Supplementary Information (SI) for RSC Advances.
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Berberine-styrene-co-maleic acid nanomicelles: unlocking opportunities for the treatment and prevention of bacterial infections

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Supporting Information:

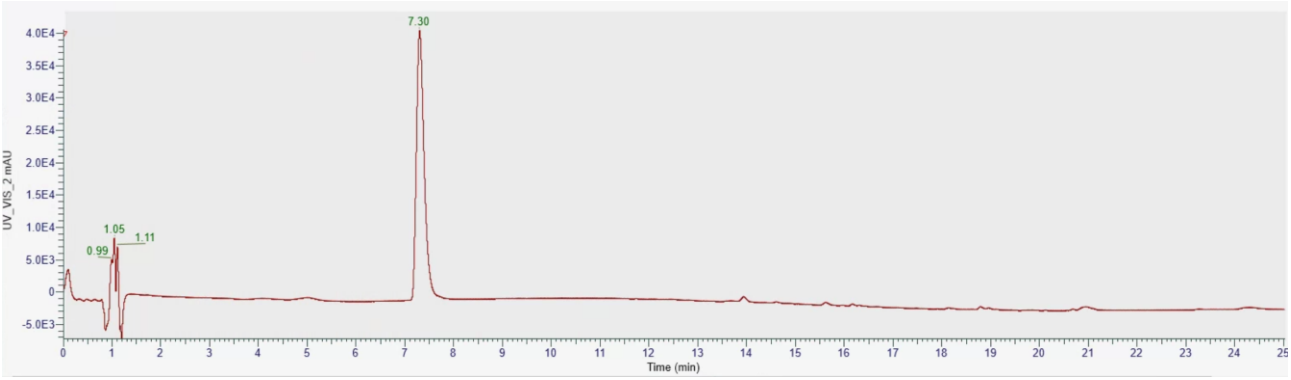

Figure S1. BER sample chromatogram (red line) shows BER peak at 7.3 min.

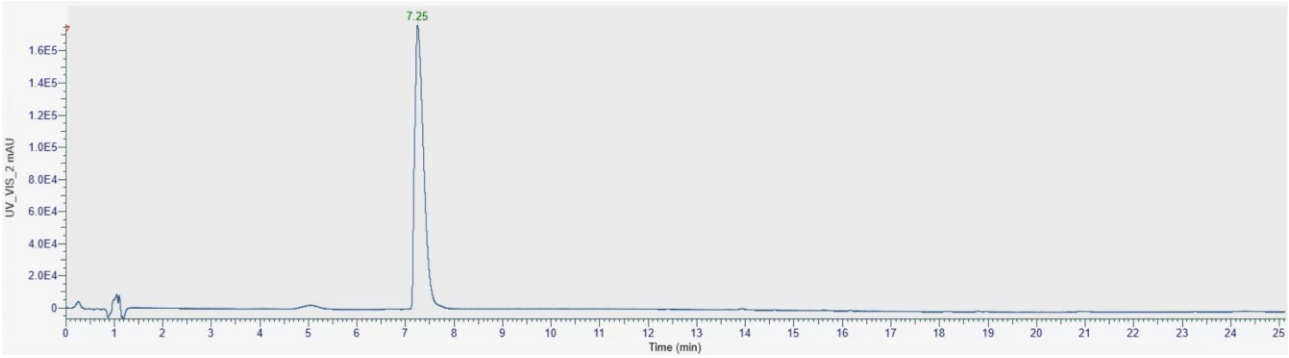

Figure S2. BER standard chromatogram (blue line) shows BER peak at 7.25 min.

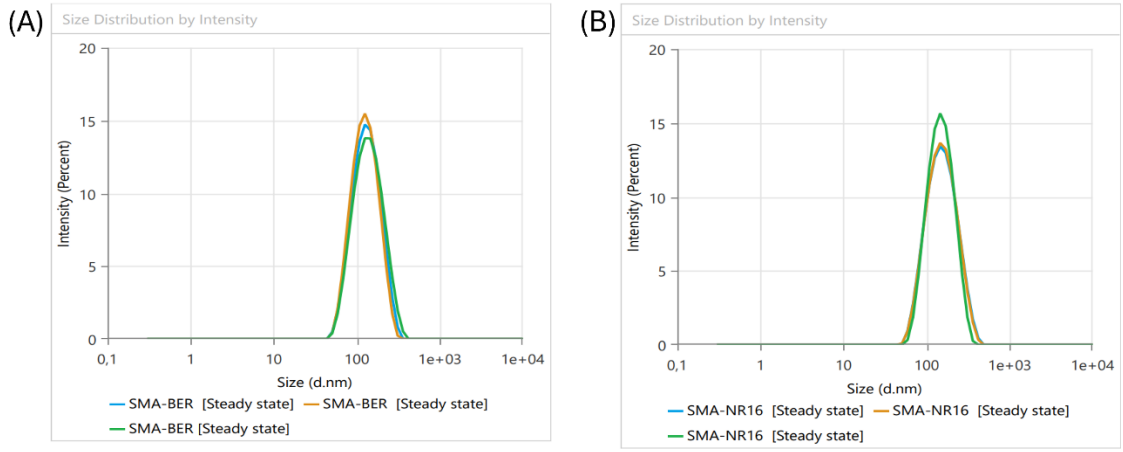

Figure S3. (A) SMA-BER and (B) SMA-NR16 size distribution by intensity in DDW.

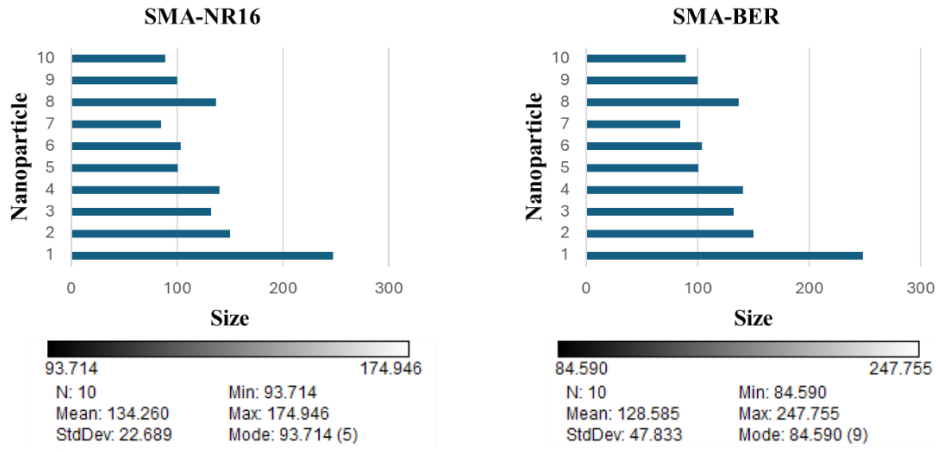

Figure S4. SMA-BER and SMA-NR16 size distribution analysis from TEM images. The nanoparticles dimensions were analyzed by ImageJ software.

