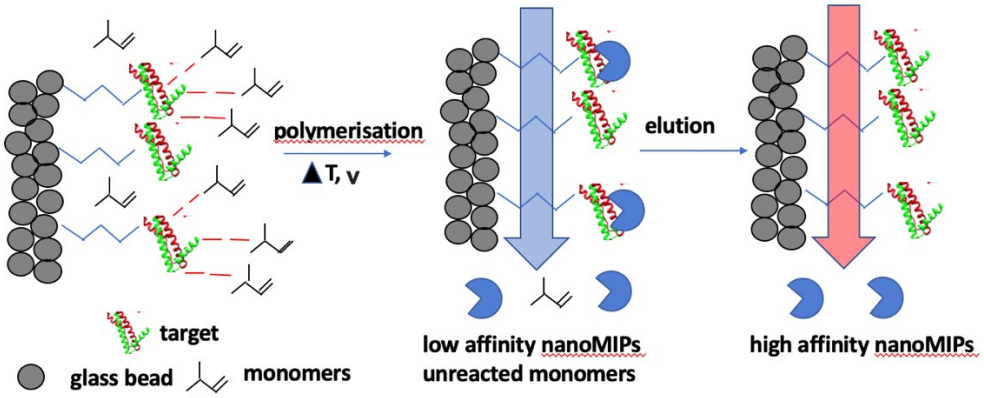
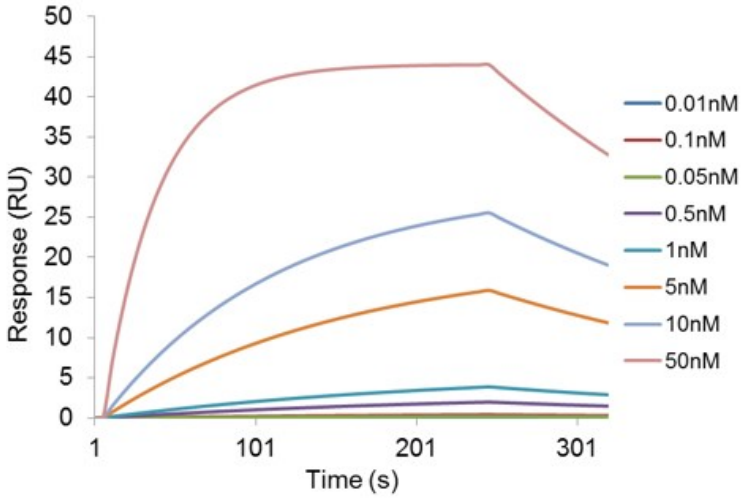
Supporting Information S-1, Synthesized nanoMIPs and SPR data

A



B



Supporting Information S-1: Scheme of the solid-phase synthesis of nanoMIPs (a). The SPR sensorgrams for the binding of the EGFR peptide epitope to immobilised anti-EGFR nanoMIP, from which the dissociation constant can be calculated, is shown in (b).

SPR analysis description: Analysis was performed on SIA Au SPR gold chips (GE Healthcare, UK) modified with mercaptoundecanoic acid (Sigma Aldrich). Bare gold chips were first cleaned by hydrogen plasma at 50 W during five minutes on an Emitech K1050X Plasma Cleaner (Emitech, UK) and then placed in ethanol containing 0.3 mg/mL lipoic acid and 5 % (v/v) acetic acid (Fisher Scientific), overnight in a sealed vial. After surface modification, chips were rinsed with ethanol and dried under a stream of N2, assembled on the holder following the manufacturer instructions and docked onto the SPR instrument (Biacore 3000, GE Healthcare, UK). For polymer coupling, the chips were activated by injection of 100 µl EDC 0.2 M and NHS 0.05 M (both from Sigma Aldrich) in water at 10 µl/min, followed by 3-5 injections of nanoMIPs (0.1 mg mL-1) in PBS at 15 µl/min until 60-80 % surface capacity was reached. The same procedure was used on a different channel to immobilise biotin nanoMIPs, which were used as a control. Remaining NHS esters were deactivated by injection of 600 µl of 0.1 M carbonate buffer pH 9.4 at 20 µl min-1.The EGFR peptide was then injected onto the nanoMIP-modified chip in concentrations ranging from 0.01 to 50 nM, and analysis was performed in 1× PBS at pH 7.4. Kinetic analysis of the sensorgrams was performed with the BiaEvaluation software v4.1 assuming a 1:1 Langmuir binding model. Chi2 values for data reported are below 10 % of the respective instrument response.

