

Supplementary information (SI)

A point-of-care, label-free OECT sensor for uric acid detection: validation in human saliva

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Table S1 - Uric acid concentration ranges in different biological fluids for healthy humans.

Biological fluid	[UA] Range	Reference
Urine	1.4-4.4 mM	[25]
Serum	24-520 μ M	[26]
	140-480 μ M	[27]
Sweat	20-60 μ M	[28]
Wound exudate	221-751 μ M	[27]
Saliva	7.3-265 μ M	[29]
	40-360 μ M	[30]

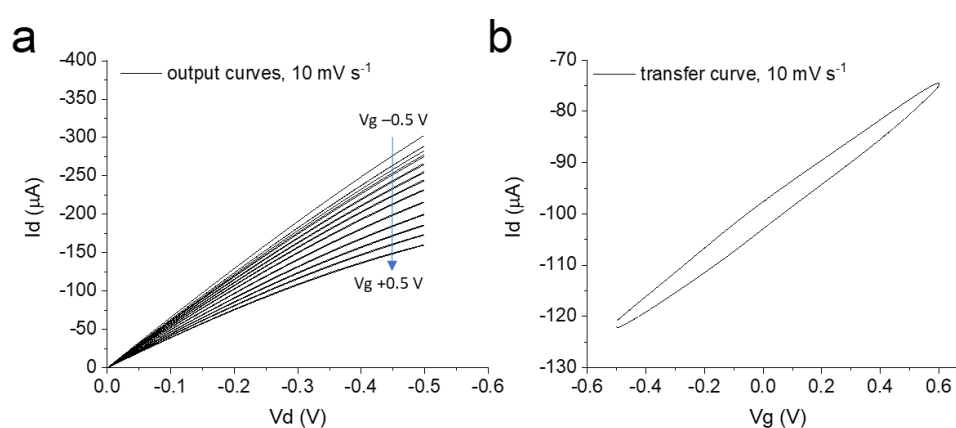


Fig. S1. a) Electrical characterization of the OECT with output curves recorded in PBS (0.1 M, pH 7.00); V_g steps from -0.5 V to 0.5 V; V_d linearly scanned from 0 V to -0.5 V; scan rate 10 mV/s. b) Electrical characterization of the OECT with transfer curves recorded in PBS (0.1 M, pH 7.00); V_g linearly scanned from -0.5 V to 0.6 V; $V_d = -0.3$ V; scan rate 10 mV/s.

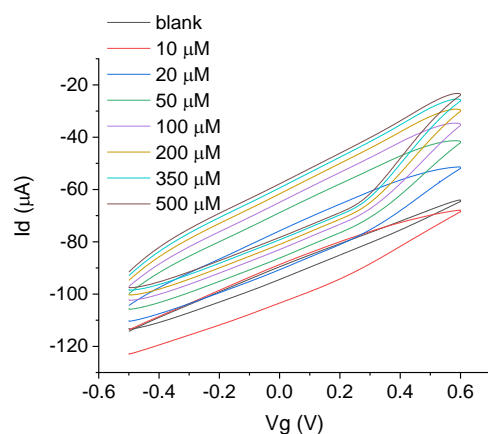


Fig. S2. Transfer curves recorded in PBS (0.1 M, pH 7.00) for incremental additions of UA from 10 to 500 μM ; V_g linearly scanned from -0.5 V to 0.6 V; $V_d = -0.3$ V; scan rate 10 mV/s.

Table S2. Comparison between the quality of the calibration curve using the first or the third cycle of analysis for the potentiodynamic detection. The analytical parameters are the slope of the curve, representing the sensitivity of the measurement, with standard deviation (SD) to estimate an error, the coefficient of determination R^2 and the time required for each calibration point.

	1 st cycle	3 rd cycle
Slope \pm SD ($\mu\text{S}/\text{dec}$)	54 \pm 2	53 \pm 2
R^2	0.994	0.994
Time required for each calibration point	\approx 4 min	\approx 12 min

