Supplementary Materials

Development and In-Depth Characterization of Bacteria Repellent and Bacteria Adhesive Antibody-Coated Surfaces Using Optical Waveguide Biosensing

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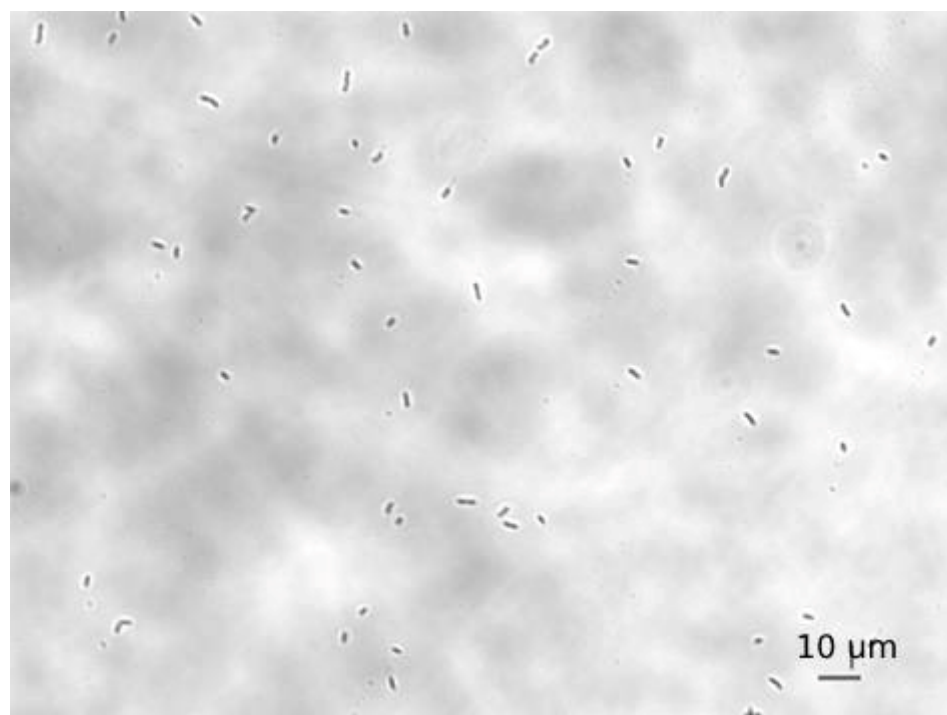[*] Correspondence: horvath.robert@energia.mta.hu (R.H.)

Figure S1. Typical microscope image of surface adsorbed bacteria on Ab (ThermoFischer goat 73032) coated sensor. Such images were taken of the OWLS chip surface after measurements, the number of bacteria was calculated for calibrating the recorded OWLS signal to the surface adsorbed density of bacteria (for results, see manuscript text in Results and Discussions).

Table S1. Averages and standard error values of the obtained adsorption kinetic parameters for each surface with polyclonal antibodies. The p values resulted from one-way ANOVA statistical analysis is also shown.

	Polyclonal						
	MG	Standard error	Protein A	Standard error	Bare sensor	Standard error	p
k_a (cm/s)	1.70E-04	4.80E-05	1.30E-04	3.20E-05	1.20E-04	3.40E-05	0.6 n.s.
k_d (1/s)	6.90E-03	1.10E-03	2.30E-03	2.50E-04	3.80E-03	1.40E-03	0.00003 ****
k_i (cm/s)	7.30E-05	2.80E-05	6.50E-04	3.80E-04	7.90E-05	3.40E-05	0.55 n.s.
a_r (nm^2)	23	5	39	1.6	20	6.5	0.00049 ***
a_i (nm^2)	36	1.5	28	2.4	23	2.9	0.07 n.s.

****- significant level (p) less than 0.0001.
***- significant level (p) less than 0.001.

Table S2. The p values resulted from post-hoc t-test where the one-way ANOVA showed significant differences in Table S1.

