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The Manufacturing and optimization of an abiotic bio cathode for an implantable glucose bio fuel cell

Context

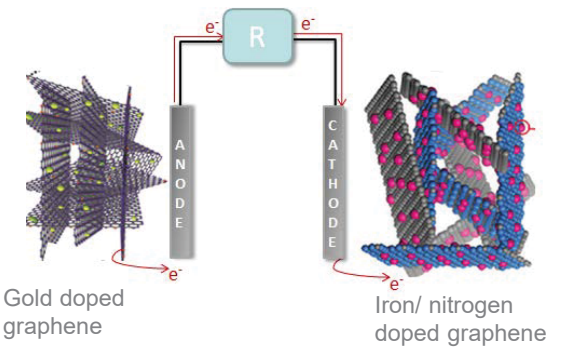
Design of flexible abiotic electrodes

Implantable glucose fuel cell generates electricity from the anodic oxidation of glucose and cathodic reduction of dissolved oxygen which are already present in tissue fluids.

- Considered as a potential power source for implanted medical micro devices.

The use of abiotic catalysts is preferable over enzymes or microorganisms since abiotic catalysts pose :

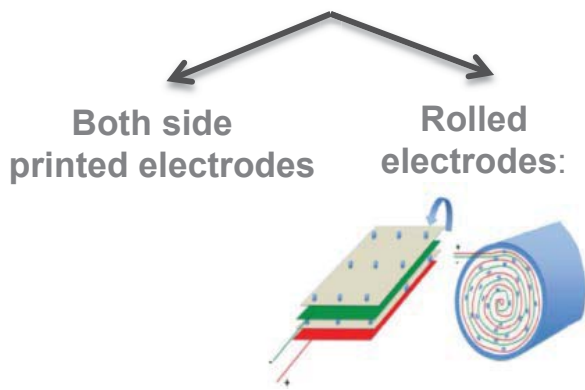
- ✓ A low infection risk
- ✓ Good stability during the time,



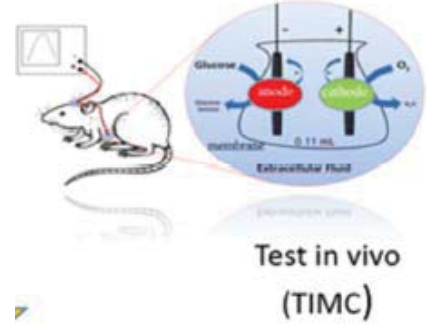
funded by ANR

Objective

The main objective of this work is the design of flexible abiotic electrodes according to two strategies:



- Integration of these electrodes in an implantable devices.
- ✓ Realization of the electrochemical tests.
- ✓ Realization of the In Vivo tests .



Methods

Ink formulation :

Choice of the adequate solvent and surfactant to obtain the best doped graphene dispersion using UV-Visible spectrophotometer.



UV-visible spectrophotometer

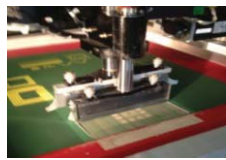


Rheological studies

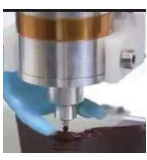
Printing processes:



Spray printing



Screen printing



3D printing technique

Electrochemical tests:



Potentiostat

