

Supporting information

Preparation, characterization and anticancer activities of resveratrol loaded redox-sensitive F127-SS-TOC micelles

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Results

1. Synthesis of F127-TOC polymer

The synthesis of F127-TOC polymer was similar as F127-SS-TOC polymer described in our previous study¹ (shown in Fig. S1). Briefly, F127 polymer (1.0 mmol), succinic anhydride (SA, 2.2 mmol), DMAP (2.2 mmol) and DCC (2.2 mmol) were dissolved in 20 mL anhydrous dimethyl sulphoxide (DMSO) and stirred at room temperature for 24 h. The excess reactants were removed by dialyzing in dialysis tube with molecular weight cutoff at 3,500 Da. Subsequently, 2.2-fold equivalent of TOC was reacted with carboxyl group in F127-SA activated by DCC/DMAP. The excess of TOC, DCC and DMAP was removed by dialysis in a dialysis bag (molecular weight cutoff =3,500), and by-product N, N'-dicyclohexylurea was removed by the filterable membrane (0.45 µm). The final product F127 -TOC polymer was obtained by lyophilization and stored at 4°C for use.

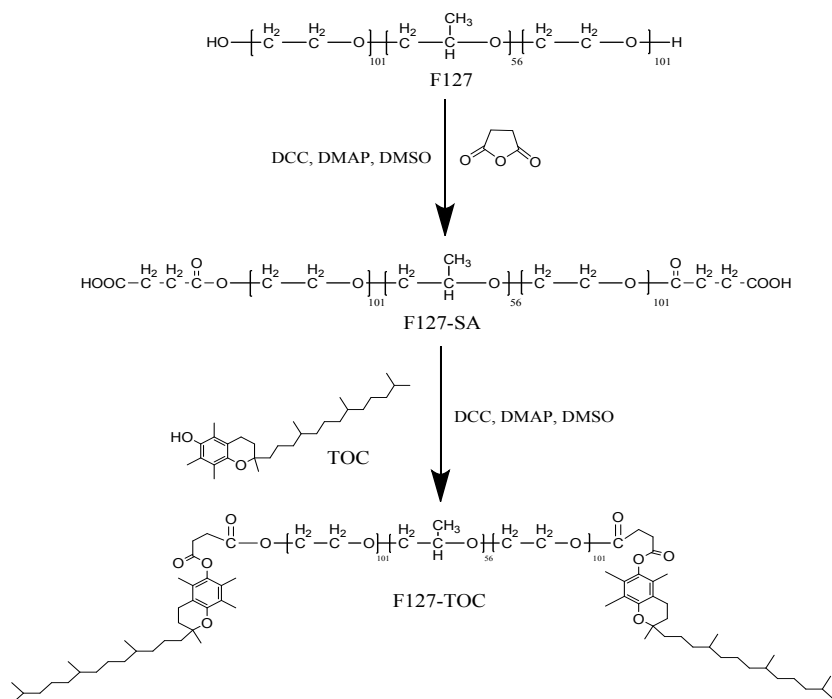


Fig. S1 Synthetic route of F127-TOC polymer.

2. Characterization of F127-TOC polymer

Due to the structure of F127-TOC was similar to F127-SS-TOC, F127-TOC polymer displayed the similar spectrum with F127-SS-TOC. Besides, the ^1H NMR spectra of F127 and TOC polymers have reported in our previous study¹. As shown in Fig. S2, the typical signals of F127 polymer including $-\text{CH}_3$ peaks (a, $\delta=1.029\sim 1.039$ ppm), $-\text{CH}$ peaks (b, $\delta=3.349\sim 3.471$ ppm) and the $-\text{CH}_2$ peaks (c, $\delta=3.493\sim 3.505$ ppm) were observed in the spectrum of F127-TOC polymer. Additionally, the typical signals of TOC polymer were found in F127-TOC polymer, including peaks f ($\delta=1.983\sim 2.014$ ppm) and peaks g ($\delta \sim 2.731$ ppm). Moreover, the $-\text{CH}_2$ peaks of SA at $\delta 2.720\sim 2.898$ ppm (peaks d and e) appeared in F127-TOC, demonstrated the successful synthesis of F127-TOC polymer.

