

**Anti-biofilm surfaces from mixed dopamine-modified
polymer brushes : synergistic role of cationic and
zwitterionic chains to resist *Staphylococcus aureus***

Yuanyuan He¹, Xinyuan Wan¹, Kecen Xiao¹, Weiwei Lin¹, Jiehua Li¹, Zhen Li¹,
Feng Luo^{*1}, Hong Tan^{*1}, Jianshu Li¹, Qiang Fu¹

¹ *College of Polymer Science and Engineering, State Key Laboratory of Polymer
Materials Engineering, Sichuan University, Chengdu 610065, China*

* E-mail: fengluo@scu.edu.cn; hongtan@scu.edu.cn

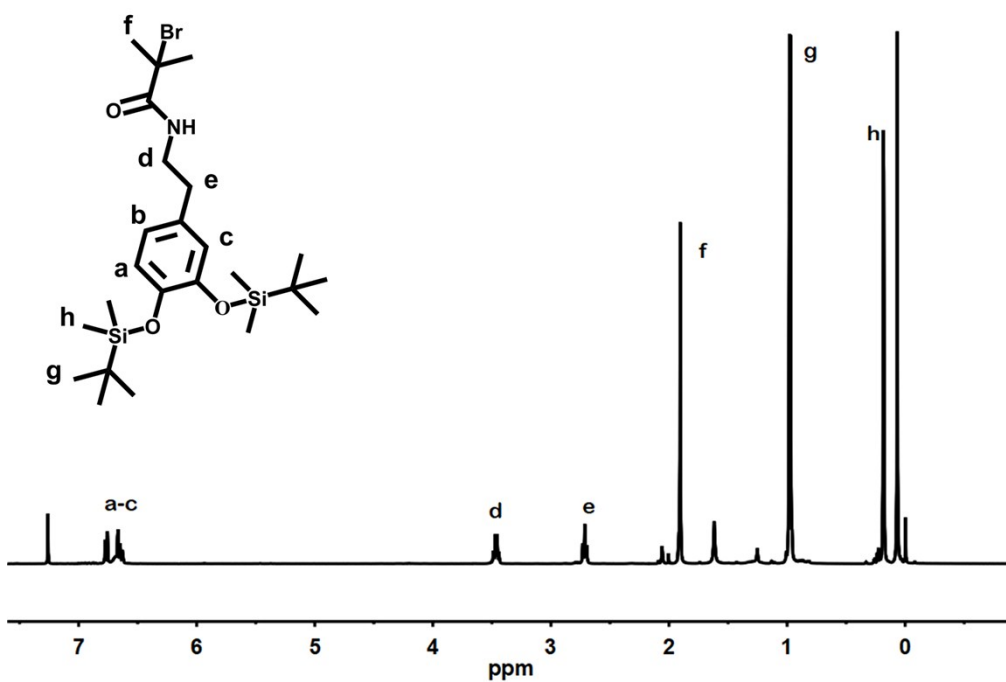


Figure S1. ¹H NMR spectra of DOPA (TBDMSCl)-BIBB in CDCl₃.

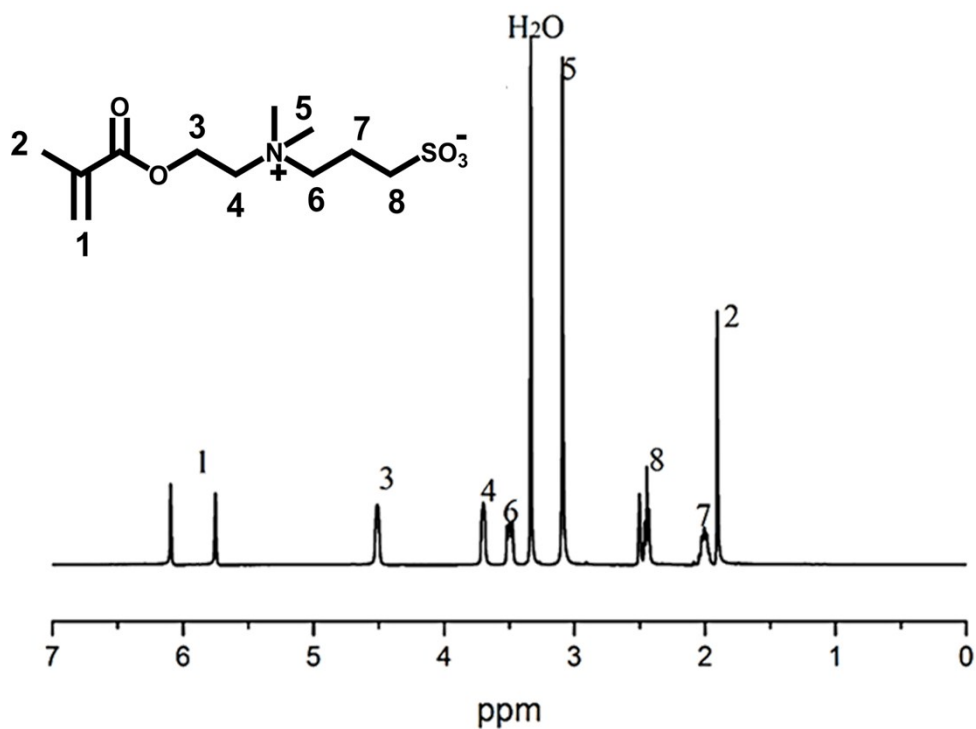


Figure S2. ¹H NMR spectra of SBMA in DMSO.

