

Supplementary Information

CannibiSenS: An on-demand rapid screen for THC in human saliva

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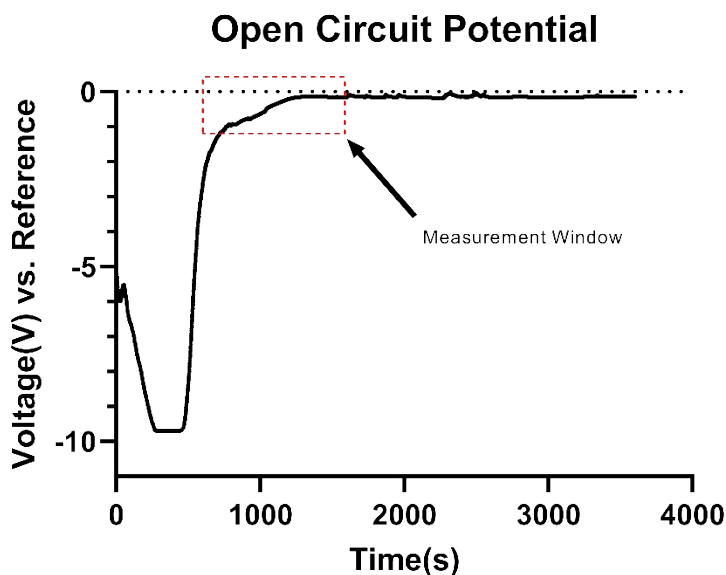


Figure S1. Open Circuit Potential of the sensing platform in PBS

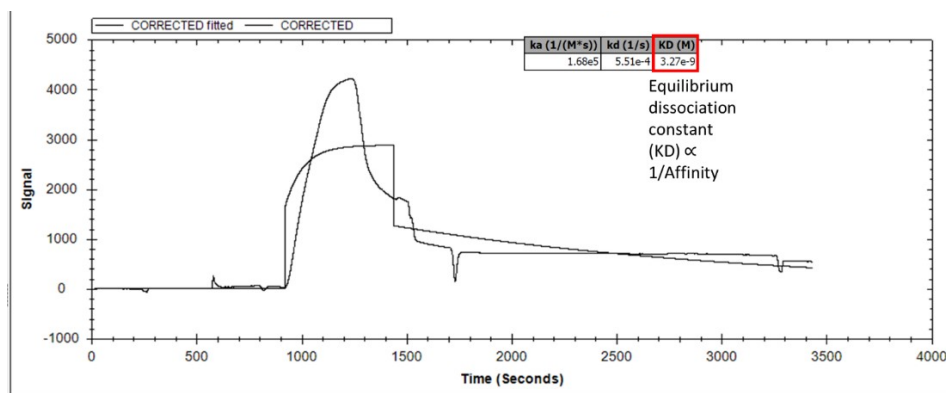


Figure S2. One-to-One fit model characteristics for antibody binding to substrate.

Fitted model binding characteristics for antibody binding to substrate is shown in Fig. S2, k_a here signifies how quickly the antibody binds to the substrate represented by the steep increasing slope, while the k_d is based on how fast the antibody dissociates from the substrate, represented by the flat line in the fitted plot.

