Supplementary Information (SI) for RSC Advances.

The impact of nanostructuring on the hemocompatibility of polysulfobetaine (PSB) coated hydrogel surfaces

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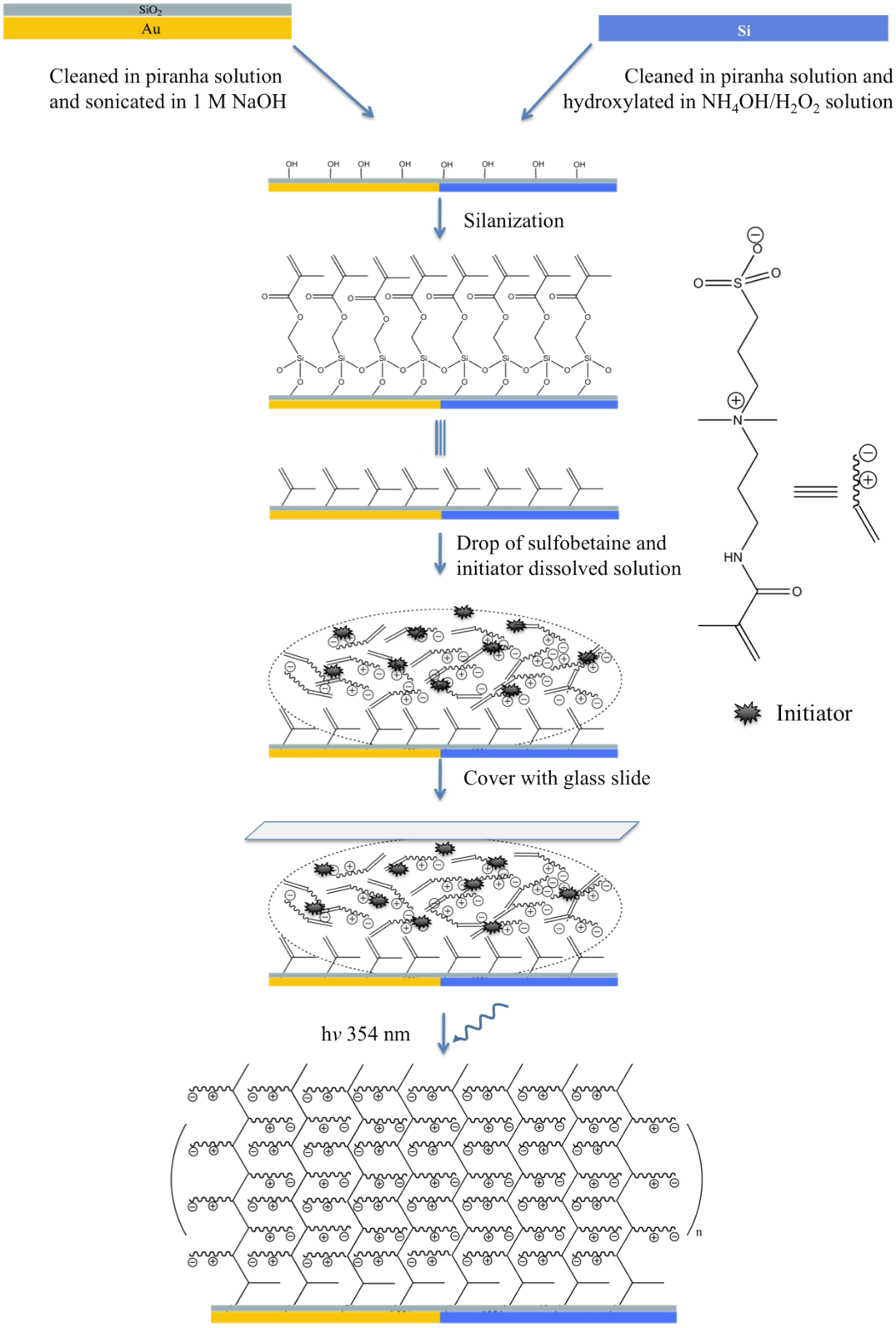
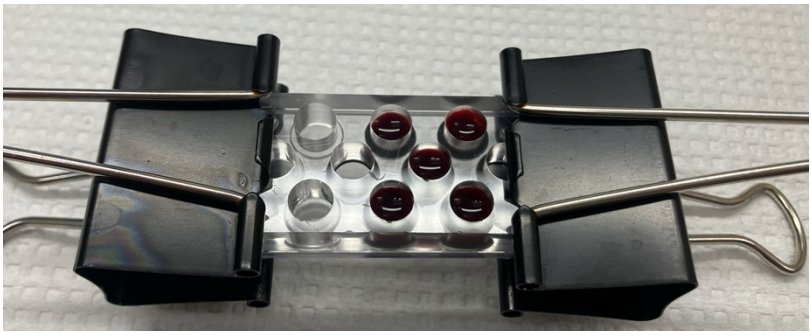
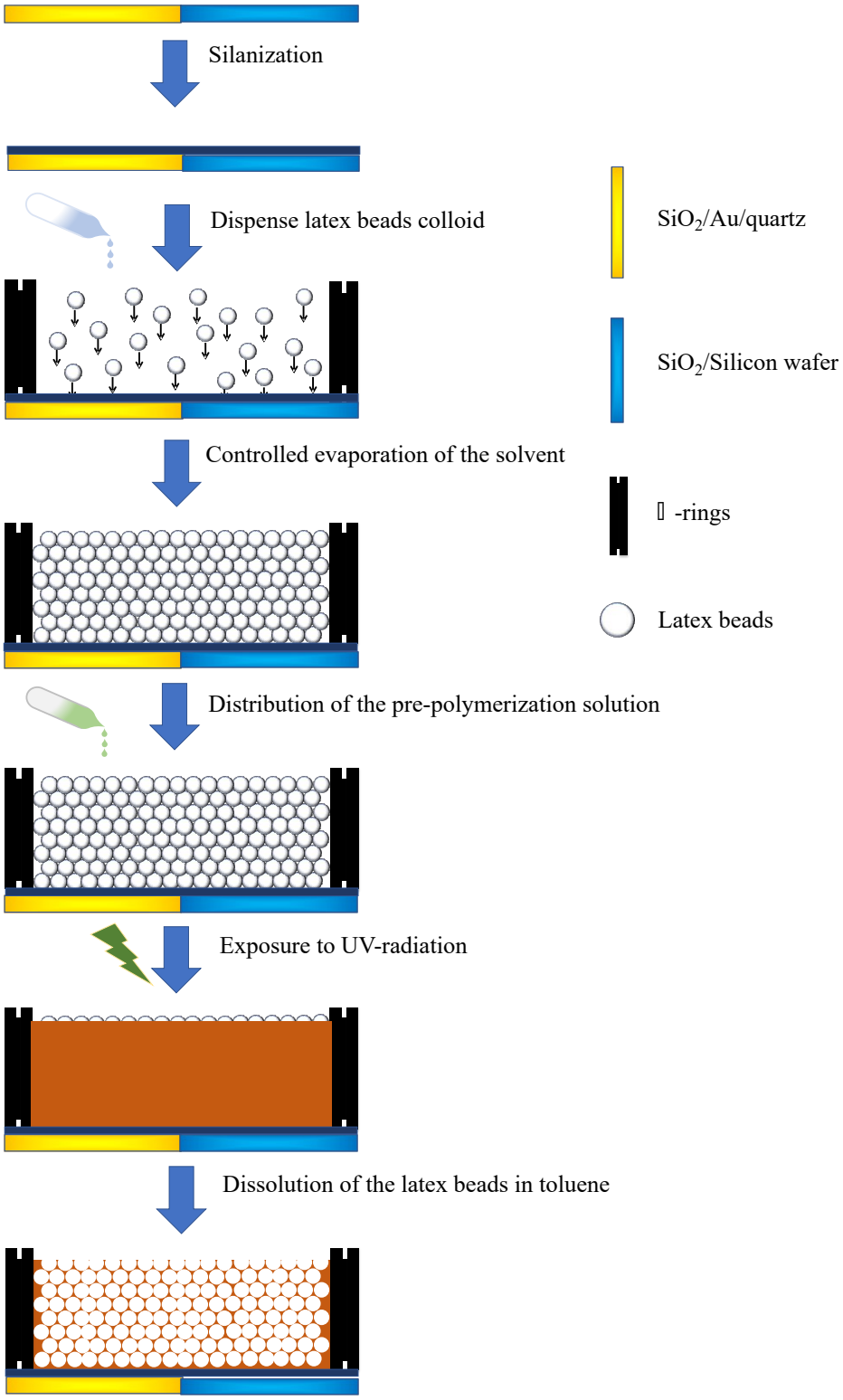


