

Supplementary Materials

A Novel Zein-Based Composite Nanoparticles for Improving Bioaccessibility and Anti-Inflammatory Activity of Resveratrol

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Table S1. Peak assignments of Res, physical mixtures of Res and zein-MSC NPs and Res-zein-MSC NPs in FTIR spectra.

Res (cm ⁻¹)	Physical mixtures of Res and zein-MSC NPs (cm ⁻¹)	Res-zein-MSC NPs (cm ⁻¹)	Peak assignments*
1604.56	1605.16	-	v(aromatic -C-C-)
1582.75	1583.11	-	v(olefinic -C=C-)
1509.41	1509.30	-	v(aromatic ring - C=C-)
1461.52	1461.49	-	v(benzene ring)
1440.28	1440.83	1447.89	v(aromatic ring - C=C-)
1379.63	1380.11	-	v(-C-O-)
1322.62	1322.44	-	δ(=C-H)
1143.93	1144.74	-	v(Phenolic -C-O-)
1008.82	1008.98	-	δ(trans olefinic H- C=C-H)
986.17	986.51	-	δ(trans olefinic H- C=C-H)
963.71	964.18	-	v(trans olefinic - C=C-)
828.09	828.86	-	δ(=C-H of phenolic ring)
673.30	673.70	-	δ(=C-H of trans double bond)
603.11	603.61	-	δ(=C-H of trans double bond)

* Vibration modes: v, stretching; δ, bending.

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Table S2. The thermodynamic parameters obtained from double-logarithmic and Van't Hoff equations.

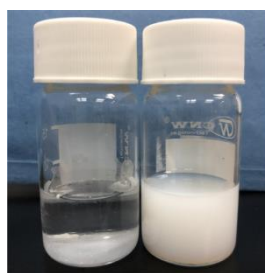
T (K)	K_a (10^2 L mol^{-1})	n	r^2	ΔH (KJ mol^{-1})	ΔS ($\text{J mol}^{-1} \text{ K}^{-1}$)	ΔG (KJ mol^{-1})
298	1.9467	0.8234	0.9958			-13.1004
310	1.6391	0.7488	0.9929	-14.9743	-6.2854	-13.0249
315	1.3763	0.7075	0.9841			-12.9935

Table S3. Parameters of the fitting curve of Korsmeyer-Peppas model in the study of *in-vitro* release behavior.

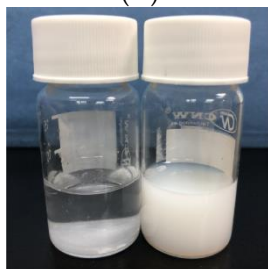
Zein:Res (w/w)	n	r²
10:1	0.2575	0.8684
8:1	0.3000	0.9031
6:1	0.2987	0.9079
4:1	0.3267	0.9288



(A)



(B)



(C)



(D)

Figure S1. Photo images of free Res and freeze-dried Res-zein-MSC NPs (zein to Res mass ratio of 10:1 (A), 8:1 (B), 6:1 (C) and 4:1 (D)), which are dispersed in water at the same amount of Res.

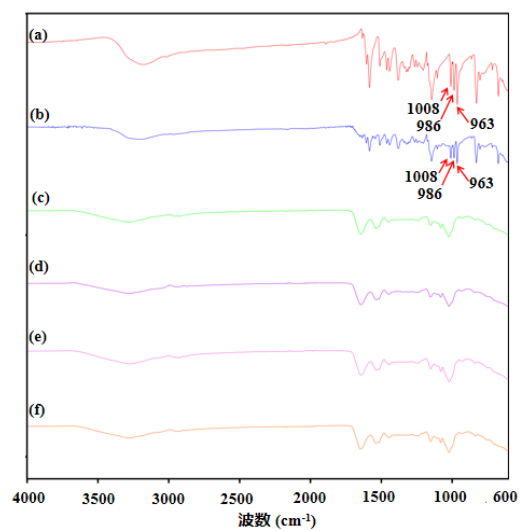


Figure S2. FTIR spectra for Res (a), physical mixtures of Res and zein-MSC NPs (b), and Res-zein-MSC NPs at zein to Res mass ratios of 10:1 (c), 8:1 (d), 6:1 (e) and 4:1 (f), respectively.

