Supplementary Information

Anchorable phosphorylcholine copolymer synthesis and cell membrane mimetic antifouling coating fabrication for blood compatible applications

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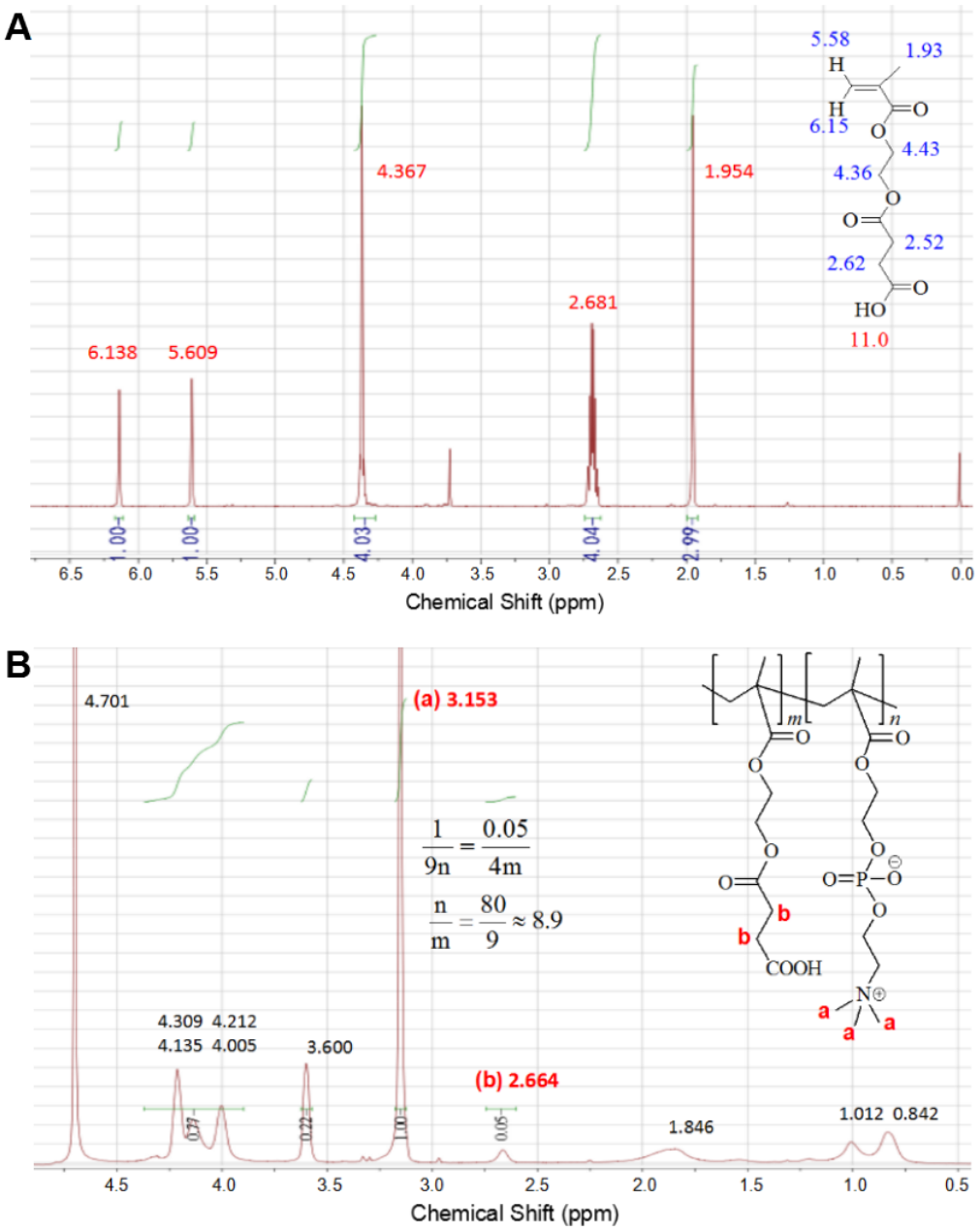


Fig. S1. 1H NMR spectra of SMA monomer (A) and the PMPCC10 copolymer (B). The inserted cemical structure of SMA is labeled with the simulated chemical shift.

