(Electronic Supplementary Information for *Journal of Materials Chemistry B*)

Evaluation of AgHAP-containing polyurethane foam dressing for wound healing: Synthesis, characterization, in vitro and in vivo studies

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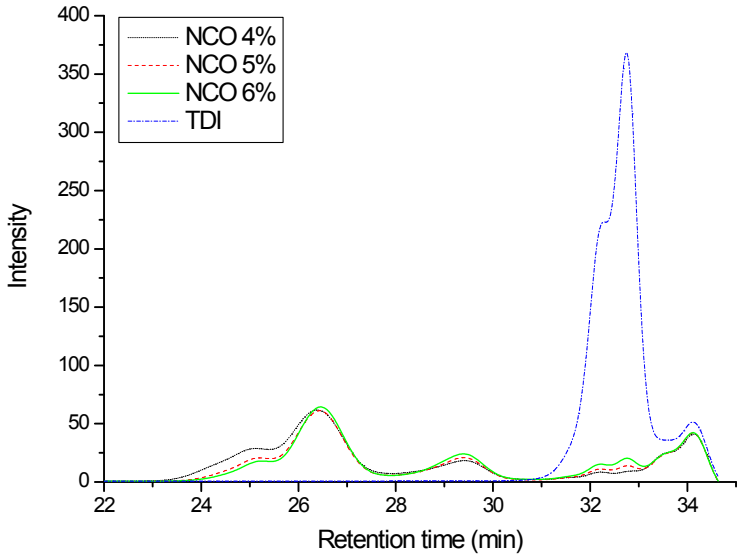


Fig. S1. The GPC chromatogram of MeOH end-capped PU copolymer prepared at different NCO/OH ratio.

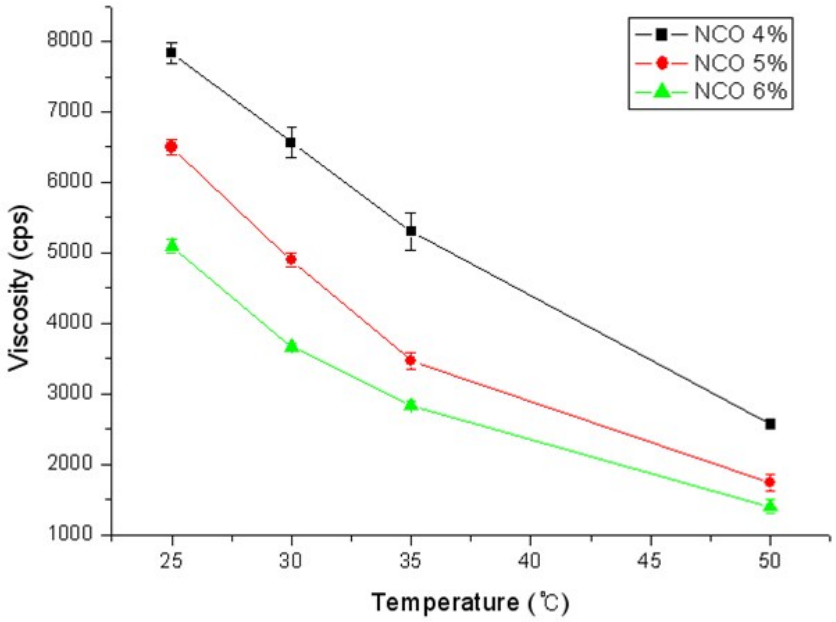


Fig. S2. Brookfield viscosity on free isocyanate content (NCO %) of PU copolymer.

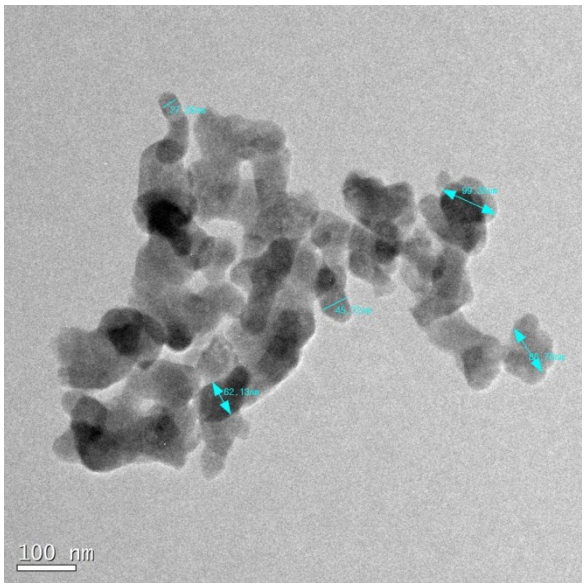


Fig. S3. TEM image of AgHAP.

