

**A simple architecture with self-assembled monolayers to build immunosensors for
detecting the pancreatic cancer biomarker CA19-9**

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Electronic Supplementary Material

Table S1: CA19-9 levels of 8 human serum samples obtained from Barretos Cancer Hospital.

Patient	CA 19-9 Concentration in Human Serum (U/mL)
P1	53.86
P2	14.37
P3	1.80
P4	8.66
P5	80.63
P6	37.16
P7	29.67
P8	185.00

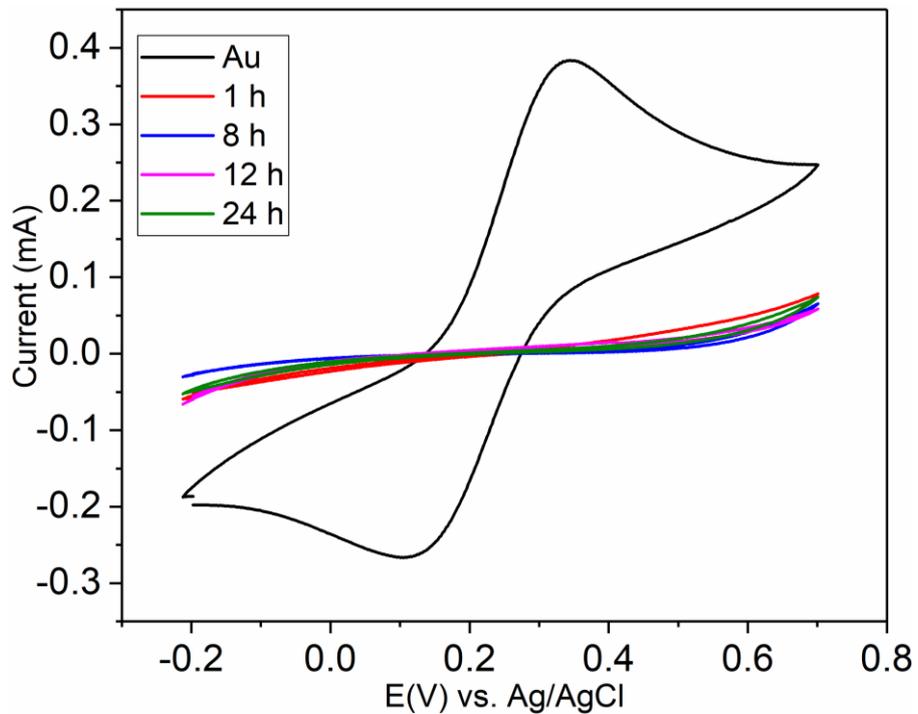


Figure S1: Cyclic voltammograms for electrodes modified with 11-mercaptoundecanoic acid (11-MUA) during 1, 8, 24, and 48h to optimize the passivation time of Au surfaces.