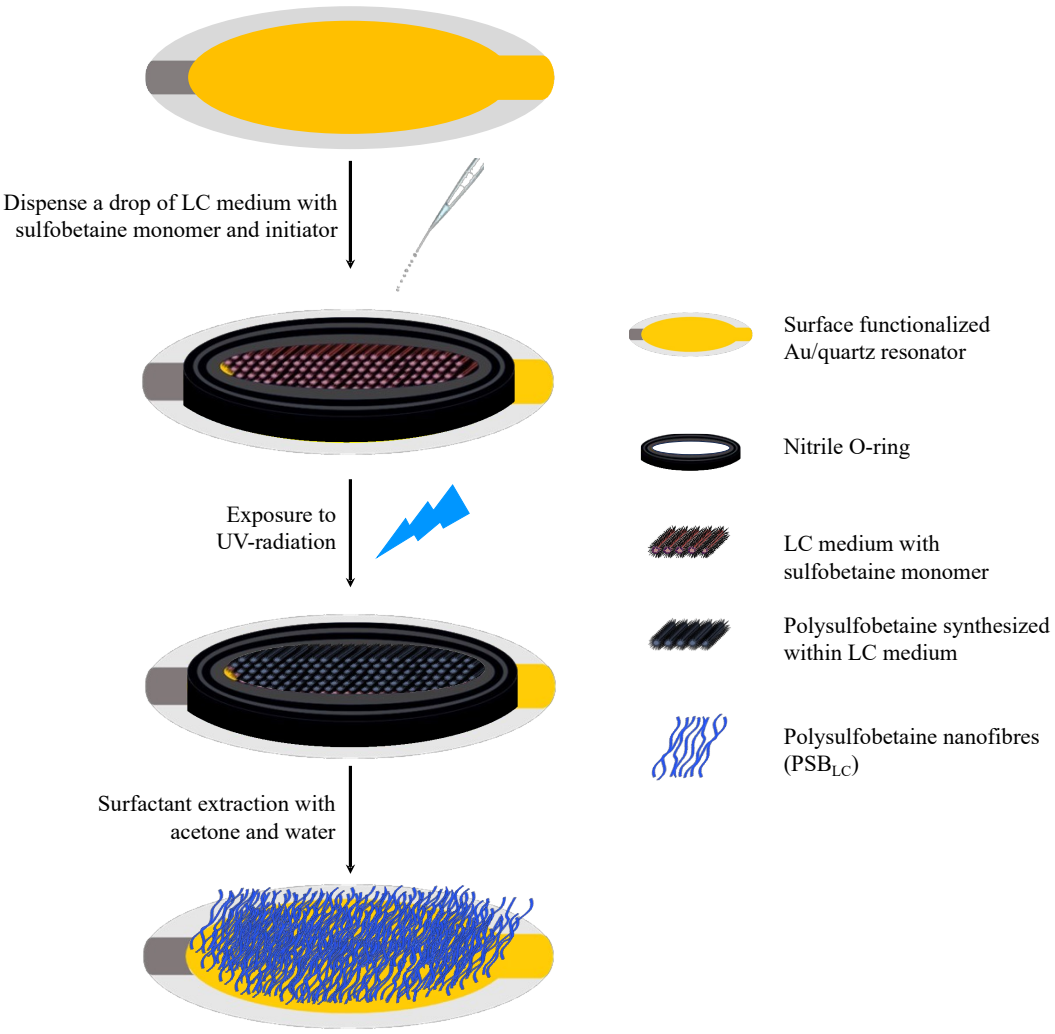
Scheme 1A-SI. Scheme for the preparation of PSB film ($PSB_{WAT\text{-}onto}$) grafted-onto functionalized SiO_2 coated Au/quartz or silicon wafers.



