Whispering the language of the neurons to restore vision

Fact Sheet

Project Information

NeuroBaBEL

Grant agreement ID: 746526

Project website

DOI
10.3030/746526

Project closed

EC signature date
12 April 2017

Start date
1 September 2017

End date
31 August 2019

Funded under
EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions

Total cost
€ 170 121,60

EU contribution
€ 170 121,60

Coordinated by
UNIVERSIDAD PABLO DE OLAVIDE
Spain

Objective

Visual neuroprostheses or the bionic eyes, aim to restore patterned vision to the blind by electrically stimulating the remaining neurons in the visual system. The ultimate goal of bionic eye research as a means of treating vision loss is the capacity to reproduce the same neural messages that travel between the eye and the brain of normal vision. The visual system 'sees' the world by way of sending signals to the brain that indicate transitions from 'light ON to light OFF' and from 'light OFF to light ON' wherever a transition exists. Despite the remarkable progress over the last decade, until recently, visual neuroprostheses could only stimulate both the ‘ON-to-OFF’ and the ‘OFF-to-ON’ pathways simultaneously, sending confusing neural

messages to the brain. Selective activation has been demonstrated in vitro while validated computational models predict that neural signals can be modulated by affecting these waveforms. This proposal aims to investigate, in a functional model of the disease (Royal College of Surgeons rats), new ways to preferentially activate the aforementioned visual pathways using amplitude- and frequency- modulated signals combined with low-power noise. It is expected that the resulting neural encoding to be more natural and to therefore improve the perception of the bionic eye recipients. Two strategies will be adopted: (1) acute electrophysiology experiments to obtain optimal stimulation parameters, and (2) chronic studies in behaving animals with retinal degeneration subjected to classical conditioning. This is a highly multidisciplinary proposal that includes a comprehensive plan for the dissemination of the results among the scientific community and the general public, while providing opportunities for industrial engagement. The fellow will be immersed in a motivating research environment and will be exposed to a series of training and networking activities which provide an excellent ground for future career perspectives.

Fields of science (EuroSciVoc)

engineering and technology > materials engineering > **fibers**

medical and health sciences > clinical medicine > **ophthalmology**

medical and health sciences > basic medicine > **pathology**

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-2016 - Individual Fellowships

Call for proposal

H2020-MSCA-IF-2016

See other projects for this call

Funding Scheme

MSCA-IF-EF-ST - Standard EF

Coordinator

UNIVERSIDAD PABLO DE OLAVIDE

Net EU contribution

€ 170 121,60

Total cost

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Region

Sur > Andalucía > Sevilla

Activity type

Higher or Secondary Education Establishments

Links

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

Last update: 16 August 2022

Permalink: https://cordis.europa.eu/project/id/746526