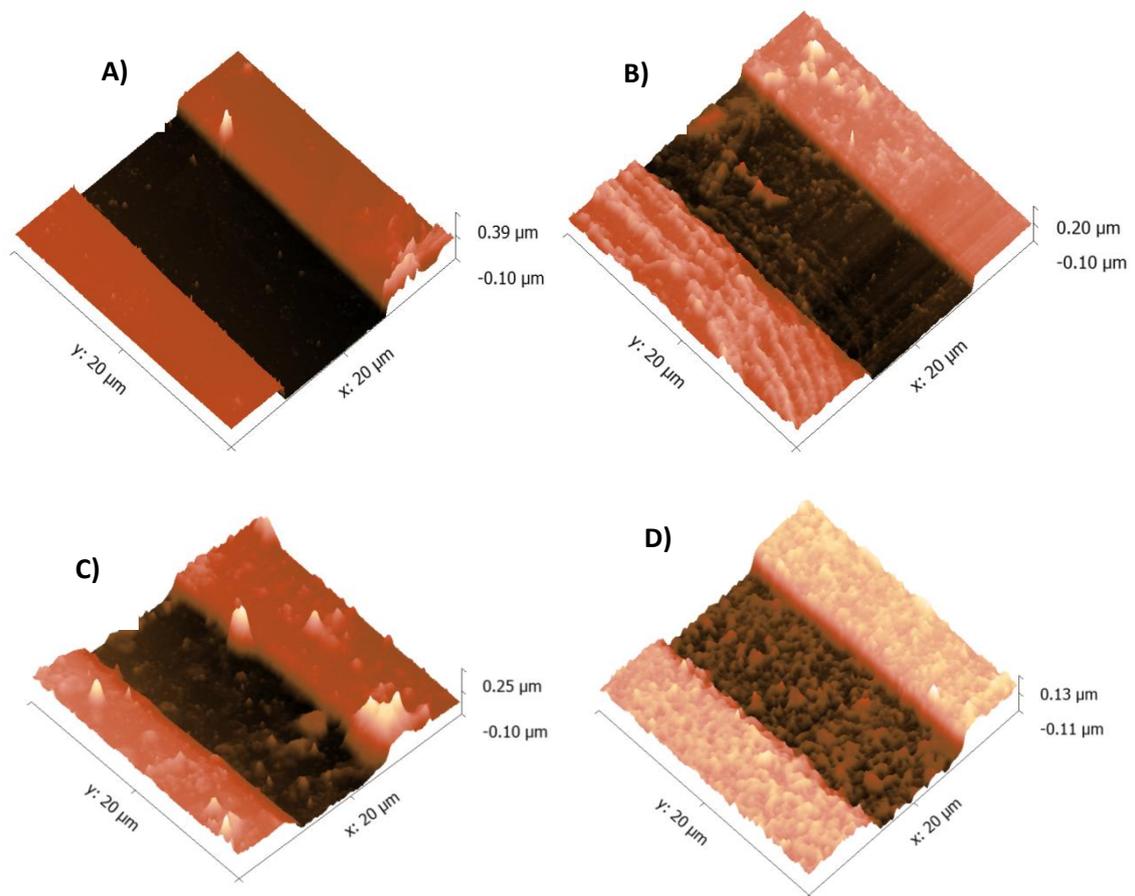


Figure S2: Topography of interdigitated electrodes functionalized with: (a) 11-MUA; (b) anti-CA19-9 antibodies; (c) after adsorption of biomarker CA19-9 at saturation; (d) after exposure to the biomarker CA19-9 at a concentration above saturation.

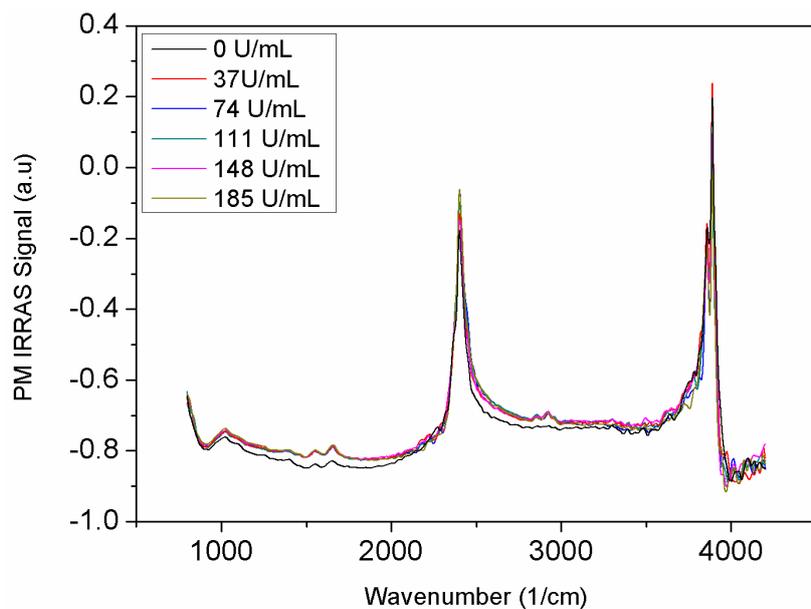


Figure S3: Entire PM-IRRAS spectra of 11-MUA/EDC/NHS film modified with antibodies and different concentrations of CA19-9 biomarkers

