Supporting Information

Universal Strategy for Efficient Fabrication of Blood Compatible Surfaces via Polydopamine Assisted Surface-Initiated ARGET ATRP of Zwitterions

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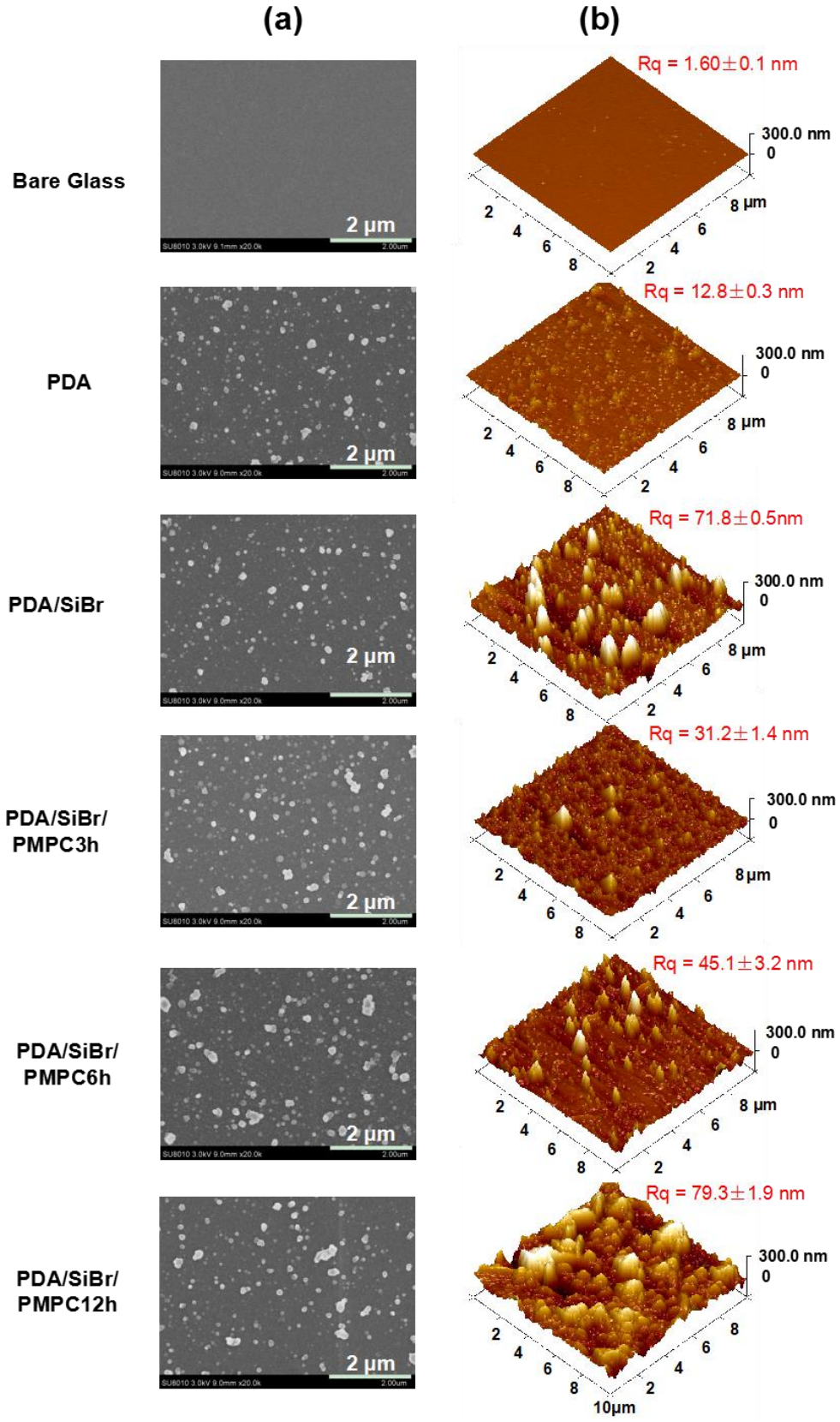

Figure S1. Scanning electron microscopy (SEM) (**a**) and AFM 3D (**b**) images of the prepared surfaces by the step-by-step PDA assisted SI-ARGET-ATRP strategy.

