Supplementary information

3D-printed organic electrochemical transistors on microfluidic paper for multianalyte point-of-care testing

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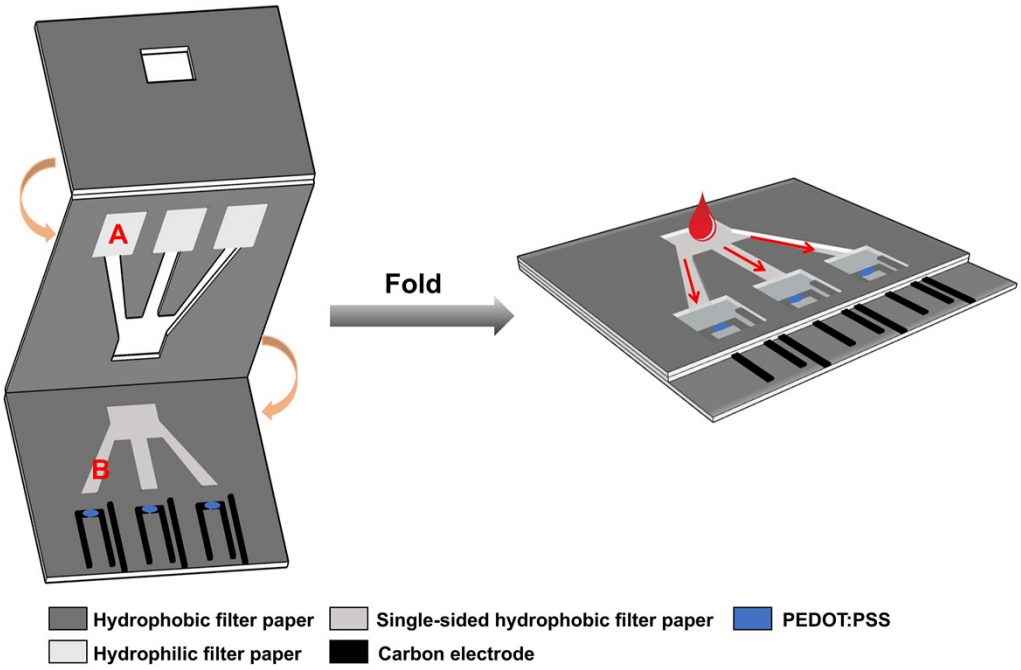

Fig. S1 Device folding schematic diagram: section A: hydrophilic filter paper, section B: single-sided hydrophilic channels.

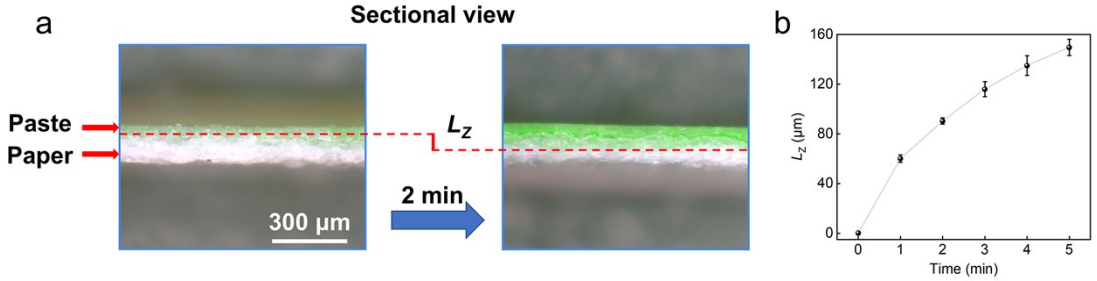

Fig. S2 Vertical penetration of the paste: (a) definition of L_Z, (b) relationship between L_Z and time.

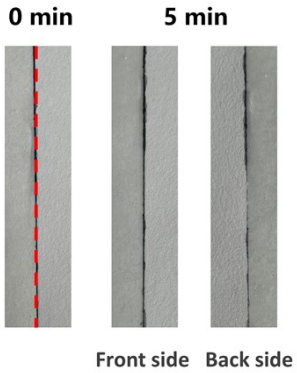

Fig. S3 Lateral penetration of the paste.