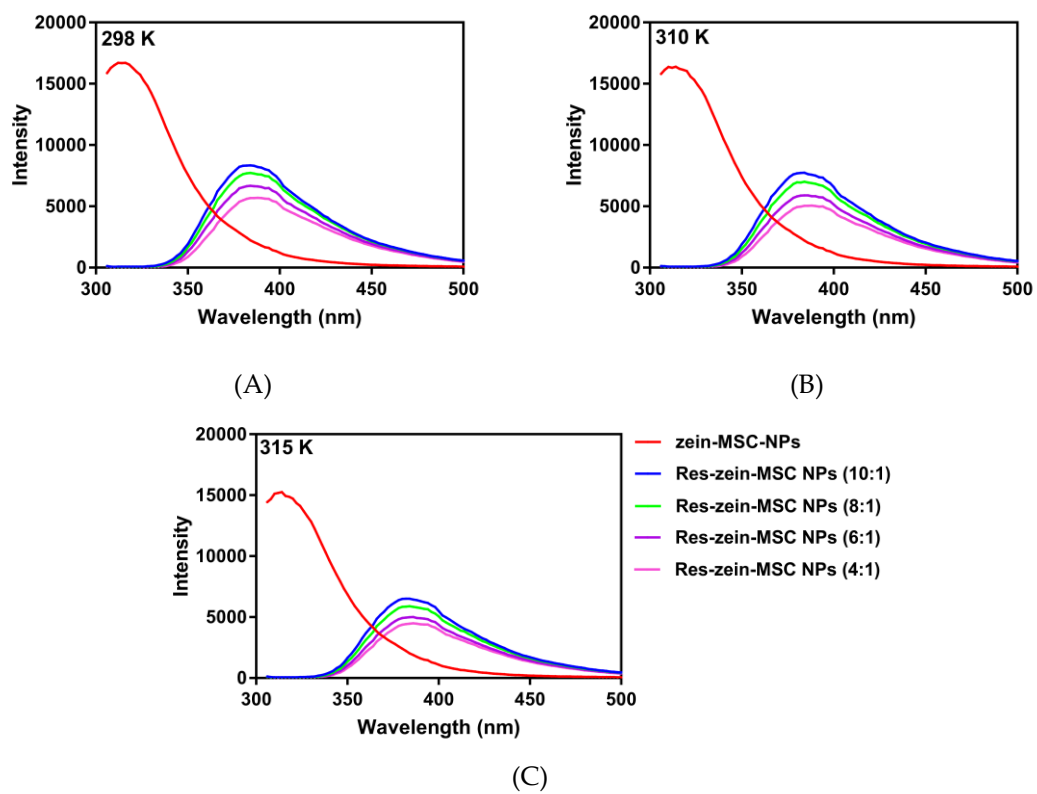


Figure S3. Emission fluorescence spectra for zein-MSC NPs and Res-zein-MSC NPs at 298 K (A), 310 K (B) and 315 K (C).

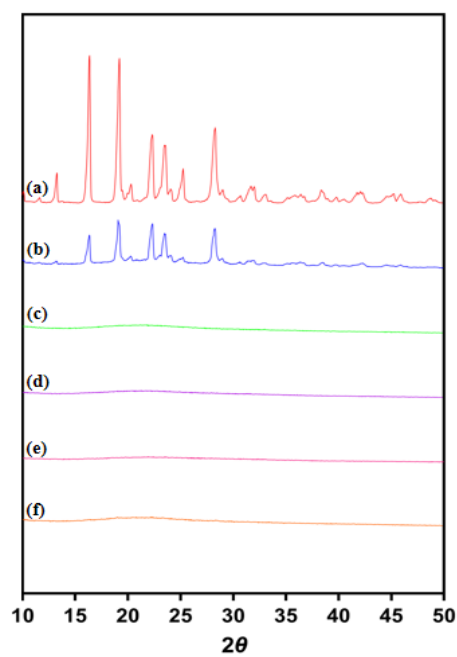


Figure S4. XRD spectra for Res (a), physical mixtures of Res and zein-MSC NPs (b), and Res-zein-MSC NPs at zein to Res mass ratios of 10:1 (c), 8:1 (d), 6:1 (e) and 4:1 (f), respectively.