Supporting Information

Application of long wavelength ultraviolet radiation for modification and patterning of protein-repelling monolayers

Y. L. Jeyachandran,[1] Theresa Weber,[2] Andreas Terfort,[2] and Michael Zharnikov*,[1]

[1] *Angewandte Physikalische Chemie, Universität Heidelberg, Im Neuenheimer Feld 253, 69120 Heidelberg, Germany*

[2] *Institut für Anorganische und Analytische Chemie, Universität Frankfurt, Max-von-Laue-Straße 7, 60438 Frankfurt, Germany*

* To whom correspondence should be addressed: phone: +49 6221 54 4921; fax: +49 6221 54 6199; e-mail: Michael.Zharnikov@pci.uni-heidelberg.de

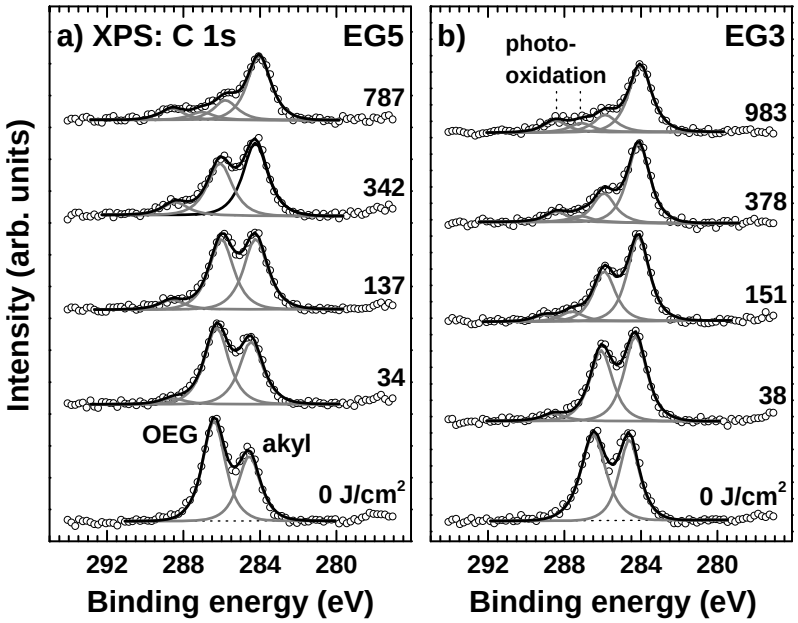

Figure S1. C 1s XPS spectra of the pristine and UV (390 nm) irradiated EG5 (a) and EG3 (b) monolayers. The spectra are decomposed into the peaks related to the alkyl (C–C), OEG (C–O), and photo-oxidized components of the SAM constituents. The irradiation doses (in J/cm^2) are given at the respective spectra. These spectra were used to calculate the I_{CO} / I_{CC} ratios presented in Figure 1b.