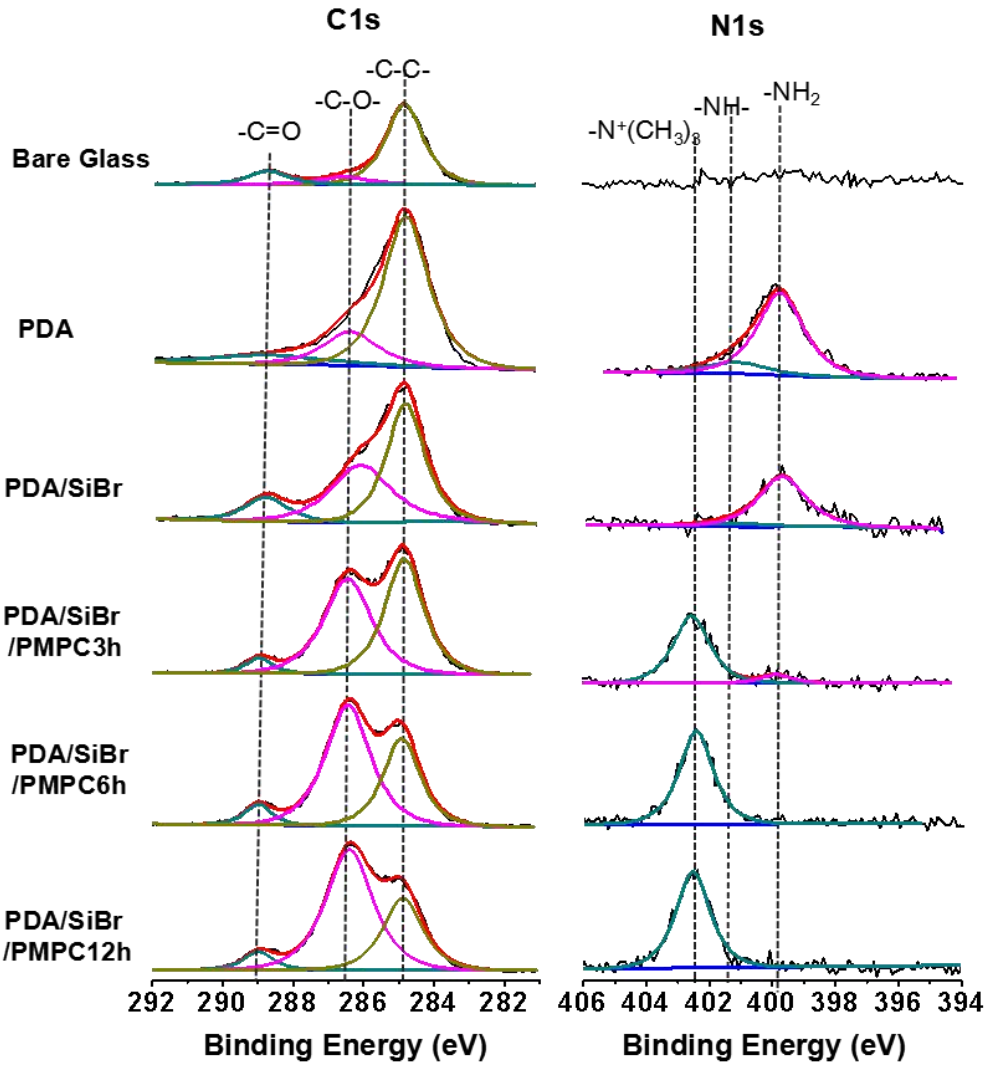

Figure S2. High resolution XPS spectra of C1s and N1s of bare glass and the prepared surfaces during the polymer brush fabrication by step-by-step PDA assisted SI-ARGET-ATRP.

Supporting Information

Table S1. Surface element concentration (%) of the modified glass surfaces during the polymer brush fabrication by XPS analysis.

Surface	Element (%)					
	C	N	O	P	Si	Br
Bare Glass	8.26	0	60.45	0	31.29	0
PDA	73.42	8.34	17.90	0	0.34	0
PDA/SiBr	59.78	0	26.19	0	8.54	4.90
PDA/SiBr/PMPC3h	64.51	4.47	26.47	4.32	0	0.23
PDA/SiBr/PMPC6h	59.54	5.23	29.95	5.18	0	0.14
PDA/SiBr/PMPC12h	59.77	5.28	29.59	5.27	0	0.09

Table S2. Coating and outer layer thicknesses of the polymer brush fabrication on a glass substrate by the step-by-step PDA assisted SI-ARGET-ATRP.