S-2, Calibration curve for temperature dependence of thermistors

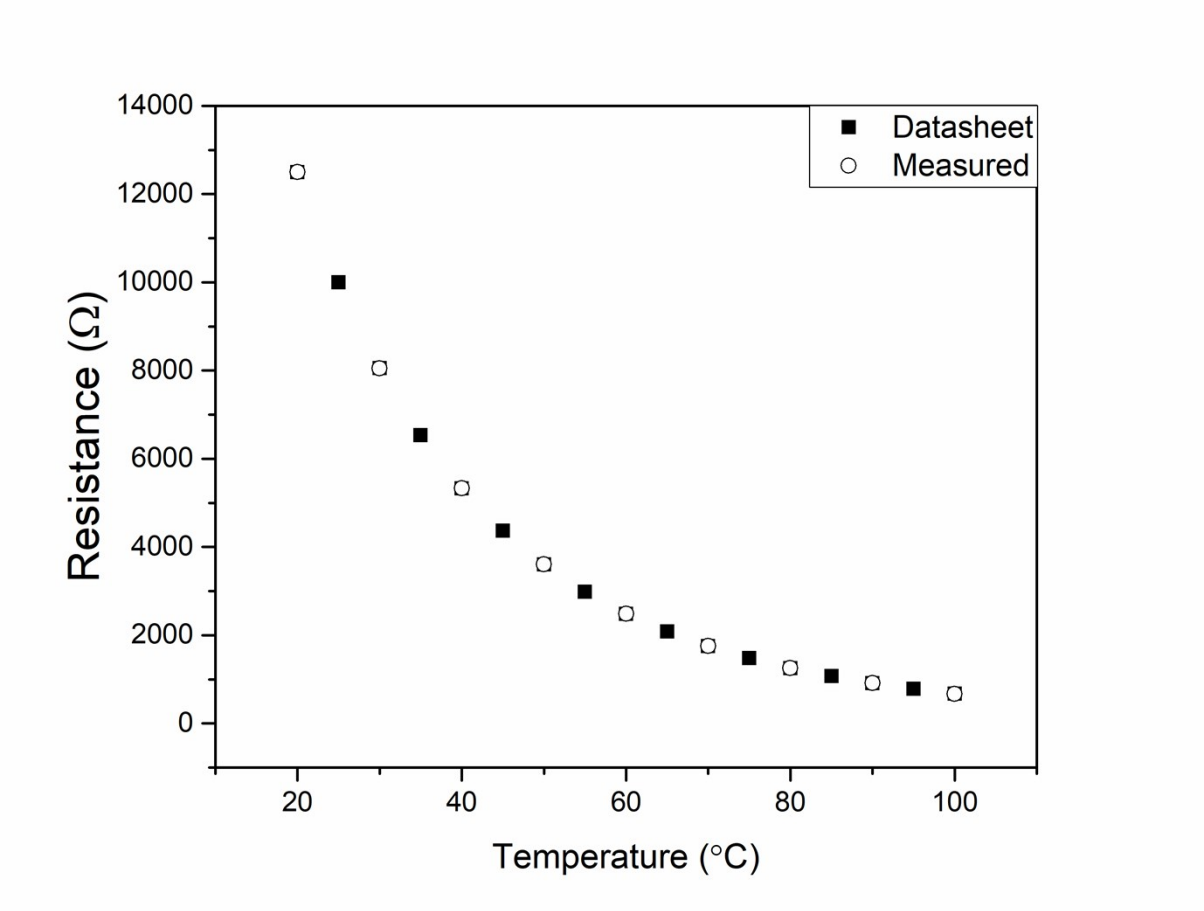
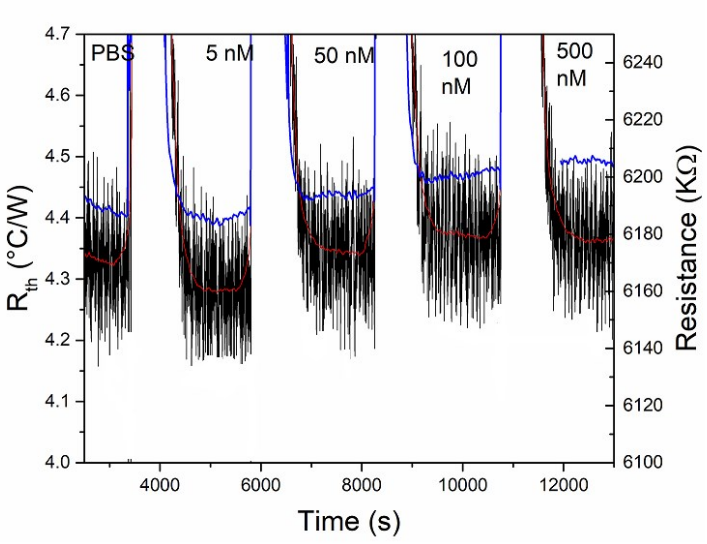


Figure S-2: The temperature of the thermistor according to the Farnell datasheet (filled squares) vs what was measured after functionalisation of the nanoMIPs (open squares). These measurements (open squares) were performed in triplicate but given the low error on commercial thermistors and minor influence of nanoMIP attachment, the standard deviation (0.02%) was smaller than symbol size.

