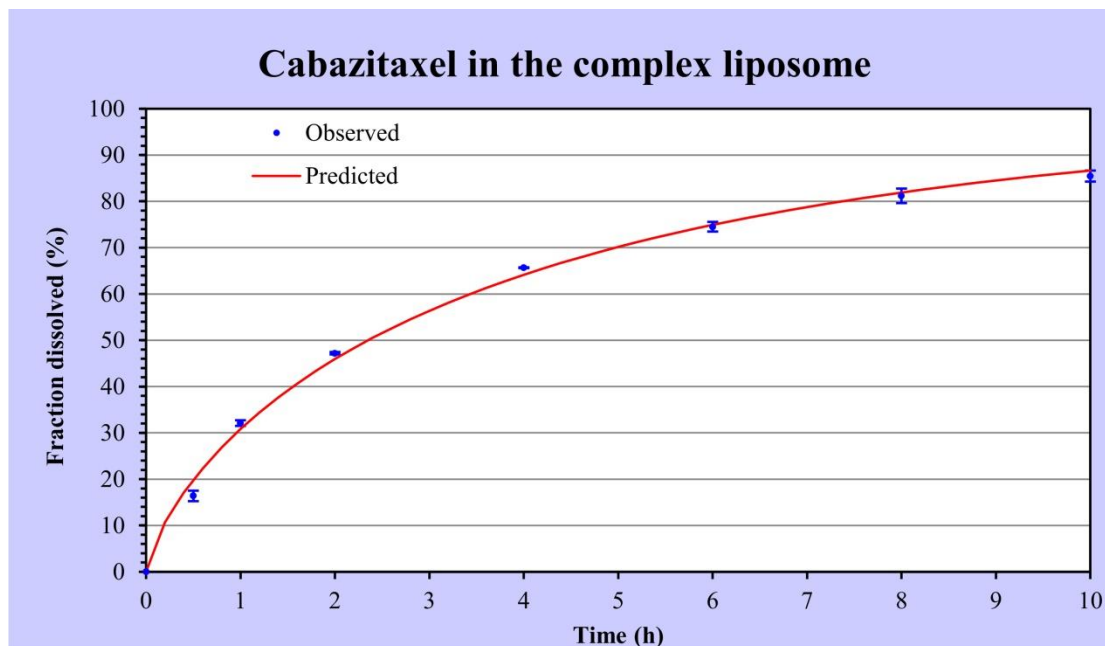


Figure S10. The release rate and fitting curve of cabazitaxel in the complex liposome

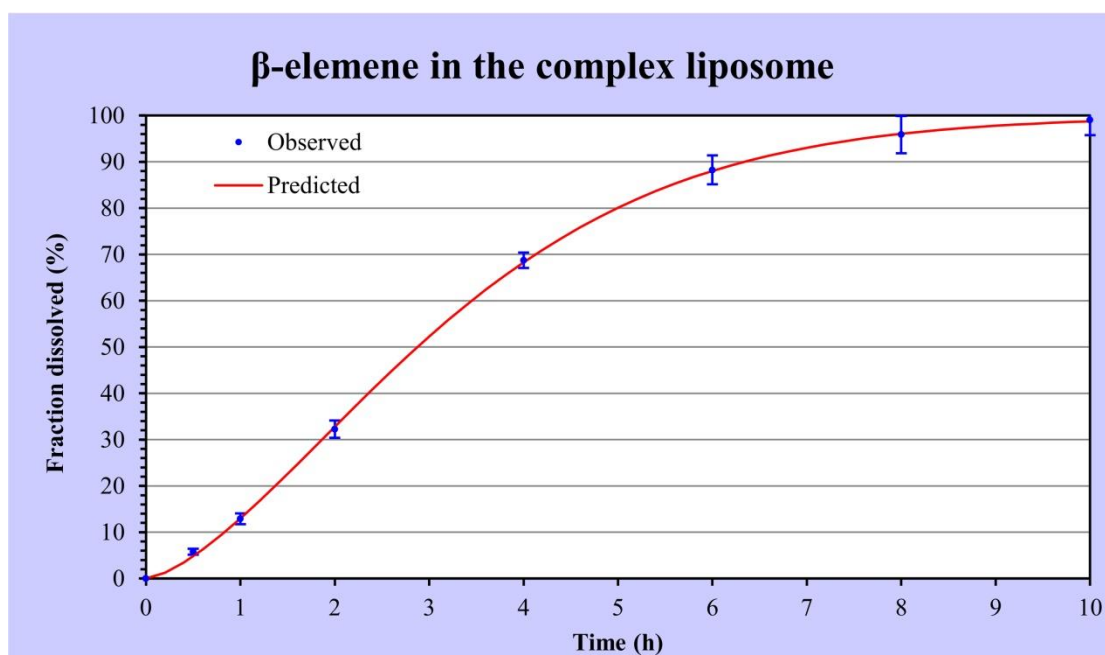


Figure S11. The release rate and fitting curve of β -elemene in the complex liposome

