Supplementary information

Flexible doctor blade coated abiotic cathodes for implantable glucose/oxygen biofuel cell.

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1. Cytotoxicity tests

3T3-NIH fibroblast cells from thermoficher have been used for cytotoxicity tests. Corning® Costar® TC-Treated Multiple Well Plates 24 wells plate from sigma Aldrich. The cytotoxity of our flexibles FeNrGO electrode was tested by investigating the effect of our electrodes on cells growth when the latter are exposed to the materials. The tests have been performed in in 24-well plates (P24) containing 3T3-NIH fibroblast cells. We investigated the cytotoxicity of the different compound of the electrodes: GDL, GDL-NTC and GDL-NTC-FeNrGO. All tests have been replicated three times to ensure the repeatability of tests. The materials were sterilized suing ethanol solution and then washed with sterilized water. Optical microscope has been used to observe cells growth and spectrophotometer readings has been used to converted into cell densities.

2. Chronoamperometries of the different prepared biocathodes

The electrochemical performances of the Gr-N-Iron (2%) based flexible cathodes were evaluated by chronoamperometry measurements at a potential equal to 0.1 V vs. SCE in physiological buffer. These measurements were realized for the prepared cathodes with different ratios under air and saturated oxygen conditions.



Figure S1 : The chronoamperometry of the four samples at 100 mV Vs. ECS in 100 mL of a solution containing phosphate buffer (0.01 mol L^{-1}), pH=7.4 and at ambient temperature (20 ± 3 C) under air and saturated oxygen.

3. Chronoamperometry of no doped rGo based biocathode

In order to check the capability of no doped rGo biocathode to electro catalyse oxygen reduction, we performed chronoamperometry measurements at 100 mV in PBS buffer (pH 7,4) in the presence and the absence of oxygen.



Figure S2: Chronoamperometry response of no doped rGo based biocathode at 100 mV Vs. SCE in 100 mL of a solution containing phosphate buffer (0.01 mol L^{-1}), pH=7.4 and at ambient temperature (20 ± 3 C).