Supporting information

for

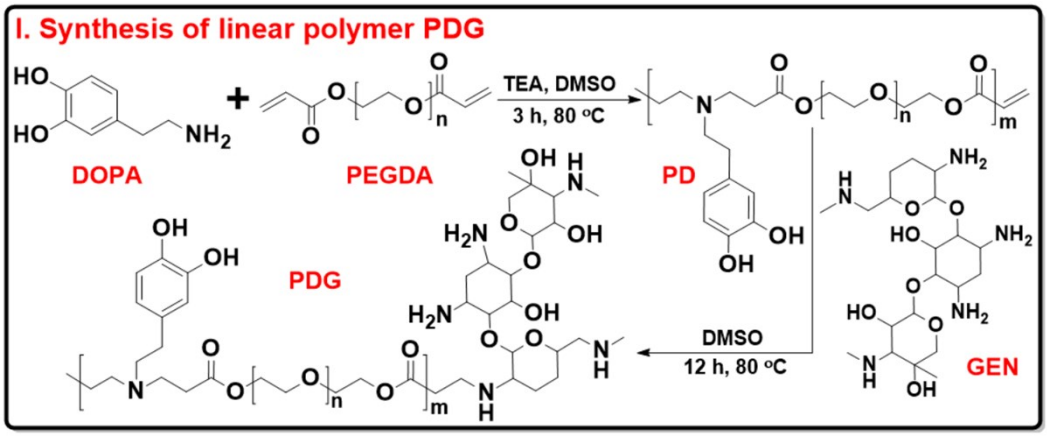
A mussel-bioinspired multi-functional hyperbranched polymeric coating with the integrating antibacterial and antifouling activities for implant interface modification

Huilin Xu[a], Yusong Cai,[a] Xing Chu[a], Hetao Chu[a], Dongyue Zhang*[a,b] and Jianshu Li*[a,b]

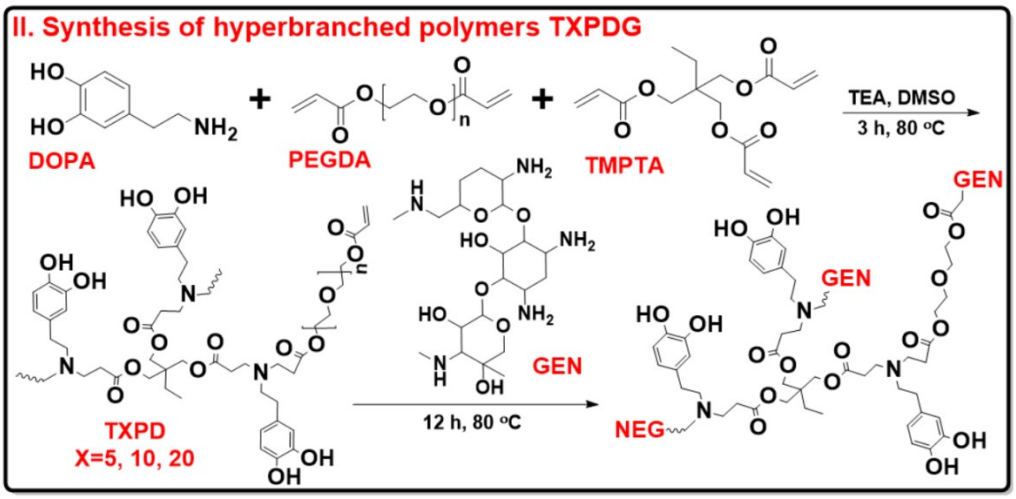
[a]College of Polymer Science and Engineering, Sichuan University, Chengdu, 610065, China.

[b]State Key Laboratory of Polymer Materials Engineering, Sichuan University, Chengdu, 610065, China.

Figure and table content



Scheme S1 Synthesis routs of linear polymer PDG.



Scheme S2 Synthesis routs of hyperbranched polymer TXPDG.

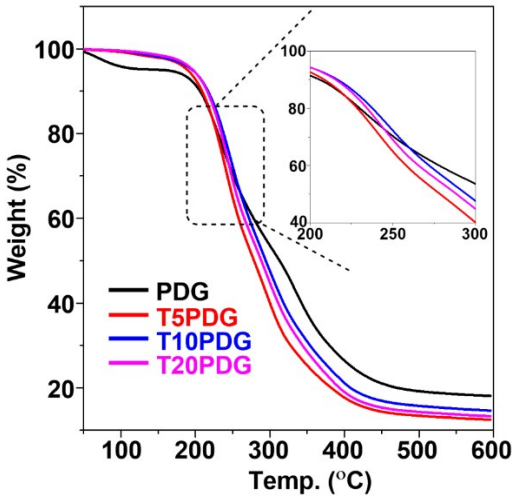


Fig. S1 Thermogravimetric analysis (TGA) measurements of PDG and TXPDG.