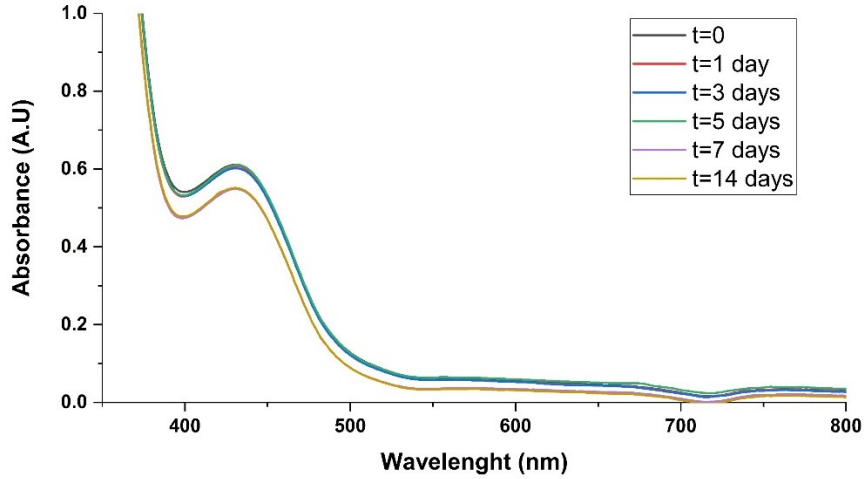

Figure S5. UV-Vis spectra stability studies of SMA-BER dissolved in DDW, and stored at 4 °C for 14 days. SMA-BER = 400 µg/mL. Spectra were recorded scanning from 200 to 800 nm, using a 1 cm path length quartz cells.

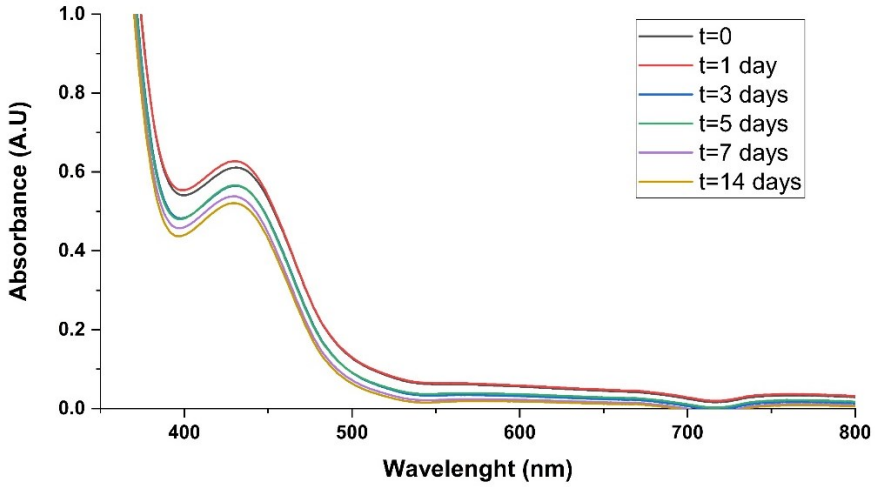

Figure S6. UV-Vis spectra stability studies of SMA-BER dissolved in DDW, and stored at r.t. for 14 days. SMA-BER = 400 µg/mL. Spectra were recorded scanning from 200 to 800 nm, using a 1 cm path length quartz cells.

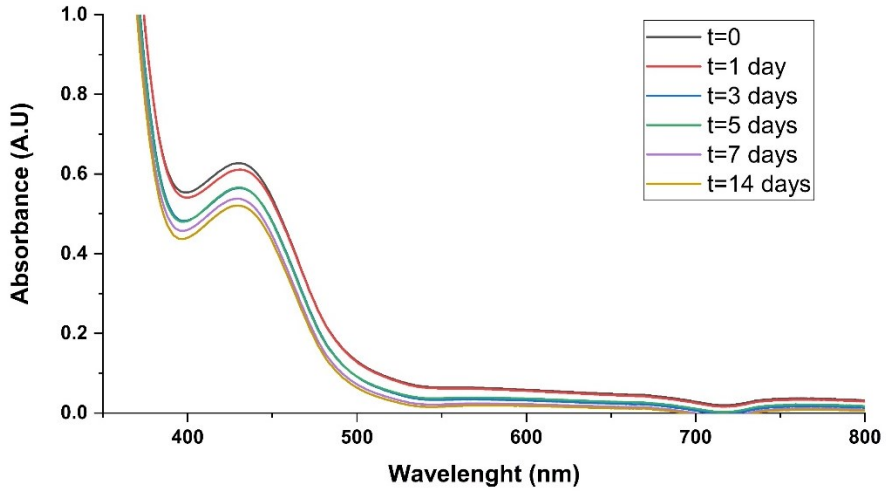

Figure S7. UV-Vis spectra stability studies of SMA-BER dissolved in DDW, and stored at 37 °C for 14 days. SMA-BER = 400 µg/mL. Spectra were recorded scanning from 200 to 800 nm, using a 1 cm path length quartz cells.

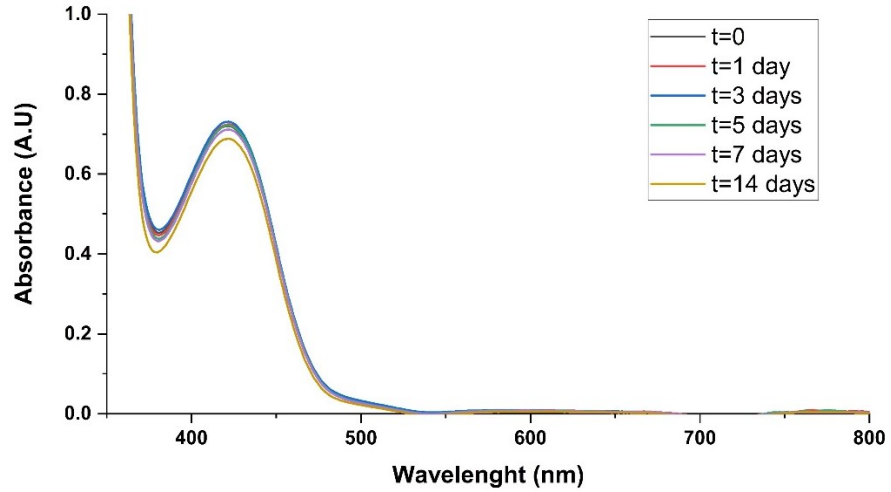

Figure S8. UV-Vis spectra stability studies of SMA-BER dissolved in NaCl aqueous solution, and stored at 4 °C for 14 days. SMA-BER = 400 µg/mL. Spectra were recorded scanning from 200 to 800 nm, using a 1 cm path length quartz cells.