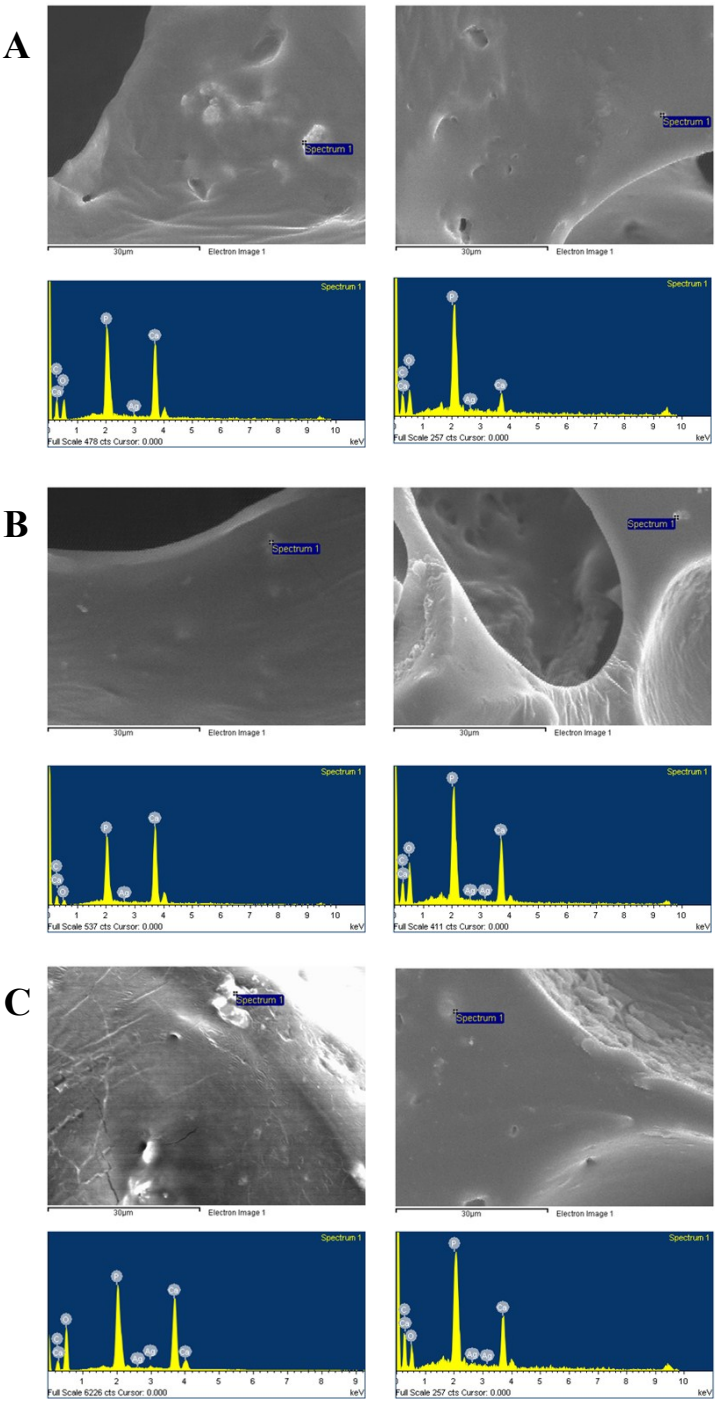


Fig. S4. SEM images and EDS analysis of AgHAP/PUFs before and after release experiments in deionized water; (A) AgHAP(2.5)/PUF, (B) AgHAP(5.0)/PUF, (C) AgHAP(7.5)/PUF (magnification 2,000 x).