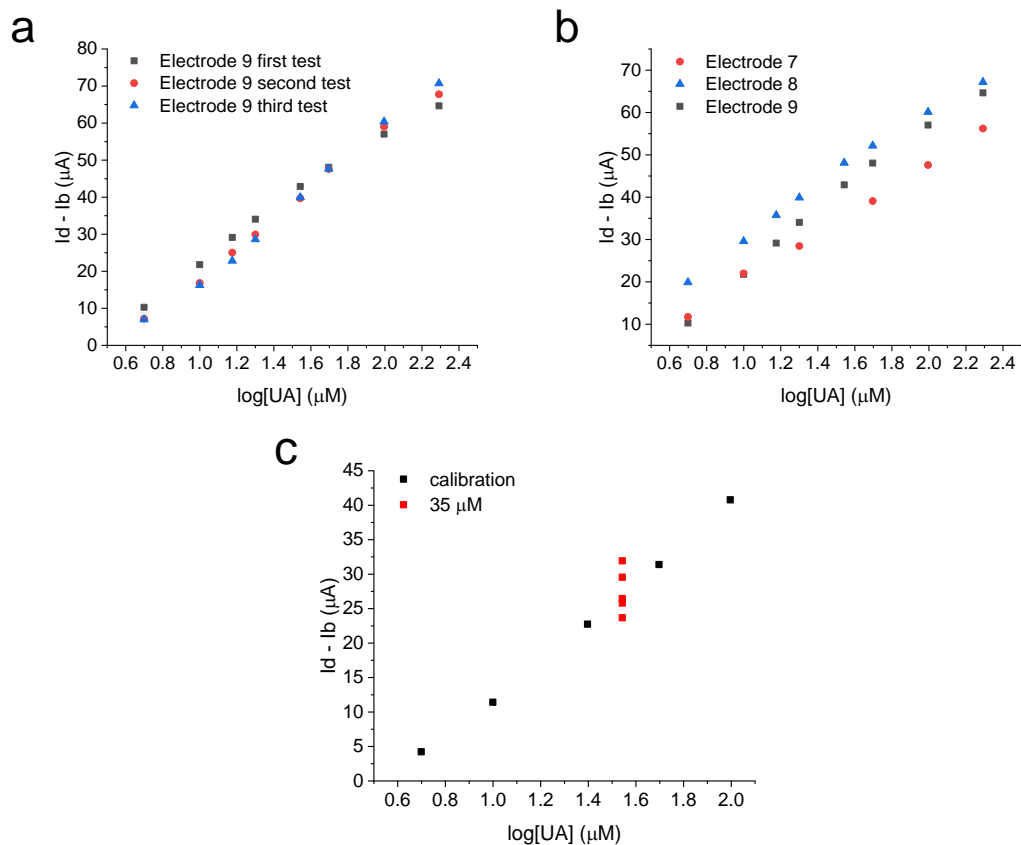


Fig. S3. a) Calibration curves obtained from three independent potentiostatic measurements in PBS (0.1 M, pH 7.00) performed on the same sensor to evaluate repeatability. b) Calibration curves obtained from three independent potentiostatic measurements in PBS (0.1 M, pH 7.00) performed on three different sensors to evaluate reproducibility. c) I_d variations (in red) recorded from five independent potentiostatic measurements on a 35 μM UA solution in PBS (0.1 M, pH 7.00) to evaluate accuracy and precision using a pre-calibrated sensor in potentiostatic mode.. $V_g = +0.6$ V; $V_d = -0.3$ V.