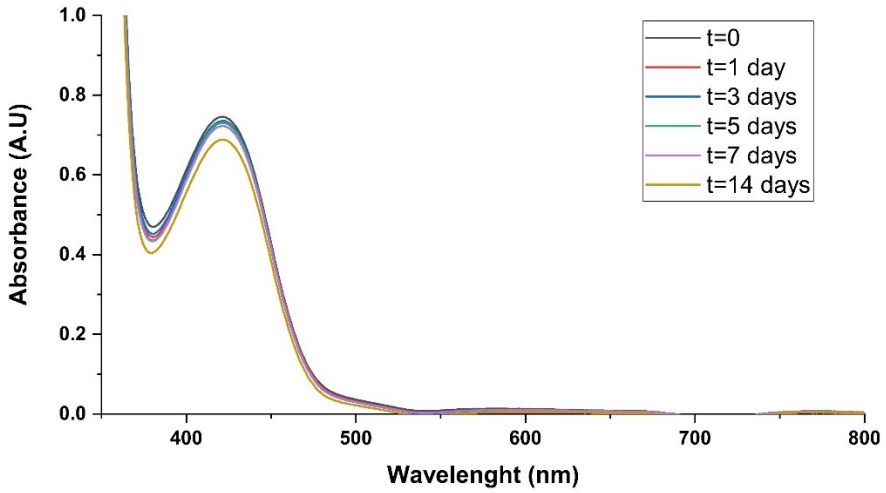

Figure S9. UV-Vis spectra stability studies of SMA-BER dissolved in NaCl aqueous solution, and stored at r.t. for 14 days. SMA-BER = 400 µg/mL. Spectra were recorded scanning from 200 to 800 nm, using a 1 cm path length quartz cells.

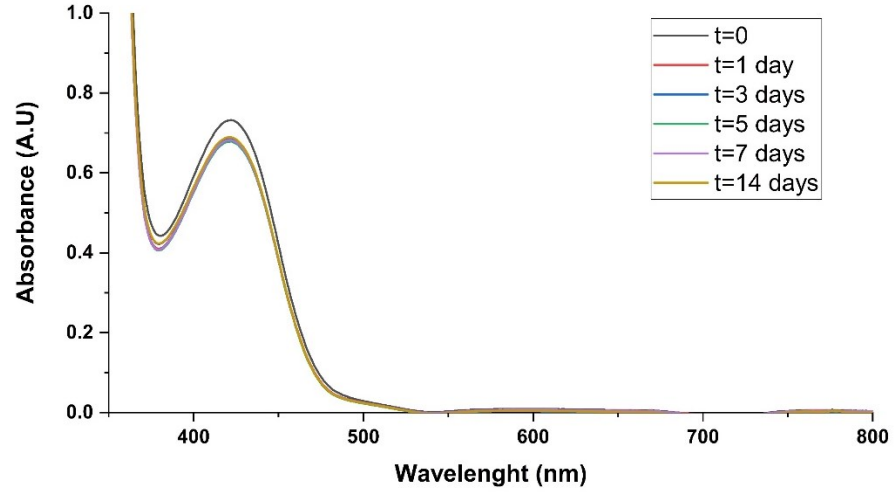

Figure S10. UV-Vis spectra stability studies of SMA-BER dissolved in PBS aqueous solution, and stored at 4 °C for 14 days. SMA-BER = 400 µg/mL. Spectra were recorded scanning from 200 to 800 nm, using a 1 cm path length quartz cells.

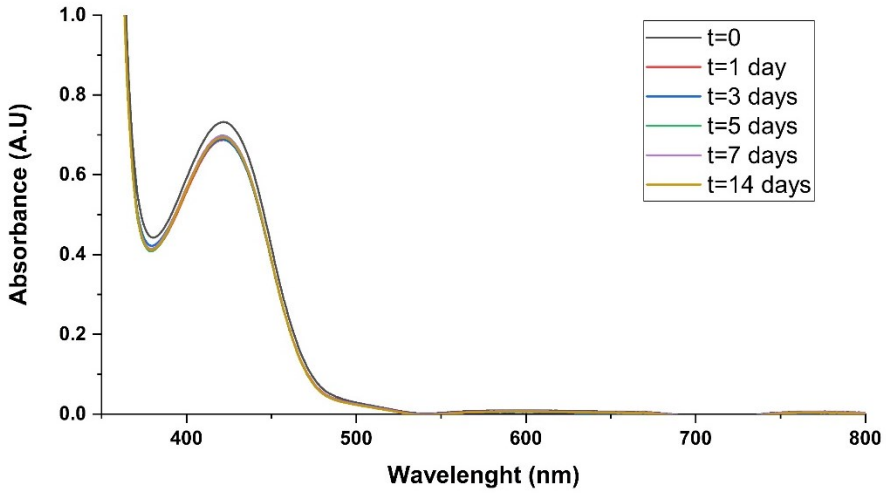

Figure S11. UV-Vis spectra stability studies of SMA-BER dissolved in PBS aqueous solution, and stored at r.t. for 14 days. SMA-BER = 400 µg/mL. Spectra were recorded scanning from 200 to 800 nm, using a 1 cm path length quartz cells.

