Electronic Supplementary Material (ESI) for Analyst.

Electronic Supplementary Information

Effect of pore diameter in nanoporous anodic alumina optical biosensors

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Table. 1. Summary of the fabrication conditions of the NAA monolayers.

Electrolyte	V_{1st} (V)	t_{1st} (h)	V_{2nd} (V)	Q (C)	t_{pw} (min)	D_p (nm)	D_{int} (nm)	P (%)
$H_2C_2O_4$ 0.3M	40	20	40	2.08	0	32 ± 4	102 ± 3	9.1 ± 2.3
					10	50 ± 3	95 ± 3	25.3 ± 3.4
					20	73 ± 2	97 ± 3	51.5 ± 4.3

Table 2. Summary of the EOT shifts during protein infiltration.

D_p (nm)	Step I (%)	Step II (100 µg/mL) (%)	Step II (10 µg/mL) (%)	Step III (100 µg/mL) (%)	Step III (10 µg/mL) (%)
32 ± 4	0.0445 ± 0.0001	0.0816 ± 0.0003	0.0798 ± 0.0008	0.1213 ± 0.0004	0.1299 ± 0.0001
50 ± 3	0.0869 ± 0.0007	0.1437 ± 0.0004	0.1129 ± 0.0005	0.2347 ± 0.0007	0.1718 ± 0.0003
73 ± 2	0.1043 ± 0.0008	0.1738 ± 0.0004	0.126 ± 0.002	0.3497 ± 0.0004	0.2124 ± 0.0048

Table. 3. Signal amplification factor of anti-human IgG.

D_p (nm)	Amplification step III (100 µg/mL)	Amplification step III (10 µg/mL)
32 ± 4	1.49	1.63
50 ± 3	1.63	1.52
73 ± 2	2.01	1.69