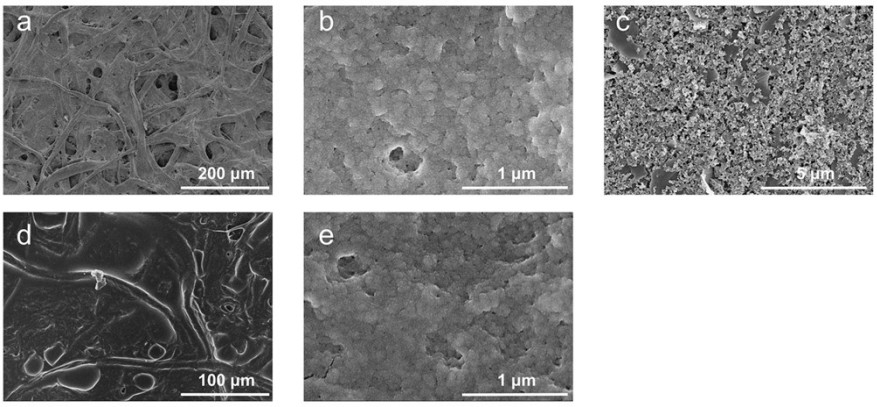

Fig. S4 Microscopic morphology characterization: (a) filter paper, (b) biofunctionalized gate (GOx), (c) carbon electrode, (d) hydrophobic filter paper, (e) biofunctionalized gate (ChOx).

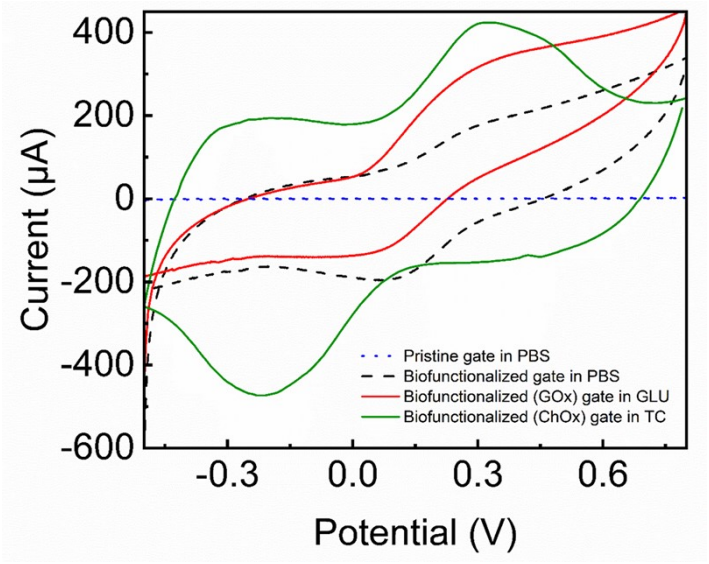

Fig. S5 Electrochemical system validation of ferrocene and enzyme immobilization.

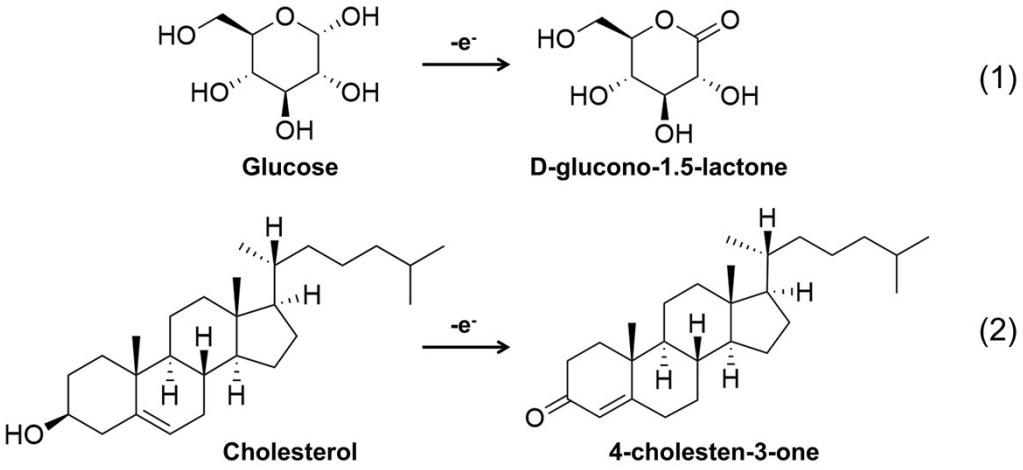

Fig. S6 Enzyme catalysis process of glucose (1) and cholesterol (2).