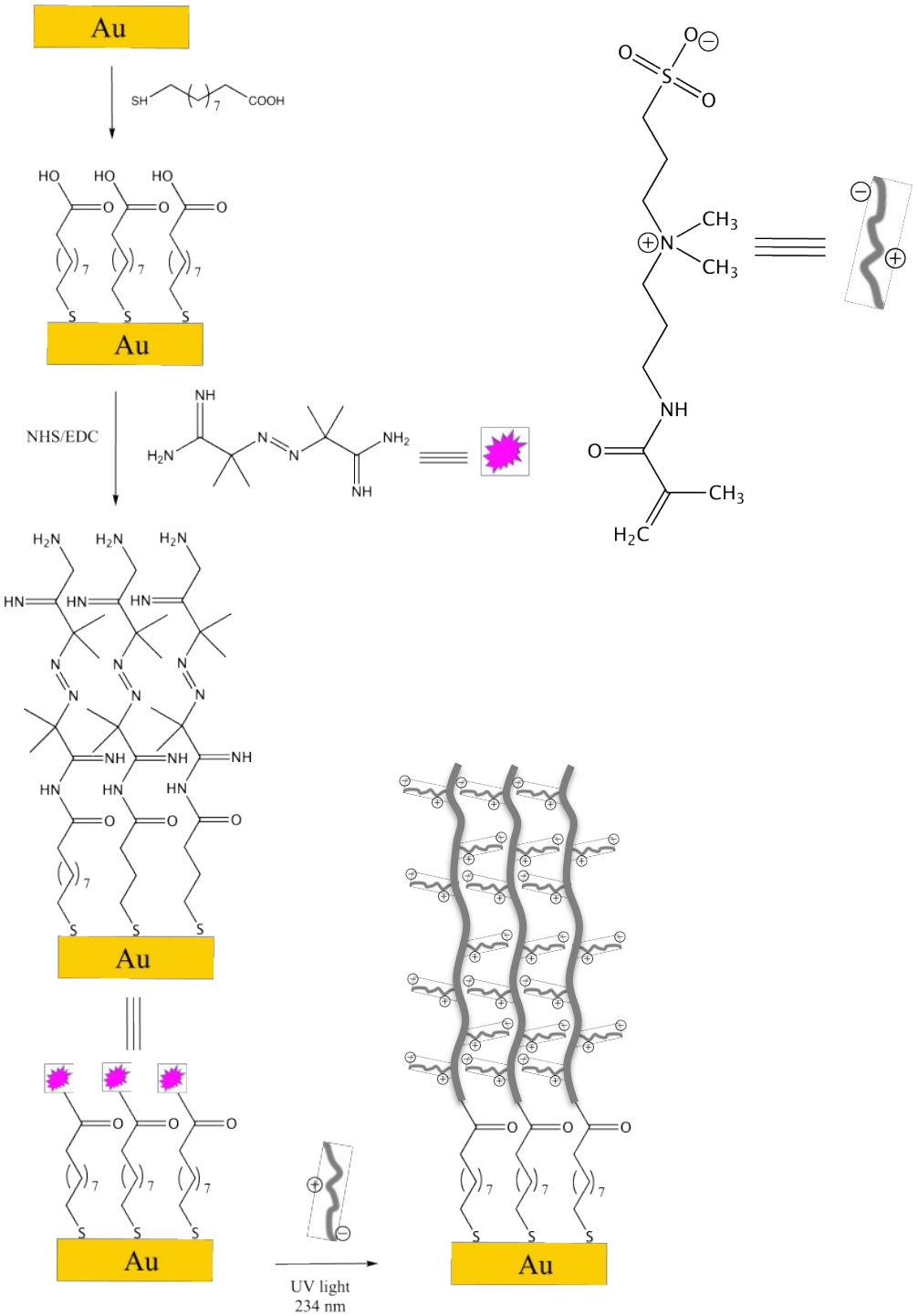
Scheme 1B-SI. Schematic representation of the blood chamber. In each experiment, chamber wells were filled with 100 µL of blood from an individual healthy human donor.



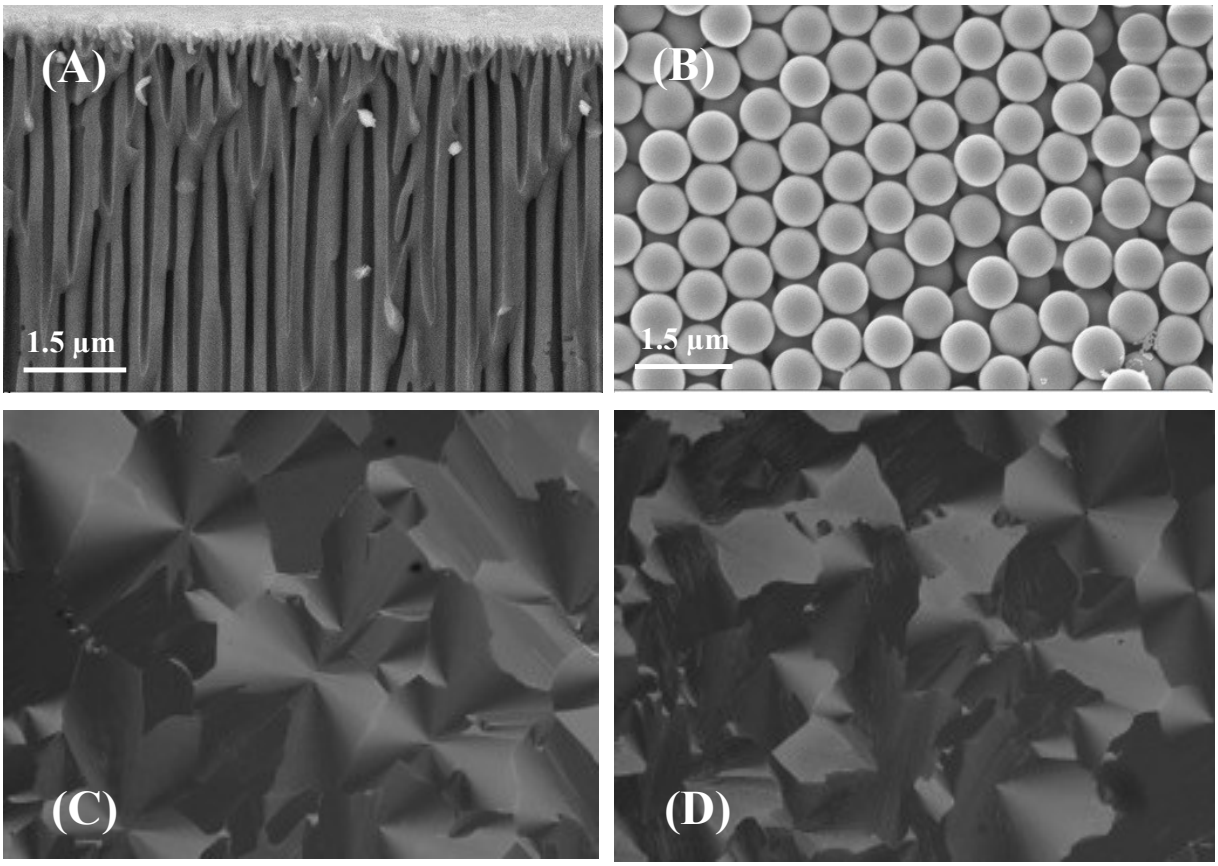
Scheme 2-SI. Chart showing the preparation protocol of nanoporous polysulfobetaine (**PSB**$_{LB}$) on silicon or Au/quartz substrate.



Scheme 3-SI. Preparation protocol for the nanofibrous polysulfobetaine (**PSB_{LC}**) on silicon or Au/quartz substrate from the AOT/p-xylene/water LC medium.



Scheme 4-SI. Illustration of polysulfobetaine film (**PSB**$_{WAT\text{-}from}$) synthesis on the functionalized SiO_2 coated Au/quartz surfaces via graft-from approach.