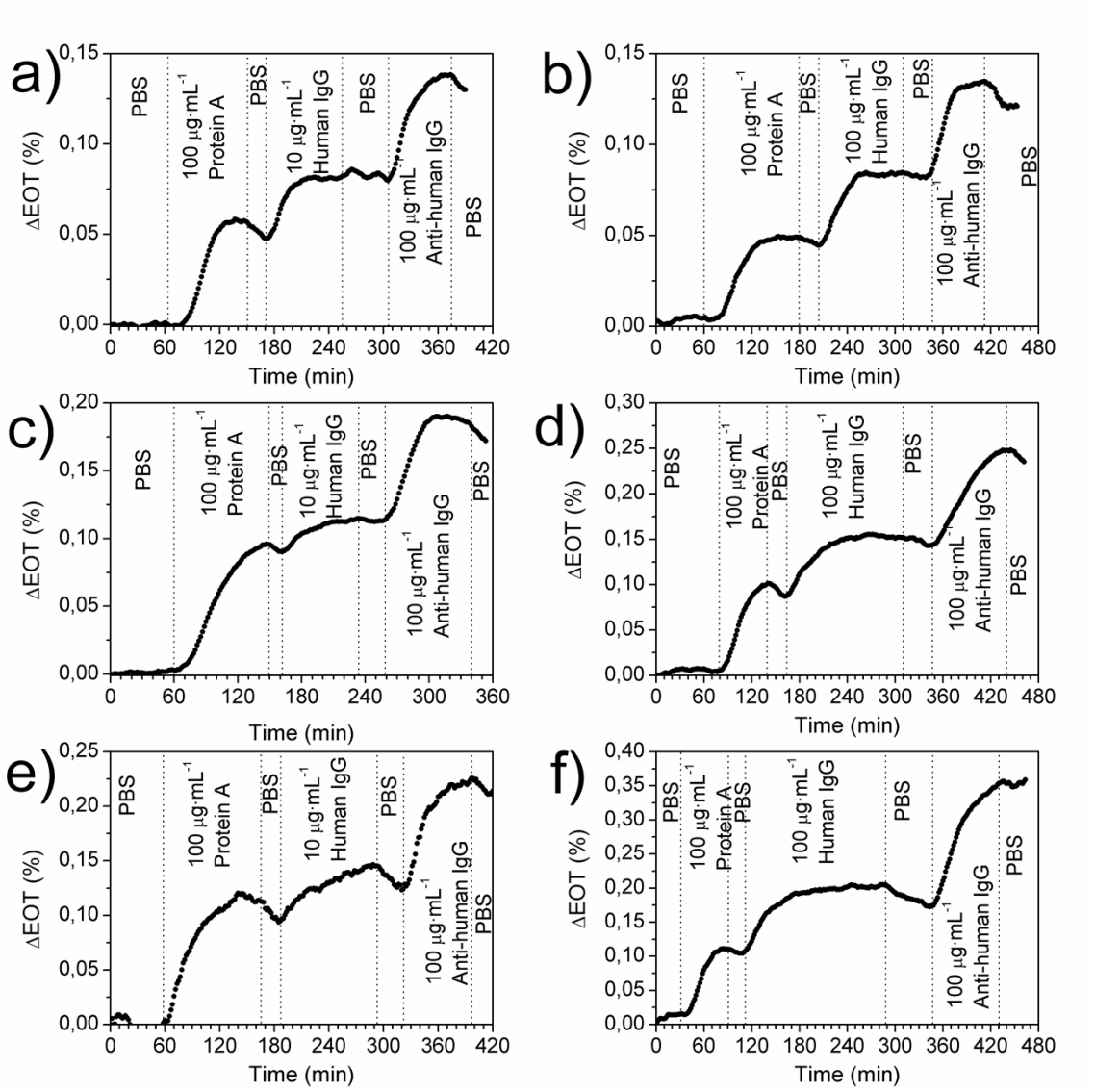

Figure 1. Real-time ΔEOT of protein dosing to NAA monolayers; a) and b) are pores of 32 nm, c) and d) pores of 50 nm, and e) and f) are pores of 73 nm. The left column (a), and c) and e)) shows the ΔEOT for 10 μg·mL^{-1} of human IgG and the right column (b), d) and f)) shows the ΔEOT for 100 μg·mL^{-1} of human IgG.

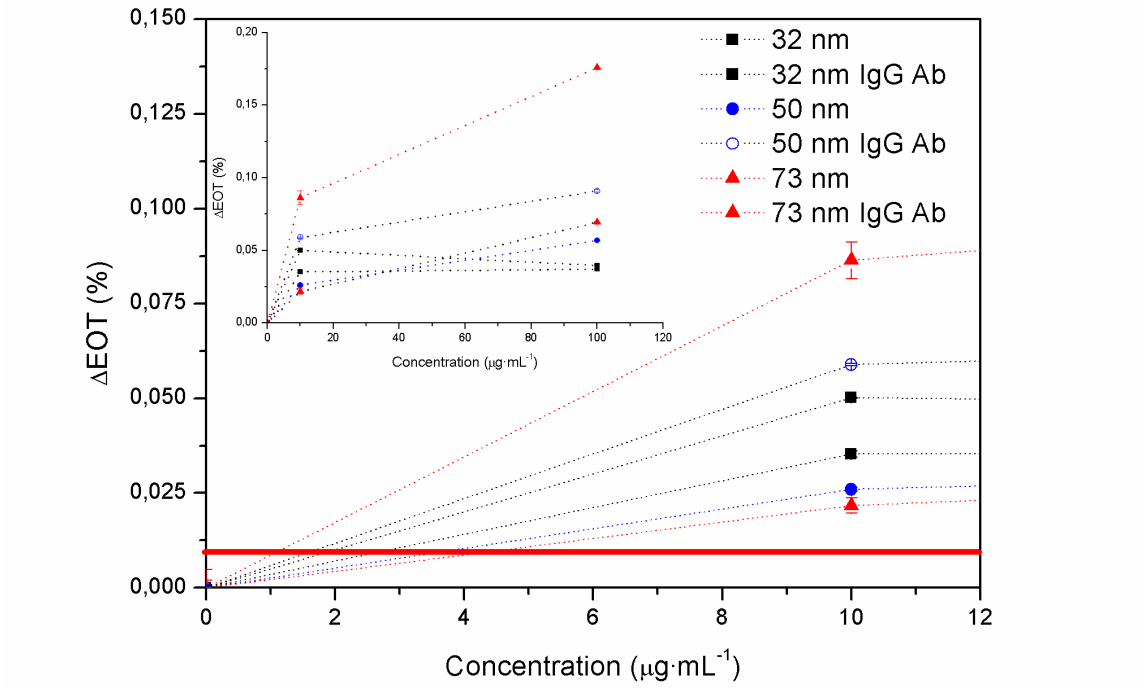

Figure 2. ΔEOT as a function of human IgG concentration for the three pore diameter distributions studied. Solid represent human IgG detection with antibody amplification and voids without amplification. The red line represents an estimation of the limit of detection based on the overall noise level.