Supplementary Materials

A fully inkjet-printed disposable glucose sensor on paper

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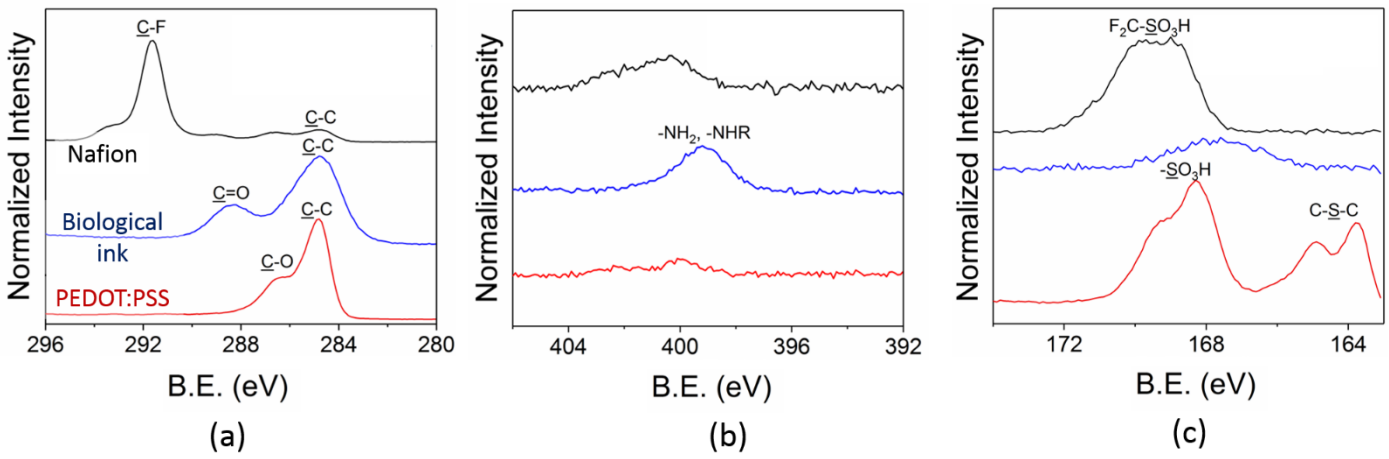

Fig. S1. Spectra of high resolution XPS C 1s **(a)**, N 1s **(b)** and S 2p **(c)** of printed PEDOT:PPSS film before (red lines) and after addition of the biological layer and nafion (blue and black lines, respectively). The spectra were calibrated to carbon (C 1s) at 284.8 eV and normalized to the maximum intensity.

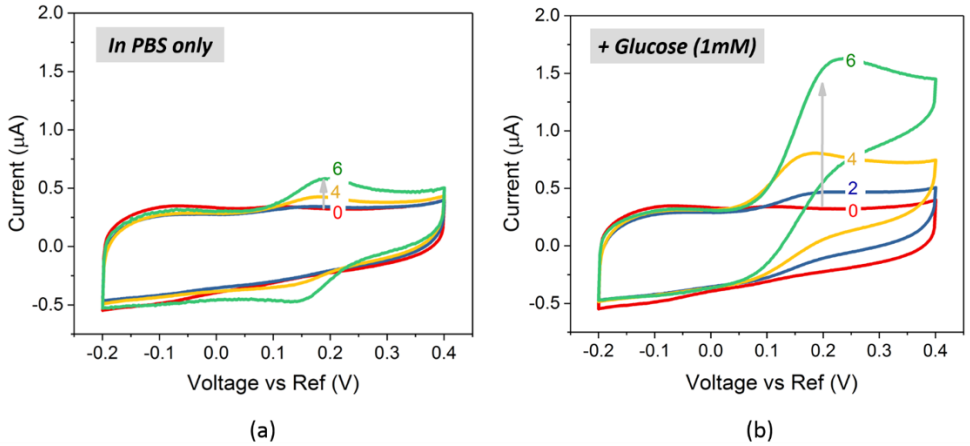

Fig. S2. Cyclic voltammetry (CV) curves of biosensors comprising 0, 2, 4 or 6 printed layers of the biological ink in PBS **(a)** and in the presence of glucose (1 mM) **(b)**. The arrows represent the increase in the number of printed layers. The voltage was applied from -0.2 V to 0. 4V versus the reference electrode and the scan rate was 20 mV/s. The devices did not contain nafion and were operated 1 hour after being printed.

