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One-pot cross-linked copolymerization for construction of robust antifouling and antibacterial composite membranes

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Supporting Information

Table S1 The water flux, rejection ratios (R_0) and flux recovery ratios (F_{RR}) for the membranes throughout the BSA ultrafiltration experiment.

Membrane Samples	Flux of PBS (mL/m^{2}h.mmHg)	R_0 (%)	F_{RR} (%)
PES-DMC6	51.8	94.6	86.3
PES-DMC5-PEGMA1	82.4	93.8	82.7
PES-DMC3-PEGMA3	83.9	92.1	78.5
PES-DMC1-PEGMA5	71.8	93.9	93.9
PES-PEGMA6	65.1	91.2	98.7
Polydopamine coated PES membrane[1]	13.6	98	83.4
Amphiphilic terpolymer blended PES membrane[2]	30.0-140.0	97.1	68.3-92.4
Poly(vinyl pyrrolidone) copolymer modified PES membrane[3]	95.8	--	96.6
Heparin-mimicking polymers modified PES membrane[4]	95.3	--	92.2

1. C. Cheng, S. Li, W. Zhao, Q. Wei, S. Nie, S. Sun and C. Zhao, J. Membr. Sci. , 2012, 417–418, 228-236.

2. C. Cheng, L. Ma, D. Wu, J. Ren, W. Zhao, J. Xue, S. Sun and C. Zhao, J. Membr. Sci. , 2011, 378, 369-381.

3. F. Ran, S. Nie, W. Zhao, J. Li, B. Su, S. Sun and C. Zhao, Acta Biomater. , 2011, 7, 3370-3381.
4. L. Ma, B. Su, C. Cheng, Z. Yin, H. Qin, J. Zhao, S. Sun and C. Zhao, J. Membr. Sci. , 2014, 470, 90-101.

As shown in the table, the composite membranes fabricated by one-pot cross-linked copolymerization exhibit comparable water flux, protein rejection ratio, and flux recovery ratio with earlier studies, especially the PES-DMC1-PEGMA5 and PES-PEGMA6.

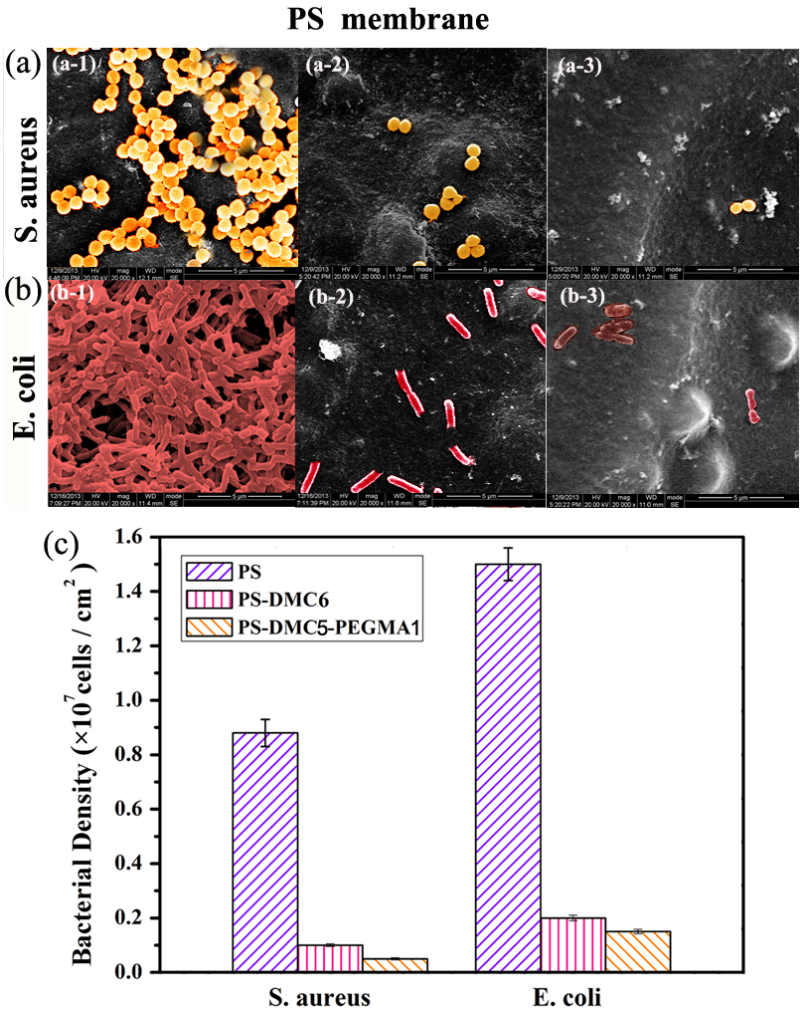

Fig. S1 (a) SEM images of *S. aureus* cells, and (b) SEM images of *E. coli* cells: (a-1) and (b-1) for PS membranes, (a-2) and (b-2) for PS-DMC6 membranes, (a-3) and (b-3) for PS-DMC5-PEGMA1 membranes. The scale bars for all SEM images are 5 μm. S. aureus cells are marked with yellow colour and E. coli cells are marked with red colour to make them clearer for view. (c) Calculated average bacterial amount adhered on membrane surfaces, n=5.

