Supporting information

The model immunoassay was built up in stages on a $SiON_x$ surface and measured with DPI. Figure 1 shows the DPI measured phase change as a function of time for a typical experiment.

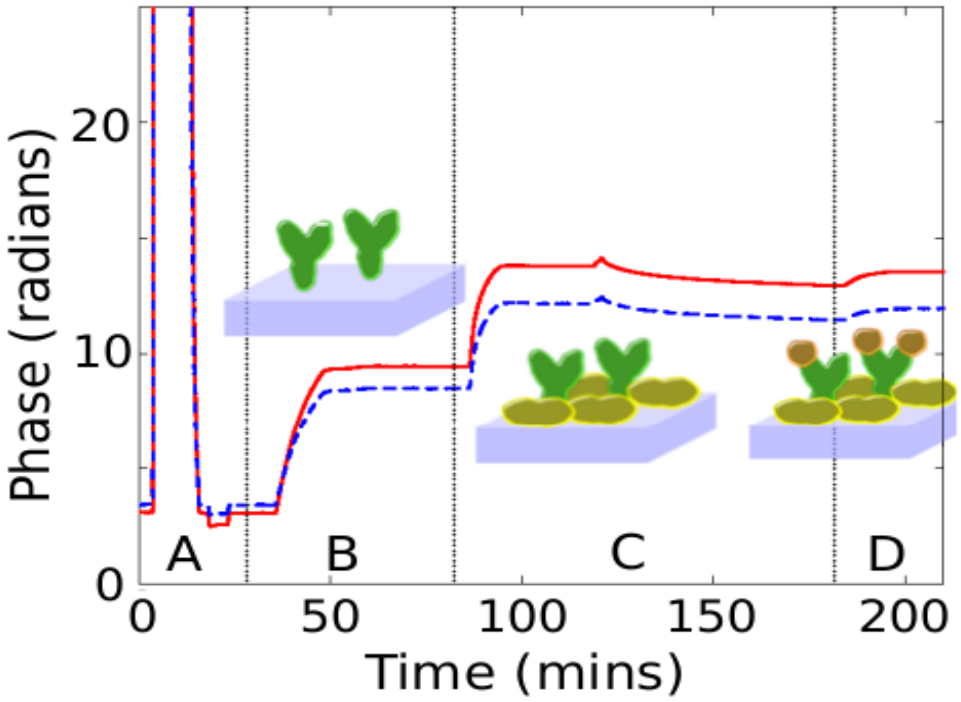

Figure 1: Region A is the water to ethanol to water calibration, B is the antibody adsorption and wash, C is the BSA adsorption and wash and D is the antigen binding and wash. The solid and dashed lines show the phase measurement of transverse magnetic and transverse electric modes respectively. The green Y-shapes represent antibodies and the yellow and orange blobs represent BSA and hCG respectively.

A water to ethanol to water calibration (figure 1, region A) was used to calibrate the waveguide. Regions B, C and D show the adsorption and wash of antibody, BSA and hCG respectively.

To determine the amount of BSA required to block the hCG from the surface a control experiment was performed. Solutions of 2 μg/ml of hCG were introduced to a waveguide that had been coated with BSA concentrations of either 0 mg/ml, 0.005 mg/ml, 0.025 mg/ml or 0.05 mg/ml, after any reversibly adsorbed BSA was removed by a buffer wash. The results are shown in figure 2 which shows that a BSA bulk concentration of 0.025 mg/ml was sufficient to reduce hCG non-specific adsorption to a negligible amount.

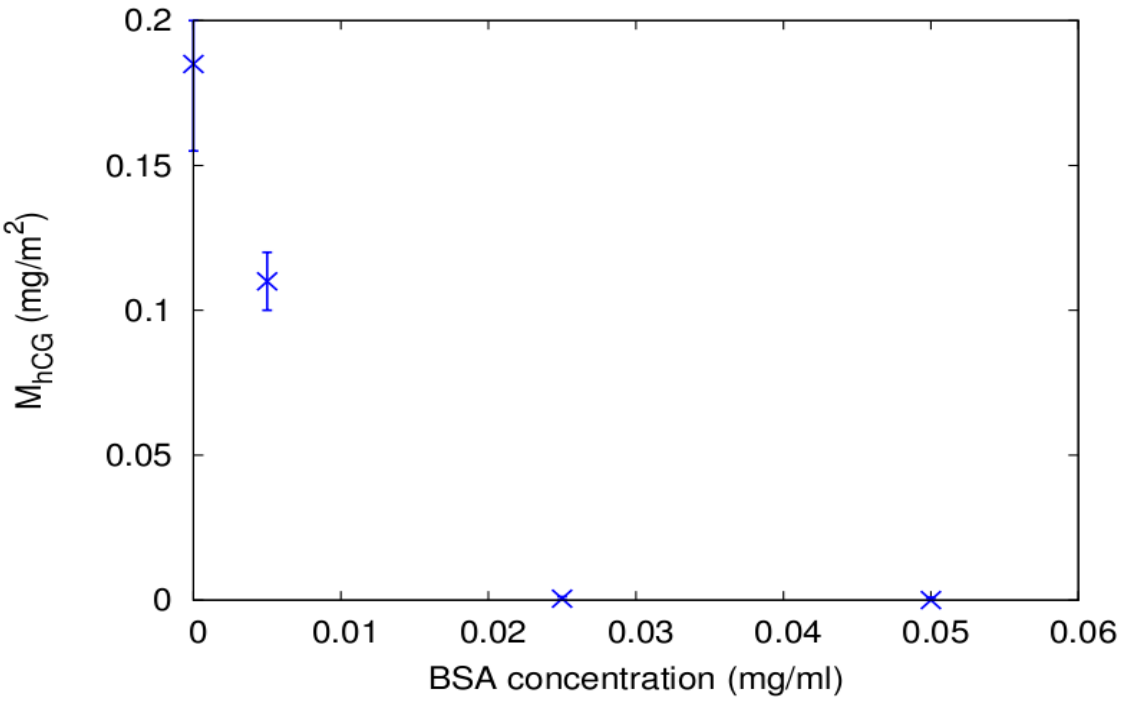

Figure 2. hCG surface coverage as a function of bulk BSA concentration. As the BSA concentration was increased the amount of non-specifically adsorbed hCG decreased. At BSA concentrations above 0.025 mg/ml the hCG adsorption was negligible.