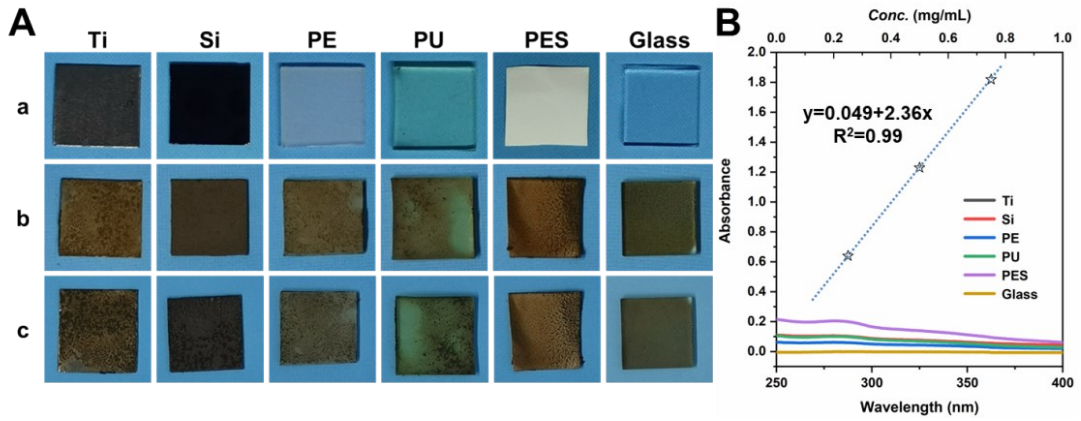


Figure S2 (A) Optical images of various bare substrates (a), those decorated by T20PDG coatings (b) and those after immersing in PBS at 37℃ for 14 days. (B) UV−vis spectra of the soaking solutions of each sample decorated by T20PDG. The star symbols represent the UV absorbance at λ=281 nm of T20PDG with different concentrations and the blue dotted line is the corresponding fitted curve.

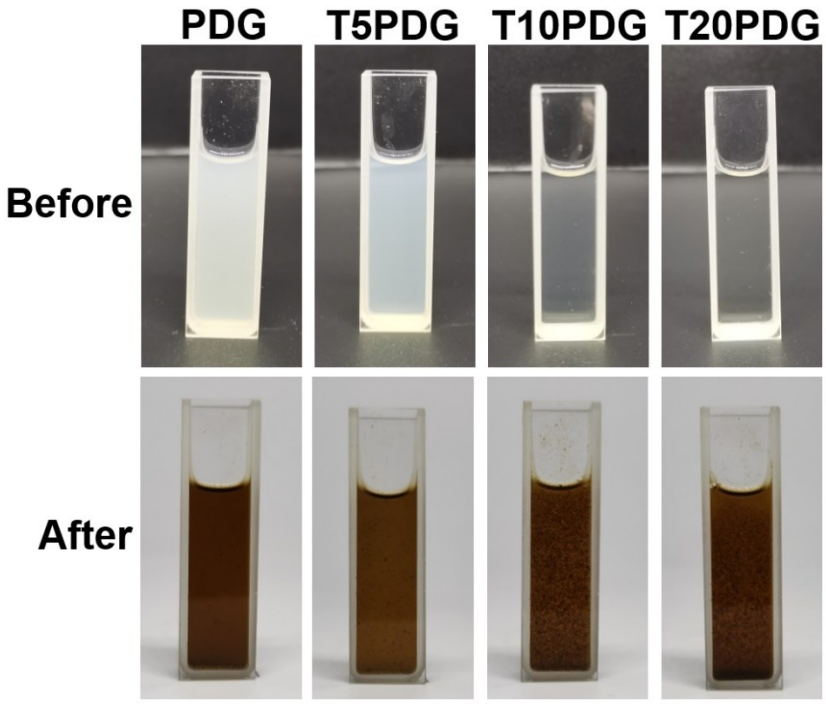


Fig. S3 Optical images of PDG and TXPDG in Tri-HCl solution (*conc.*=10 mg/mL) before and after oxidation process.