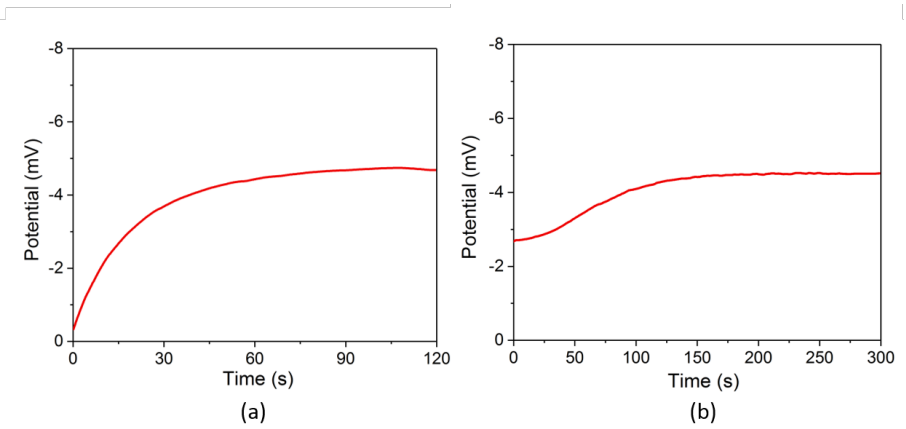

Fig. S3. The open circuit potential of a nafion coated PEDOT:PSS film *vs* printed PEDOT:PSS reference electrode as a function of time, measured in PBS **(a)** and in saliva (**b**).

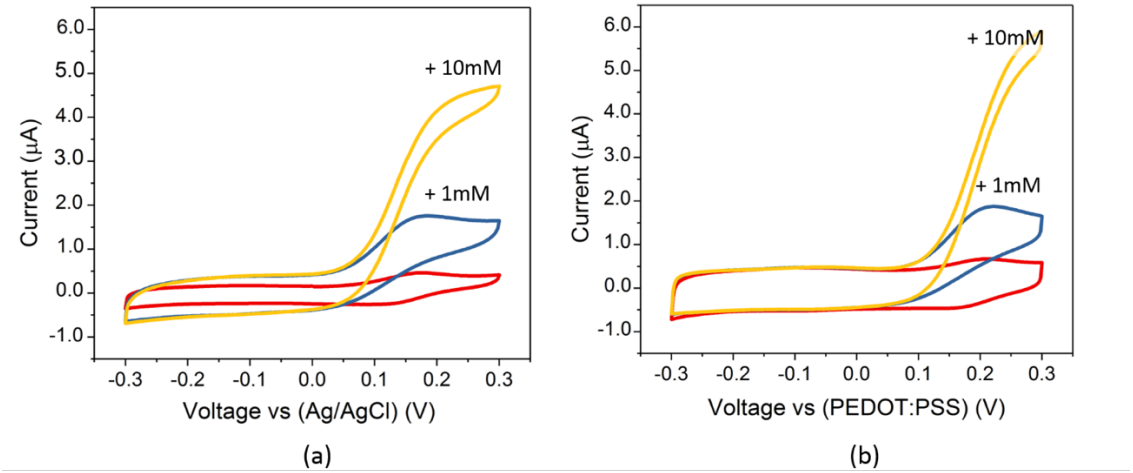

Fig. S4. CV curves of a printed sensor in the absence (red lines) and in the presence of glucose (1 mM; blue lines and 10 mM; yellow lines). In **(a)**, the reference and counter electrodes are printed Ag/AgCl electrodes while in **(b)** these are PEDOT:PSS electrodes of the same geometry. The scan rate is 20 mV/s. The devices did not contain nafion and were used 1 hour after being printed.