Coating	Total thichness (nm)	Outer layer (nm)※
PDA	22 ± 1	22 ± 1
PDA/SiBr	45 ± 2	23 ± 2
PDA/SiBr/PMPC3h	87 ± 3	42 ± 3
PDA/SiBr/PMPC6h	166 ± 6	121 ± 6
PDA/SiBr/PMPC12h	320 ± 8	275 ± 8

※ The outer layer thickness was calculated by subtraction of the sub-layer thickness from the total thickness of the complex coatings.

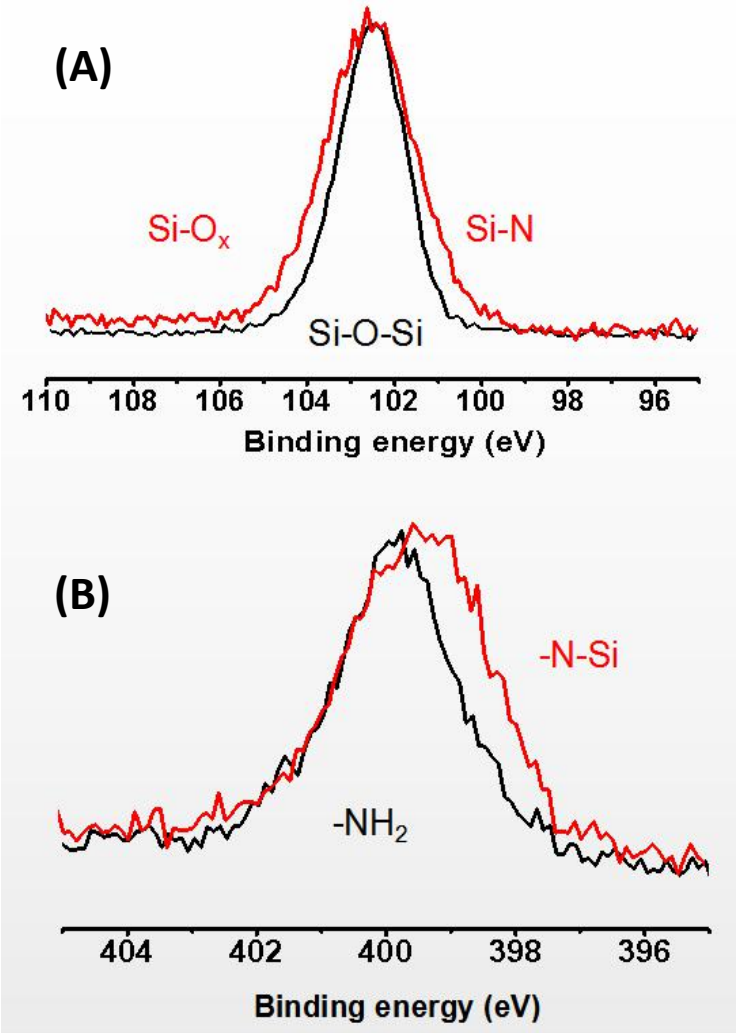

Figure S3. Normalized high resolution XPS spectra of Si2p and N1s. (A) Si2p spectra on the surface (black line) and at the interface (red line) of the PDA/SiBr complex coating. (B) N1s spectra on the surface of PDA coating (black line) and at the interface (red line) of the PDA/SiBr complex coating. The Si2p spectrum on the coating surface shows a narrow peak due to the formation of Si-O-Si bond by self-condensation of SiBr. The Si2p spectrum at the interface of PDA/SiBr coating shows broad peak possibly due to the formation of crosslinking bonds (C-O-Si-O-C) and Si-N-C between the SiBr silicon hydroxyl and PDA hydroxyl or amino groups.[1,2,3] The Si-N-C linkage is clearly demonstrated by the N1s high resolution XPS spectra on the PDA surface (black line) and at the interface of PDA/SiBr coating with appearing a new peak of N-Si (398 eV).[4]