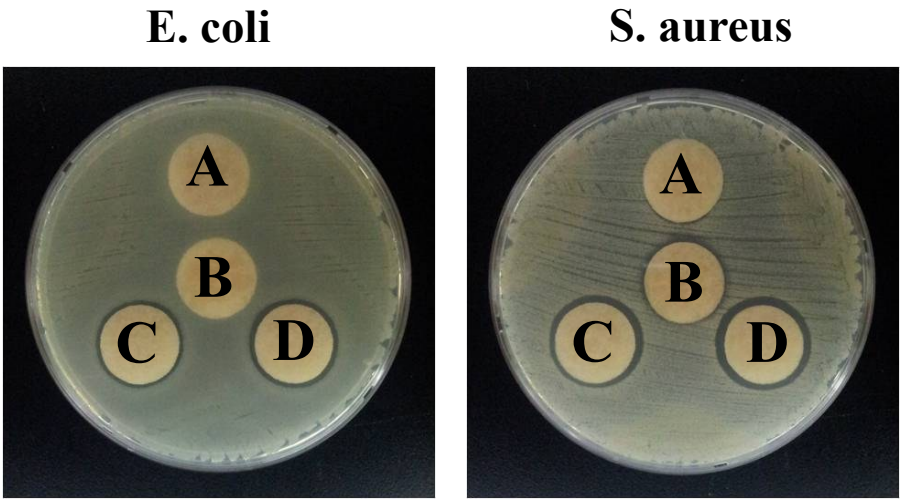


Fig. S5. Inhibitory effect of AgHAP/PUFs against *Escherichia coli* and *Staphylococcus aureus*; (A) AgHAP(0)/PUF, (B) AgHAP(2.5)/PUF, (C) AgHAP(5.0)/PUF, (D) AgHAP(7.5)/PUF.