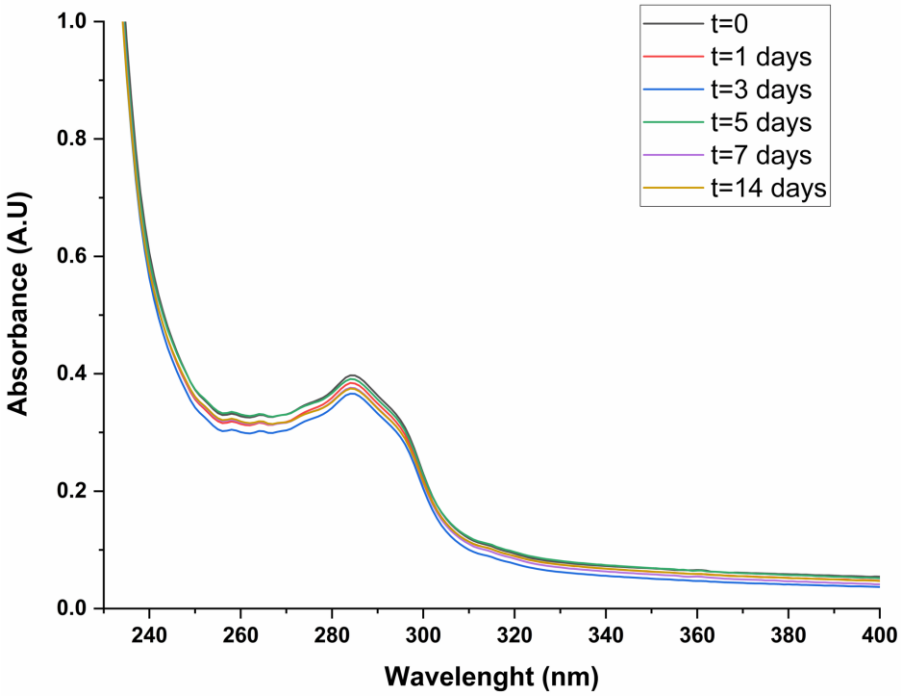

Figure S12. UV-Vis spectra stability studies of SMA-NR16 dissolved in DDW, and stored at 4 °C for 14 days. SMA-NR16 = 100 µg/mL. Spectra were recorded scanning from 200 to 800 nm, using a 1 cm path length quartz cells.

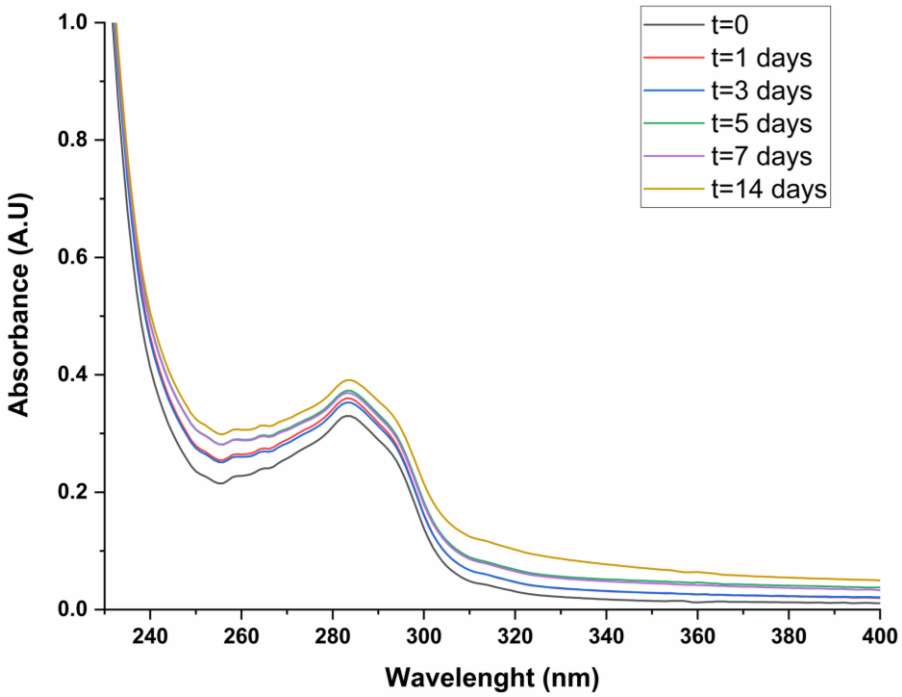

Figure S13. UV-Vis spectra stability studies of SMA-NR16 dissolved in NaCl aqueous solution, and stored at 4 °C for 14 days. SMA-NR16 = 100 µg/mL. Spectra were recorded scanning from 200 to 800 nm, using a 1 cm path length quartz cells.

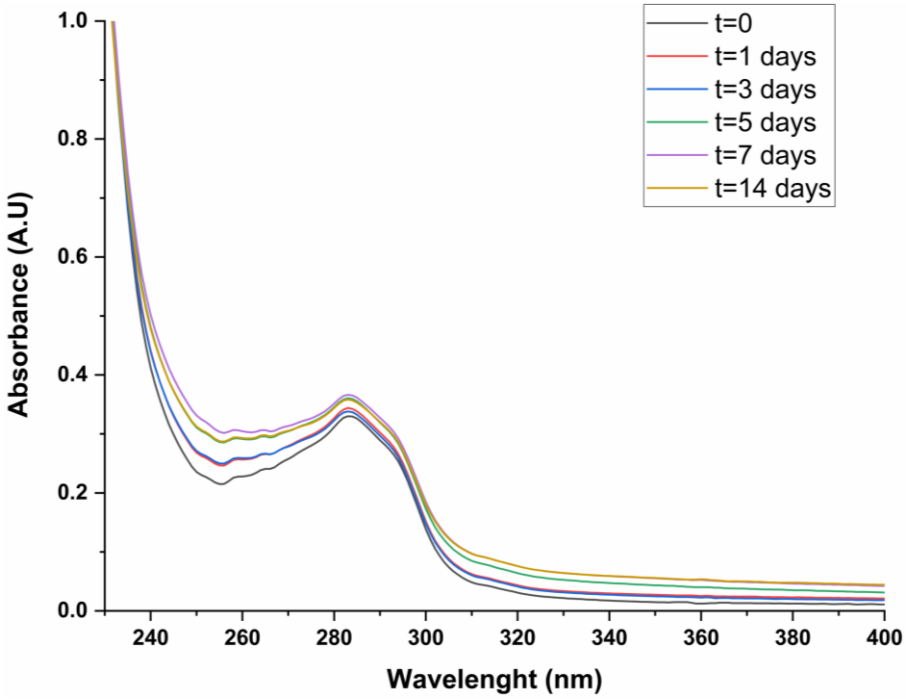

Figure S14. UV-Vis spectra stability studies of SMA-NR16 dissolved in NaCl aqueous solution, and stored at r.t. for 14 days. SMA-NR16 = 100 µg/mL. Spectra were recorded scanning from 200 to 800 nm, using a 1 cm path length quartz cells.