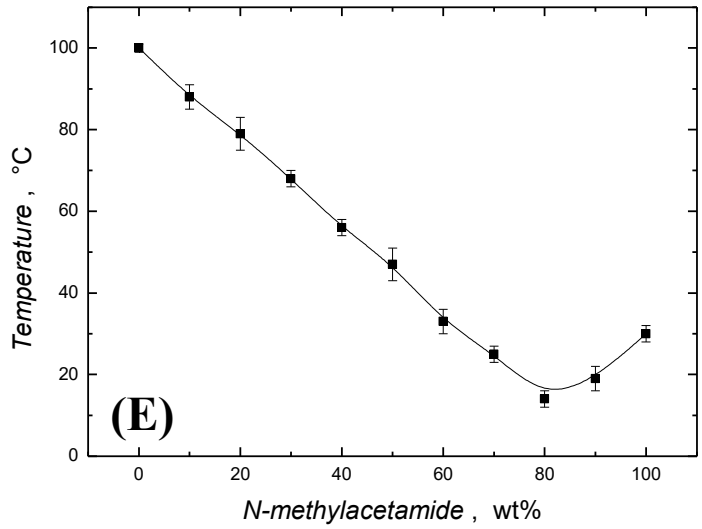


Figure 1-SI. SEM image of the (A) anodized aluminium oxide (AAO) membrane and (B) self-assembled 300-nm sized latex beads on Si wafer. Hexagonal liquid crystals of the *p*-xylene/AOT/water reverse micelle phase, imaged with polarizing light microscope, in the (C) absence and (D) presence of sulfobetaine methacrylate monomer. (E) Phase diagram of the NMA-NMU ni-DES system.

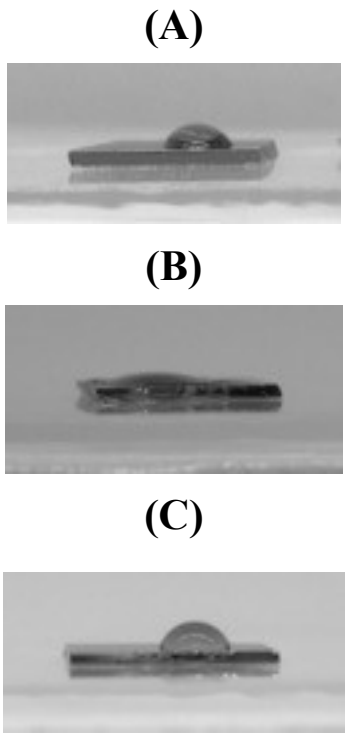


Figure 2-SI. Image showing the static contact angle of water droplet on (A) Si-wafer (B) Si/SiO_2, (C) Si/SiO_2/silane.

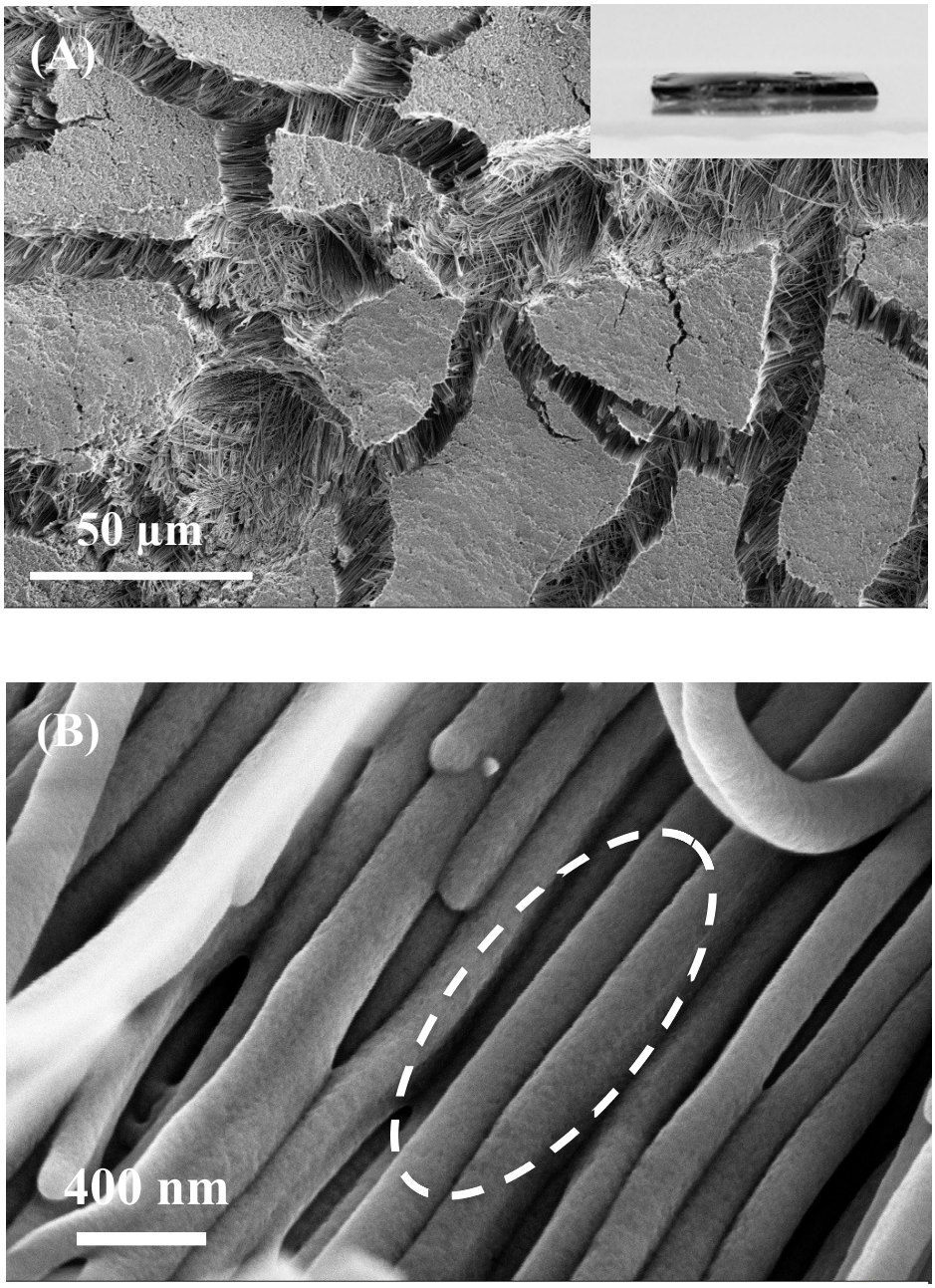


Figure 3-SI. Electron micrograph of $\mathbf{PSB}_{AAO}$ films observed with scanning electron microscope (SEM) at (A) 1350 and (B) 105000 x magnification scale. Inset is the image of the water droplet on the corresponding surface.