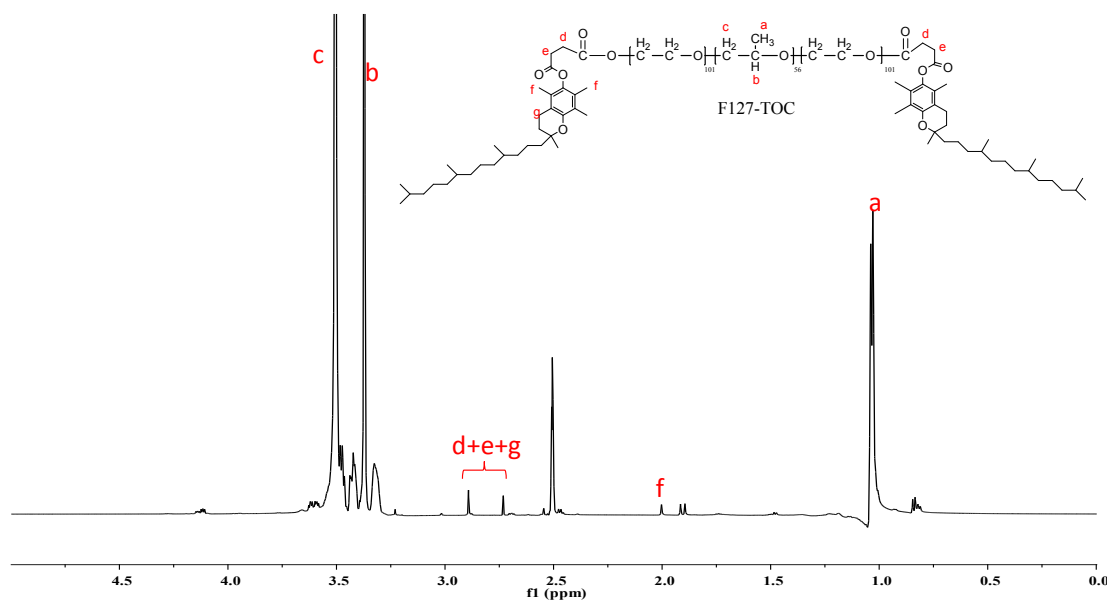


Fig. S2 ^1H NMR spectrum of F127-TOC polymer.

3. Characterization of F127-TOC/RES micelles

F127-TOC/RES micelles were prepared by the same method with F127-TOC/RES micelles. As shown in Fig. S3, the particle size and PDI of F127-TOC/RES micelles were 43.47 ± 2.96 nm and 0.21 ± 0.04 , respectively. Besides, the zeta potential of F127-TOC /RES micelles was -2.93 ± 0.29 mV measured by DLS. The morphology of F127-TOC/RES micelles was observed in Fig. S4, and the particle size shown in the TEM spectra was similar with the results obtained from DLS.

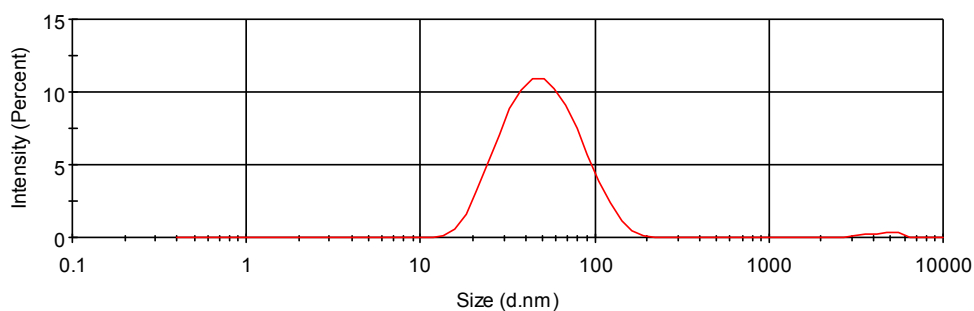


Fig. S3 The particle size of F127-TOC/RES micelles.

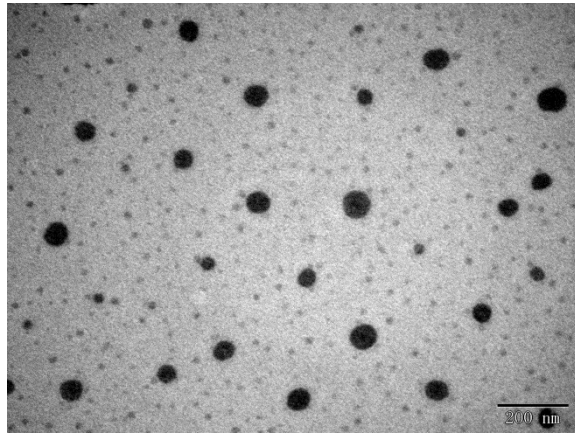


Fig. S4 TEM image of F127-TOC/RES micelles. The scale bars correspond to 200 nm in the image.

Reference

1. Y. Liu, S. Fu, L. Lin, Y. Cao, X. Xie, H. Yu, M. Chen and H. Li, *Int J Nanomedicine*, 2017, **12**, 2635-2644.