	MG vs. Protein A	MG vs. Bare sensor	Protein A vs. Bare sensor
k_d	0.000007 ****	0.19 n.s.	0.09 n.s.
a_r	0.00046 ***	0.8 n.s.	0.00099 ***

****- significant level (p) less than 0.0001.
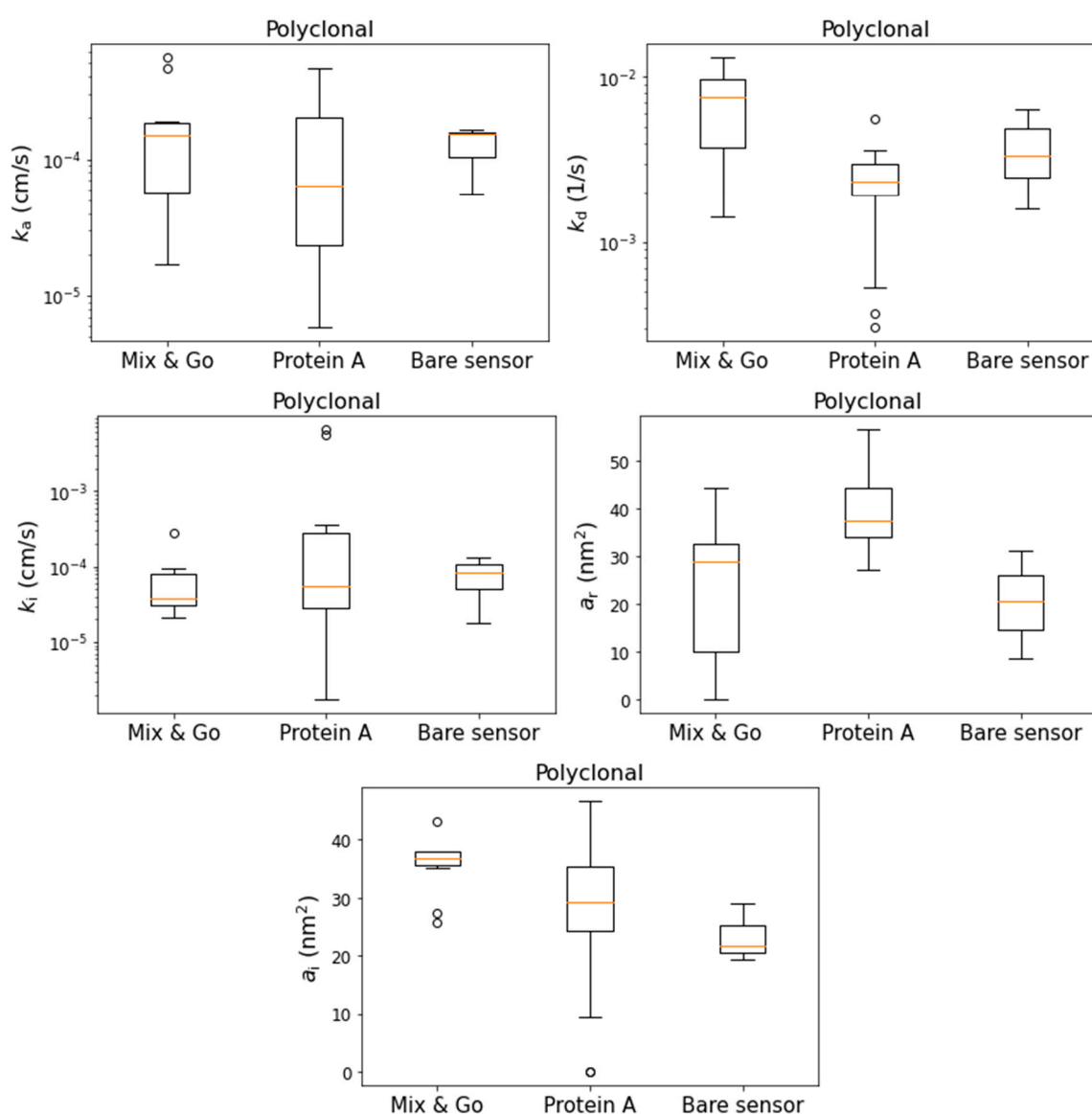***- significant level (p) less than 0.001.