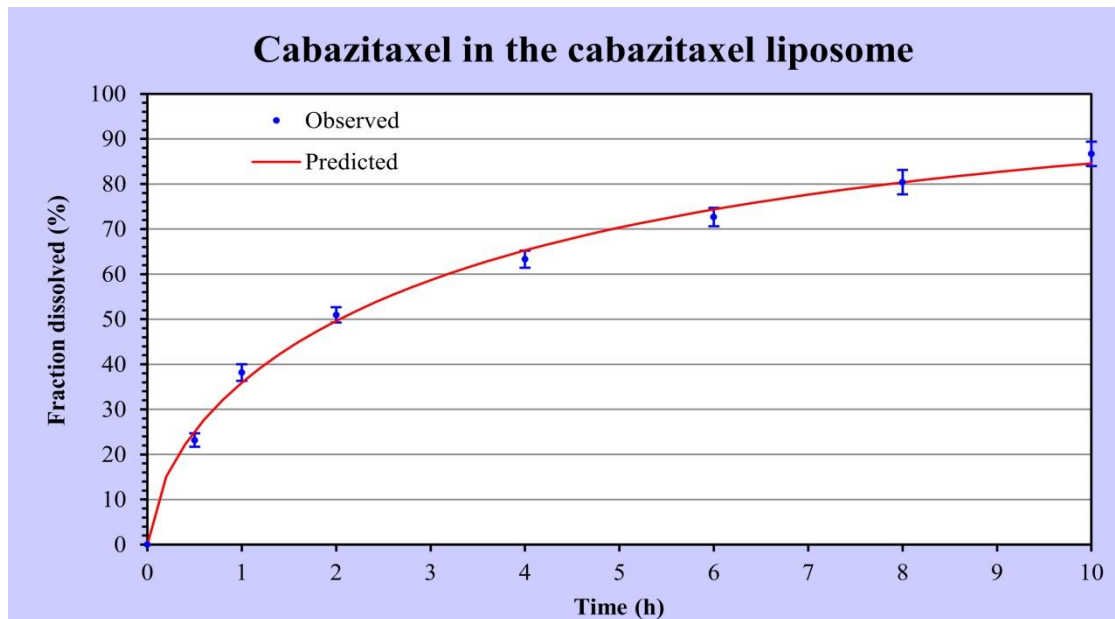


Figure S12. The release rate and fitting curve of cabazitaxel in the cabazitaxel liposome

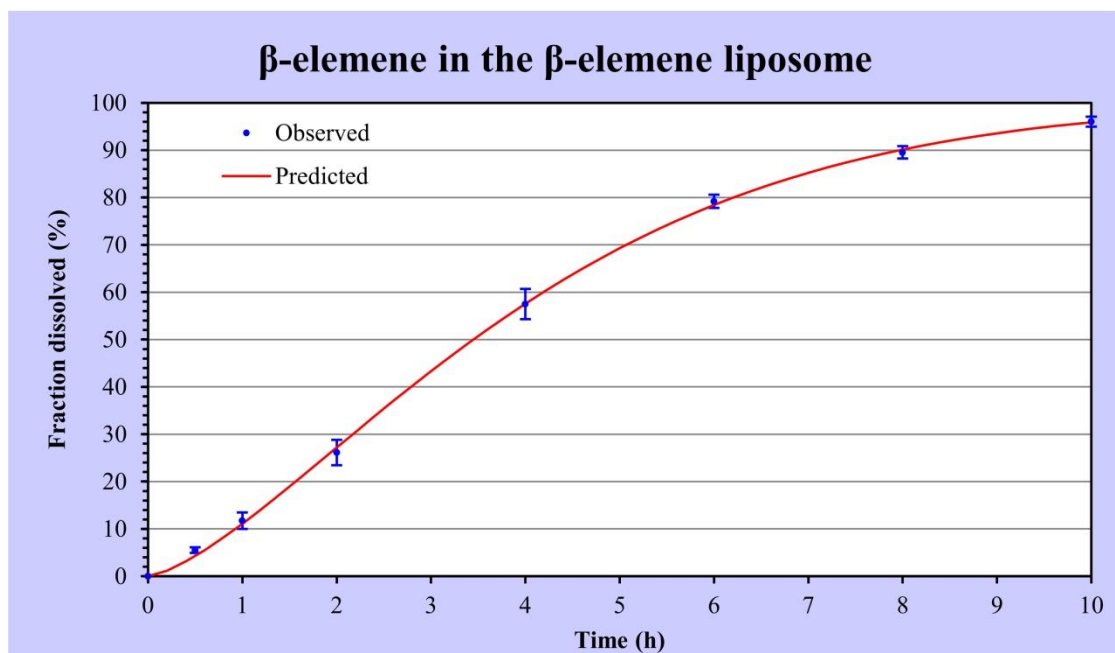


Figure S13. The release rate and fitting curve of β -elemene in the β -elemene liposome