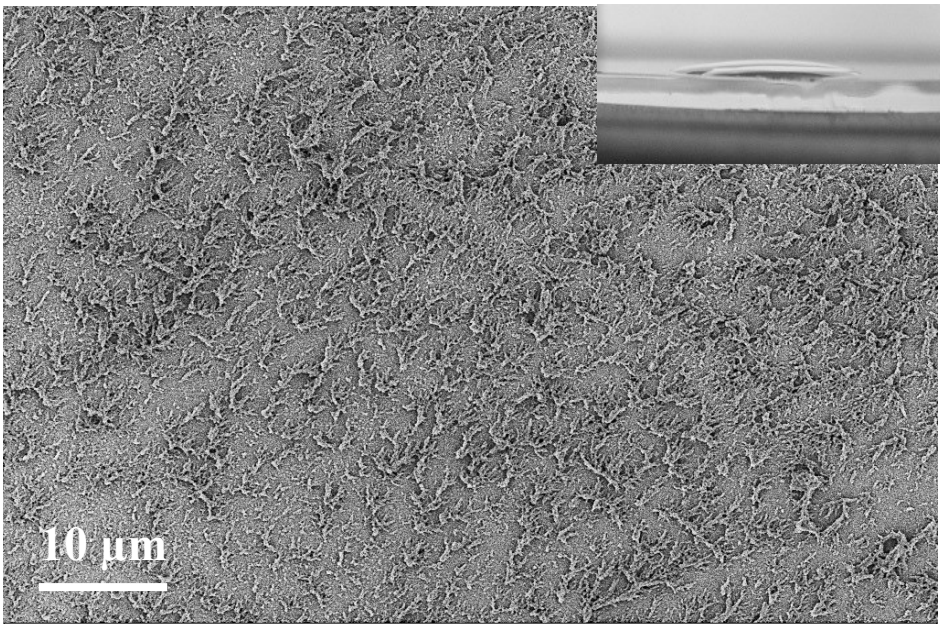


Figure 4-SI. Morphology of the $\mathbf{PSB}_{LC}$ films observed under SEM at 9000 magnification scale. Inset is the image of the water droplet on the corresponding surface.

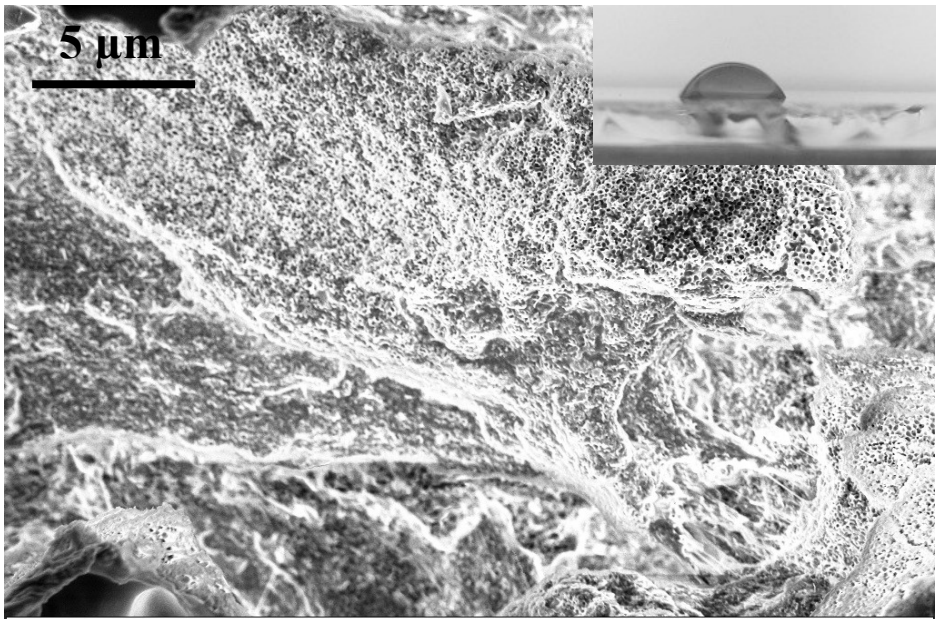
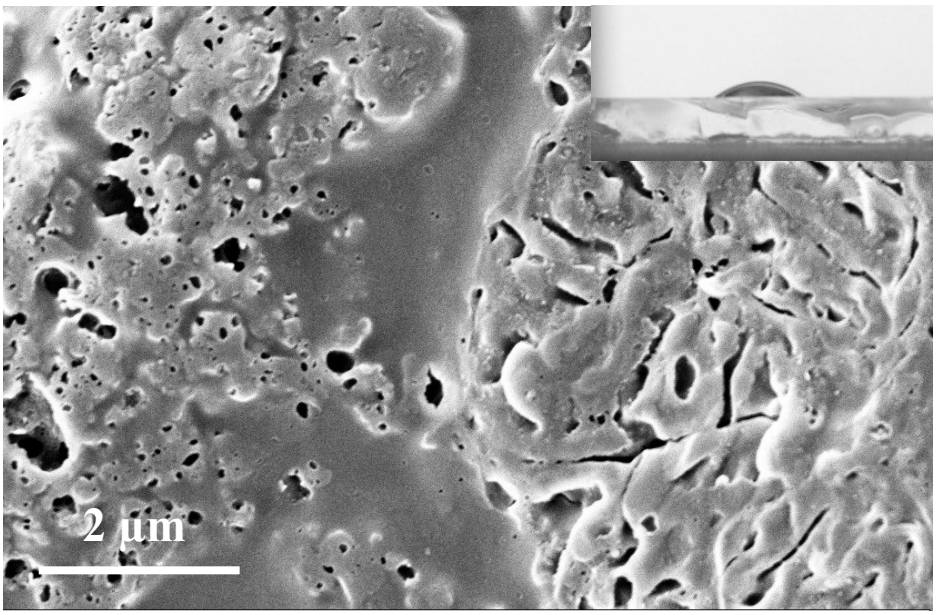


Figure 5-SI. Surface topography of the $\mathbf{PSB}_{LB}$ films imaged with SEM at 3000 magnification scale. Inset is the image of the water droplet on the corresponding surface.

