Multi-sensing polymer transistors for in vivo recording

Fact Sheet

Project Information

MultiSENS

Grant agreement ID: 274074

Project closed

Start date
1 September 2011

End date
31 August 2013

Funded under
Specific programme "People" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Total cost
€ 185 748,00

EU contribution
€ 185 748,00

Coordinated by
ECOLE NATIONALE SUPERIEURE DES MINES DE SAINT-ETIENNE
France

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Objective

The computational power of the brain arises from the complex interaction and cooperation of a large number of neurons embedded in a functional network. Thus, a direct investigation of the temporal dynamics of neuronal populations (and structures) must address the simultaneous observation of multiple neurons. Most breakthroughs in our understanding of the basic mechanisms of information processing in the brain have been obtained with local field potentials (LFPs) and single neuron recordings in freely moving animals. Those measurements have been performed with silicon probes, but the process is prone to errors, since this technology suffers from several limitations, directly related to the materials used for the probe fabrication. In particular, the electrodes are not biocompatible and create tissue scars, they are rigid, and thus cannot compensate for small brain movements (as a result, a given cell cannot be recorded over extended periods of time). More important, information is only electrical and there is no information regarding how the system uses metabolites or how neuronal activity maintains the appropriate level of metabolites to operate properly. The purpose of MultiSENS is to develop a new generation of chronically implantable biocompatible probes displaying multi-sensing recording sites for monitoring brain activity. The most recent technology - organic electronics - will be used to address this issue. In particular, organic electrochemical transistors (OECTs) will be used as sensing sites for metabolites and ion current in situ measurements, thanks to their peculiar properties of strong ion-to-electron transduction, biocompatibility and mechanical flexibility. MultiSENS will make available multi-sensing probes capable of simultaneous in vivo recording of LFPs and ion currents/glucose concentration, delivering an advanced biomedical tool that will have a major impact on neuroscience research.

Fields of science (EuroSciVoc)

natural sciences > biological sciences > **neurobiology**

natural sciences > chemical sciences > **polymer sciences**

natural sciences > chemical sciences > inorganic chemistry > **metalloids**

natural sciences > computer and information sciences > data science > **data processing**

Programme(s)

FP7-PEOPLE - Specific programme "People" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Topic(s)

FP7-PEOPLE-2010-IEF - Marie-Curie Action: "Intra-European fellowships for career development"

Call for proposal

FP7-PEOPLE-2010-IEF
See other projects for this call

Funding Scheme

MC-IEF - Intra-European Fellowships (IEF)

Coordinator

ECOLE NATIONALE SUPERIEURE DES MINES DE SAINT-ETIENNE

EU contribution

€ 185 748,00

Total cost

No data

Address

COURS FAURIEL 158
42023 SAINT ETIENNE CEDEX
France

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation
Participation in EU R&I programmes
HORIZON collaboration network

Last update: 2 August 2019

Permalink: https://cordis.europa.eu/project/id/274074