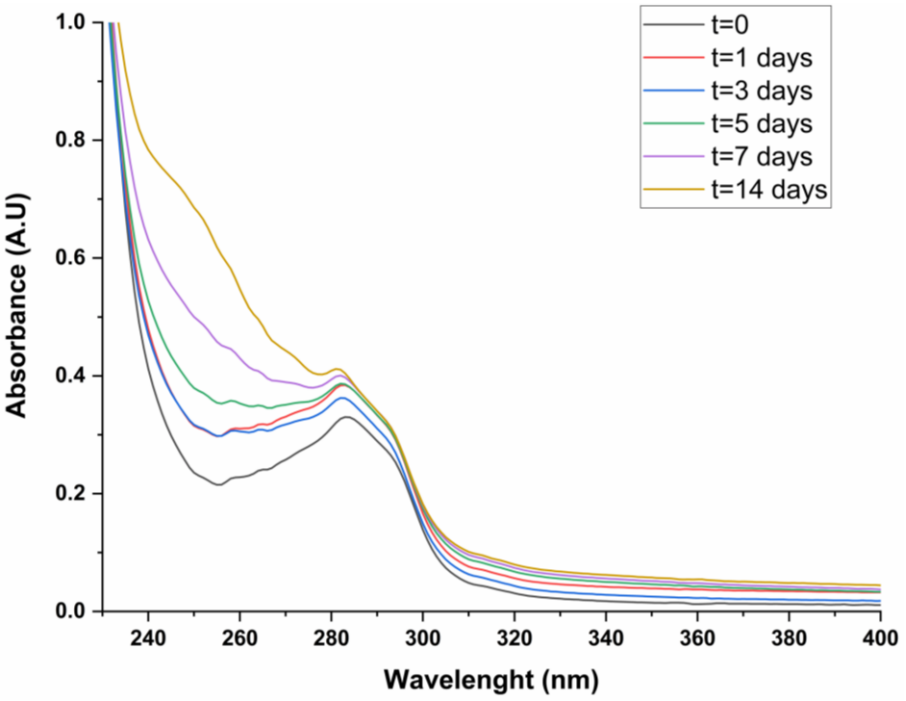

Figure S15. UV-Vis spectra stability studies of SMA-NR16 dissolved in NaCl aqueous solution, and stored at 37 °C for 14 days. SMA-NR16 = 100 µg/mL. Spectra were recorded scanning from 200 to 800 nm, using a 1 cm path length quartz cells.

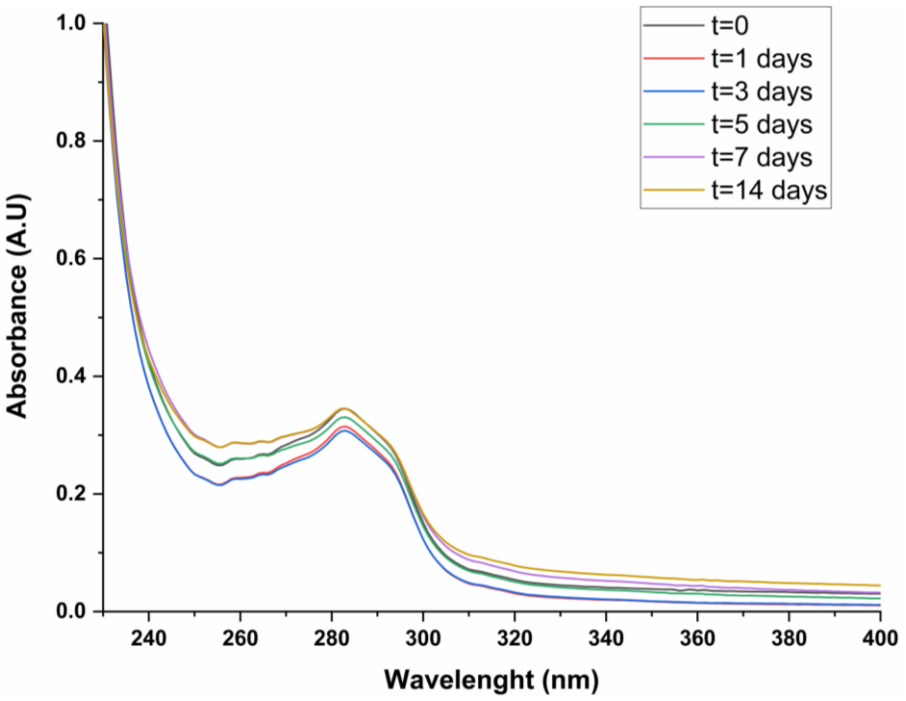

Figure S16. UV-Vis spectra stability studies of SMA-NR16 dissolved in PBS aqueous solution, and stored at 4 °C for 14 days. SMA-NR16 = 100 µg/mL. Spectra were recorded scanning from 200 to 800 nm, using a 1 cm path length quartz cells.

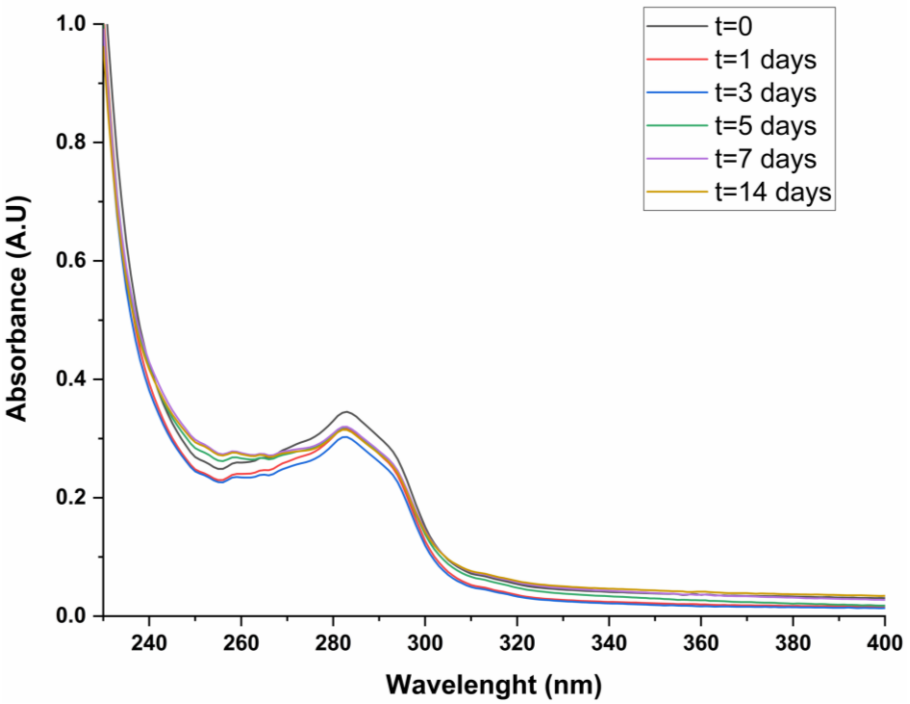

Figure S17. UV-Vis spectra stability studies of SMA-NR16 dissolved in PBS aqueous solution, and stored at r.t. for 14 days. SMA-NR16 = 100 µg/mL. Spectra were recorded scanning from 200 to 800 nm, using a 1 cm path length quartz cells.