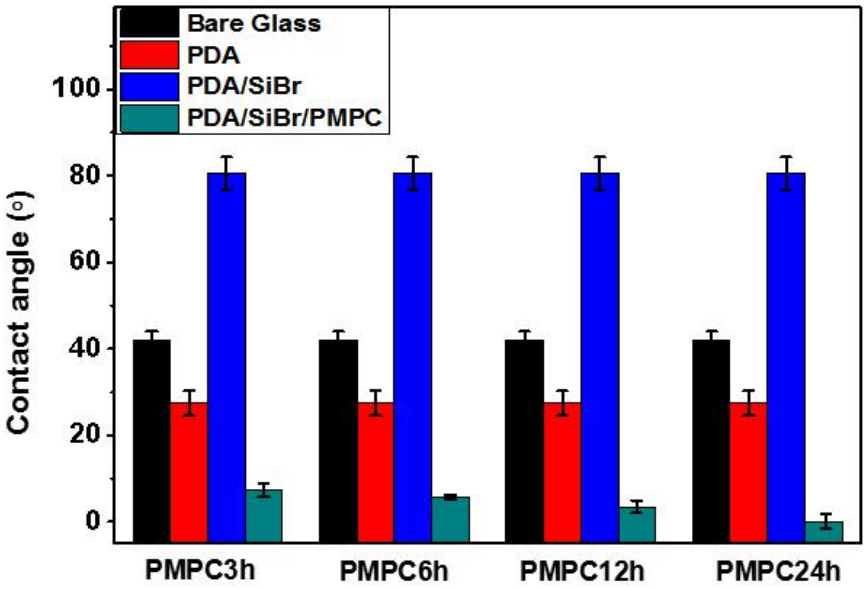

Figure S4. Water contact angles of the surfaces prepared by the polydopamine assisted PDA-SI-ARGET-ATRP step by step strategy. The PMPC polymerization is performed for 3, 6, 12 and 24 h, respectively.

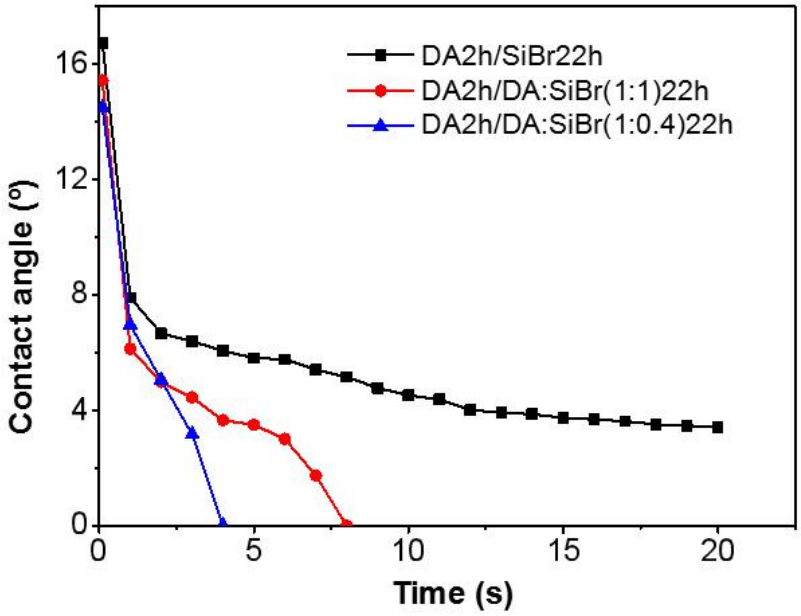

Figure S5. Water contact angle change with time on PMPC polymer brush grafted glass surfaces with different ATRP initiator coatings. All the ATRP initiator coatings (PDA/SiBr, PDA/(PDA:SiBr) were prepared firstly in 2 mg mL^{-1} dopamine (DA) aqueous solution (pH 8.5) for 2 h at room temperature, and then in SiBr solution of ethanol/water (50 v/v%) containing 0:1, 1:1, 1:0.4 (DA:SiBr) molar ratios of DA and reacted at 50˚C for 22 h.

