Supplementary information

## Sensitive detection of a prostate specific antigen (PSA) using impedimetric assays with *in-situ* PSA´s glycan analysis

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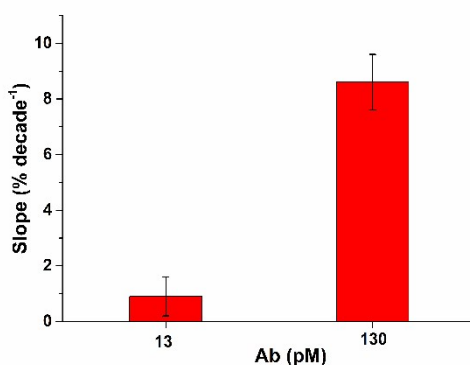
Figure S1: Calibration slope for detection of PSA with an impedimetric immunosensor prepared either by covalent immobilisation of an antibody from a stock solution of 13 pM or 130 pM on a mixed SAM composed of MUA and MCH of 1:3.
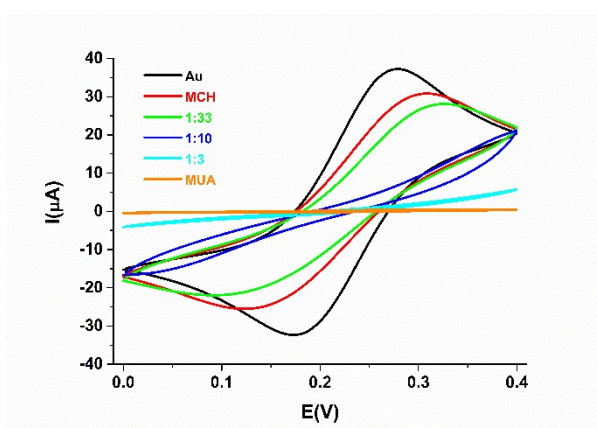