S-3 Blank measurements for EGFR and trypsin



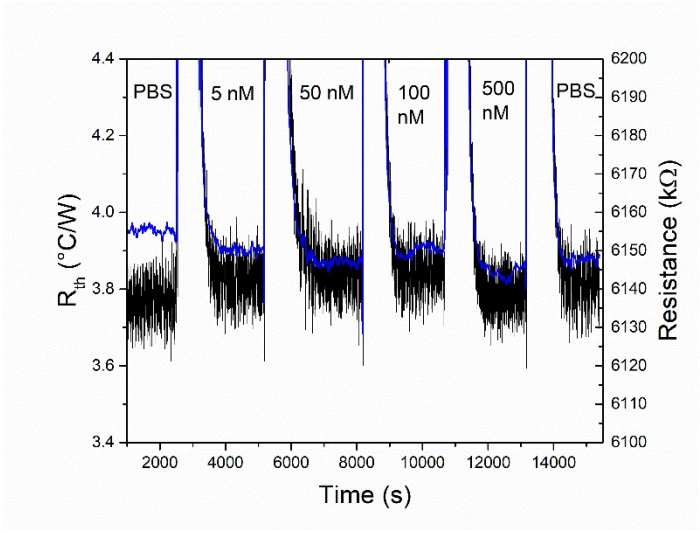


Figure S-3: a) The top image demonstrates the thermal resistance (black line) over time upon additions of PBS and PBS solutions containing EGFR. The red line corresponds to a median filter (taken over 60 points) of the thermal resistance. The blue line corresponds to the electrical resistance measured by the bare thermistor.

b) The bottom image demonstrates the thermal resistance (black) line over time upon additions of PBS and PBS solutions containing trypsin. The blue line again relates to the electrical resistance measured by the bare thermistor.

S-4 Measurement of an epitope of EGFR in PBS with a freshly prepared nanoMIP-functionalised thermistor