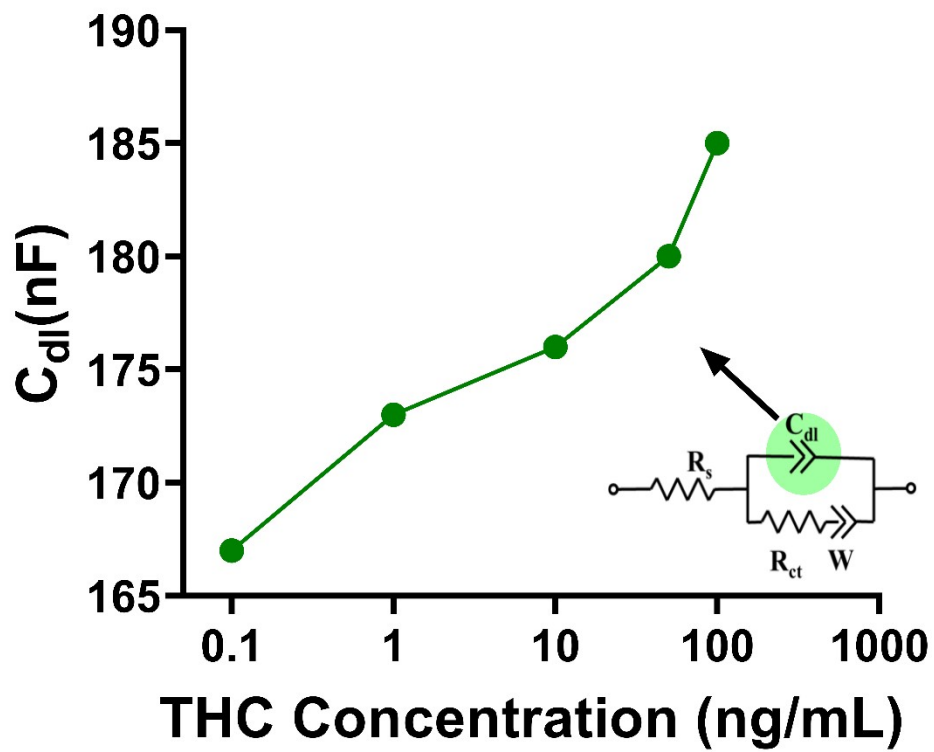


Figure S3. Change in double layer capacitance from fitted data from benchtop data

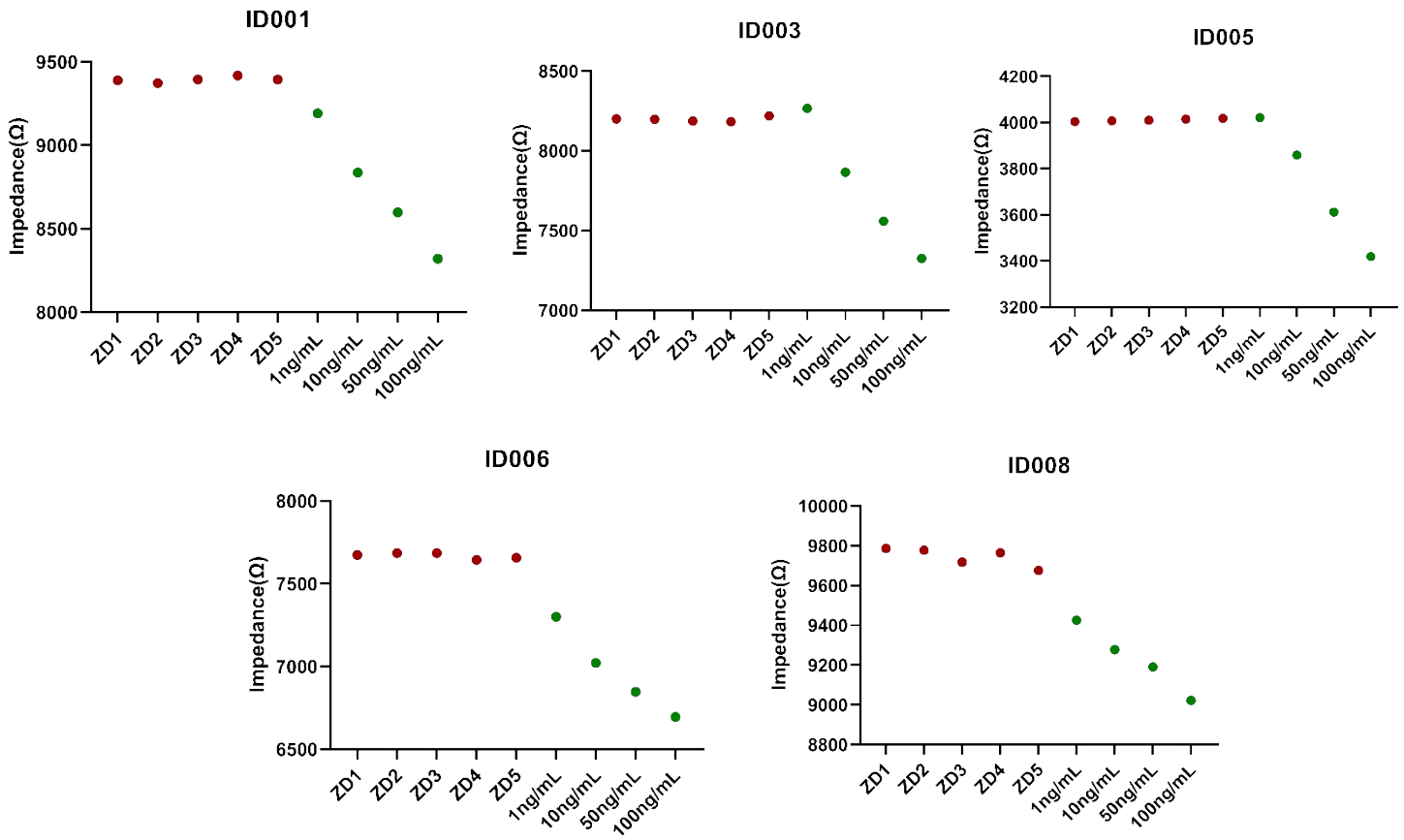


Figure S4. Impedance measurements for THC deficient human saliva (ZD1-ZD5) and increasing doses of THC in human saliva