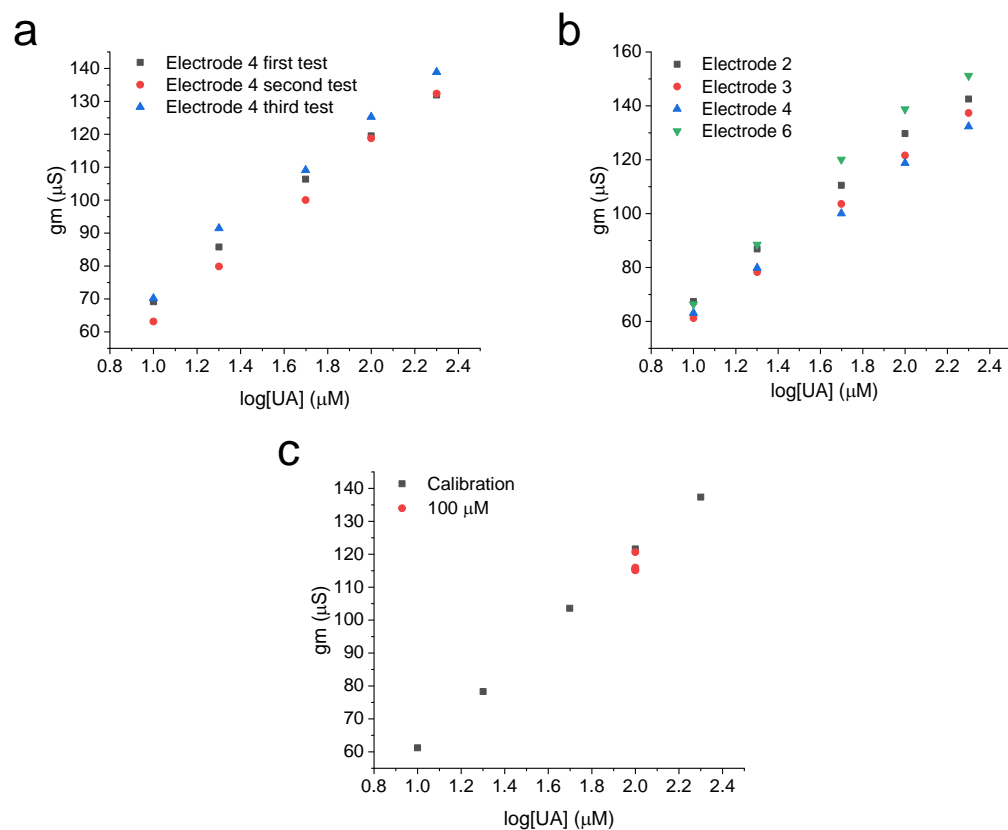


Fig. S4. a) Calibration curves obtained from three independent potentiodynamic measurements in PBS (0.1 M, pH 7.00) performed on the same sensor to evaluate repeatability. b) Calibration curves obtained from four independent potentiodynamic measurements in PBS (0.1 M, pH 7.00) performed on four different sensors to evaluate reproducibility. c) gm values (in red) recorded from five independent potentiodynamic measurements on a 100 μM UA solution in PBS (0.1 M, pH 7.00) to evaluate accuracy and precision using a pre-calibrated sensor in potentiodynamic mode. Vg linearly scanned from -0.5 V to 0.6 V; Vd = -0.3 V; scan rate 10 mV/s.

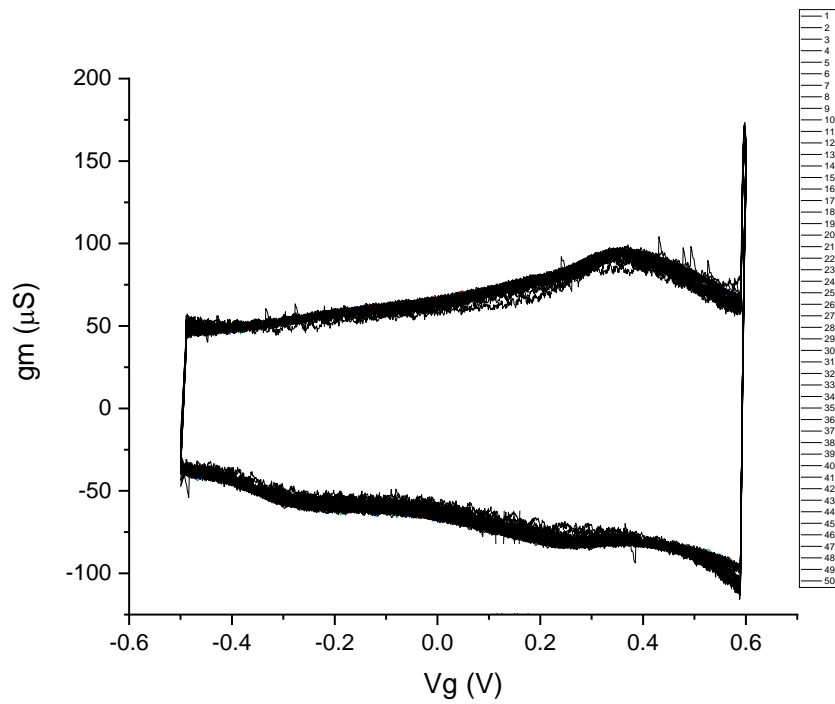


Fig. S5. g_m vs V_g curves obtained for 50 repeated measurements on the same saliva sample showing the stability of the sensor. V_g linearly scanned from -0.5 V to 0.6 V; $V_d = -0.3$ V; scan rate 10 mV/s.

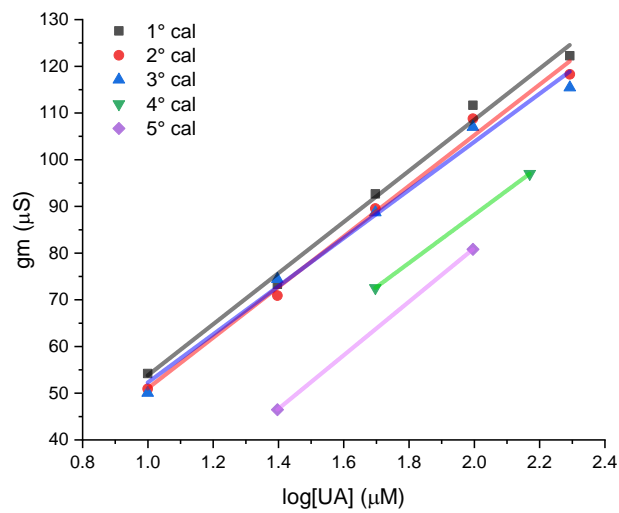


Fig. S6. Assessment of calibration stability upon repeated use of an OECT sensor as detailed in Table S3.

Table S3. Summary of the procedures followed for assessing the calibration stability of the OECT sensor corresponding to Fig. S 6.

Calibration procedure name	Day	Type	Sensitivity \pm SD ($\mu\text{S dec}^{-1}$)	Sensor usage after the calibration
1° cal.	1	5-point calibration	55 ± 3	no
2° cal.	3	5-point calibration	54 ± 3	no
3° cal.	4	5-point calibration	52 ± 3	yes: 15 measurements in pure saliva
4° cal.	10	2-point calibration	52	yes: 3 measurements in diluted saliva and recovery tests
5° cal.	17	2-point calibration	57	yes: 3 measurements in diluted saliva and recovery tests



Fig. S7. OECT equipped with a PDMS well to analyze 250 μL of sample.