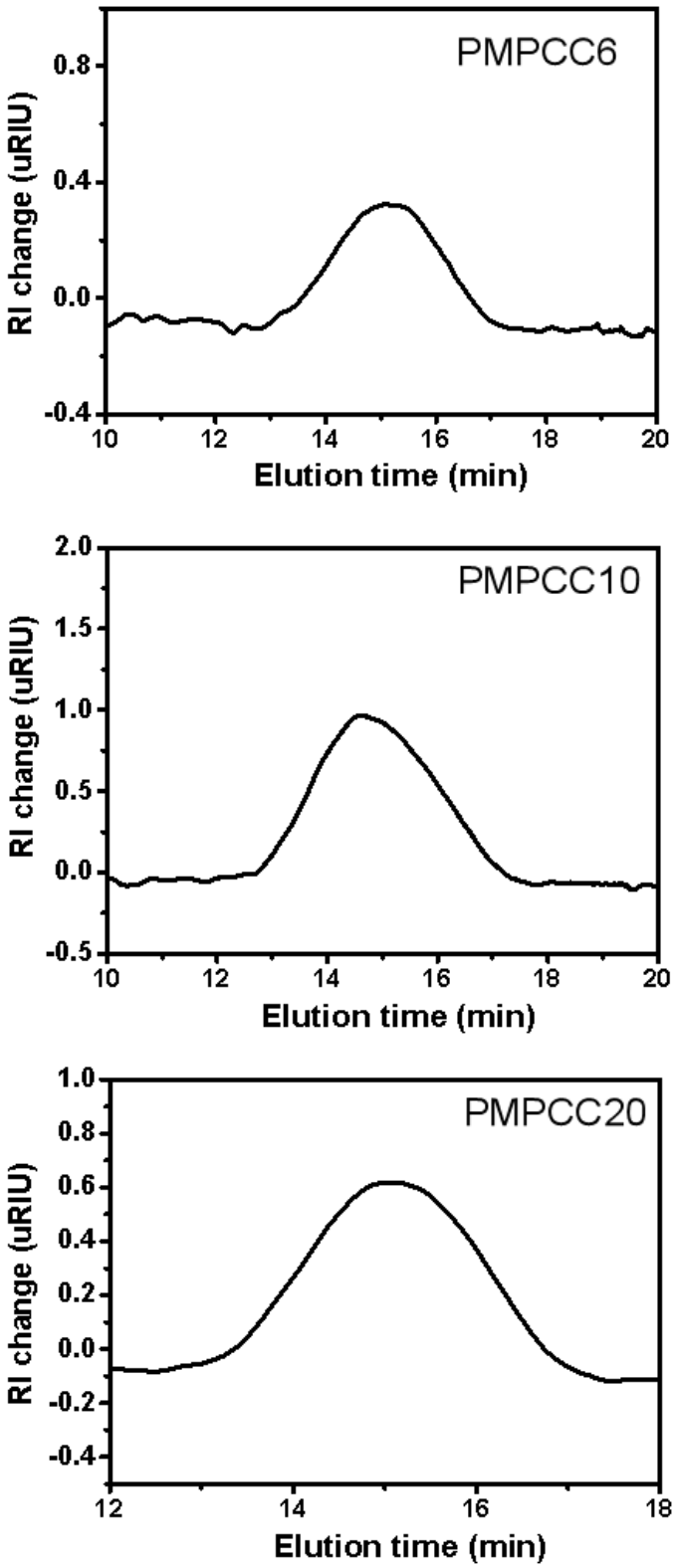


Fig. S2. GPC elution time vs refractive index change of PMPCC aqueous solutions containing 0.20 mol/L $NaNO_3$ at 35°C.