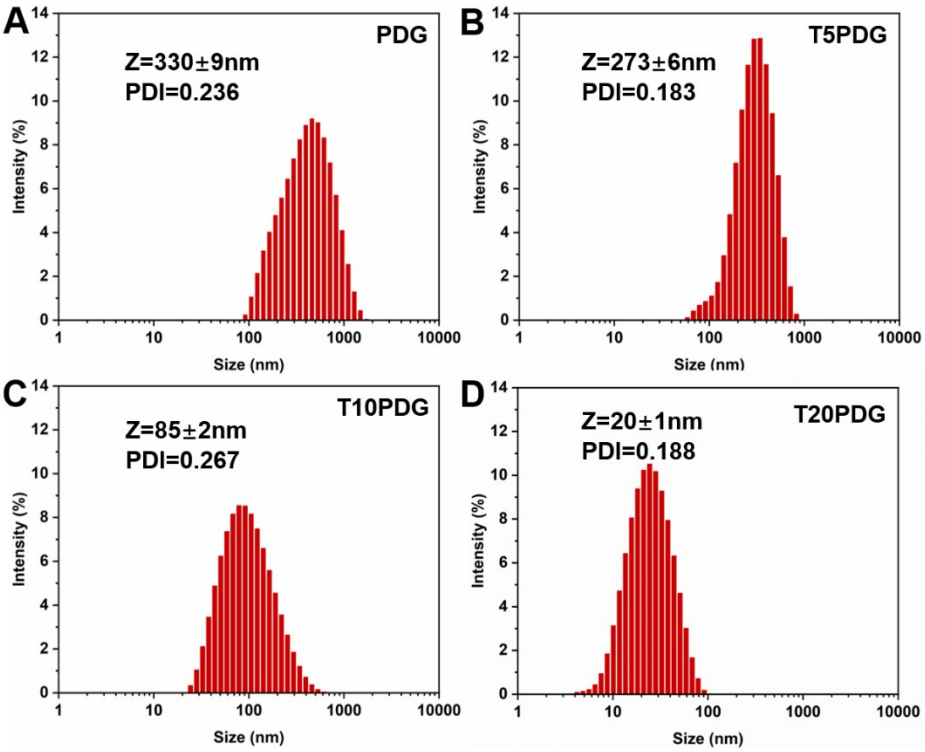


Fig. S4 Dynamic laser scattering (DLS) measurements of PDG and TXPDG in Tris-HCl solution (*conc.*=10 mg/mL).

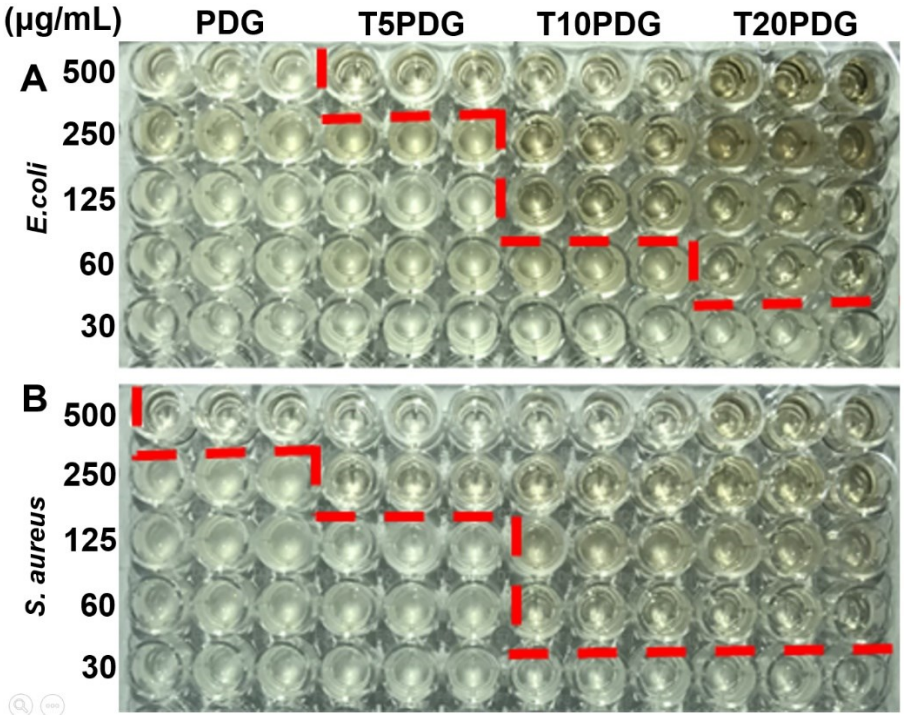


Fig. S5 Optical images of *E.* coli and *S.* aureus bacteria solutions (*conc.*=1×10^6 CFU/mL) cultivated with various polymers at various concentrations for 24 h.