Figure S2. The different kinetic parameters for each surface for the polyclonal antibodies are depicted with box plots.

Table S3. Average and standard error values of the kinetic parameters for the polyclonal and monoclonal antibodies on Protein A surface and the p values resulted from one-way ANOVA.

	Protein A				
	Polyclonal	Standard error	Monoclonal	Standard error	p
k_a (cm/s)	1.30E-04	3.20E-05	6.30E-06	1.20E-06	0.03 *
k_d (1/s)	2.30E-03	2.50E-04	2.00E-03	3.70E-04	0.6 n.s.
k_i (cm/s)	6.50E-04	3.80E-04	7.20E-06	5.00E-06	0.4 n.s.
a_r (nm^2)	39	1.6	150	35	0.0000028 ****
a_i (nm^2)	28	2.4	32	5.5	0.4666 n.s.

****- significant level (p) less than 0.0001.
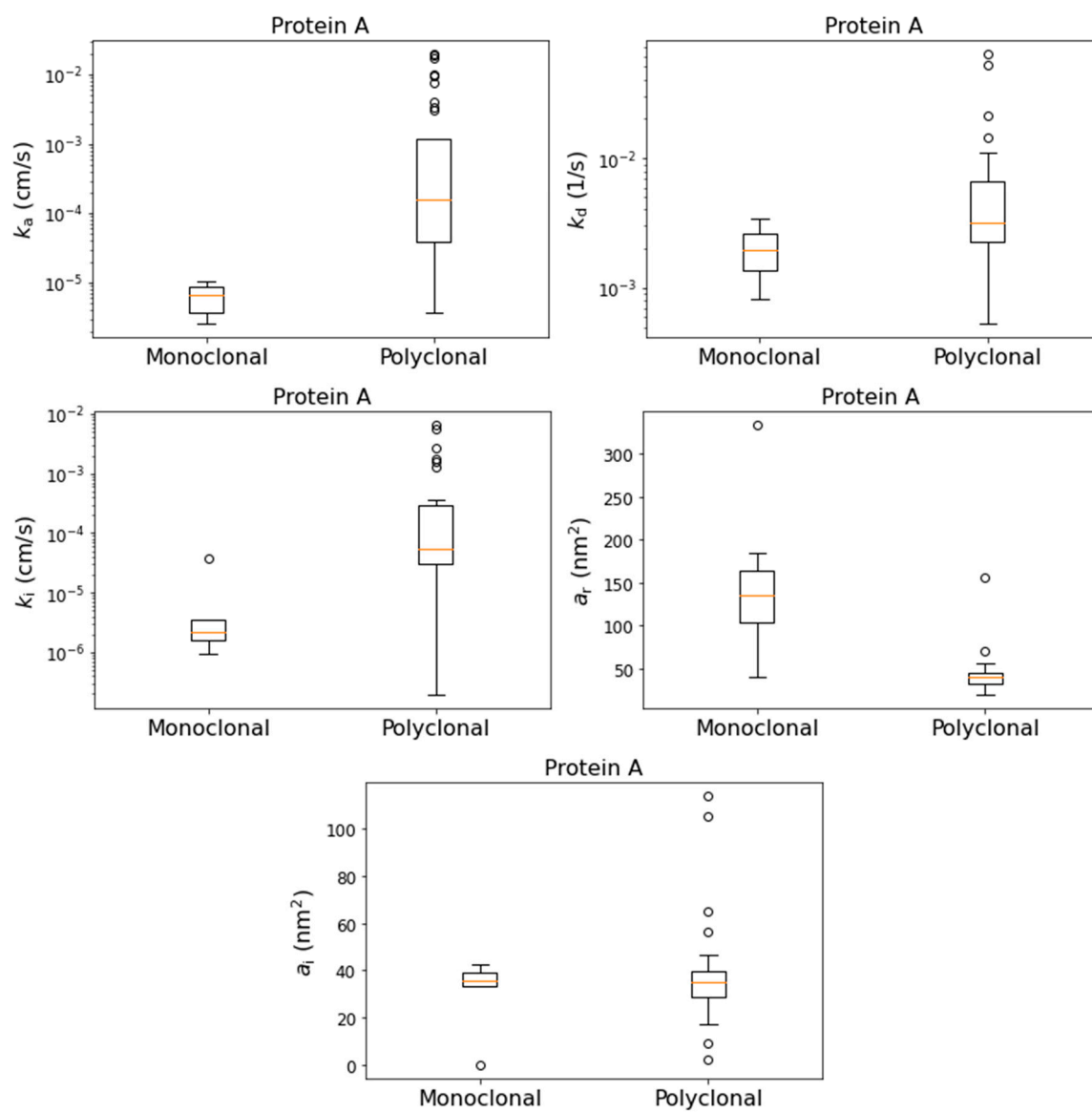
*- significant level (p) less than 0.05.