CDR Fitting for THC on benchtop

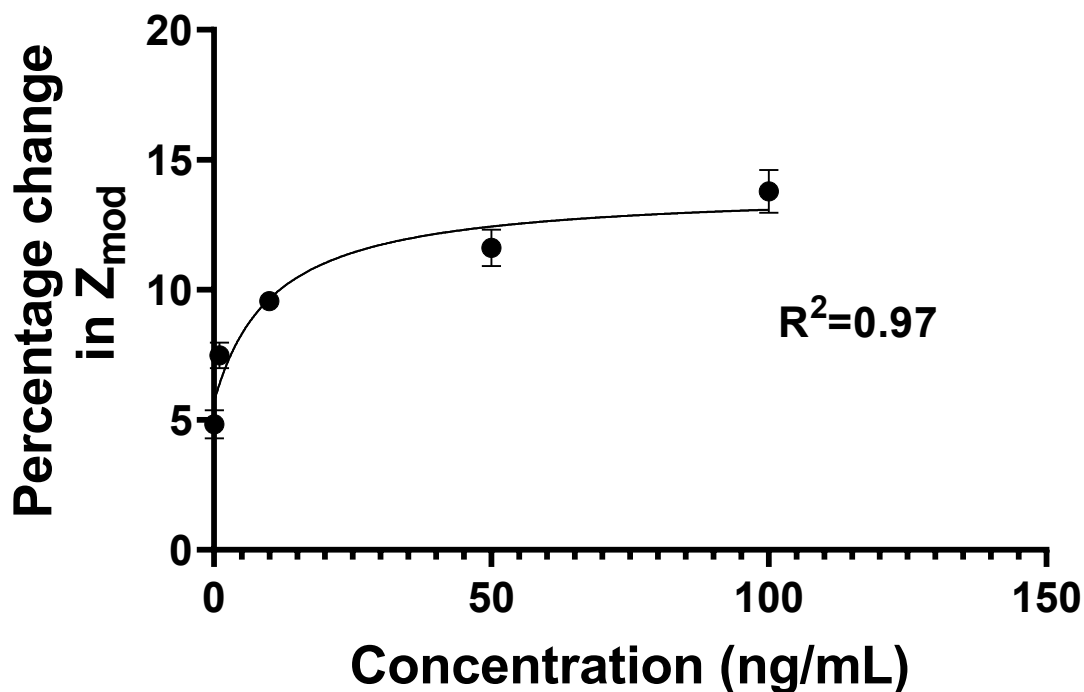


Figure S5. CDR Fitting of the dose response for THC on benchtop device

Table S1. Electrochemical methods used in the detection of THC in saliva

Detection Technique	Time of Detection	Matrix Modifications / Volume Used	Biomarker Detected	Range of Detection	Limit of Detection (LOD)	Electrode Set-up	References
Square Wave Voltammetry (SWV)	~3 mins	10X PBS dilution of collected saliva/ 200 μ L	THC	1-6 μ M	0.5 μ M	W.E printed from 1% MWCNT modified carbon ink coupled with Ag/AgCl in a 3-electrode system	¹
Square Wave Voltammetry	38 seconds	Saliva samples were diluted with either methanol (or PBS or a	THC	2-25ng/mL	1.6 ng/mL in real saliva	Screen-printed carbon-based electrodes couples with Ag/AgCl in a	²

		combination of both/100µL				3-electrode system	
Electrochemical Impedance Spectroscopy	Measurement was under a minute	Authors didn't mention any modifications made to the saliva collected	THC- BSA hapten	100pg/mL - 100ng/mL	100pg/mL	Gold on PET (polyethylene terephthalate) substrates	3
Organic electrochemical transistor (OECT)	~5 mins	Detection of THC in synthetic saliva/10 µL	THC	0.1nM- 5 µM	1nM (0.31ug/mL)	Platinum wires coupled with OECT as the WE and CE and Ag/AgCl in a 3-electrode system	4
Differential Pulse Voltammetry	1 min	Saliva was filtered and diluted (50% or 90%) with 20mM PBS/ 1 µM methylene blue/ ~60 µL	THC	1-100nM	5nM	Aptamer modified gold-SPE combined with a microfluidic cartridge setup	5
Cyclic Voltammetry (CV)/ Square Wave Voltammetry (SWV)	~3.5mins	Saliva was diluted/250 µL	THC	2.5-40 pmol	4nM-SWV 12nM- CV	A 3-electrode system with a Pt mesh counter electrode, a saturated calomel reference electrode (SCE), and porous carbon paper working electrodes	6
Non-Faradaic Electrochemical impedance spectroscopy	Measurement under a minute with 15 mins incubation	Pooled human sweat (diluted in a 2:1 ratio with 0.1x PBS)/5µL	THC	0.1- 100ng/mL	0.1ng/mL	2 gold interdigitated electrodes fabricated on printed	This work

	time					circuit board (PCB)	
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References

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