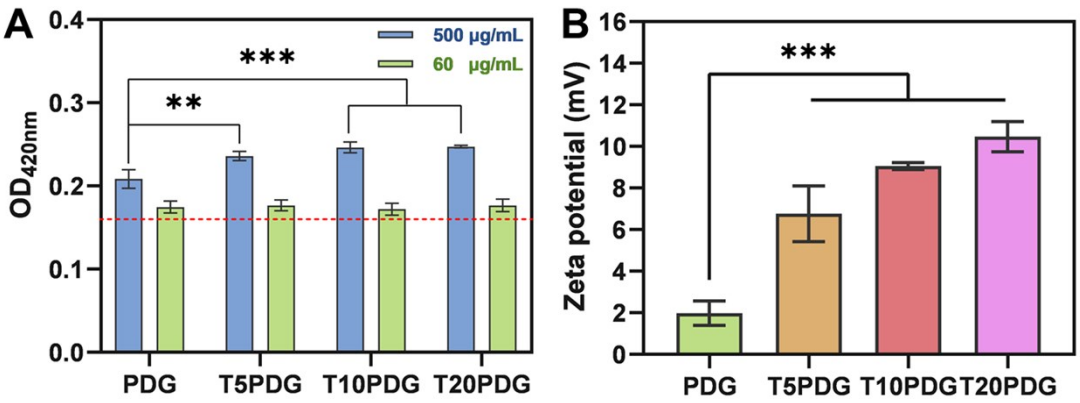


Fig. S6 (A) The effects on the membrane integrity of *E. coli* after induced by various HBPs, and the red dotted line represents the absorbance of the control group without the addition of HBPs. (B) Zeta-potentials of different HBPs TXPDG (x=5, 10, 20).

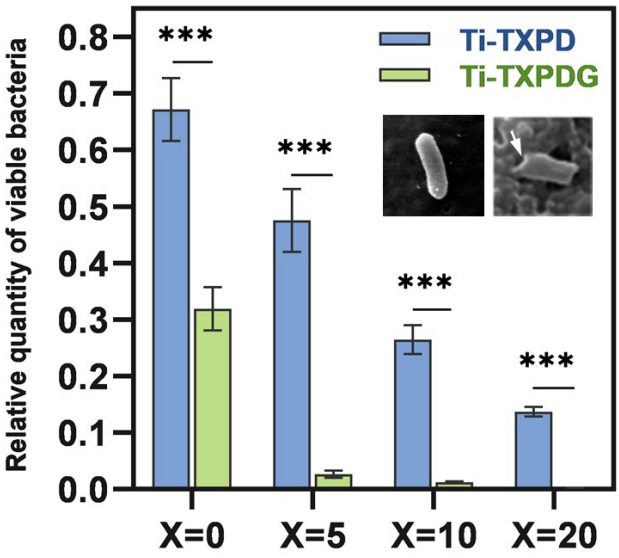


Fig. S7 Relative quantity of viable bacteria on various HBPs coated substrates.

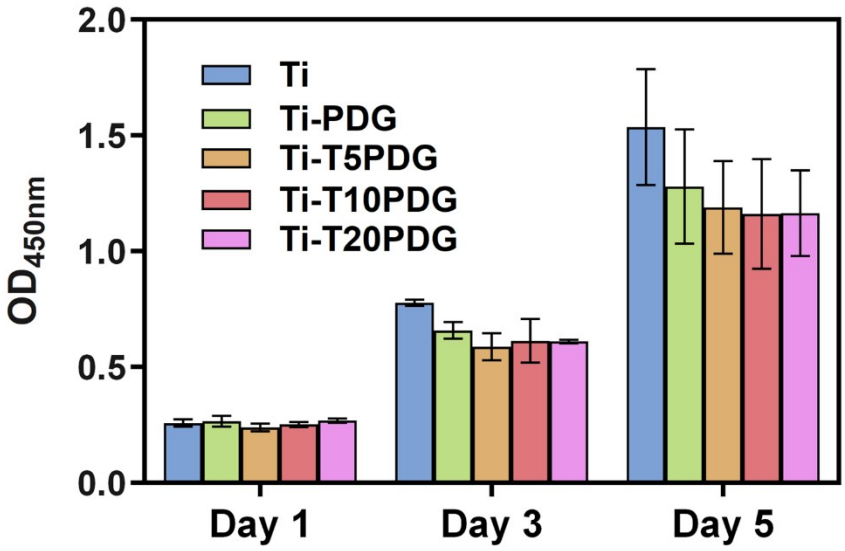


Fig. S8 Proliferation ($OD_{\lambda=450\ nm}$ values) of MC3T3 cells cultivated on bare Ti plates and those modified with various functional polymeric coatings.

Table S1 Minimum inhibiting concentration (MIC) of various polymers towards *E. coli* and *S. aureus* bacteria.

	MIC (μg/mL)	
Samples	***E.coli***	***S.aureus***
PDG	**>500**	**500**
T5PDG	**500**	**250**
T10PDG	**125**	**60**
T20PDG	**60**	**60**