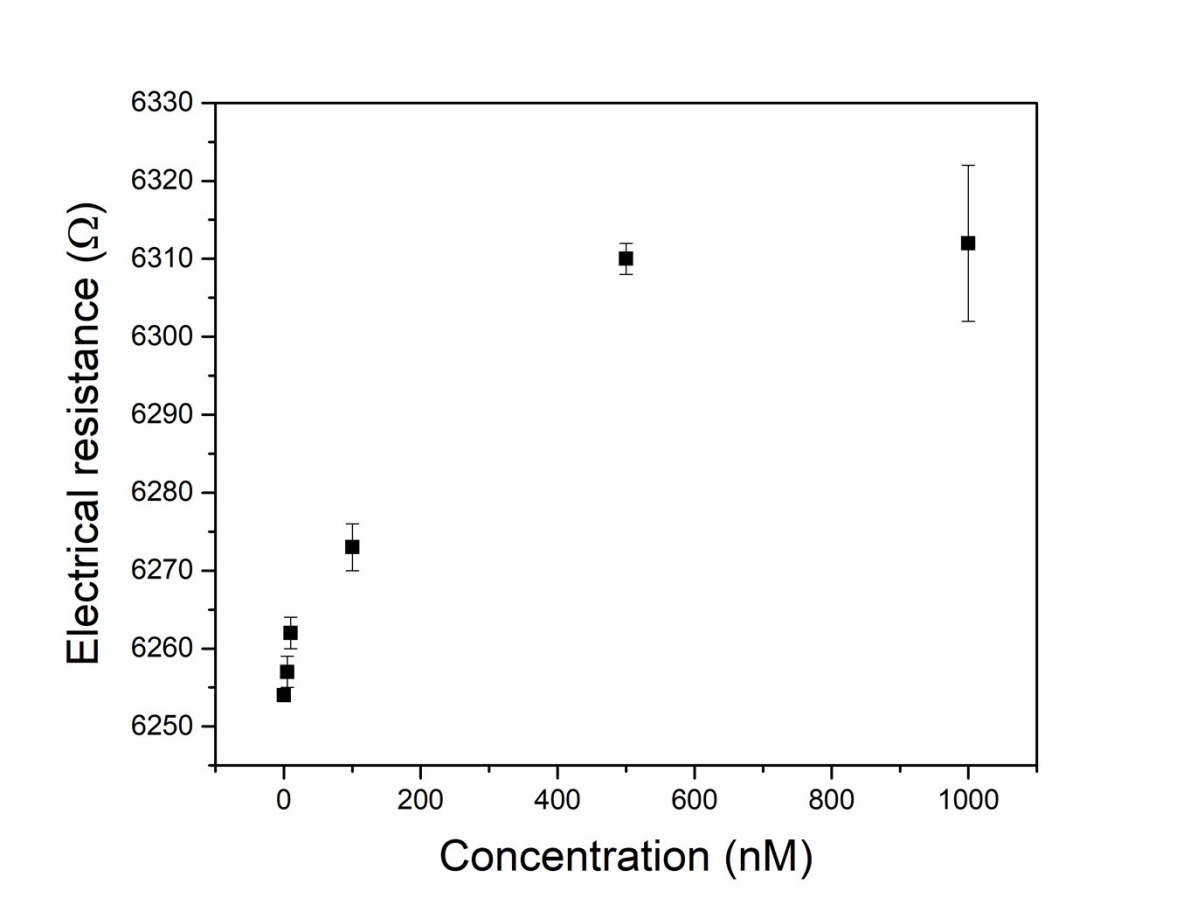


Figure S-4: The electrical resistance of the MIP-functionalised thermistor as a function of the concentration of an EGFR epitope in PBS solution. The error bar on the signal corresponds to the standard deviation of three independent measurements.

S-5 Measurements of trypsin in PBS with a freshly prepared nanoMIP-functionalised thermistor