(A)



(B)

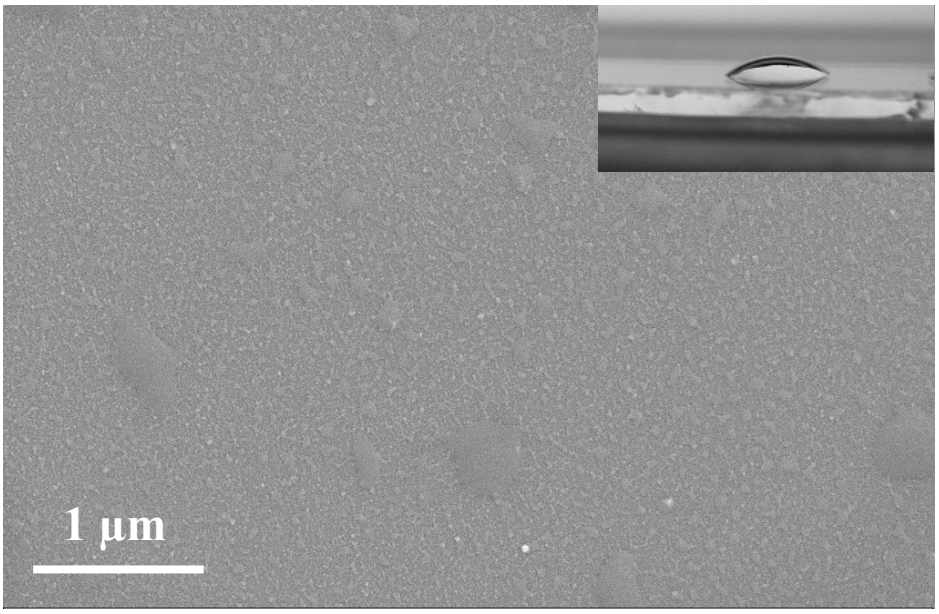
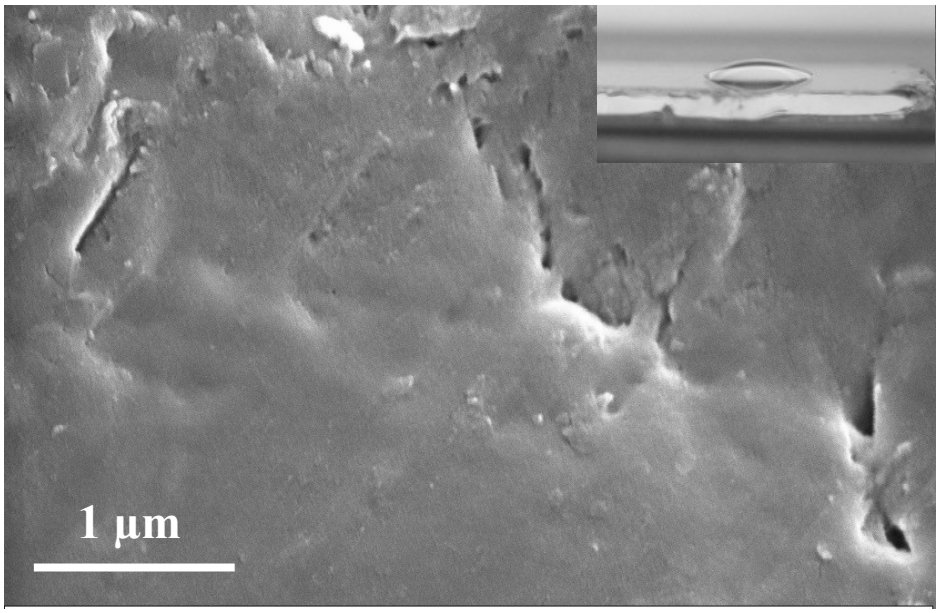


Figure 6-SI. Electron micrograph of the (A) $\mathbf{PSB}_{DES}$ and (B) $\mathbf{PSB}_{MeOH}$ films imaged with SEM. Inset is the image of the water droplet on the corresponding surfaces.

(A)



(B)

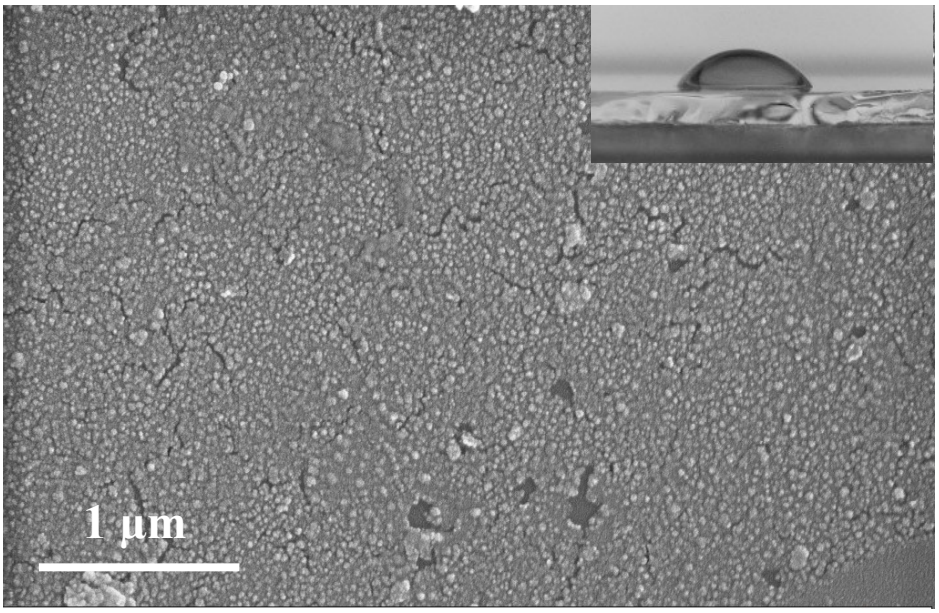


Figure 7-SI. SEM image of (A) $\mathbf{PSB}_{\text{WAT-onto}}$ and (B) $\mathbf{PSB}_{\text{WAT-from}}$ films. Inset is the image of the water droplet on the corresponding surfaces.