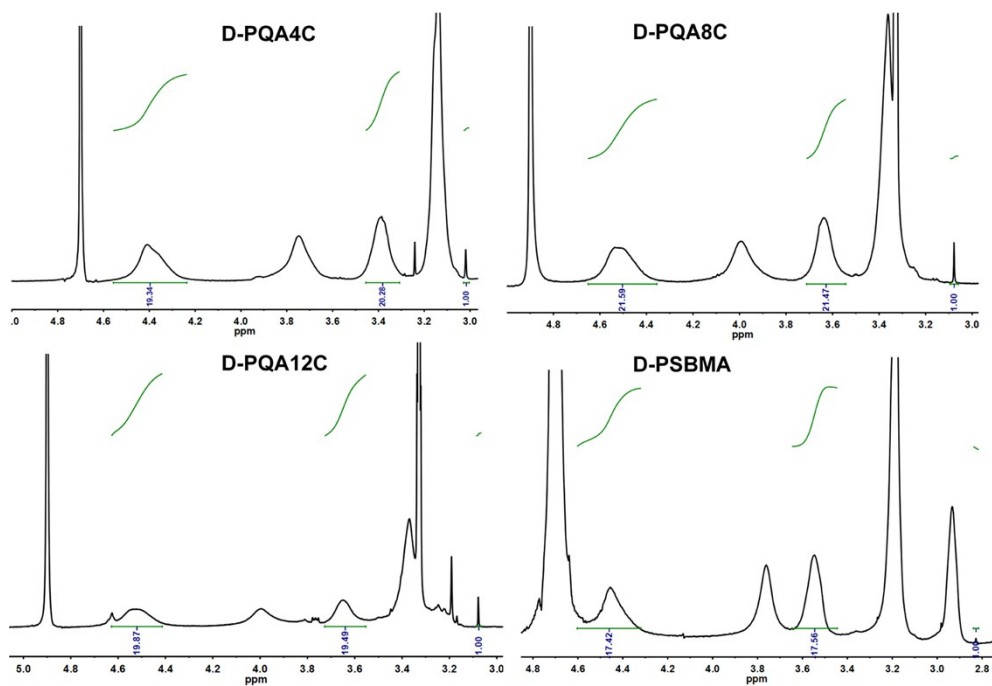


Figure S3. The calculation of the degree of polymerization (DP) of D-PQAs and D-PSBMA. The DPs for the D-PQA4C, D-PQA8C, D-PQA12C, and D-PSBMA are 20, 21, 19, and 18, respectively.

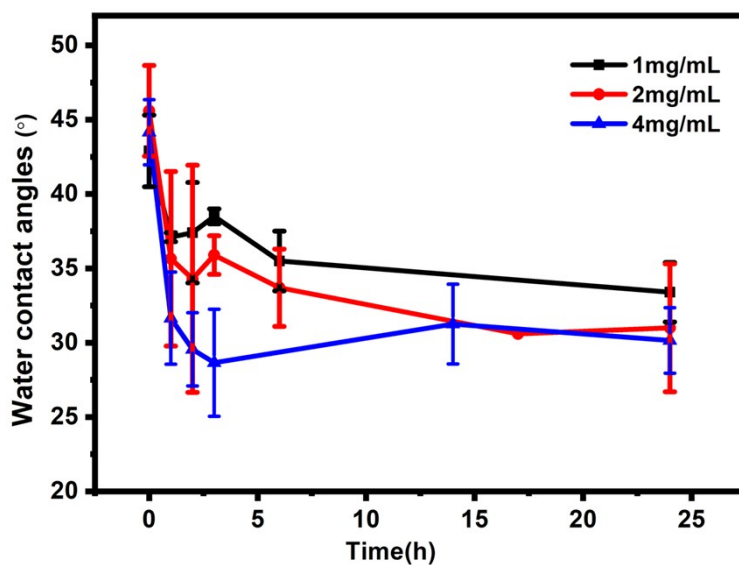


Figure S4. The water contact angles (WCA) of PQA4C brush grafting with different concentration D-PSBMA over time.

Table S1. Atomic percentages on the surfaces of PQA4C brush coating and PQA4C/PSBMA mixed brushes coating on Si wafer from XPS spectra at 90° take-off angle.

