Rewiring Brain Units - bridging the gap of neuronal communication by means of intelligent hybrid systems

Fact Sheet

Project Information

Re.B.Us

Grant agreement ID: 660689

Project website

DOI
10.3030/660689

Project closed

EC signature date
8 April 2015

Start date
16 March 2016

End date
15 March 2018

Funded under
EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions

Total cost
€ 180 277,20

EU contribution
€ 180 277,20

Coordinated by
FONDAZIONE ISTITUTO ITALIANO DI TECNOLOGIA
Italy

Objective

People suffering for disorders of the Central Nervous System (CNS) often have to cope with every-day challenges. In spite of our strong commitment to primary prevention, CNS disorders significantly impact on the global burden of disease. Thus, restoring the physiological function of a dysfunctional brain is a primary challenge. As pharmacological treatment is not suitable to restore broken neuronal pathways, research is exploring biological and engineering approaches, but the sole exploitation

of either of these strategies is technically limited by inherent pitfalls. Neural transplants benefit of the intrinsic plasticity of ‘real’ neurons, yet the interaction of the graft with the host nervous tissue is consequently poorly predictable. Silicon-based technology provides highly controllable systems, yet at the cost of limited flexibility. Here, we intend to overcome these limitations by exploiting a novel ‘hybrid’ approach. We will establish a functional partnership between a biological ‘graft’ neuronal network and an intelligent controller that fine-tunes the dynamics of the graft by activity-dependent neural control and mediates its integration into the diseased host nervous tissue. We aim at obtaining a biocompatible hybrid device of previously unexpected stability, capable of pursuing a self-healing process of dysfunctional neuronal circuits. The novel biohybrid system conceived in Re.B.Us will be at the core of further development of innovative neuroprostheses endowed with intrinsic adaptive behavior and capable of bi-directional communication with the host CNS, that would restore, by themselves, the function of a diseased brain, with no anatomical or pathophysiological boundaries. By virtue of its unprecedented therapeutic potential, Re.B.Us will undoubtedly impact on EU economy by reducing the financial burden of public health and improving the societal impact of CNS dysfunction.

Fields of science (EuroSciVoc)

medical and health sciences > basic medicine > neurology > **epilepsy**

medical and health sciences > health sciences > **public health**

medical and health sciences > basic medicine > neurology > **stroke**

medical and health sciences > basic medicine > neurology > **parkinson**

medical and health sciences > medical biotechnology > **implants**

Programme(s)

H2020-EU.1.3. - EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions MAIN PROGRAMME

H2020-EU.1.3.2. - Nurturing excellence by means of cross-border and cross-sector mobility

Topic(s)

MSCA-IF-2014-EF - Marie Skłodowska-Curie Individual Fellowships (IF-EF)

Call for proposal

H2020-MSCA-IF-2014

See other projects for this call

Funding Scheme

MSCA-IF-EF-ST - Standard EF

Coordinator

FONDAZIONE ISTITUTO ITALIANO DI TECNOLOGIA

Net EU contribution

€ 180 277,20

Total cost

€ 180 277,20

Address

VIA MOREGO 30
16163 Genova
Italy

Region

Nord-Ovest > Liguria > Genova

Activity type

Research Organisations

Links

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

Last update: 4 September 2022

Permalink: https://cordis.europa.eu/project/id/660689