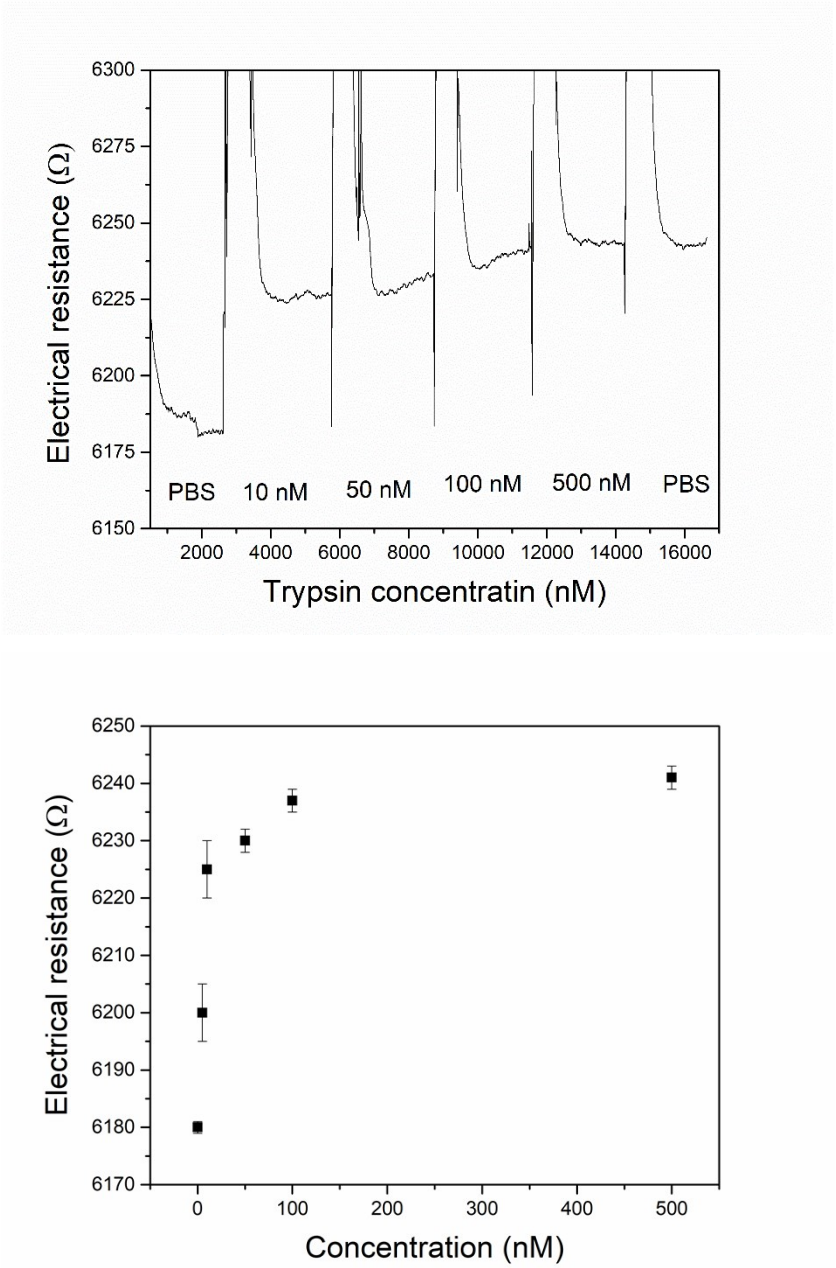


Figure S-5 The electrical resistance of the MIP-functionalised thermistor as a function of the concentration of trypsin in PBS solution (a). The dose-response curve, where error bars correspond to the standard deviation of three independent measurements, is shown in (b).

S-6 Selectivity experiments by exposing thermistor functionalised with nanoMIP for trypsin to PBS solutions with increasing biotin concentration

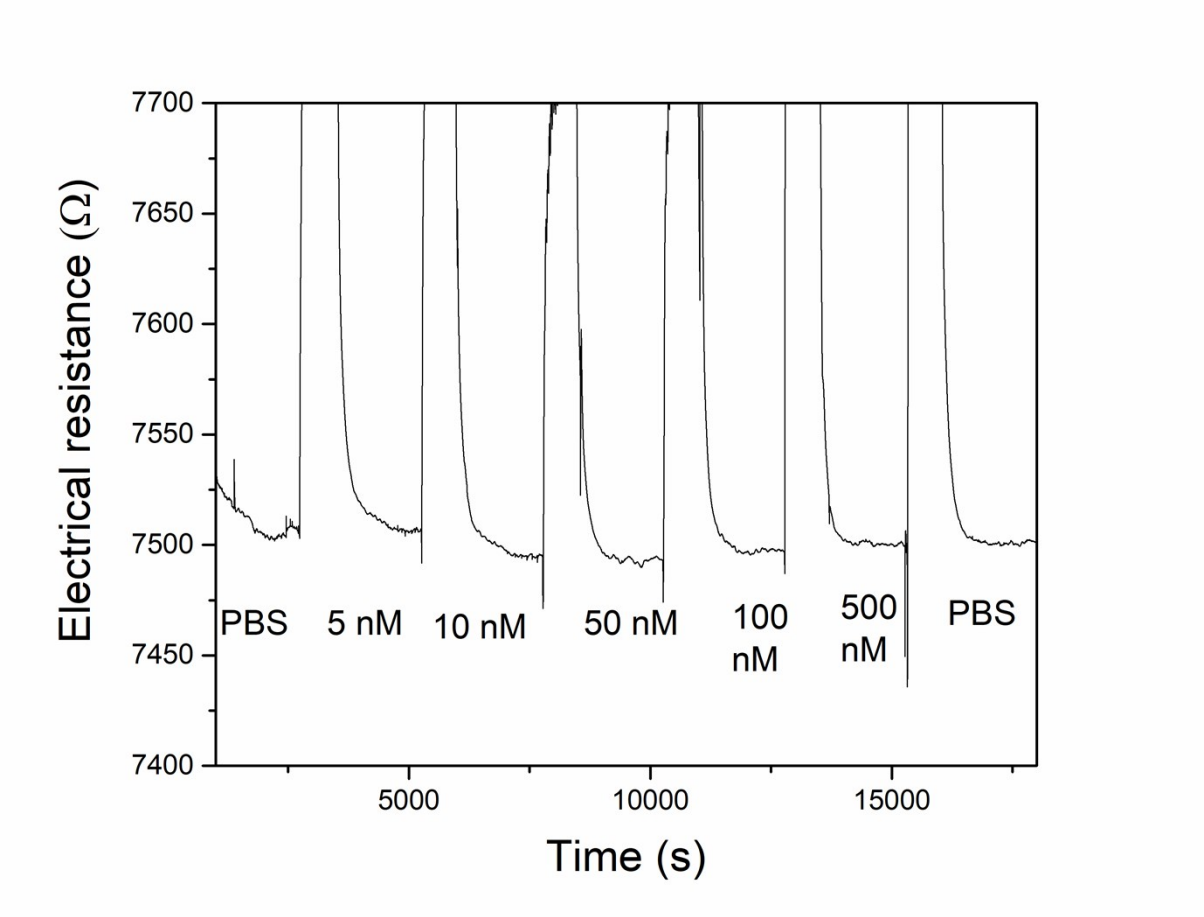


Figure S-6 The selectivity of the nanoMIP for trypsin was evaluated by exposing the functionalised thermistors to PBS solutions with increasing concentrations of biotin (0-500 nM).