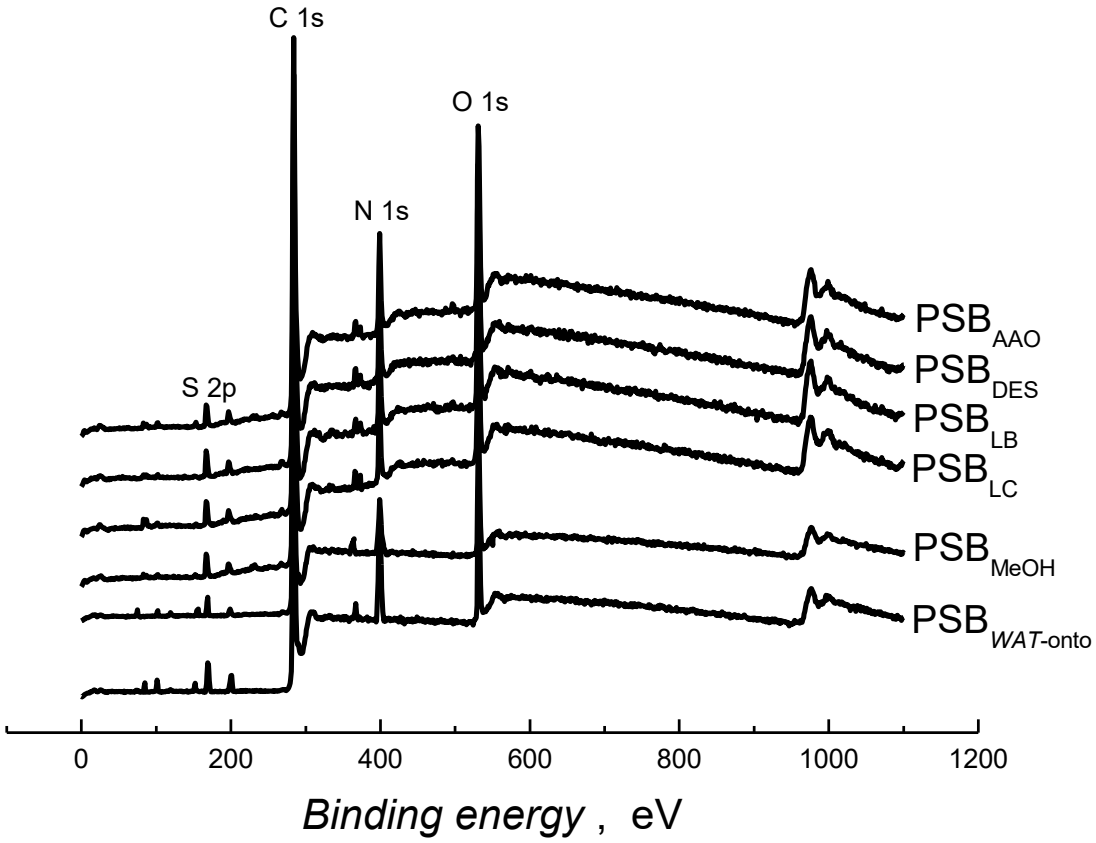


Figure 8-SI. XPS Survey spectra of PSB film prepared in this study.

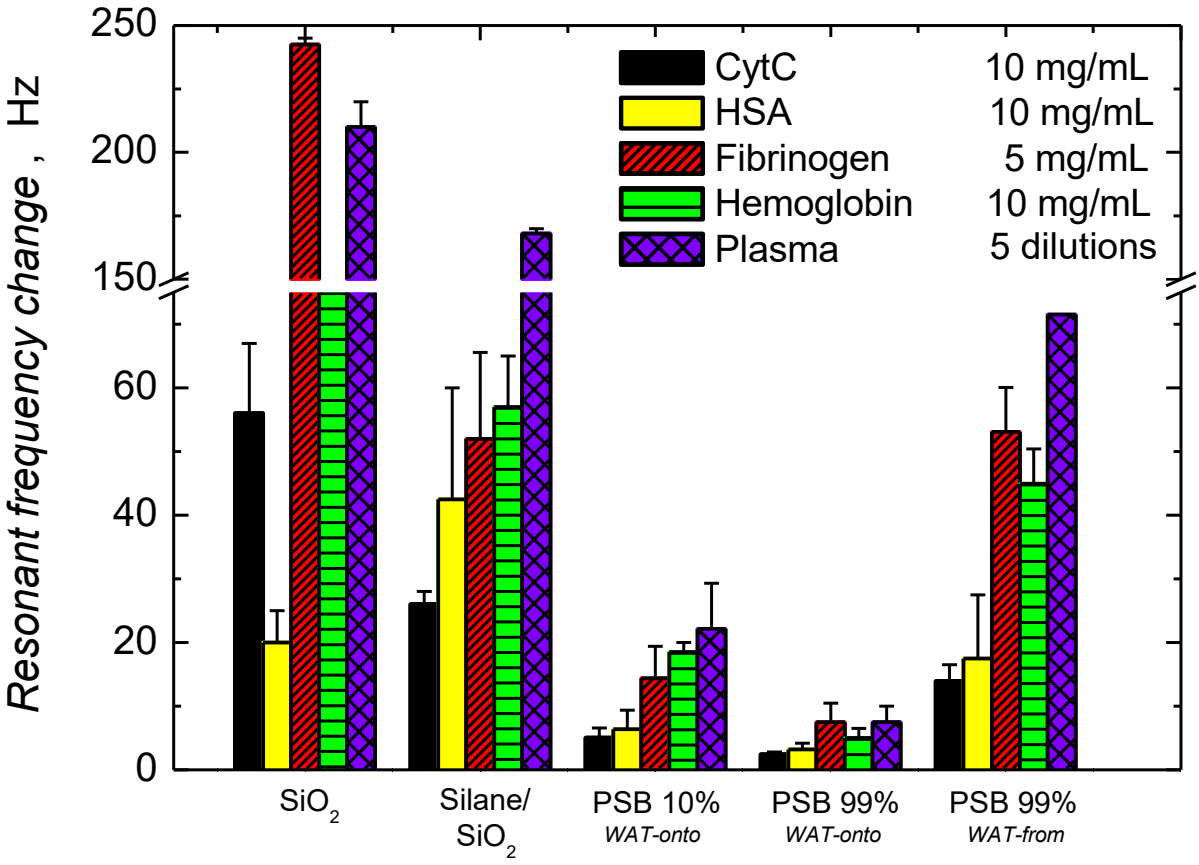


Figure 9-SI. Histogram for the resonant frequency change observed on modified SiO_2/Au/quartz surfaces due to the repetitive injection of different protein samples under FIA conditions. The blood plasma was diluted with PBS (pH 7.4).