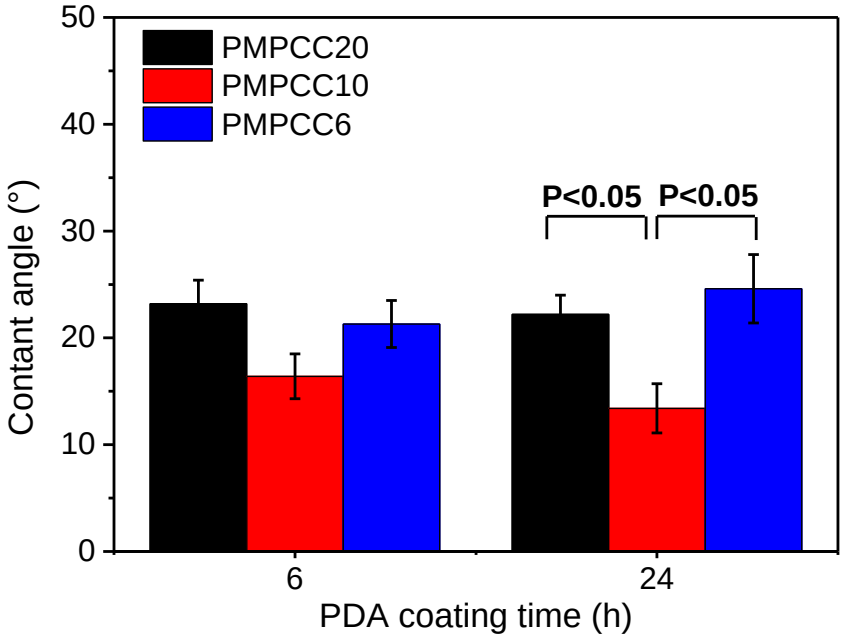


Fig. S3. Water contact angle change with the surface anchored PMPCC copolymers containing different molar percentage of the carboxylic acid units. PMPCC10 coated surfaces on both the thin (6h) or thick (24h) PDA primer layers show lwest contact angle among the higher and lower carboxylic acid cntent samples. Data represent mean ± SD (n = 3).

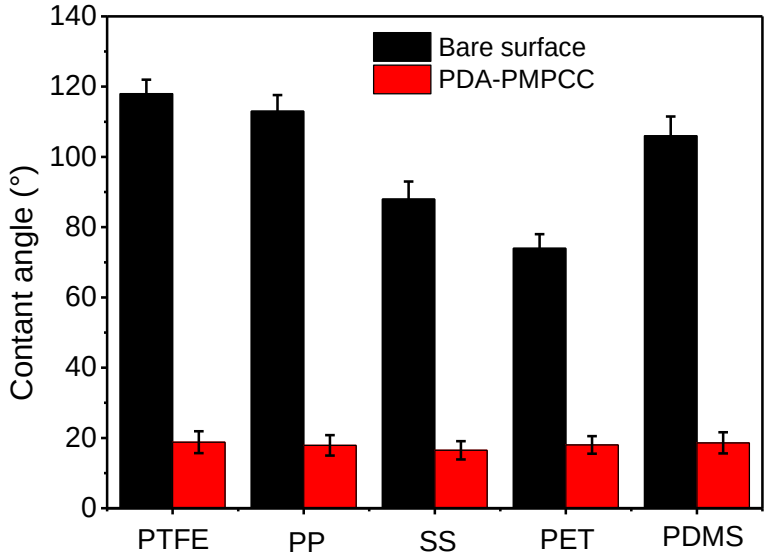
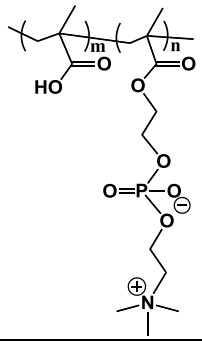
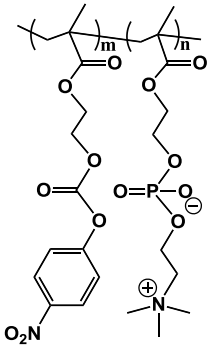
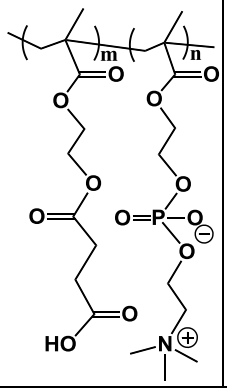


Fig. S4. Water contact angles of the bare and PDA-PMPCC10 coated polytetrafluoroethylene (PTFE), polypropylene (PP), stainless steel (SS), polyethylene glycol terephthalate (PET), polydimethylsiloxane (PDMS) surfaces. The remarkable decrease of water contact angles of all the modified material surfaces demonstrate the effectiveness of the PDA-PMPCC coating. Data represent mean ± SD (n = 4).

