

Improving Protein Transfer Efficiency and Selectivity in Affinity Contact Printing by Using UV-Modified Surfaces

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Experimental Section

X-ray Photoelectron Spectroscopy (XPS). The chemical composition of the surface was determined by using XPS in an AXIS-His spectrometer (Kratos Analytical, Japan) with a monochromatized Al K α X-ray source (1486.6 eV) and a pass energy of 40 eV. The X-ray source was operated at 150 W, and the pressure in the chamber was kept at 10⁻⁸ Torr during the analysis. The samples were loaded on standard studs by using double-sided adhesive tape. The C (1s) hydrocarbon peak at 285.0 eV was used as the reference peak for all binding energy measurements.

Results and Discussion

Surface Characterization of UV-modified Surfaces by XPS. To further verify the formation of aldehyde groups on the UV-modified surfaces, we performed an additional characterization on the UV-modified PDMS and DMOAP surface by using XPS. As shown in Figure S1a and S1b, there is an additional C (1s) shoulder peak (~ 288.0 eV) in the XPS spectrum after UV-modification on the PDMS stamp. It can be attributed to the formation of aldehyde ($\text{C}=\text{O}$) groups on the PDMS surface. However, since the composition of C-C and C-H bond in PDMS stamp is predominant, the shoulder peak caused by the aldehyde groups is not obvious. Therefore, we feel that the XPS result does not provide a conclusive evidence to demonstrate the formation of aldehyde on the surface. On the other hand, the C (1s) XPS spectra of UV-modified DMOAP surface in Figure S2a also shows an additional shoulder peak (~ 288.0 eV) which can be attributed to aldehyde groups. However, this peak overlaps with the C-N peak (~ 286.0 eV) of DMOAP.

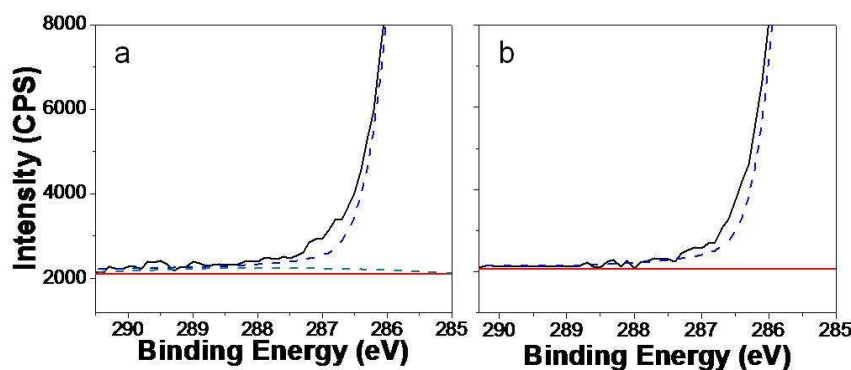


Figure S1. C (1s) XPS spectra of (a) UV-modified and (b) unmodified PDMS surface.

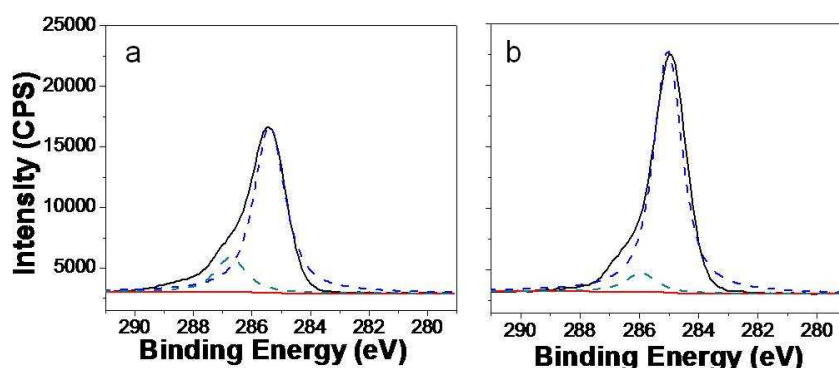


Figure S2. C (1s) XPS spectra of (a) UV-modified and (b) unmodified DMOAP surface