Figure S3. The different kinetic parameters for the polyclonal and monoclonal antibodies on protein A surface are depicted with box plots.
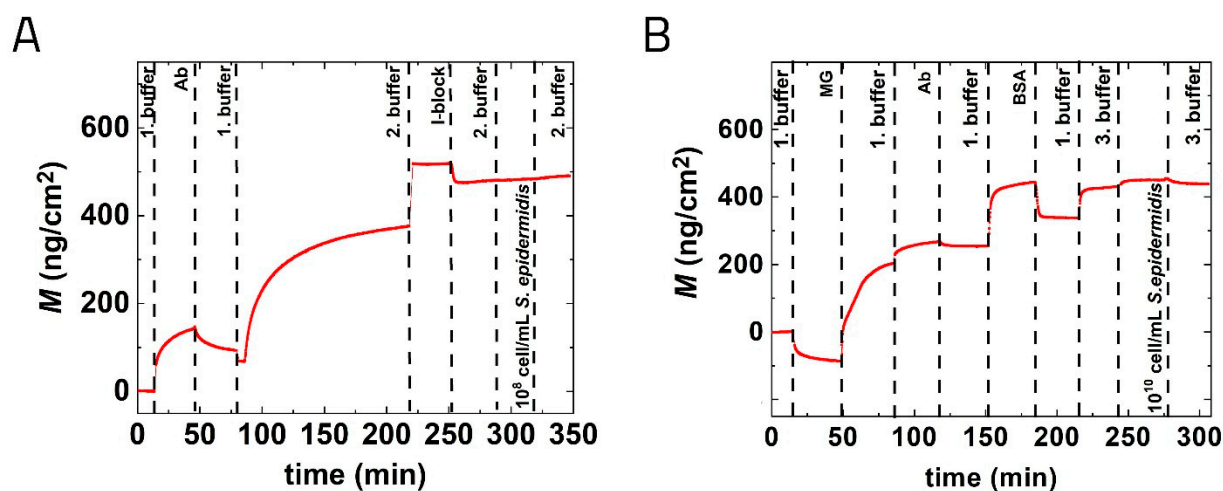
Figure S4. Real-time OWLS measurements of S.epidermidis bacteria adhesion on E. coli specific antibody based surfaces. (**A**) Sensogram of a complete experiment including the in situ coating procedures and subsequent bacteria (10^8 cell/mL) adsorption for protein A based immobilized Ab (Bio-Rad mouse OBT0749) with I-block blocking agent. (**B**) The complete OWLS measurement is shown Ab (Thermo Fisher PA1-7213) immobilization with MG and BSA blocking, followed by the adhesion of bacteria (10^{10} cell/mL) on it. 1. buffer: MES buffer 2. buffer: PBS 3. buffer: physiological saline solution.