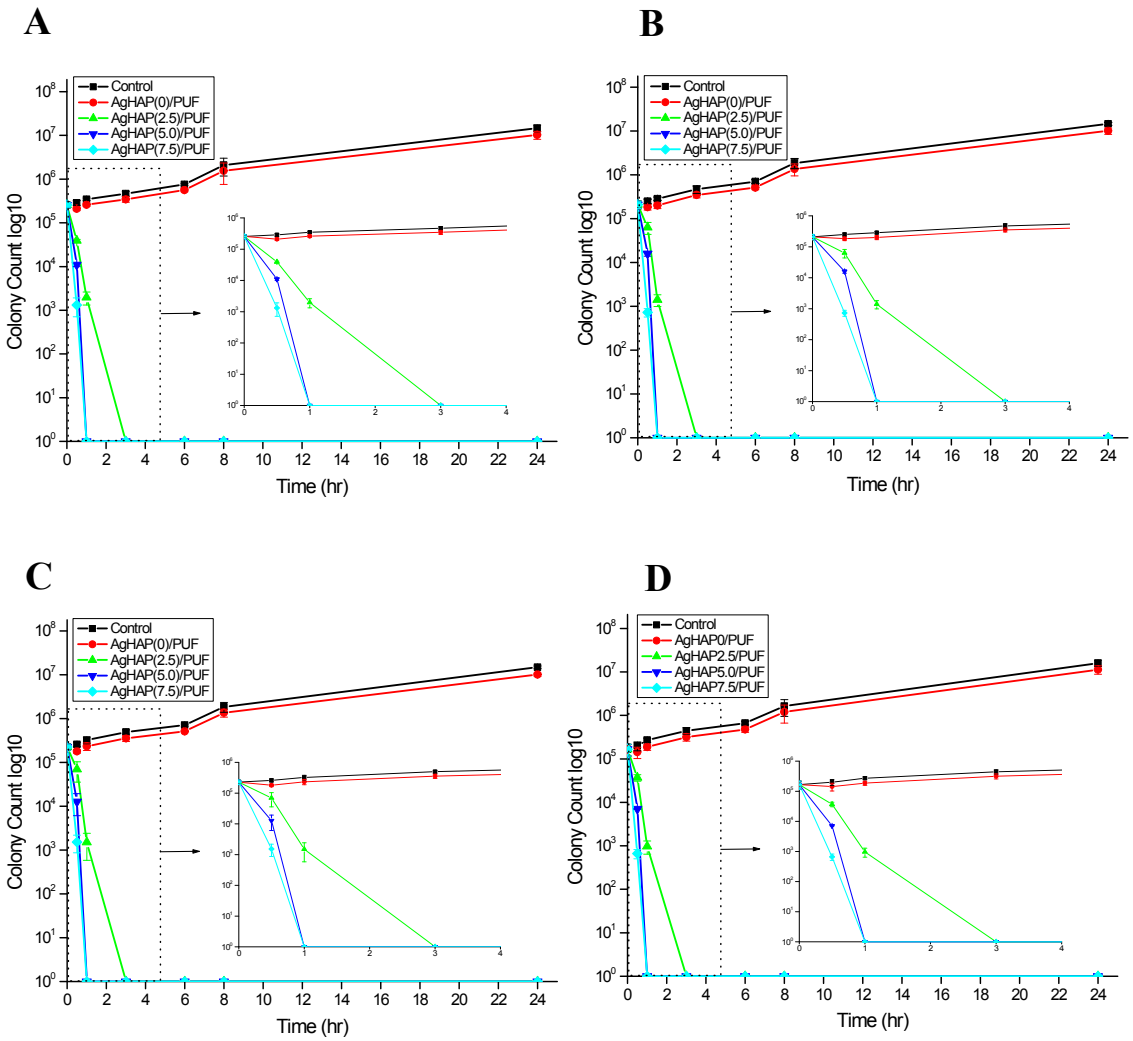
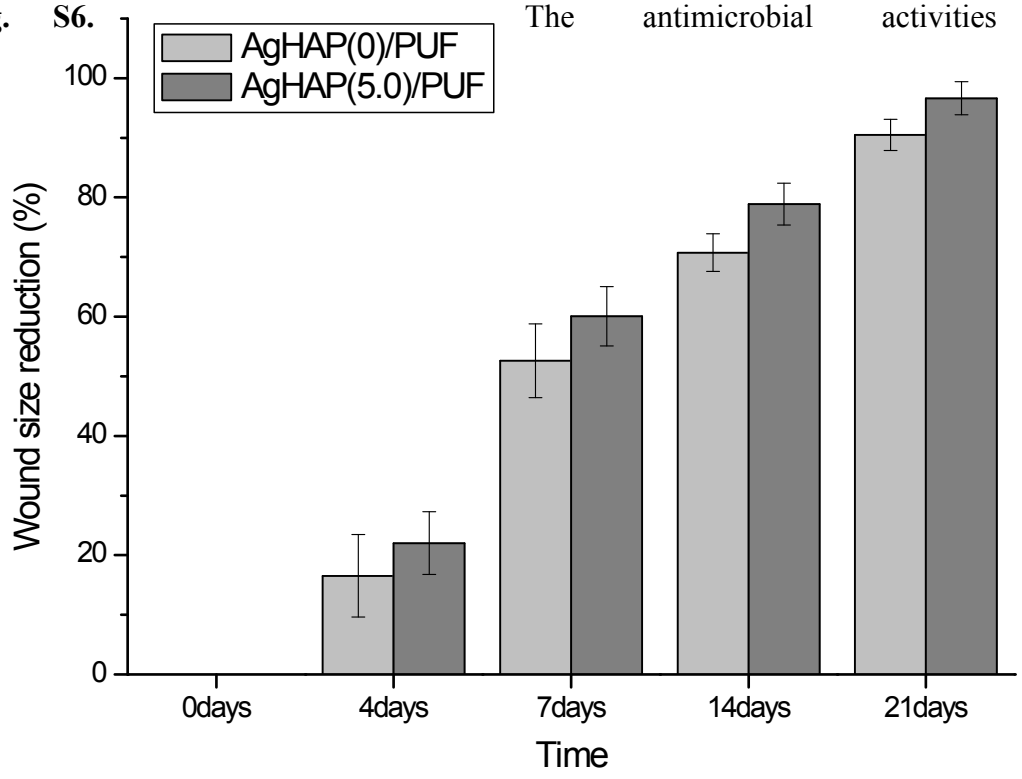

A
B
C
D
Control
AgHAP(0)/PUF
AgHAP(2.5)/PUF
AgHAP(5.0)/PUF
AgHAP(7.5)/PUF
AgHAP0/PUF
AgHAP2.5/PUF
AgHAP5.0/PUF
AgHAP7.5/PUF
Colony Count log10
Time (hr)

Fig. S6. The antimicrobial activities of



AgHAP/PUFs against four micro-organisms during a 24 h period; (A) MRSA (ATCC 33591), (B) *E. coli* (ATCC 35218), (C) *P. aeruginosa* (ATCC 27853), (D) *S. aureus* (ATCC 25923).

Fig. S7. Wound size reduction (%) in infected wound treated with AgHAP(0)/PUF and AgHAP(5.0)/PUF (n = 5).