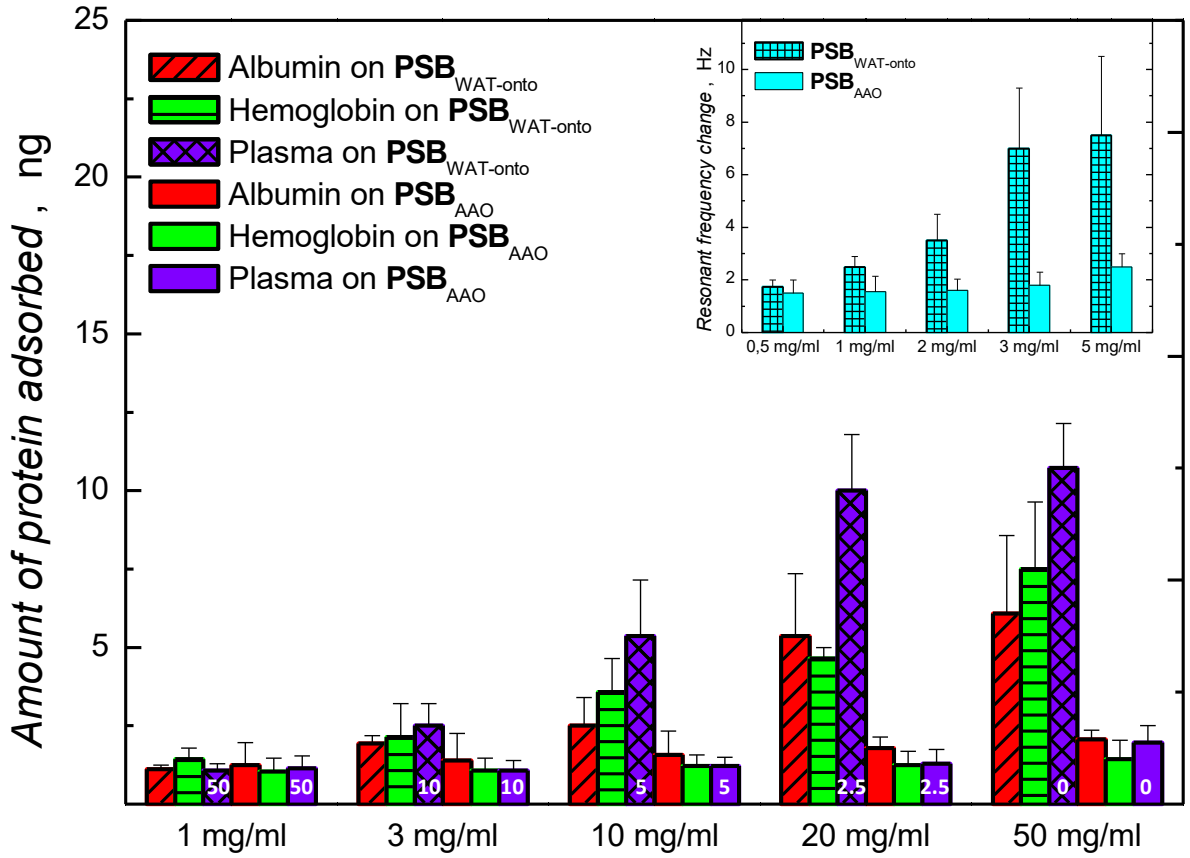


Figure 10-SI. Piezoelectric microgravimetric analysis for amount of proteins adsorbed on $\mathbf{PSB}_{\text{WAT-onto}}$ and $\mathbf{PSB}_{\text{AAO}}$ modified SiO_2/Au/quartz surfaces when introduced with different protein samples under FIA conditions. Inset is the resonant frequency change due to the adsorption of fibrinogen protein on $\mathbf{PSB}_{\text{WAT-onto}}$ and $\mathbf{PSB}_{\text{AAO}}$ surfaces. The blood plasma was diluted with PBS (pH 7.4). (Dilution factor was 50, 10, 5, 2.5 or undiluted in the order mentioned in the figure).

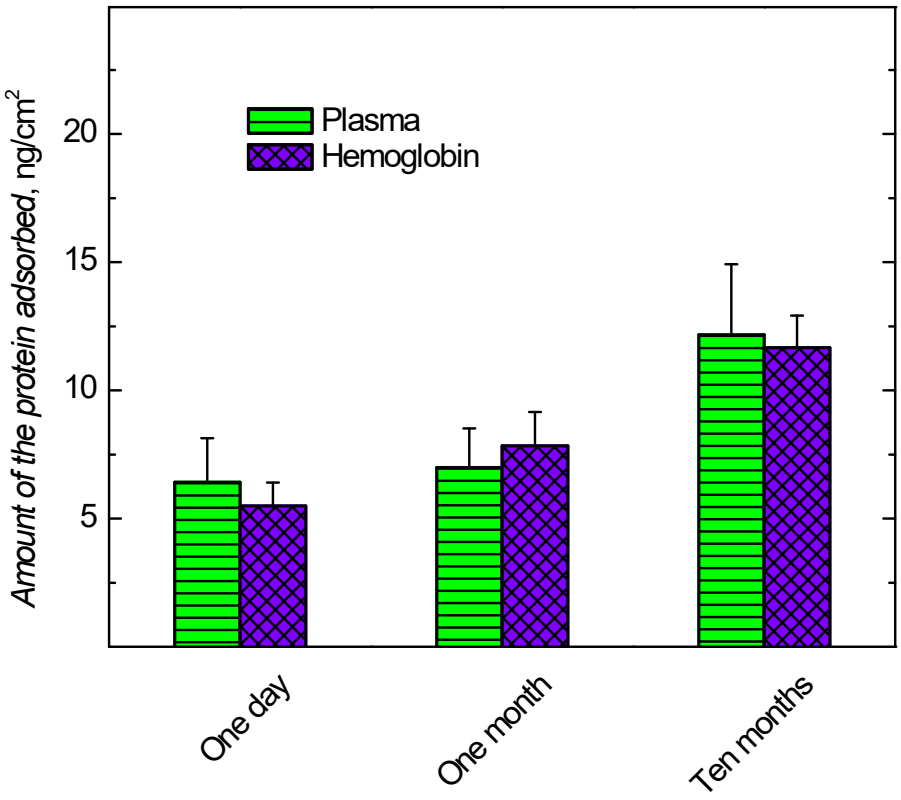


Figure 11-SI. Resonant frequency change for the **PSB**$_{AAO}$ coated SiO_2/Au/quartz resonators upon injecting human plasma-hirudin and hemoglobin repeatedly under FIA conditions. Measurements were performed using quartz crystal microbalance (QCM) techniques at stipulated time intervals after storing the resonators in specified conditions.

Table 1-SI. Contact angles values of the water droplet measured on the PSB film coated surfaces prepared in this study.

Substrate	End group	Static contact angle, θ
Si wafer	Si	54 ± 5
Si wafer/SiO_2	Si-OH	22 ± 4
Si wafer/SiO_2/Silane	$-C(=CH_2)CH_3$	70 ± 9
Si wafer/SiO_2/Silane/**PSB$_{AAO}$**	R_4N^+/SO_3^-	14 ± 3
Si wafer/SiO_2/Silane/**PSB$_{LB}$**	R_4N^+/SO_3^-	48 ± 3
Si wafer/SiO_2/Silane/**PSB$_{LC}$**	R_4N^+/SO_3^-	16 ± 3
Si wafer/SiO_2/Silane/**PSB$_{DES}$**	R_4N^+/SO_3^-	21 ± 4
Si wafer/SiO_2/Silane/**PSB$_{MeOH}$**	R_4N^+/SO_3^-	31 ± 3
Si wafer/SiO_2/Silane/**PSB$_{WAT\text{-}onto}$**	R_4N^+/SO_3^-	28 ± 3
Si wafer/SiO_2/Silane/**PSB$_{WAT\text{-}from}$**	R_4N^+/SO_3^-	42 ± 4

Table 2-SI. List of protein used for the evaluation of anti(bio)fouling characteristics of the PSB films synthesized in this study.

Proteins	Molecular weight (kD)	pI
Cytochrome *c* (Cyt C)	12.4	10.0
Human serum albumin (HSA)	66.4	4.7
Hemoglobin	64.5	6.8
Fibrinogen	340	5.1 – 6.3
ribonuclease A	13.7	9.8