Table S1. Structure and surface immobilized density of differently designed MPC copolymers.

Copolymer	Structure	Spacer arm length	Immobilized PC content	Reference
PMA		0 atom	0.8 P% on plat titanium alloy	[1]
PMEN		5 atoms	0.9 N^+% on flat silicon	[2]
			1.29 P% on flat glass	[3]
			3.0 P% on porous PVDF membrane	[4]
PMPCC		8 atoms	2.40 P% on flat glass	This work

References:

[1] Ye S.-H.; Johnson C. A. Jr; Woolley J. R; Snyder T. A; Gamble L. J; Wagner W. R. Covalent surface modification of a titanium alloy with a phosphorylcholine-containing copolym for reduced thrombogenicity in cardiovascular devices. *J. Biomed. Mater. Res. A* 2009, 91(1), 18-28.

[2] C.-M. Xing, F.-N. Meng, M. Quan, K. Ding, Y. Dang, Y.-K. Gong, Quantitative fabrication, performance optimization and comparison of PEG and zwitterionic polymer antifouling coatings, *Acta Biomaterialia* 2017, 59, 129-138.

[3] T. Li, N. Li, Y. Ma, Y.-J. Bai, C.-M. Xing, Y.-K. Gong. Blood cell repelling and tumor cell capturing surface for highpurity enrichment of circulating tumor cells. *J. Mater. Chem. B* 2019, 7, 6087-6098.

[4] F.-N. Meng, M.-Q. Zhang, K. Ding, T. Zhang, Y.-K. Gong, *J. Mater. Chem. A*, 2018, 6, 3231-3241.

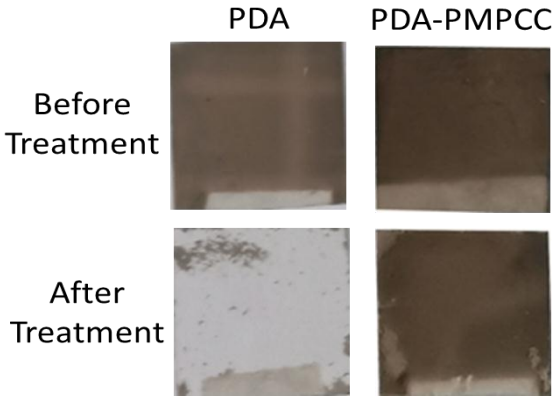


Figure S5. Photographs of PDA and PDA-PMPCC coated cover glasses before and after immersed in pH 13 NaOH aqueous solution for 2 hours. Obvious dissolution/detachment of the PDA coating is observed. By contrast, in significant dissolution/detachment of the PDA-PMPCC coating suggests the stablization effect from multipoint anchoring/crosslinking of PMPCC.