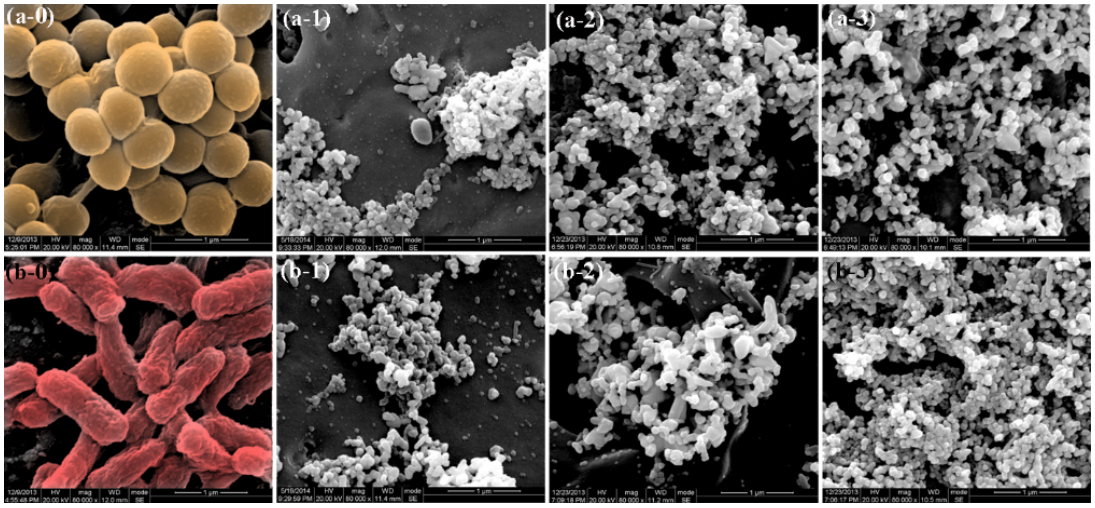

Fig. S2 SEM images of the morphologies of adhered bacteria on the Ag NPs coated membranes. (a) for *S. aureus* and (b) for *E. coli*, (a-0) and (b-0) PES membrane, (a-1) and (b-1) PES-DMC6-Ag-1 membrane, (a-2) and (b-2) PES-DMC6-Ag-5 membrane, (a-2) and (b-2) PES-DMC6-Ag-10 membrane. *S. aureus* cells are marked in yellow colour and *E. coli* cells are marked in red colour to make them clearer.

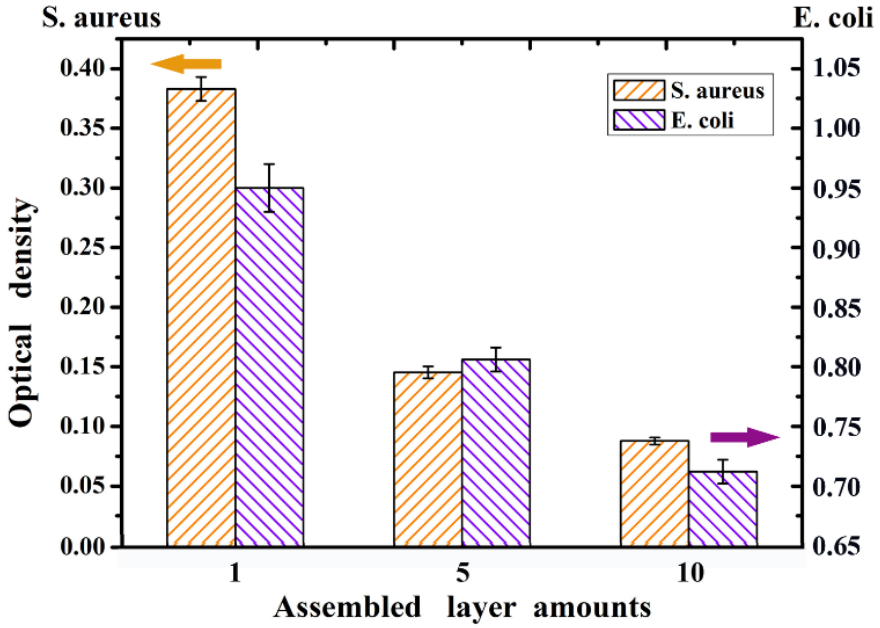

Fig. S3 Optical densities for the Ag NPs-PDMC coated membranes in different bilayers.