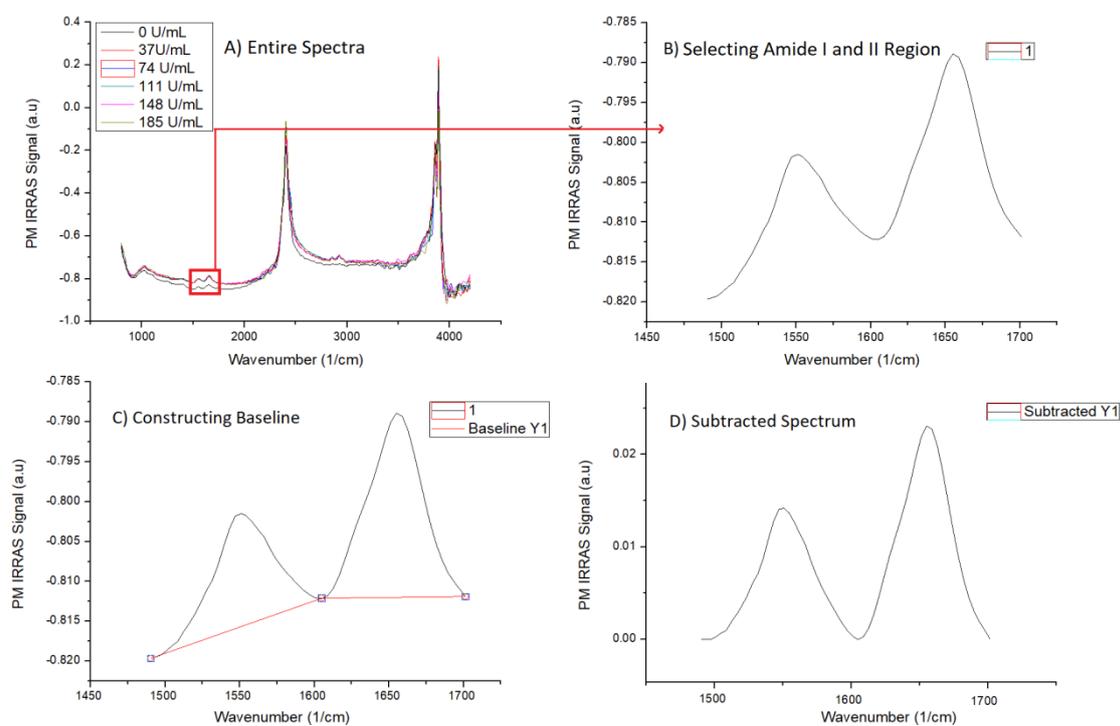


Figure S4: Construction of the baseline from the amide I and II region of the spectra.

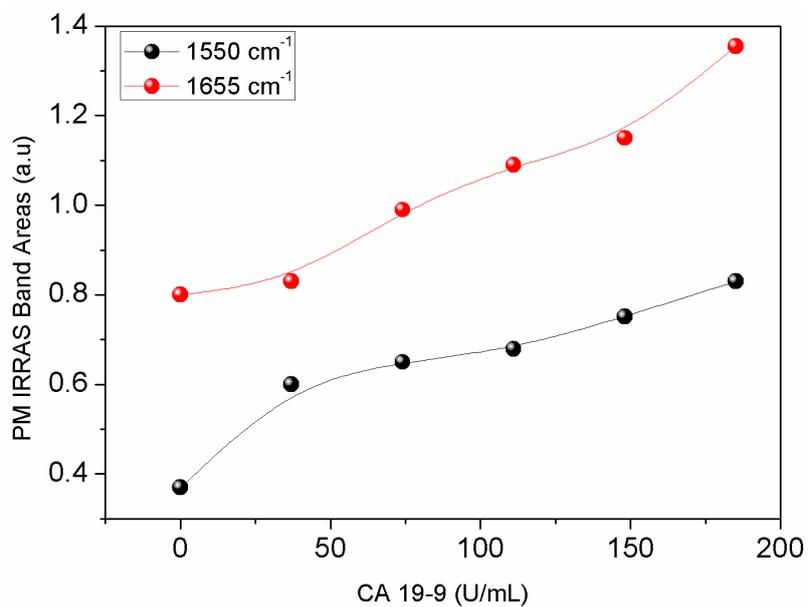


Figure S5: Calibration curves obtained by taking the areas of the bands at 1550 cm⁻¹ and 1655 cm⁻¹.

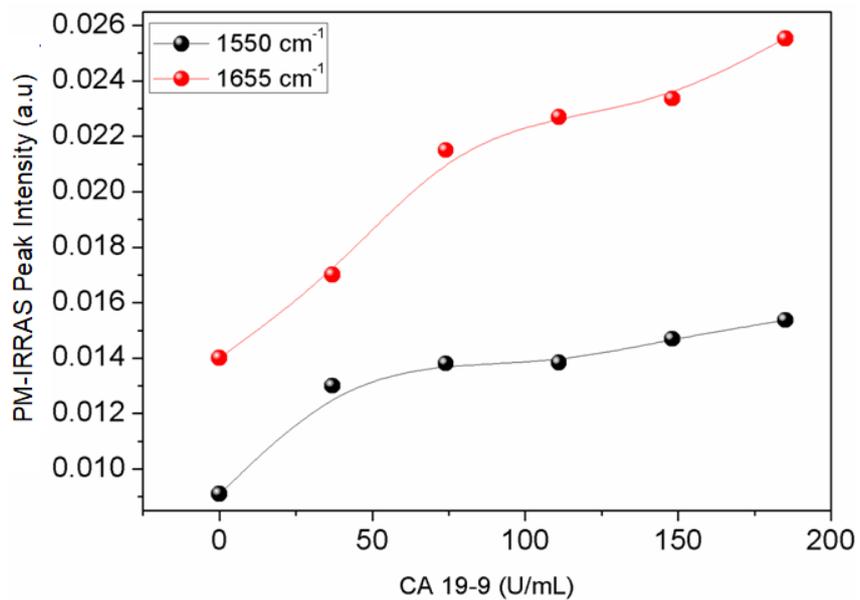


Figure S6: Calibration curves obtained by taking the maximum peak intensity at 1550 cm⁻¹ and 1655 cm⁻¹.