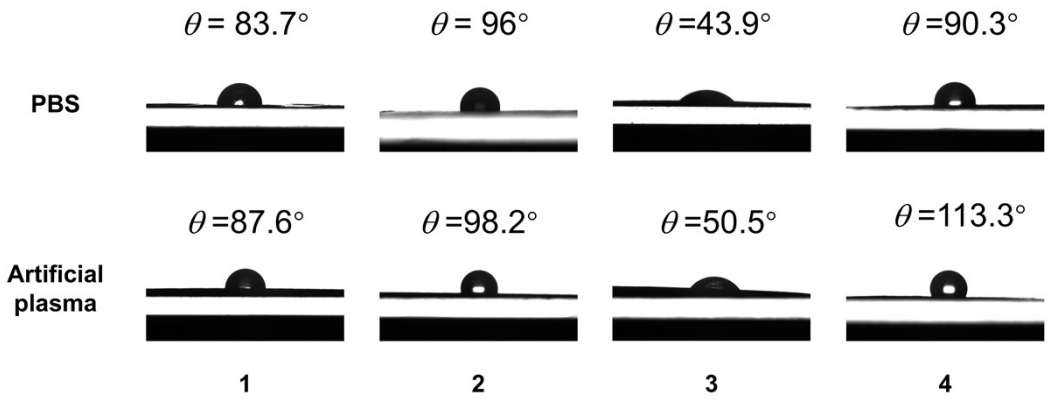

Fig. S7 The specific image of the contact angle.

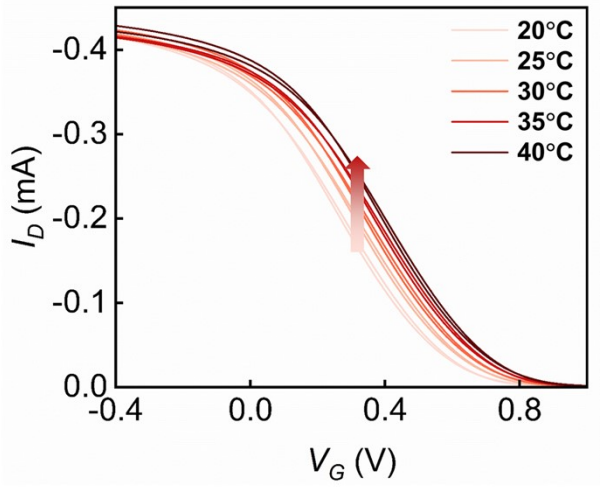

Fig. S8 Effect of temperature on device performance.

