

Supplementary information for:

Microdialysis SPR: Diffusion-gated sensing in blood

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Materials

Dimethylformamide (DMF), sucrose, sulfuric acid and 30 % hydrogen peroxide were purchased from Fisher Scientific (Pittsburgh, PA). 16-mercaptohexadecanoic acid (16-MHA), N-hydroxysuccinimide (NHS), ethanolamine hydrochloride, N α ,N α -bis(carboxymethyl)-L-lysine (NTA), poly(acrylic acid) MW 2000 (PAA), human serum, bovine serum albumin (BSA) and human hemoglobin were purchased from Sigma-Aldrich (St. Louis, MO). Phosphate buffer saline (PBS) was purchased from Corning cellgro (Manassas, VA). AffiniPure Goat Anti-Human IgG (H+L) and Human Gamma Globulin were purchased from Jackson Immunoresearch Labs. (West Grove, PA). 184 silicone elastomer base and 184 silicone elastomer curing were purchased from Dow Corning (Midland, MI). Copper (II) sulfate pentahydrate and Isopore® membrane Filter (polycarbonate and hydrophilic) with 0.4 μ m pore diameter and 10-20% porosity were purchased from EMD Inc. (cat. no. HTTP09030, Mississauga, ON). Ethanol was purchased from Commercial alcohols (Brampton, ON). Single donor human whole blood with Na Heparin added as an anticoagulant was purchased from Innovative Research (Novi, MI).

Supplementary figures and tables:

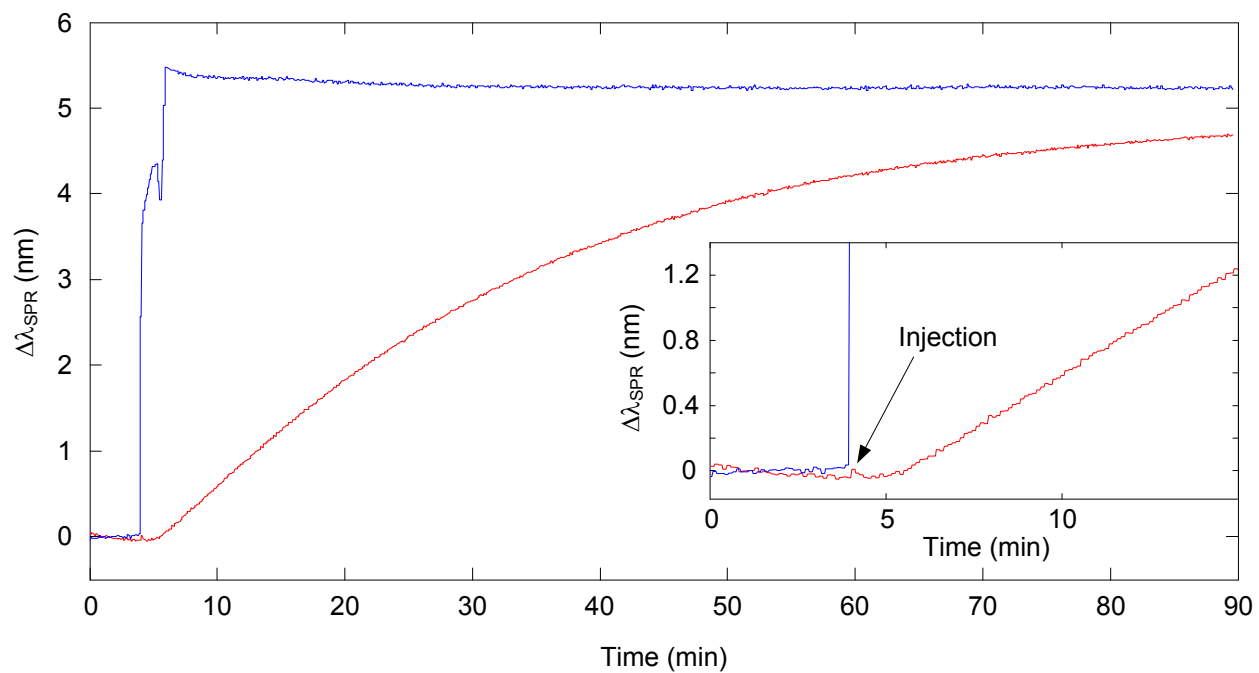


Figure SI1. Sensorgram for a 10 mg/mL sucrose solution without (top blue line) and with (bottom red line) a microporous membrane. The inset shows the delayed SPR response caused by the diffusion to the SPR sensor.