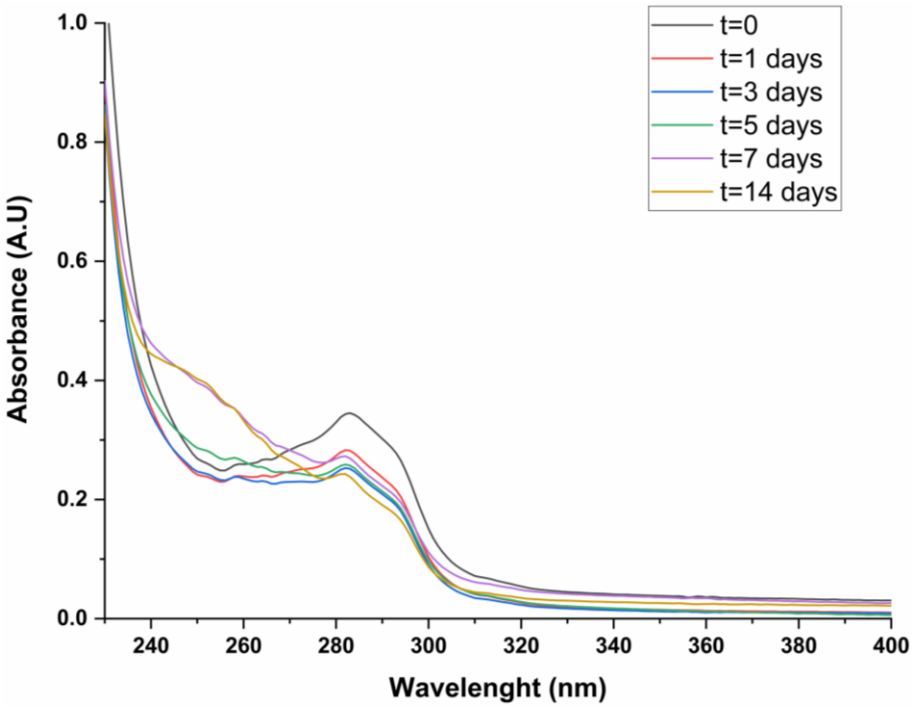

Figure S18. UV-Vis spectra stability studies of SMA-NR16 dissolved in PBS aqueous solution, and stored at 37 °C for 14 days. SMA-NR16 = 100 µg/mL. Spectra were recorded scanning from 200 to 800 nm, using a 1 cm path length quartz cells.

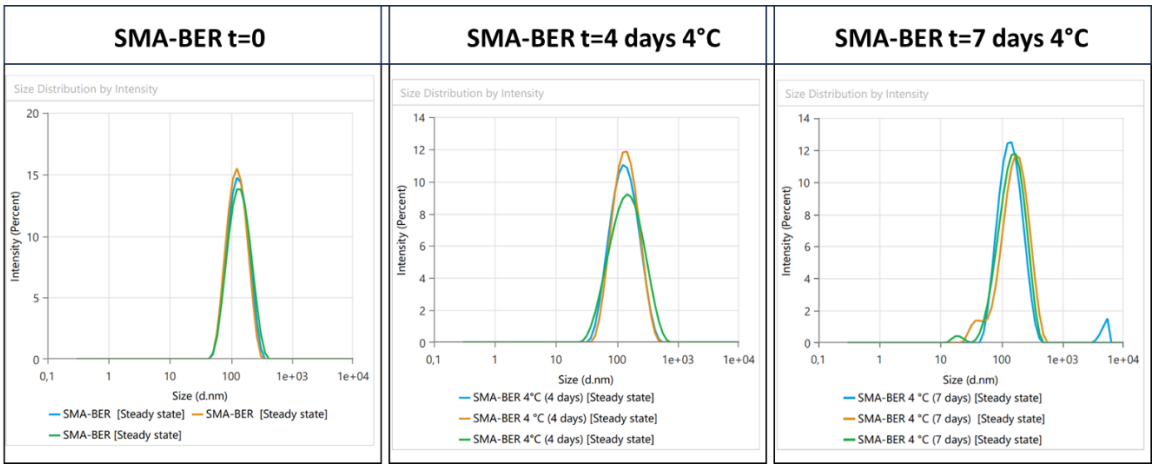

Figure S19. DLS stability study of SMA-BER solution in DDW (conc. 0.05 µg/mL) stored at 4 °C for 7 days.

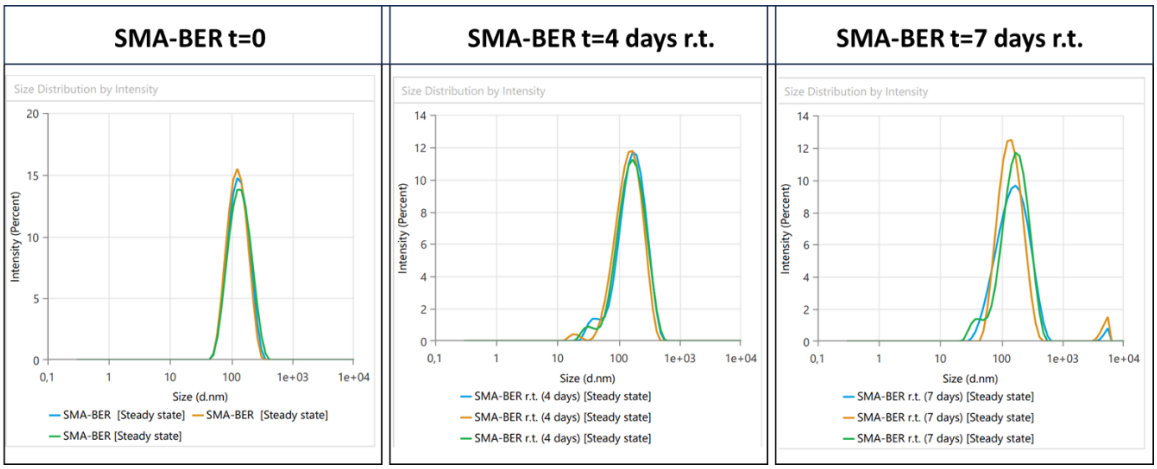

Figure S20. DLS stability study of SMA-BER solution in DDW (conc. 0.05 µg/mL) stored at r.t. for 7 days.