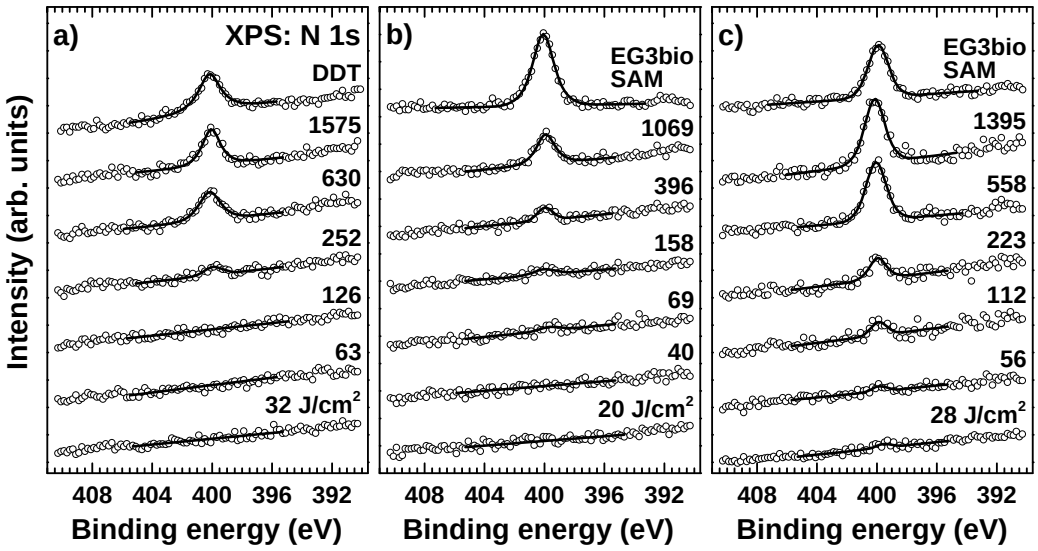

Figure S2. The N 1s XPS spectra of UV (390 nm) irradiated EG6 monolayers measured after exposure to BSA directly after irradiation (a, UVDW), exchange reaction with EG3bio (b, UVPER), and subsequent exposure to avidin (c). The same y-axis scale is used in all the panels. The irradiation doses (in J/cm^2) are given at the respective spectra. The duration of the EG3bio exchange reaction was 5 min and that of the protein exposure was 30 min. Analogous spectra were also recorded for the EG5 and EG3 monolayers. The intensity of the characteristic N 1s emission was used to calculate the coverage of BSA and avidin as well as EG3bio coverage that are presented in Figures 4a and 4b for EG6 SAMs and in Figure S3 for EG5 and EG3 monolayers. The N 1s spectra acquired after the BSA adsorption on alkanethiol (dodecanethiol: DDT) monolayer (a), the N1s spectra of the single-component EG3bio SAM (b), and the N1s spectra acquired after the avidin adsorption on the single component EG3bio SAM (c) are also shown. These spectra were used as the references to calculate the BSA, EG3bio, and avidin coverage, respectively.

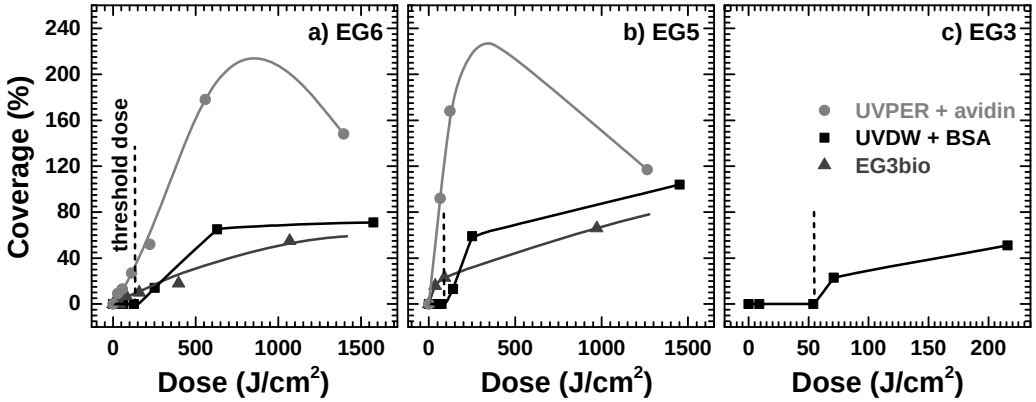

Figure S3. Coverage and composition data for the UV (390 nm) irradiated EG6 (a), EG5 (b), and EG3 (c) monolayers: surface coverage of BSA adsorbed *non-specifically* after UVDW (squares), coverage of EG3bio (triangles) after UVPER, and surface coverage of avidin adsorbed *specifically* after UVPER (circles). The solid lines are guides to the eye. The coverage of EG3bio is referenced to the single-component EG3bio SAM. The BSA and avidin coverages are related to those on alkanethiol and EG3bio SAMs, respectively. The vertical dashed lines represent the threshold doses for the UVDW process. The panel (a) is a repetition of Figure 4a; it is given here for comparison. The maximum value of the avidin coverage between two experimental points was estimated on the basis of the EG3bio surface concentration using the reference data from our earlier studies.[1-3]

References

(1) Ballav, N.; Terfort, A.; Zharnikov, M. *Langmuir* **2009**, *25*, 9189–9196.

(2) Jeyachandran, Y. L.; Terfort, A.; Zharnikov, M. *J. Phys. Chem. C* **2012**, *116*, 9019–9028.

(3) Jeyachandran, Y. L.; Zharnikov, M. J. Phys. Chem. C **2012**, *116*, 14950–14959.