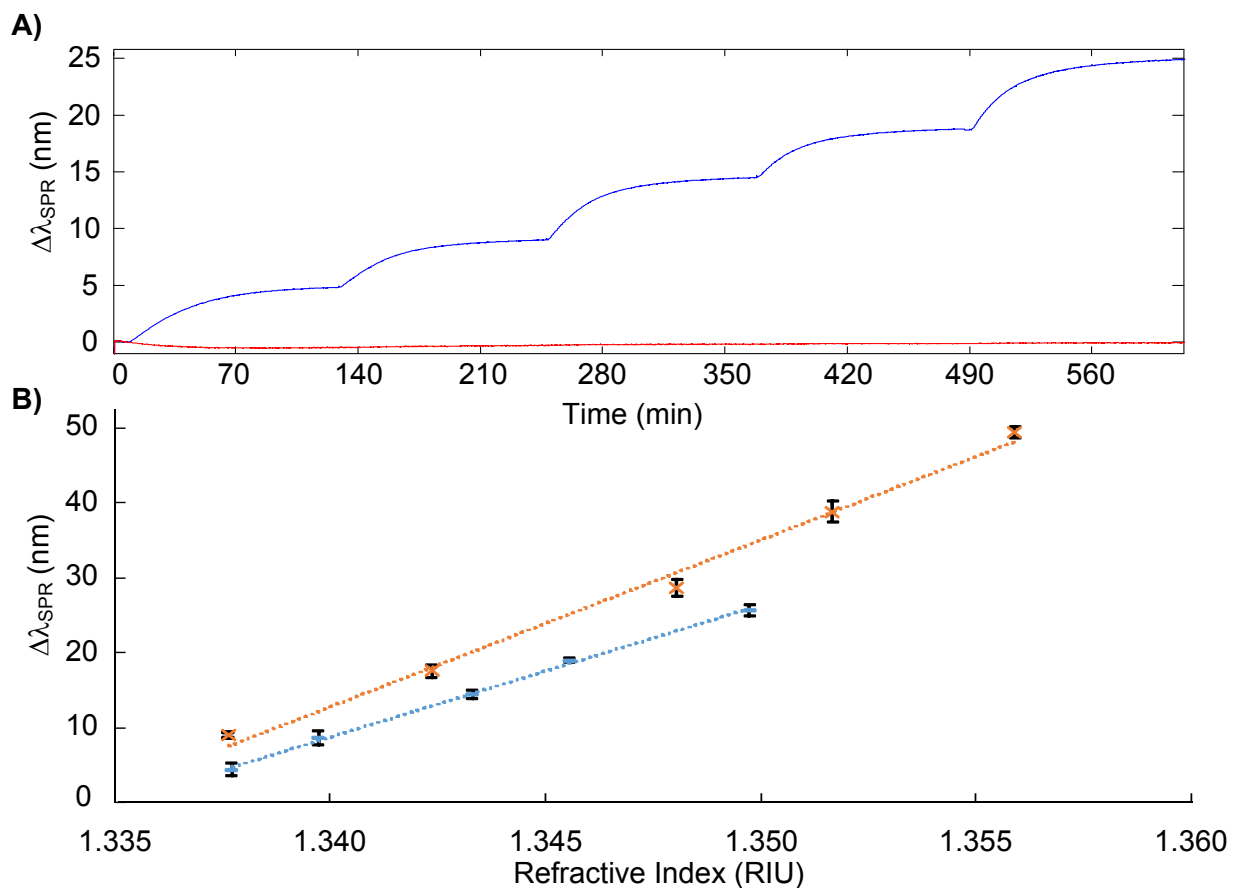


Figure SI2. (Panel A) Calibration of the SPR instrument with dialysis microfluidic (microporous membrane of 0.4 μm pore size and a spacer of 0.15 mm). The upper trace (blue) represents the signal acquired from an analytical channel with the addition of varying sucrose concentrations over time and the lower trace (red) represents the reference channel (no sensor). Panel B) Calibration with sucrose solution of the SPR instrument with (blue) or without (orange) a microporous membrane. *With microporous membrane:* $\Delta\lambda_{SPR} = 1764.1 \times RI + 2355.3$, $R^2 = 0.9983$; *Without microporous membrane:* $\Delta\lambda_{SPR} = 2221.2 \times RI + 2963.6$, $R^2 = 0.9923$