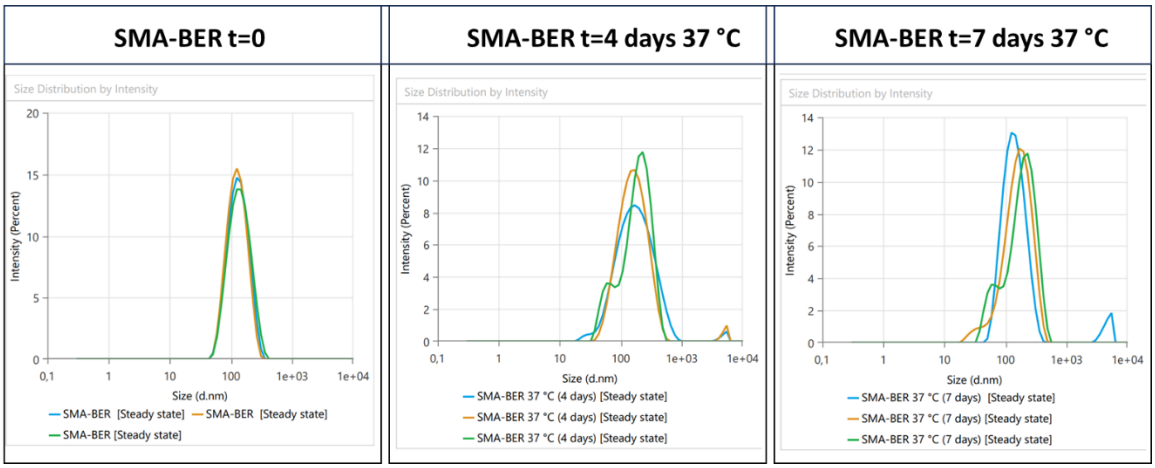

Figure S21. DLS stability study of SMA-BER solution in DDW (conc. 0.05 µg/mL) stored at 37 °C for 7 days.

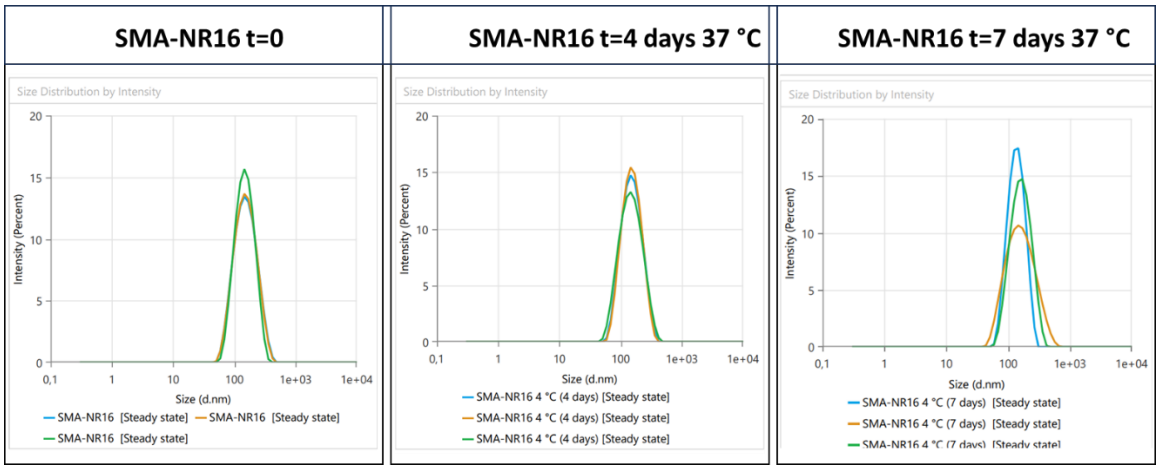

Figure S22. DLS stability study of SMA-NR16 solution in DDW (conc. 0.05 µg/mL) stored at 4 °C for 7 days.

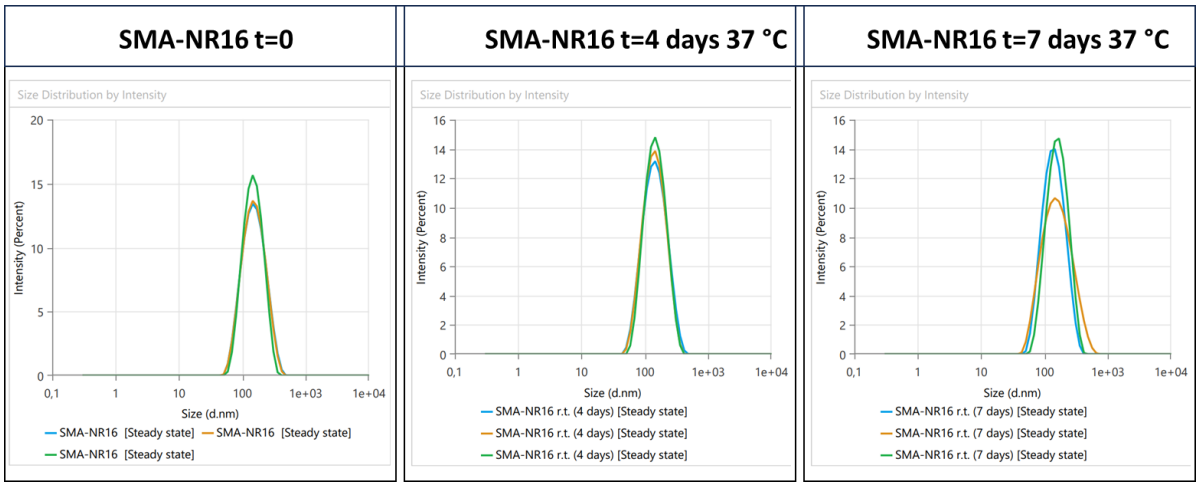

Figure S23. DLS stability study of SMA-NR16 solution in DDW (conc. 0.05 μg/mL) stored at r.t. for 7 days.