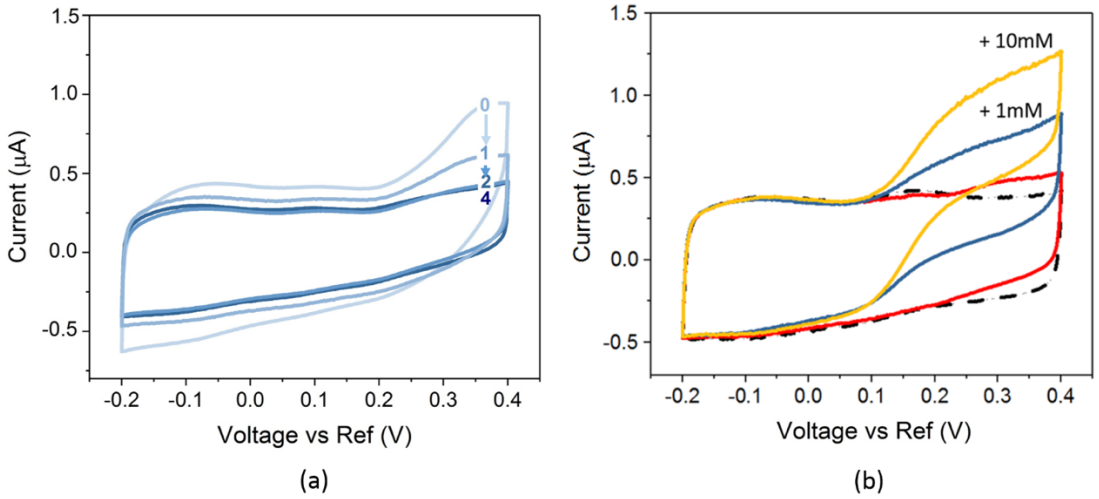

Fig. S5. (a) CV curves of PEDOT:PSS films (no biological coating) in saliva. Nafion layers of a variety of thicknesses (0, 1, 2 and 4 printed layers) are deposited on these bare PEDOT:PSS films. Without nafion, PEDOT:PSS is sensitive to electroactive species in saliva (0). As the nafion coating gets thicker (1 and 2), the interference is reduced. The curves are similar for PEDOT:PSS films coated with 2 and 4 layers of nafion. **(b)** CV curves of the sensor (with 2 layers of nafion) measured in PBS (black dashed lines) and in saliva (red solid lines). The blue and yellow curves represent the response of the sensor to additions of 1 mM and 10 mM of glucose to saliva, respectively.

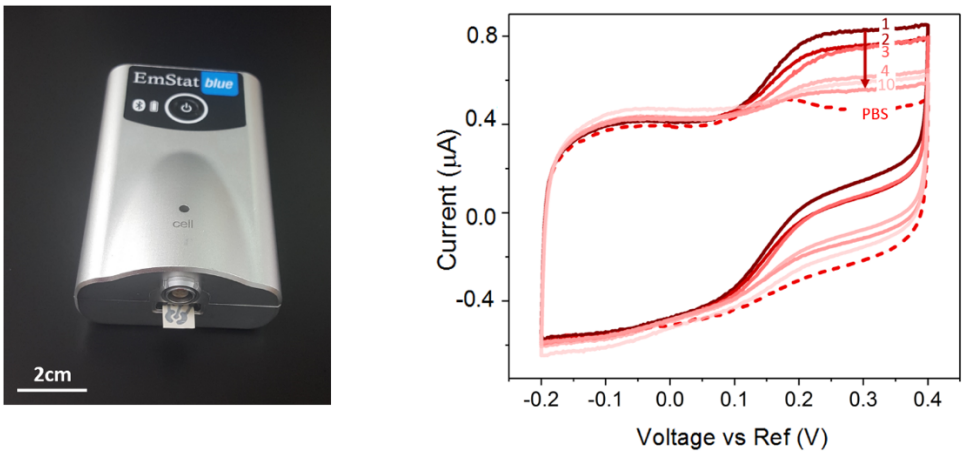

Fig. S6. (a) Photograph of the miniaturized system including the mini potentiostat and the sensor placed in the sample holder. **(b)** The response of the sensor to glucose (1 mM, in PBS) upon 10 successive measurements. After each addition of 1 mM of glucose into the measurement solution (solid lines), the sensor was rinsed with PBS and CV curve was recorded. Dashed lines represent the CV of the sensor in PBS (no glucose).

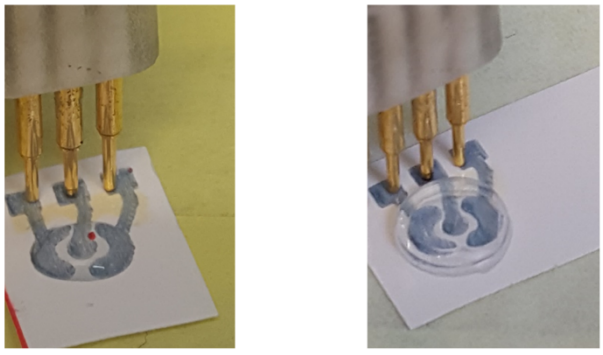

Fig. S7. Photographs of the printed biosensor before **(a)** and after **(b)** placing the PDMS well confining the measurement solution on the active area. Note that the sensor can be used without the well by placing the liquid on the designated area.