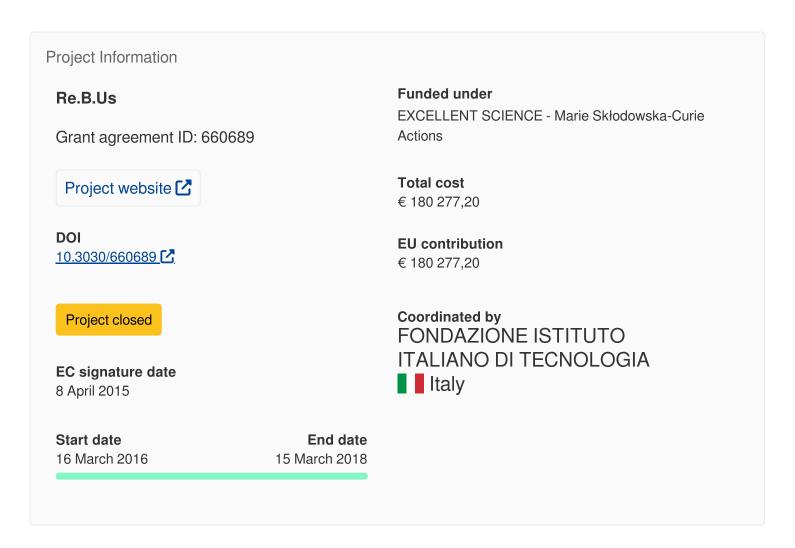
Rewiring Brain Units - bridging the gap of neuronal communication by means of intelligent hybrid systems



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Fact Sheet



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.

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 C

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



Region

Nord-Ovest > Liguria > Genova

Activity type

Research Organisations

Links

Contact the organisation Website Medicipation in EU R&I programmes Medicipation in EU R&I programmes Medicipation network Medicipation

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