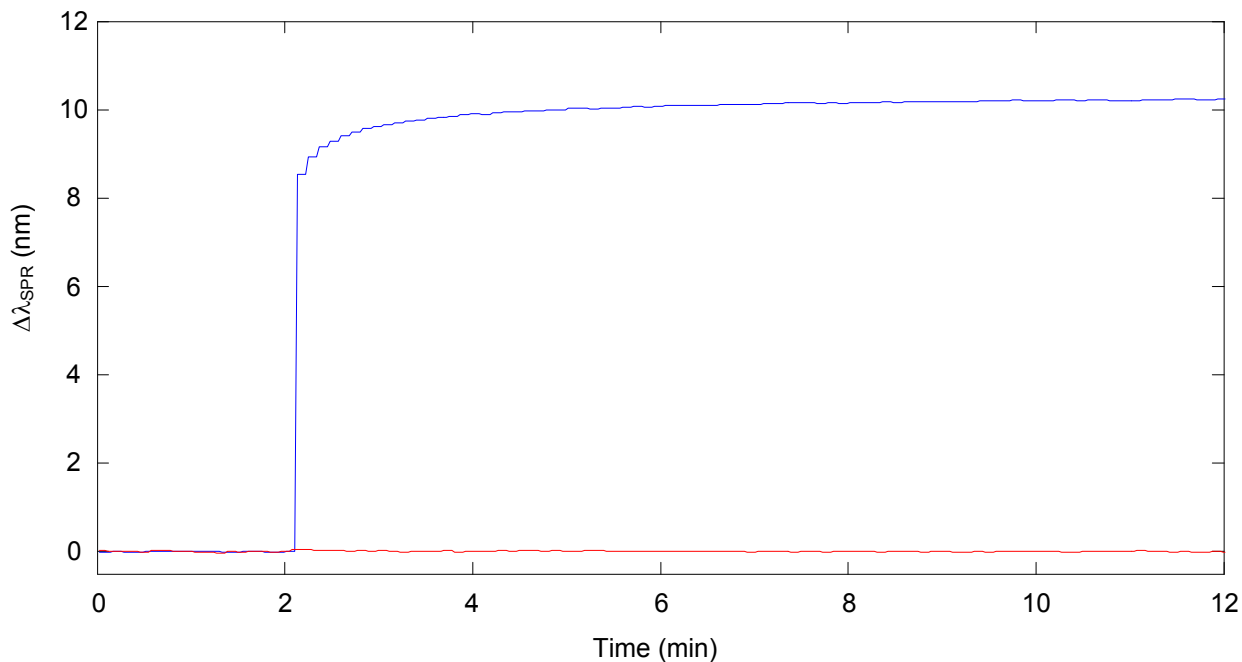


Figure SI3. Injection of a 1 mg/mL IgG solution without (blue line) and with (orange line) a microporous membrane. The SPR response shows the efficacy of the microporous membrane in reducing background signal from proteins.

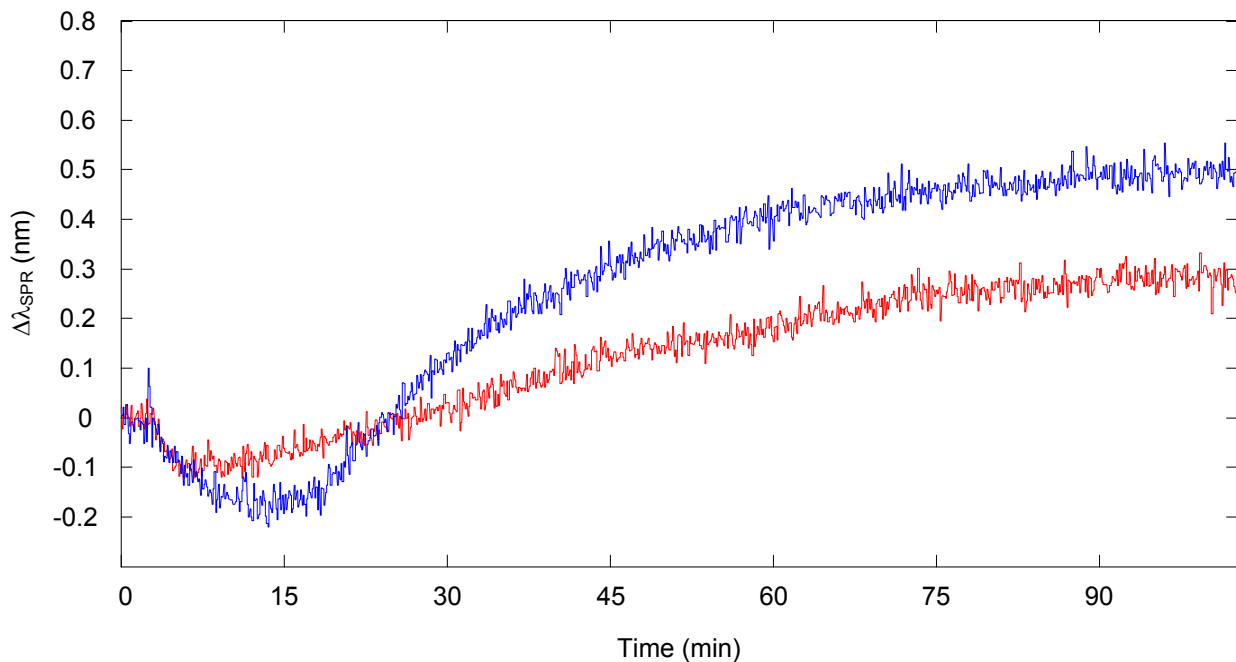


Figure SI4. Stabilization of the SPR response after injection of PBS (blue) and human blood spiked with DBG178 in presence of a microporous membrane.