Table S1. Average molecular weights and polydispersity index (PDI) of PU prepolymers with different NCO/OH ratio.

NCO %	Retention time (min)	Mn	Mw	MP	Polydispersity

4	25.952	8,822	10,698	7,344	1.212681
5	25.940	8,327	9,797	7,382	1.176435
6	25.911	8,003	9,144	7,477	1.142612

Table S2. Inhibition zone length (mm). The size of each foam sample was 15mm diameter.

Micro-organisms	Inhibition zone length diameter (mm)			
	(A)AgHAP(0) /PUF	(B)AgHAP(2.5) /PUF	(C)AgHAP(5.0) /PUF	(D)AgHAP(7.5) /PUF
E. coli	0	0	0.75	1.5
S. aureus	0	0.5	2.0	2.3

Table S3. Antimicrobial activity of AgHAP/PUFs ; The colony-forming unit (CFU) of MRSA, E. coli, P. aeruginosa and S. aureus after treatment with AgHAP/PUFs after (A) 1 h and (B) 3 h.

(A) after 1 h

		MRSA (ATCC 33591)		*E. coli (ATCC 35218)*	
Ma(untreated, 0 contact time)		2.2 x 10^5 CFU	Reduction of bacteria (%)	2.1 x 10^5 CFU	Reduction of bacteria (%)
Sample code		Number of surviving bacteria (CFU/ml)		Number of surviving bacteria (CFU/ml)	
Mc	Control	3.3 x 10^5	0	2.9 x 10^5	0
	AgHAP(0)/PUF	2.4 x 10^5	27.3	2.0 x 10^5	31.0
	AgHAP(2.5)/PUF	1.7 x 10^3	99.5	1.7 x 10^3	99.4
	AgHAP(5.0)/PUF	< 10	99.9	< 10	99.9
	AgHAP(7.5)/PUF	< 10	99.9	< 10	99.9

		P. aeruginosa (ATCC 27853)		*S. aureus (ATCC 25923)*	
Ma(untreated, 0 contact time)		2.3 x 10^5 CFU	Reduction of bacteria (%)	2.2 x 10^5 CFU	Reduction of bacteria (%)
Sample code		Number of surviving bacteria (CFU/ml)		Number of surviving bacteria (CFU/ml)	
Mc	Control	2.6 x 10^5	0	3.0 x 10^5	0
	AgHAP(0)/PUF	1.8 x 10^5	30.8	2.2 x 10^5	26.6
	AgHAP(2.5)/PUF	1.3 x 10^3	99.5	6.0 x 10^3	98.0
	AgHAP(5.0)/PUF	< 10	99.9	< 10	99.9
	AgHAP(7.5)/PUF	< 10	99.9	< 10	99.9

(B) after 3 h

	MRSA (ATCC 33591)	*E. coli (ATCC 35218)*

Ma(untreated, 0 contact time)		2.2 x 10^5 CFU	Reduction of bacteria (%)	2.1 x 10^5 CFU	Reduction of bacteria (%)
Sample code		Number of surviving bacteria (CFU/ml)		Number of surviving bacteria (CFU/ml)	
Mc	Control	4.2 x 10^5	0	5.6 x 10^5	0
	AgHAP(0)/PUF	3.0 x 10^5	28.6	4.0 x 10^5	28.6
	AgHAP(2.5)/PUF	< 10	99.9	< 10	99.9
	AgHAP(5.0)/PUF	< 10	99.9	< 10	99.9
	AgHAP(7.5)/PUF	< 10	99.9	< 10	99.9

		P. aeruginosa (ATCC 27853)		*S. aureus (ATCC 25923)*	
Ma(untreated, 0 contact time)		2.3 x 10^5 CFU	Reduction of bacteria (%)	2.2 x 10^5 CFU	Reduction of bacteria (%)
Sample code		Number of surviving bacteria (CFU/ml)		Number of surviving bacteria (CFU/ml)	
Mc	Control	5.6 x 10^5	0	5.1 x 10^5	0
	AgHAP(0)/PUF	4.2 x 10^5	25.0	3.8 x 10^5	25.5
	AgHAP(2.5)/PUF	< 10	99.9	< 10	99.9
	AgHAP(5.0)/PUF	< 10	99.9	< 10	99.9
	AgHAP(7.5)/PUF	< 10	99.9	< 10	99.9