Analytical and Bioanalytical Chemistry

Electronic Supplementary Material

Physisorbed surface coatings for poly(dimethylsiloxane) and quartz microfluidic devices

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This Electronic Supplementary Material shows data on the adsorption of fibrinogen on statically coated F_{108} surfaces as well as the time dependence of the incubation steps performed for dynamic coating procedures.

Fibrinogen adsorption on F_{108} coated surfaces

In order to show reduction of protein adsorption for fibrinogen, which mediates adhesion for many cell types, further adsorption tests were carried out. PDMS slabs were fabricated by curing Sylgard 184 at a few mm thickness. The surfaces of these slabs were oxidized with a plasma cleaner (Harrick, US) and incubated with varying concentrations of coating agent F_{108} in 20 mM phosphate buffer over night. The concentration of F_{108} was varied from 2.5 µM to 10 mM. After rinsing the surface, Alexa488-fibrinogen (Invitrogen, US) at a concentration of 100 nM was incubated on the coated surface for 2 h, followed by another rinsing step with buffer. This corresponds to the case of static surface coatings (see main manuscript). Fluorescence intensity measurements of adsorbed protein were carried out on a IX71 inverted microscope (Olympus, US) using a QuantEM camera (Photometrics, US). The percentage values of the decrease of protein adsorption were calculated in comparison to non-coated surfaces.

Figure S1 shows the concentration dependence of F_{108} in respect to prevention of fibrinogen adsorption. Above 1 mM F_{108} concentration a saturation region is reached, where reduction of protein adsorption cannot be further increased above 80 %. Below 1 mM the reduction of protein adsorption ceases rapidly. These data are in very good accordance with the adsorption study of BSA on F_{108} coated surfaces.

In conclusion, F_{108} coated surfaces are well suited to reduce protein adsorption on PDMS above an incubation concentration of 1 mM both for BSA (see main text) and fibrinogen.

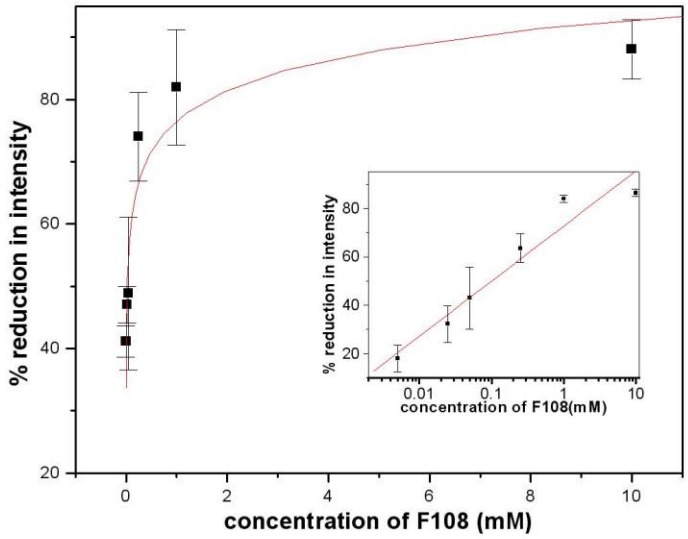

Figure S1: *Fibrinogen adsorption for varying concentration of coating agent F_{108}: All values are averages of three independent measurements. The line shows a logarithmic fit to the data points as a guide to the eye. The insets show the same data set plotted logarithmically to demonstrate the values at low concentrations. Lines in the insets are linear fits.*

Time dependence of protein adsorption in dynamic coating procedure of F_{108}

We further examined the time dependence of the incubation steps performed to test non specific protein adsorption on dynamically coated F_{108} surfaces. This analysis is important in order to reveal the saturation time above which protein adsorption no longer decreases for a specific coating procedure or in other words, when a surface is saturated with the coating agent. This saturation time is of further importance to design the coating procedures in the least possible time and thus saves experimental time.

The dynamic coating procedure consisted of an incubation step with the coating agent followed by an incubation time with a mixture of coating agent and the fluorescently labeled BSA (Alexa488-BSA). We varied the first incubation time with the coating agent (F_{108} at a concentration of 1 mM) and held the second incubation with the mixture (100 nM BSA and 1 mM F_{108}) constant at 1 h. As can be seen from Figure S2, the reduction of protein adsorption

did not vary significantly with time. We thus chose an incubation time of 10 min for the first step for all adsorption experiments referring to the dynamic procedure in the main manuscript.

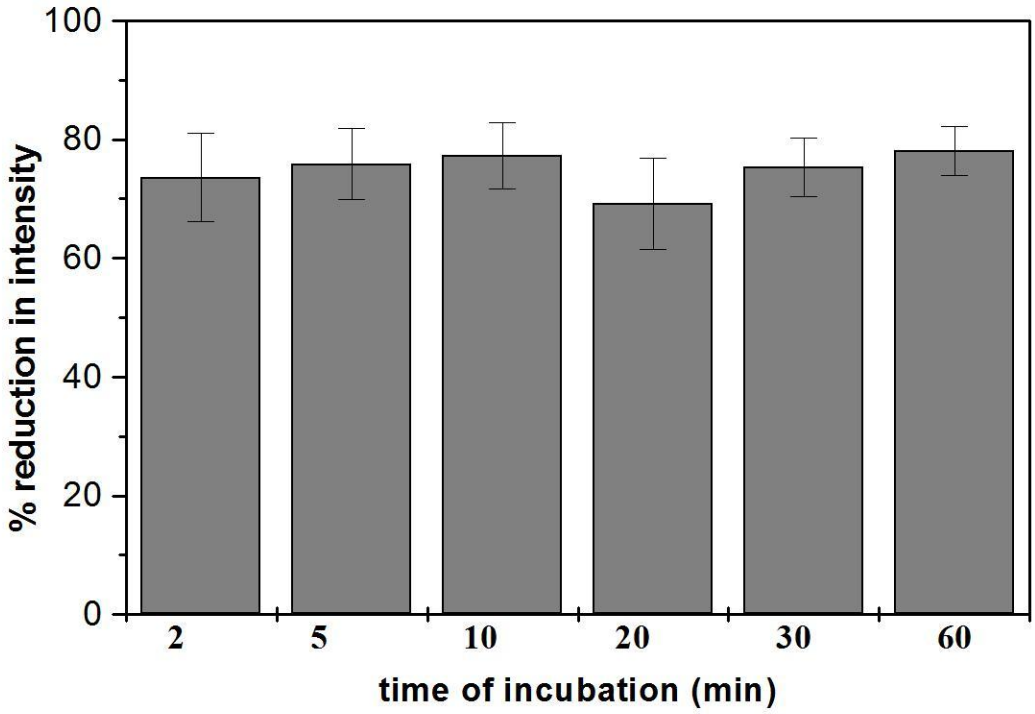

Figure S2: *The reduction in protein adsorption is shown in variation of the duration of the first incubation step for dynamic coating experiments.*