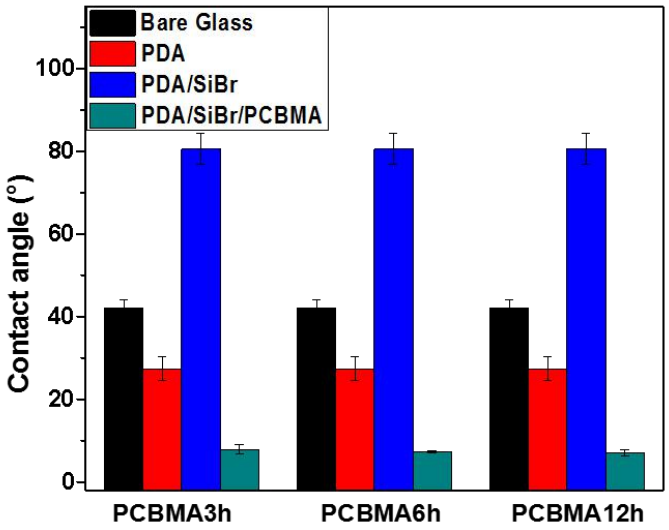

Figure S6. Contact angles of bare glass and the PDA, PDA/SiBr, and PDA/SiBr/PCBMA brush coated surfaces. Data represent means±SD (n=5). The low water contact angle ($6 \pm 2°$) of the PSBMA brush coated glass surface, as well as the PMPC brush coated different substrates, demonstrates that the polydopamine assisted PDA-SI-ARGET-ATRP strategy is effective for preparing different zwitterion polymer brushes.

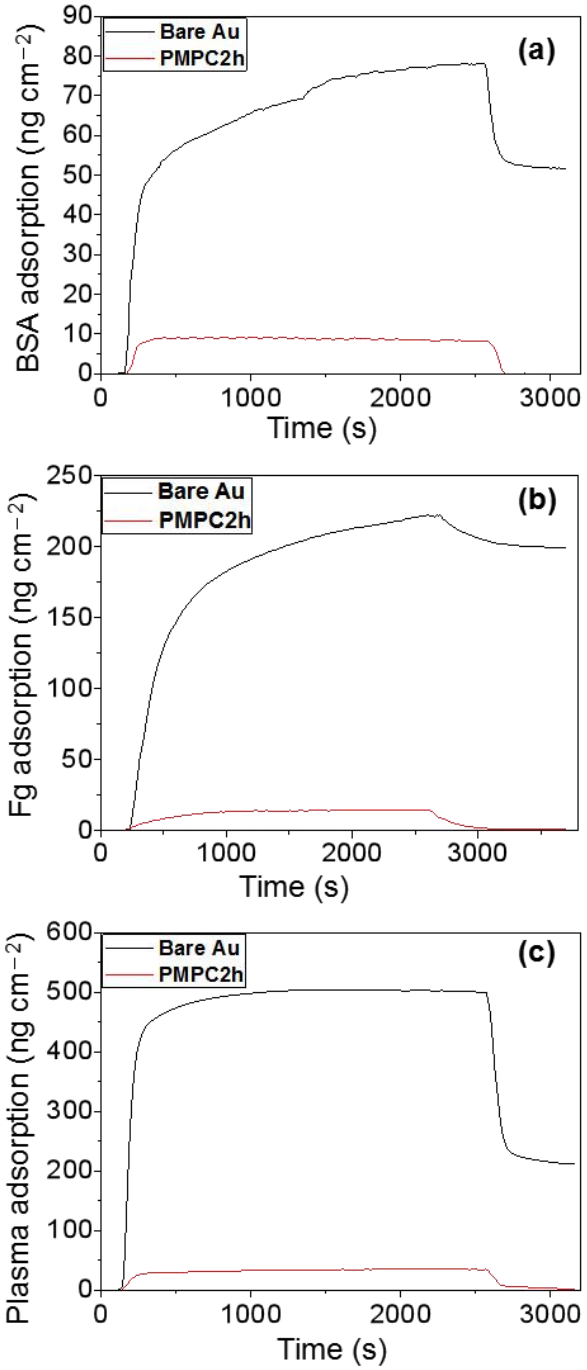

Figure S7. SPR adsorption curves of the bare and PMPC brush coated sensor surfaces. (**a**) BSA, (**b**) Fg and (c) whole blood plasma. The adsorption amounts on the PMPC2h surface were 0, 1.0 and 1.9 ng cm^{-2} for BSA, Fg and plasma, respectively. The PMPC2h brush was grafted on the sensor chips coated with much thin PDA/SiBr film (3~5 nm) to satisfy the thickness requirement of SPR technique.

