Blood activation and compatibility on single-molecular-layer biointerfaces

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Supporting Information

Table S1 Comparison of elements Si, C, and O on the Si surfaces before and after treating with UV/O_3 detected by XPS (mass fraction).

Sample	Si (%)	C (%)	O (%)
Si (before treating)	56.44	15.74	27.82
Si (after treating)	43.08	9.25	47.67

Table S2 The contents of elements Si, C, O, N, S, and F on the Si surfaces detected by XPS (mass fraction).

Sample	Si (%)	C (%)	O (%)	N (%)	S (%)	F (%)
Si-GPS	22.43	28.18	49.39	-	-	-
Si-E	34.18	29.78	34.38	1.66	-	-
Si-OH	17.66	20.49	58.20	3.66	-	-
Si-NH_2	14.93	36.36	44.59	4.12	-	-
Si-SO_3H	18.74	30.61	48.05	2.29	2.30	-
Si-COOH	16.08	27.99	53.71	2.22	-	-
Si-A	18.01	50.44	30.06	1.48	-	-
Si-B	20.18	51.23	26.94	1.64	-	-
Si-F	19.27	46.11	29.26	1.21	-	4.15

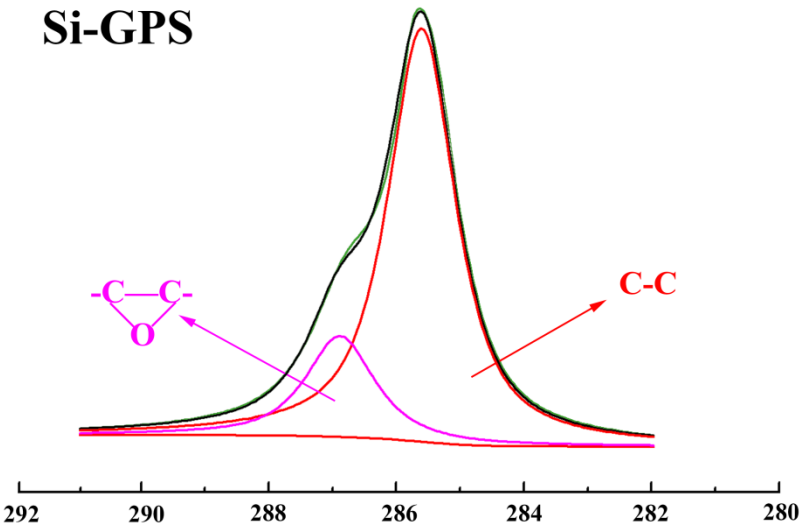

Figure S1 Narrow-scan XPS C (1s) spectra for Si-GPS surface.

Surface grafting density of different groups immobilized Si surface

The surface grafting density of the single-molecular-layer was very important to compare the data generated by different surface chemistries. In order to keep the grafting density in the same level, the reaction conditions of the Si wafer pretreatment and silanization procedure were the same. However, due to the different reaction activity of the functional groups, it was difficult to ensure that the grafting density was the same. The molar ratios of functional groups were calculated from XPS results in this study. The comparison of surface molar ratios of the functional groups could indicate the difference in the surface grafting density. Before grafting the groups, the substrates of Si-GPS were prepared under the same reaction conditions. Based on the XPS data of element N shown in Table 2S, the grafting molar ratios of Si-OH, Si-COOH, Si-SO_3H, Si-E, Si-A, Si-B and Si-F were calculated to be 3.66%, 2.22%, 2.29%, 1.66%, 1.48%, 1.64% and 1.21%, respectively; since the functional groups were grafted onto the Si surfaces via the reaction between the amino groups and epoxy groups. For Si-NH_2, the grafting molar ratios should be a half of the element N (2.06%), because two moles of element N existed in each ethanediamine molecule. By comparing the grafting molar ratios of the groups, it could be found that the grafting molar ratios were at the same level. Although the XPS results could reveal the surface grafting ratios of the functional groups, the results were rough, since the surface enrichment of the groups might affect the surface element contents.