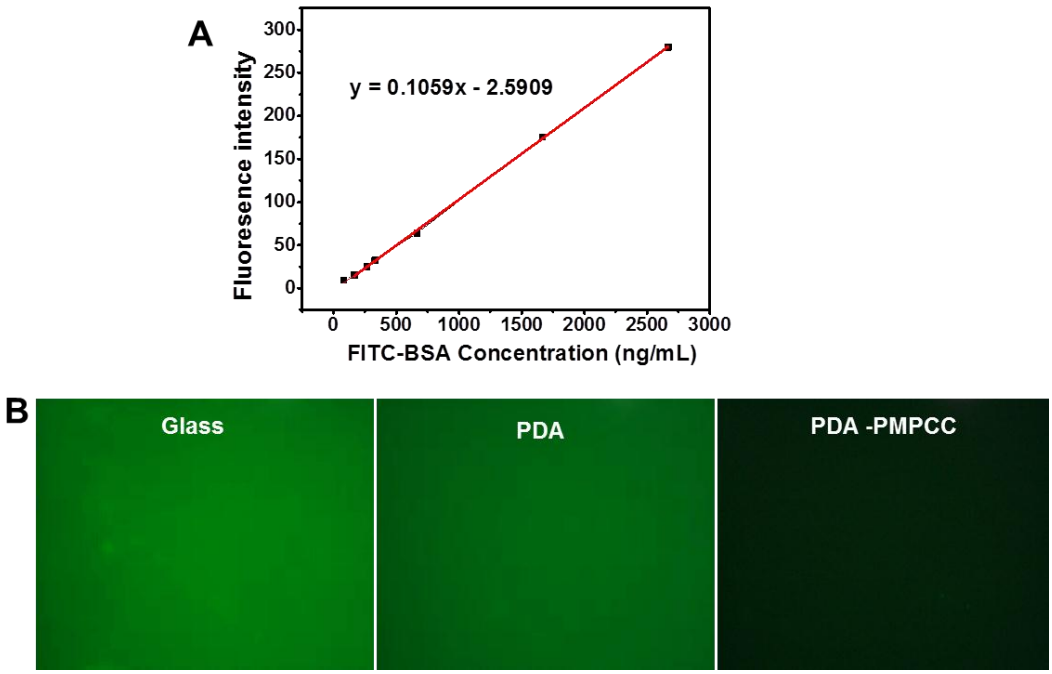


Fig. S6. (A) Fluorescene intensity vs concentration curve of FITC-BSA solutions. (B) Fluorescene microscopic images of the FITC-BSA adsorbed from 1.00 mg/mL solution on the bare, PDA and PDA-PMPCC coated glass surfaces.

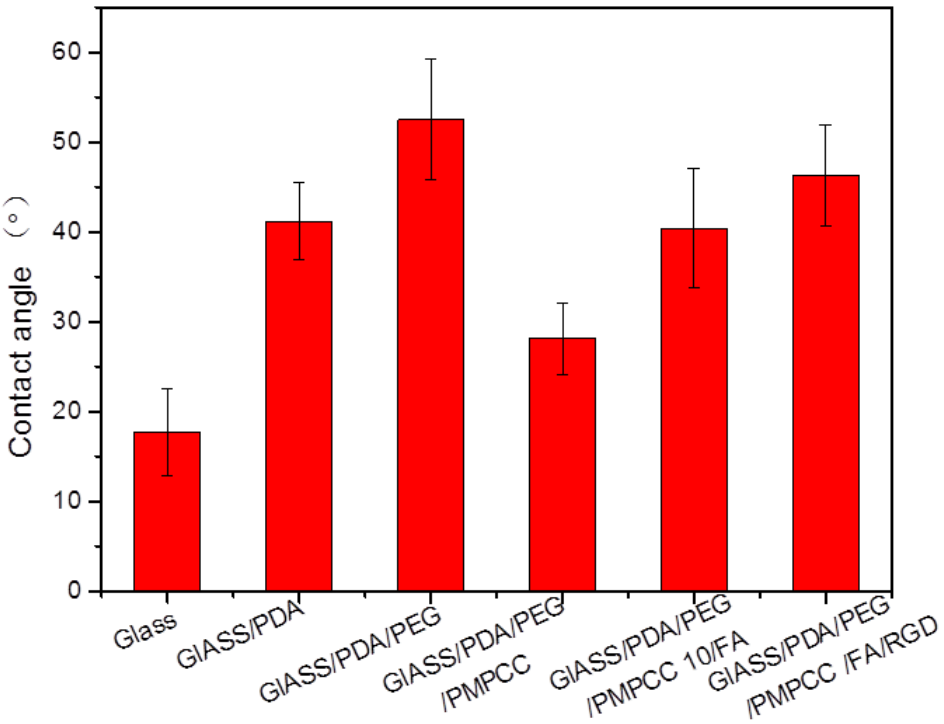


Fig. S7. Water contact angle changes during the step-by-step coating process of PDA-PEG-PMPCC-FA-RGD surface.