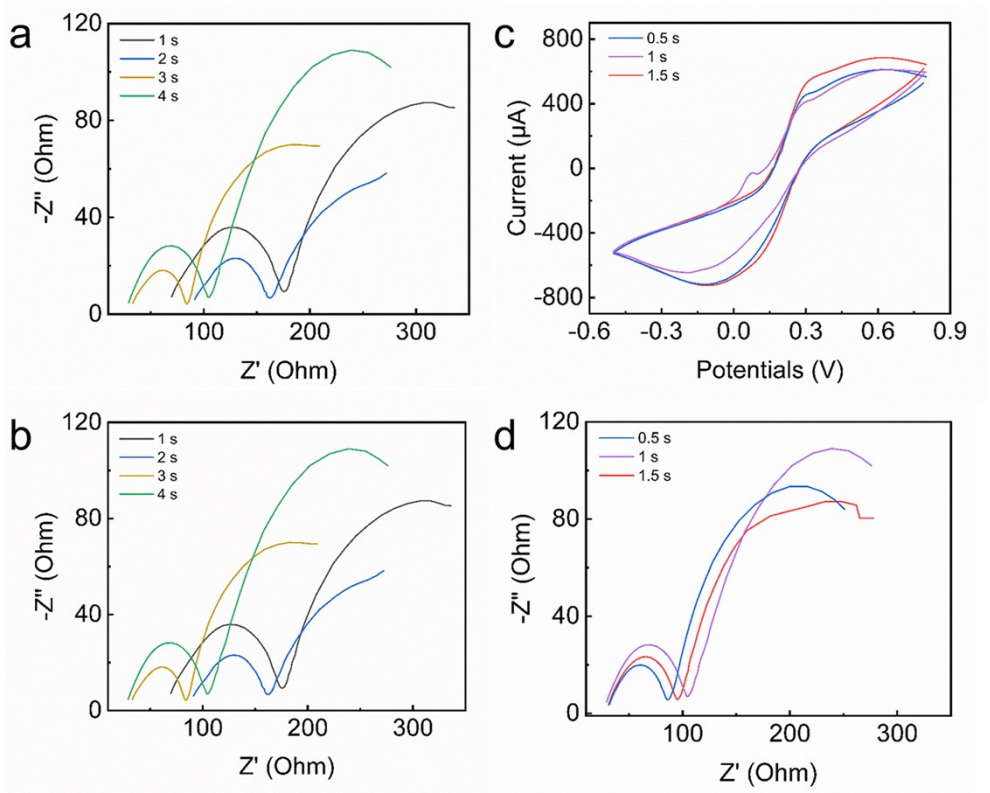

Fig. S9 Optimization of the fabrication of OECT-based sensors (a, b) modify the carbon electrode with PEODT:PSS, controlling the extrusion time to 1, 2, 3 and 4 seconds. The modified electrodes are used as working electrodes for CV and EIS measurements. (c, d) control the extrusion time of the ferrocene solution to 0.5, 1 and 1.5 seconds.

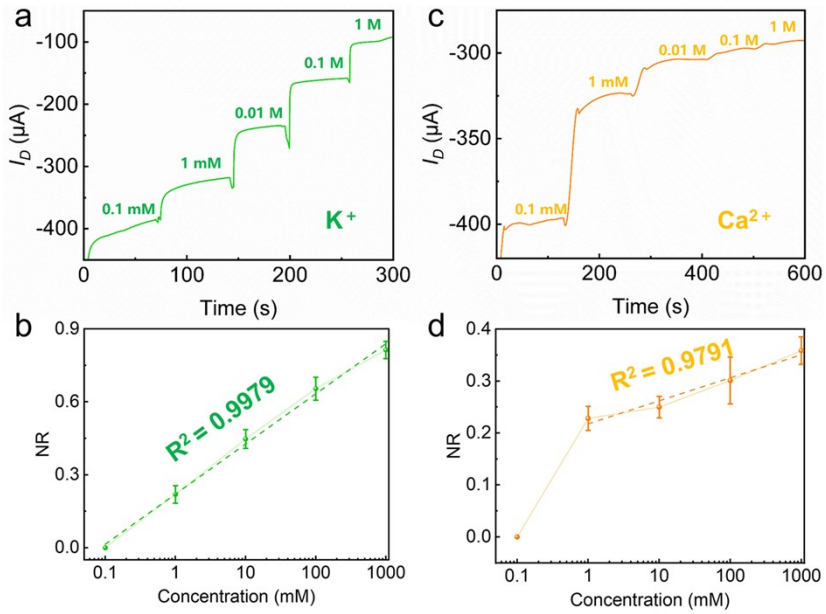

Fig. S10 Ion-sensitive properties of potassium and calcium ions (a, b) potassium ions, (c, d) calcium ions.

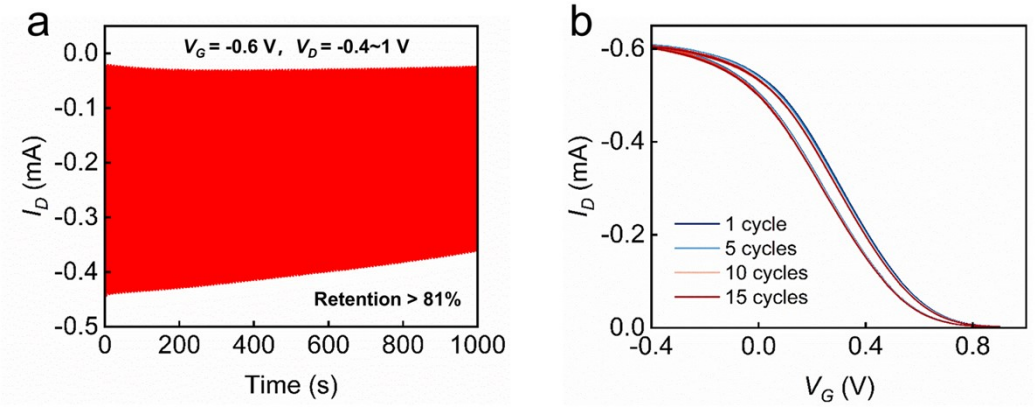

Fig. S11 Stability of PET-based OECTs.

