

## Supporting information

### **Reactive oxygen species generated by cold atmospheric plasmas in aqueous solution: successful electrochemical monitoring *in situ* under a high voltage system**

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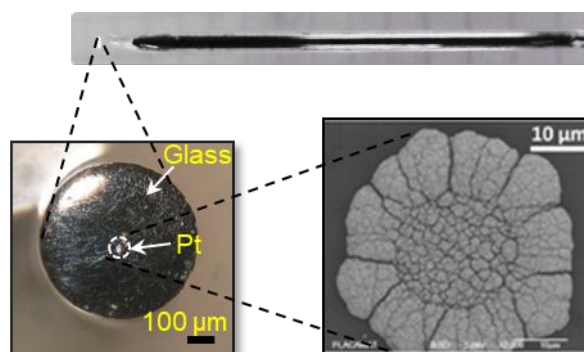
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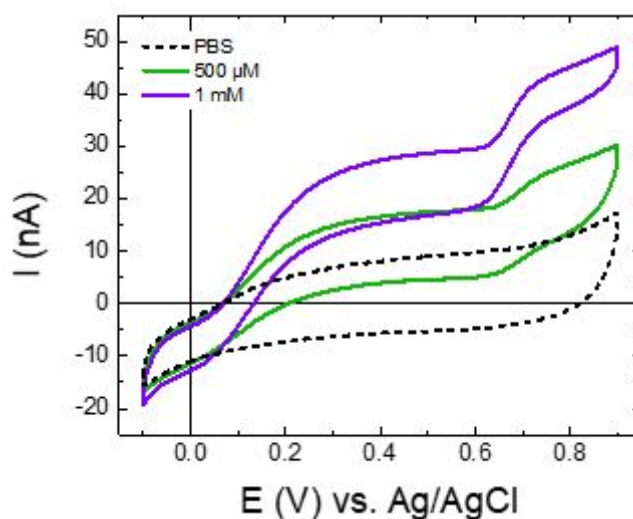
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Supporting informations include the protocol for ultramicroelectrode fabrication (corresponding references at the end) as well as optical and SEM images of a modified UME (Figure S1). Then, a calibration by cyclic voltammetry in hydrogen peroxide + nitrite solutions of the UME used for measurements in Figure 4b is described in Figure S2.

**UME fabrication.** Modified UMEs were designed for these experiments: a thin Pt wire (25  $\mu\text{m}$  diameter; 99 % purity, Goodfellow) was sealed in a glass capillary for a final diameter close to 1 mm (Figure 1B). Each UME was polished with coarse- and fine-grade polishing papers before use and further modification. As already described<sup>1</sup>, the sensitivity of the working microelectrodes was enhanced by doing a potentiostatic electro-deposition of black platinum performed by reduction of hydrogen hexachloroplatinate (115 mM, diluted in 10 mM PBS, pH 7.4 with 0.76 mM of lead acetate)<sup>2</sup> at a potential of -60 mV vs Ag/AgCl/NaCl 3M. The electrodeposition was stopped when the total reduction charge reached  $0,07 \mu\text{C} \cdot \mu\text{m}^{-2}$ <sup>3</sup> (see Figure S1).



**Figure S1.** Multiscale view based on optical (top and down left) and SEM (down right) imaging of a platinized platinum ultramicroelectrode (Pt wire  $\varnothing$  25 $\mu\text{m}$ , total external diameter 1 mm) used as WE in the experiments.



**Figure S2.** Cyclic voltammograms recorded with a platinized Pt UME (WE1) between -0.1 V and +0.9 V vs Ag/AgCl in solutions of combined  $\text{H}_2\text{O}_2 + \text{NO}_2^-$  prepared at the same concentrations in PBS (10 mM, pH 7.4).

## REFERENCES

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- (2) Ben-Amor, S.; Devin, A.; Rigoulet, M.; Sojic, N.; Arbault, S. Oxygen Plasma Treatment of Platinized Ultramicroelectrodes Increases Sensitivity for Hydrogen Peroxide Detection on Mitochondria. *Electroanalysis* **2013**, 25 (3), 656–663.
- (3) Ben-Amor, S. Capteurs Électrochimiques Pour La Caractérisation Du Métabolisme Oxydatif Mitochondrial. Thesis, Université Bordeaux 1, France, 2013.