Electronic Supplementary Information (ESI) for

Preparation of water-dispersible silver-decorated polymer vesicles and micelles with excellent antibacterial efficacy

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Determination of the block copolymer composition:

In the ^{1}H NMR spectra (Fig. 1), peak c and peak f belong to PDMA, peak g+i and peak h belong to PtBA. The degrees of polymerization were calculated according to the following procedures.

In Table S1, a_a, a_b, a_c $a_{c\sim i}$ and $a_{c\sim j}$ are the area of the peaks a, b, c, c+d+f+g+i+e+h and c+d+j+h+f+g+i+e in Fig. 1. x, y and z are the degrees of polymerization of PMDA, PtBA and PAA, respectively. B represents the copolymer PEO$_{43}$-b-P(DMA$_x$-$stat$-tBA$_y$) (polymer **1**). C corresponds to PEO$_{43}$-b-P(DMA$_x$-$stat$-tBA$_y$-$stat$-AA$_z$) (polymer **2**).

Table S1. The integrals of different peaks and the degrees of polymerization of PEO$_{43}$-b-P(DMA$_x$-$stat$-tBA$_y$) (polymer **1**) and PEO$_{43}$-b-P(DMA$_x$-$stat$-tBA$_y$-$stat$-AA$_z$) (polymer **2**).

Spectrum	Polymer	Solvent	a_a	a_b	a_c	$a_{c\sim i}$	$a_{c\sim j}$	x	y	z
B	1	CDCl$_3$	170	64.3	63.7	1395		31	81	
C	2	CD$_3$OD	170	56.2	53.4		777	27	32	49

A sharp peak at 1.492 ppm exists in Figure 1B, which belongs to the residual proton from the tBA monomer. The amount of the tBA monomer mixed in the polymer is around 1.5 which is calculated by comparing the three separated peaks from 6.322 to 5.710 ppm.

We set the area of peak a as 170, which corresponds to the amount of H in PEO$_{43}$ ($43 \times 4 - 2 = 170$). The areas of peaks b and c in spectra B and C are listed in Table S1 according to the following equations:

B: according to peak b: $x = \dfrac{64.3 - 2}{170} \times \dfrac{43 \times 4 - 2}{2} = 31.2 \approx 31$

according to peak c: $x = \dfrac{63.7}{170} \times \dfrac{43 \times 4 - 2}{2} = 31.8 \approx 32$

according to peaks c+d+f+g+i+e+h :

$$y = \dfrac{1395 - 31 \times (3 + 2 + 2 + 6)}{170} \times \dfrac{43 \times 4 - 2}{12} - 1.5 = 81.2 \approx 81$$

C: according to peak b: $x = \dfrac{56.2 - 2}{170} \times \dfrac{43 \times 4 - 2}{2} = 27.1 \approx 27$

according to peak c: $x = \dfrac{53.4}{170} \times \dfrac{43 \times 4 - 2}{2} = 26.7 \approx 27$
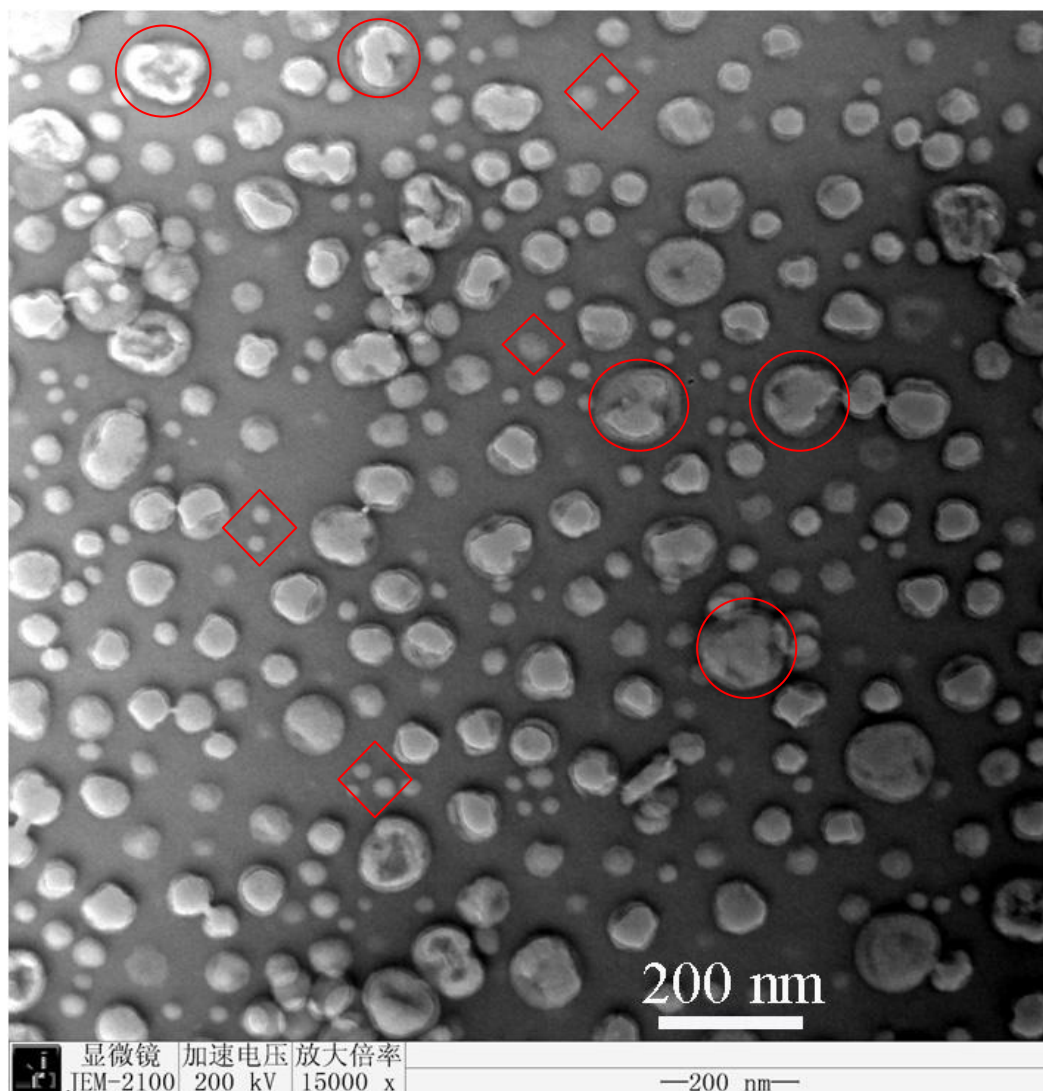
according to peaks c+d+j+h+f+g+i+e:

$$y + z = 81$$

$$11y + (2 + 6 + 3) \times 27 + z + 81 = 777.0$$

$$\rightarrow y = 32, \, z = 49$$

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Fig. S1. TEM images of PEO_{43}-b-$P(DMA_{31}$-$stat$-$tBA_{81})$ (polymer **1**) vesicles and co-existed micelles at pH 10. The particles were stained by PTA at 1.65 mg/mL. Round circle: vesicles; diamond: micelles.

Fig. S2. Magnified TEM images of PEO_{43}-b-P(DMA_{31}-$stat$-tBA_{81}) copolymer vesicles decorated with silver nanoparticles, clearly indicating the silver nanoparticles (the black dots) in the vesicle membrane. Some small micelles are co-existed.
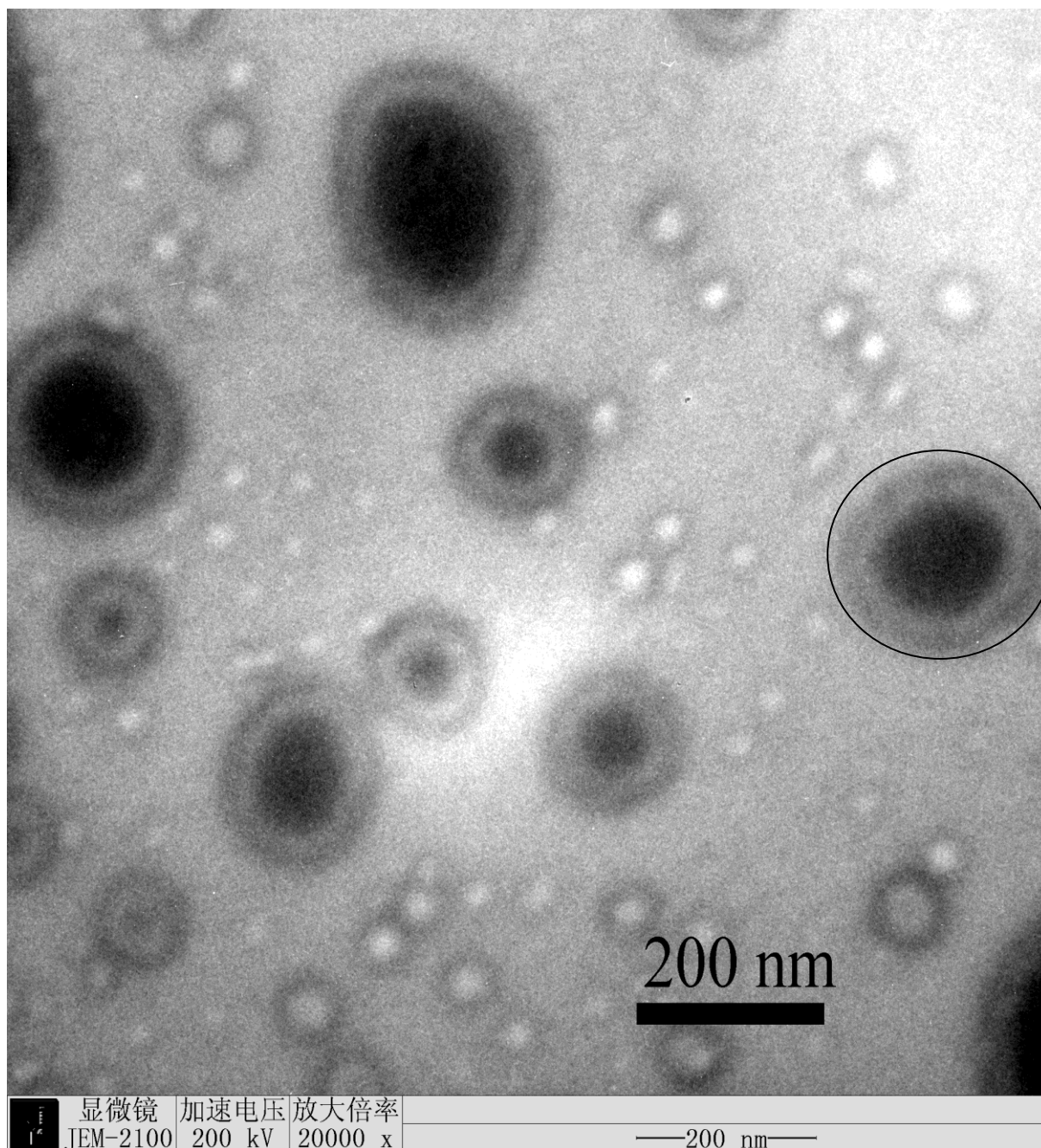
Below is the magnified TEM image of the vesicle circled in the above image. The average diameter of silver nanoparticles (black dots) is 1.9 nm.