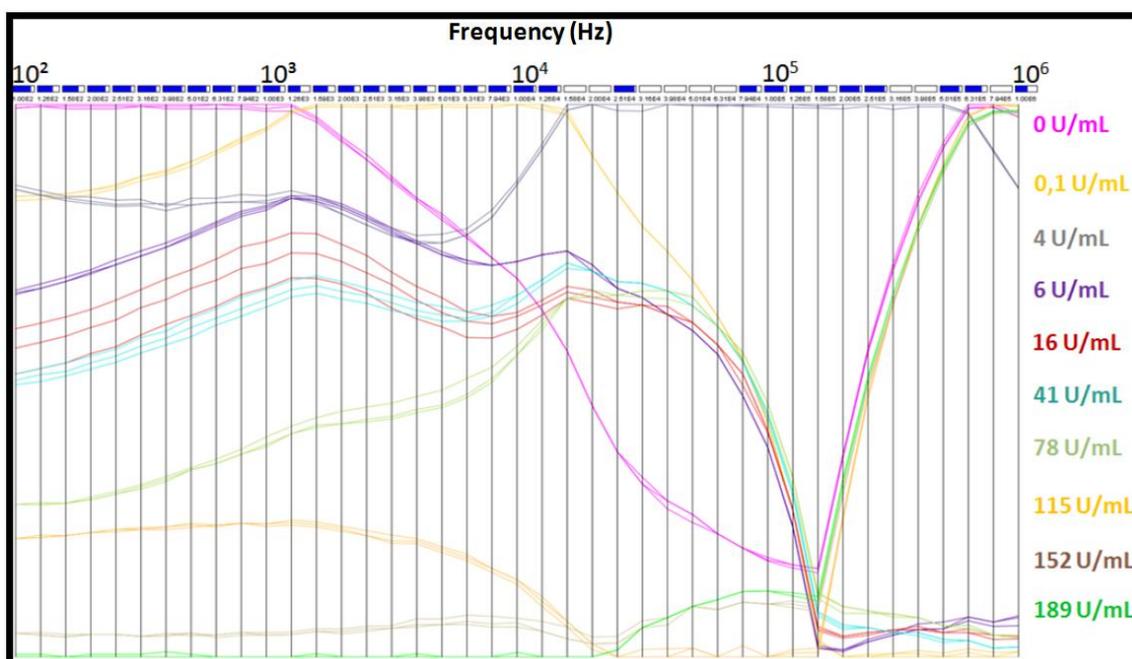


Figure S7: Parallel Coordinates plot for the capacitance spectra of ten CA19-9 commercial samples with distinct concentrations as marked in the figure. The abscissa corresponds to the frequency and the ordinate brings normalized capacitance values. The blue boxes indicate that the region below 10 kHz is more suitable for distinguishing the samples.

Table S2: Quantifications of HT-29 and CA19-9 commercial samples immersed in FBS.

Samples	Quantification (U/mL)	Reference (U/mL)
HT-29	10.7	
FBS + CA19-9	12.6	12.26

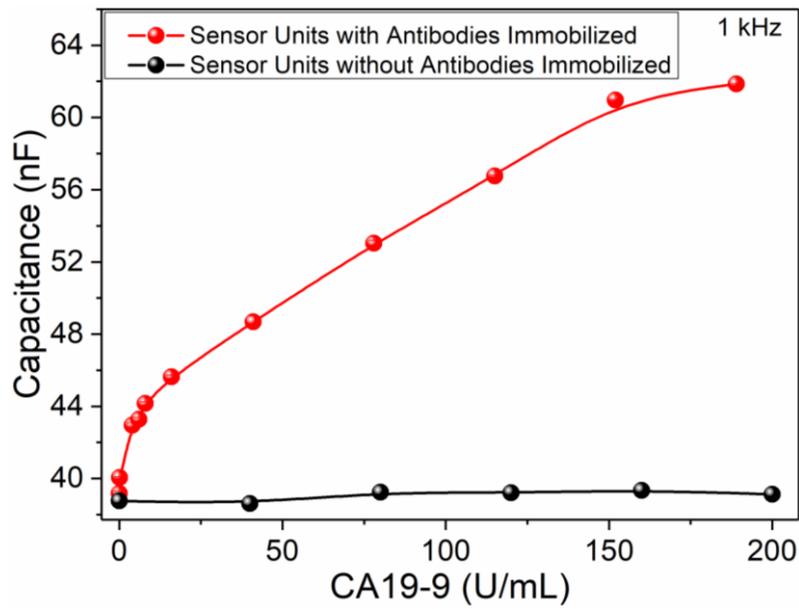


Figure S8: Comparison of the electrical signal between sensor units with immobilized anti-CA19-9 antibodies and units without antibodies.