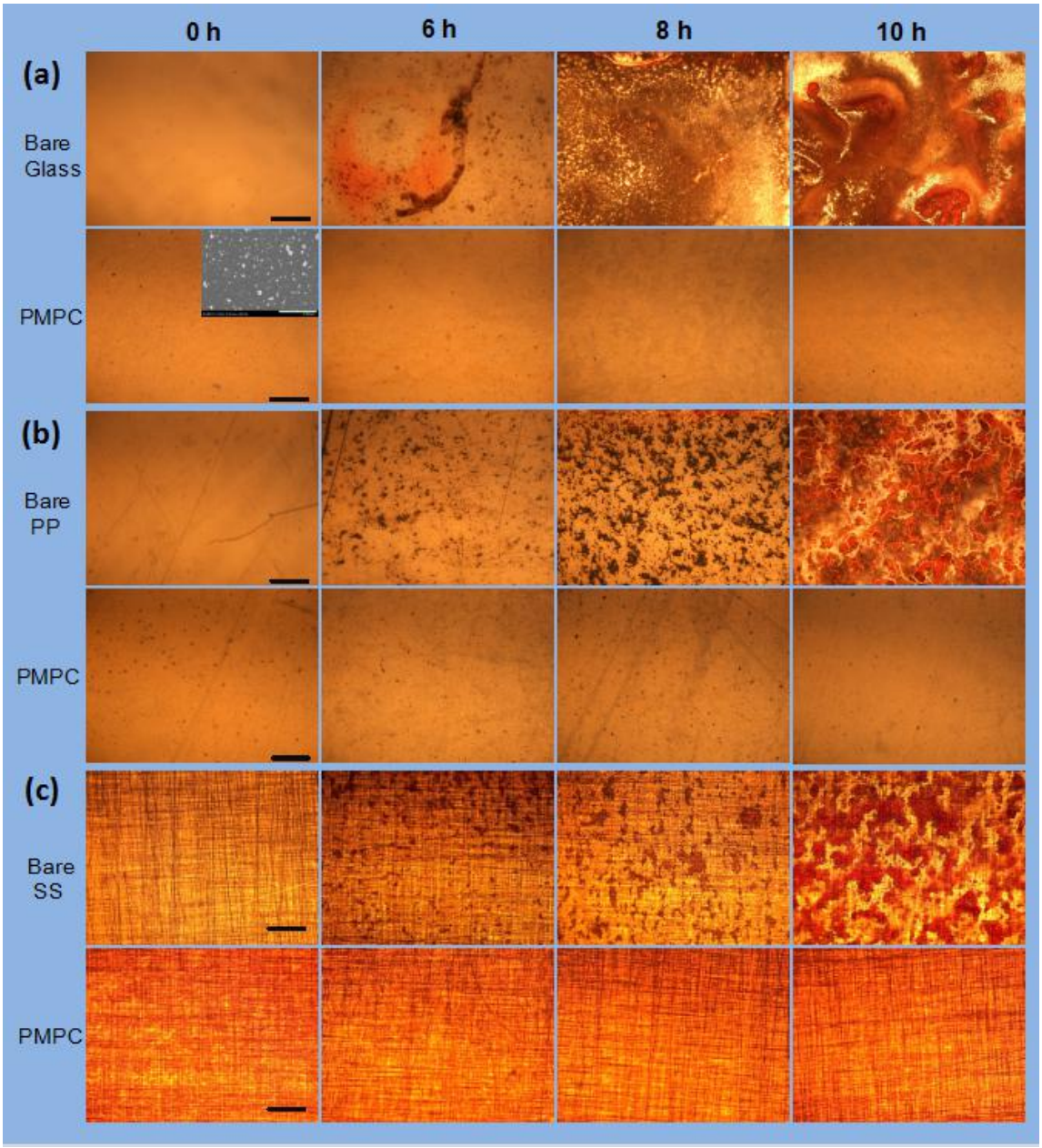

Figure S8. Optical microscopic images of thrombus formation on the pristine and PDA/SiBr/PMPC12h coated (**a**) glass, (**b**) polypropylene (PP) and (**c**) stainless steel (SS) surfaces immersed in the same whole blood for different hours. The scale bars are 500 μm for all optical microscopic images and 2 μm for the inserted SEM image.

Supporting Information

References

[1] Wang, Z.; Zhao, S.; Zhang, W.; Qi, C.; Zhang, S.; Li, J. Bio-inspired cellulose nanofiber-reinforced soy protein resin adhesives with dopamine-induced codeposition of "water-resistant" interphases. *Appl. Surf. Sci.* **2019**, *478*, 441-450.

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[3] Tung, J.; Tew, L. S.; Coluccini, C.; Lin, Y.-D.; Khung, Y. L. Grafting behavior for the resonating variants of ethynylaniline on hydrogenated silicon (100) surfaces under thermal hydrosilylation. *Chem. Eur. J*. **2018**, *24*(50), 13270-13277.

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