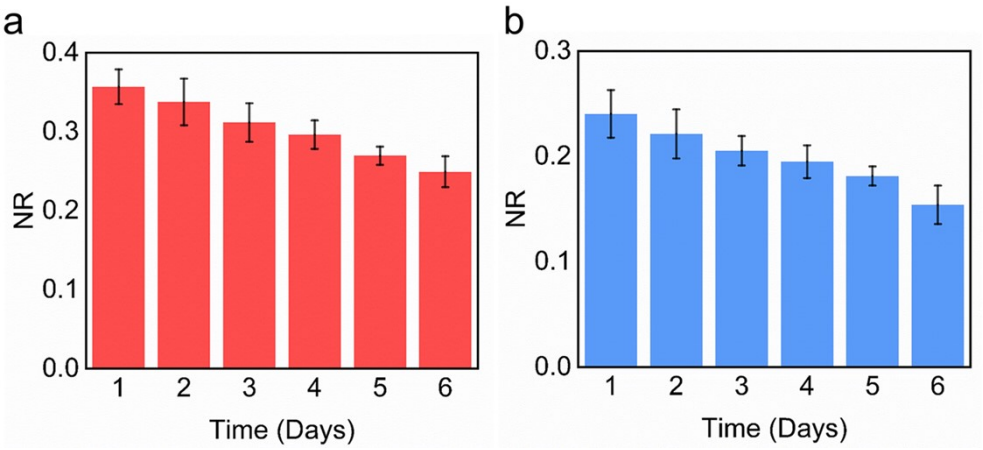

Fig. S12 Long-term storage stability of biofunctionalized devices: (a) biofunctionalized gate (GOx), (b) biofunctionalized gate (ChOx).

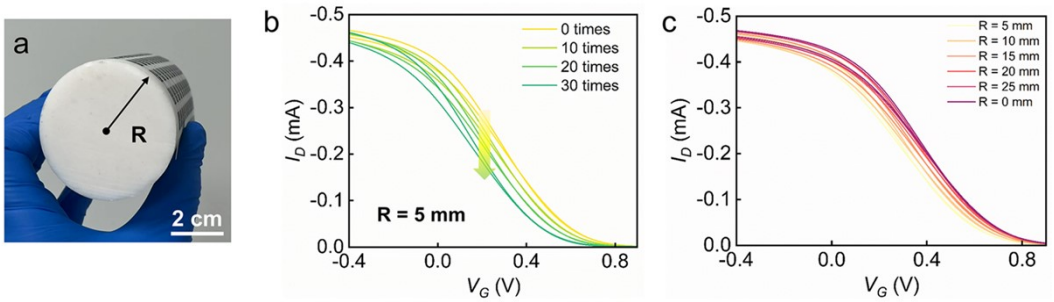

Fig. S13 Mechanical bending performance of paper-based OECTs.

Table S1 Thickness of each part of the device

Material	Thickness (mm)
Filter paper	**0.147 ± 0.005**
Hydrophobic filter paper	**0.154 ± 0.008**
Filter paper with carbon electrode	**0.163 ± 0.024**
Single-sided hydrophilic filter paper	**0.242 ± 0.037**

Table S2 Comparison of the sensitivity of OECTs on different substrates

Material	Biomarkers	Linear range equation	LOD
Filter paper	**Na^+**	**$0.20+0.21\,\Delta I/I_0$**	**1 μM**
	Glucose	**$-2.12+0.95\,\Delta I/I_0$**	**50 μM**
	Cholesterol	**$-1.40+0.63\,\Delta I/I_0$**	**100 μM**
PET	**Na^+**	**$0.16+0.17\,\Delta I/I_0$**	**1 μM**
	Glucose	**$-1.52+0.79\,\Delta I/I_0$**	**50 μM**
	Cholesterol	**$-2.36+0.63\,\Delta I/I_0$**	**50 μM**

Video S1 Time to absorb water <1 s (See annex for details)

Video S2 Time to absorb artificial plasma <1 s (See annex for details)