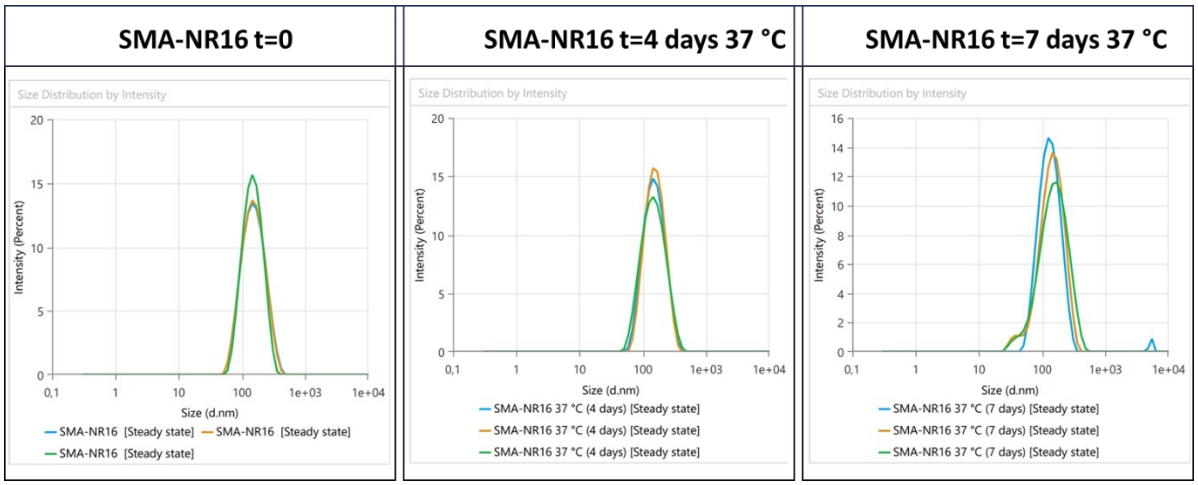

Figure S24. DLS stability study of SMA-NR16 solution in DDW (conc. 0.05 μg/mL) stored at 37 °C for 7 days.

MIC and MBC raw data

1st Experimental set

	BER		SMA-BER[b]		NR16		SMA-NR16[b]		H-SMA
Strain	MIC[a]	MBC[a]	MIC	MBC	MIC	MBC	MIC	MBC	MIC
E. coli ATCC 25922	>512	/	>512	/	256	/	256	>512	>512
K. pneumoniae ATCC BAA-2814	>512	/	>512	/	>512	/	>512	/	>512
A. baumannii ATCC 17978	>512	/	>512	/	256	/	>512	/	>512
P. aeruginosa ATCC 27853	>512	/	>512	/	>512	/	>512	/	>512
VS *E. faecalis* ATCC 29219	>512	/	256	>512	256	256	>512	/	>512
VR *E. faecalis* ATCC 51299	64	>512	16	>512	32	256	>512	/	>512
MS *S. aureus* ATCC 12598	256	>512	128	128	256	256	>512	/	>512
MS *S. aureus* ATCC 25923	64	64	64	64	128	128	>512	/	>512
MR *S. aureus* USA 300	128	>512	128	128	256	256	>512	/	>512
S. epidermidis ATCC 35984	32	64	64	128	128	256	>512	/	>512
C. albicans ATCC 10231	128	256	128	256	256	256	>512	/	>512

[a]MIC and MBC values calculated as the geometric mean of three different tests and they are expressed as mg/L. [b]SMA-BER and SMA-NR16 concentrations are referred to the amount (mg) of encapsulated drug.

2nd Experimental set

	BER		SMA-BER[b]		NR16		SMA-NR16[b]		H-SMA
Strain	MIC[a]	MBC[a]	MIC	MBC	MIC	MBC	MIC	MBC	MIC
E. coli ATCC 25922	>512	/	>512	/	256	>512	512	>512	>512
K. pneumoniae ATCC BAA-2814	>512	/	>512	/	256	>512	>512	/	>512
A. baumannii ATCC 17978	>512	/	>512	/	256	>512	>512	/	>512
P. aeruginosa ATCC 27853	>512	/	>512	/	>512	/	>512	/	>512
VS *E. faecalis* ATCC 29219	512	>512	128	>256	256	256	>512	/	>512
VR *E. faecalis* ATCC 51299	128	>512	32	>512	64	256	>512	/	>512
MS *S. aureus* ATCC 12598	128	>512	128	128	256	256	>512	/	>512
MS *S. aureus* ATCC 25923	64	128	128	128	128	128	>512	/	>512
MR *S. aureus* USA 300	128	>512	128	128	256	256	>512	/	>512
S. epidermidis ATCC 35984	32	64	128	128	256	256	>512	/	>512
C. albicans ATCC 10231	256	256	128	256	256	512	>512	/	>512

[a]MIC and MBC values calculated as the geometric mean of three different tests and they are expressed as mg/L. [b]SMA-BER and SMA-NR16 concentrations are referred to the amount (mg) of encapsulated drug.

3rd experimental set

	BER		SMA-BER[b]		NR16		SMA-NR16[b]		H-SMA
Strain	MIC[a]	MBC[a]	MIC	MBC	MIC	MBC	MIC	MBC	MIC
E. coli ATCC 25922	>512	/	>512	/	256	>512	512	>512	>512
K. pneumoniae ATCC BAA-2814	>512	/	>512	/	256	>512	>512	/	>512
A. baumannii ATCC 17978	>512	/	>512	/	256	>512	>512	/	>512
P. aeruginosa ATCC 27853	>512	/	>512	/	>512	/	>512	/	>512
VS *E. faecalis* ATCC 29219	512	>512	64	>512	256	256	>512	/	>512
VR *E. faecalis* ATCC 51299	256	>512	16	>512	128	256	>512	/	>512
MS *S. aureus* ATCC 12598	128	>512	64	128	256	256	>512	/	>512
MS *S. aureus* ATCC 25923	64	64	64	64	128	256	>512	/	>512
MR *S. aureus* USA 300	128	>512	64	128	256	256	>512	/	>512
S. epidermidis ATCC 35984	32	64	64	128	128	256	>512	/	>512
C. albicans ATCC 10231	128	256	128	256	256	256	>512	/	>512

[a]MIC and MBC values calculated as the geometric mean of three different tests and they are expressed as mg/L. [b]SMA-BER and SMA-NR16 concentrations are referred to the amount (mg) of encapsulated drug.