Figure S2: CV of ferricyanide as a redox probe at various SAMs i.e. pure SAMs composed of MUA or MCH and a mixed SAMs composed of MUA and MCH with a different ratio (1:33, 1:10 and 1:3). Moreover CV of ferricyanide on a bare gold surface is shown, as well.
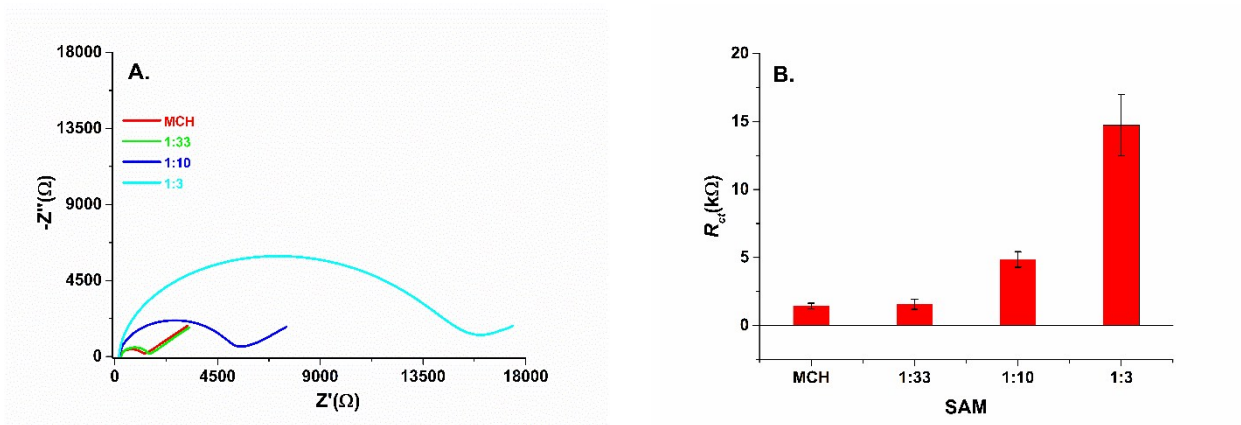
Figure S3: A) Nyquist plots obtained at various SAMs i.e. pure SAMs composed of MCH and a mixed SAMs composed of MUA and MCH with a different ratio (1:33, 1:10 and 1:3). **B)** Typical values of R_{ct} obtained at various SAM layers.
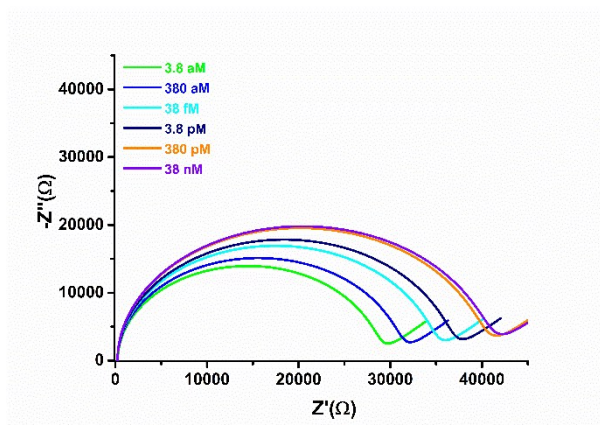
Figure S4: Nyquist plot for construction of a calibration curve for PSA analysis with an impedimetric immunosensor prepared by covalent immobilisation of an antibody from a stock solution of 130 pM.
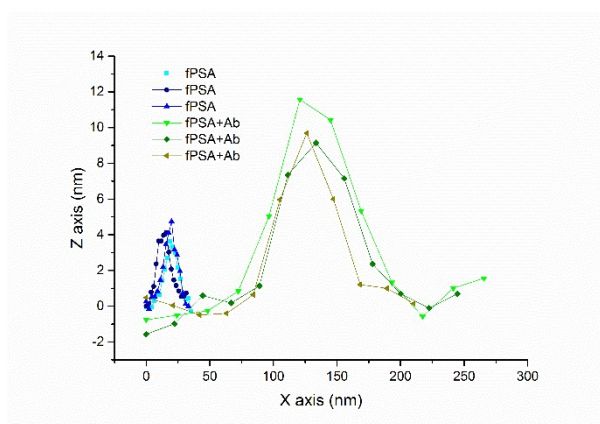
Figure S5: AFM profile of PSA proteins attached to the surface (fPSA) and features appeared after incubation of the PSA modified surface with an antibody (fPSA+Ab).
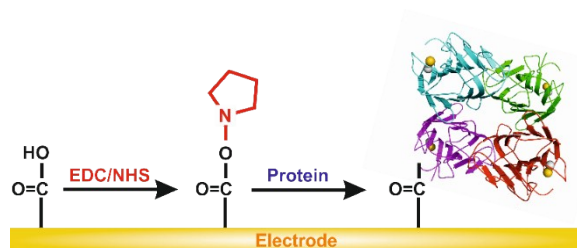
Figure S6: Scheme of covalent protein immobilisation on Au electrode modified by a mixed SAM containing –COOH groups using EDC/NHS coupling reagents.

Table S1: Results obtained by fitting Nyquist plot shown in Fig. 3A with an equivalent circuit [R(C[RW])] with relevant fitted elements shown.

R_s	RSD	R_{ct}	RSD	C	RSD	x^2
Ω	%	Ω	%	F	%	
730	0.85	13500	0.91	1.77E-07	1.1	0.051

R_s – solution resistance, R_{ct} – charge transfer resistance, C – capacitance, x^2 – deviation of fitted values from real ones

Table S2: Results obtained by fitting Nyquist plot shown in Fig. 3B with an equivalent circuit [R(Q[RW])] with relevant fitted elements shown.

R_s	RSD	R_{ct}	RSD	n	RSD	x^2
Ω	%	Ω	%		%	
720	0.51	13800	0.55	0.97	0.35	0.015

R_s – solution resistance, R_{ct} – charge transfer resistance, n – constant, x^2 – deviation of fitted values from real ones