Sample	Element (atom %)			
	C	N	O	S
PQA4C	50.05	3.52	47.39	0.00
PQA4C/PSBMA 1mg/mL 1h	53.56	4.79	42.97	1.06
PQA4C/PSBMA 1mg/mL 24h	51.95	5.28	43.55	2.06
PQA4C/PSBMA 2mg/mL 1h	51.17	6.46	44.15	1.66
PQA4C/PSBMA 2mg/mL 24h	52.26	5.22	43.71	1.74
PQA4C/PSBMA 4mg/mL 1h	52.70	6.65	42.23	1.90
PQA4C/PSBMA 4mg/mL 24h	52.56	6.44	42.68	1.60

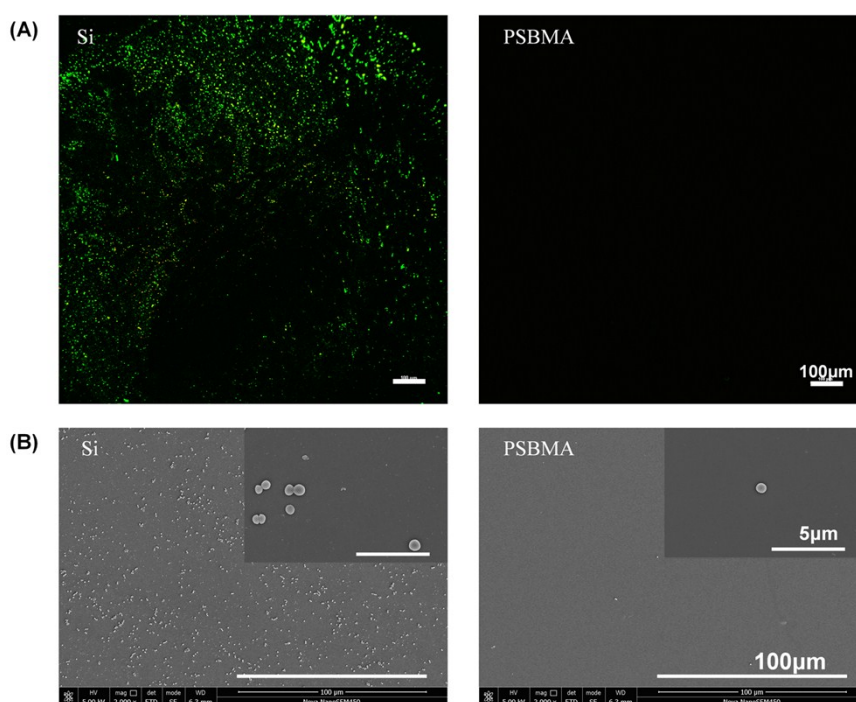


Figure S5. (A) Representative CLSM images of bacterial colonization on Si and PSBMA brushes after incubating with 1ml bacterial suspensions (10^5 CFU/mL) for 24 h. Scale bars in CLSM images represent 100 μ m.(B) Representative SEM images of bacterial colonization on Si and PSBMA brushes after incubating with 1ml bacterial suspensions (10^5 CFU/mL) for 24 h. Scale bars in SEM images represent 100 μ m and 5 μ m.

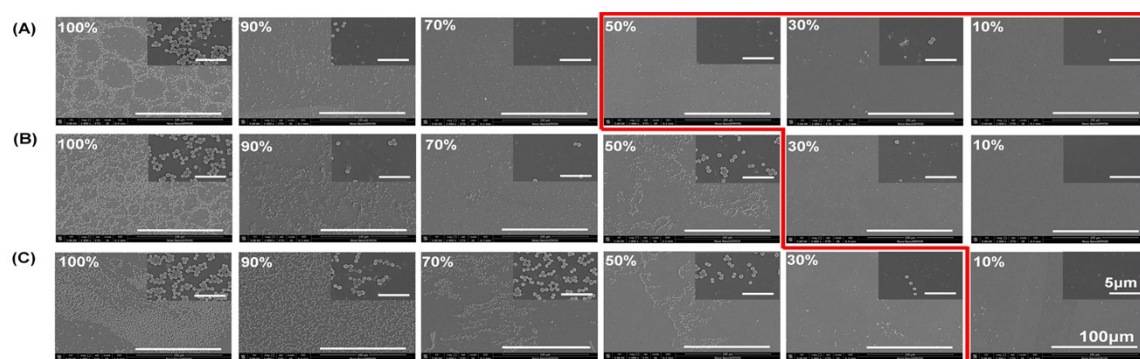


Figure S6. SEM images of bacterial colonization on PSBMA/PQAs mixed brushes (PSBMA/PQA4C(A); PSBMA/PQA8C(B); PSBMA/PQA12C(C)) after incubating with 1ml bacterial suspensions (10^5 CFU/mL) for 24 h. Scale bars in SEM images represent 100 μ m and 5 μ m. The number on the upper left represent the content of PQAs. The zones of red frame show excellent antibacterial efficacy.