Neuroprosthetic interface systems for restoring motor functions (NEUWALK)

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Title of project or programme

Neuroprosthetic interface systems for restoring motor functions (NEUWALK)

Principal Investigators of project/programme grant

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Source of funding information

European Commission

Total sum awarded (Euro)

8800000

Start date of award

01-06-2010

Total duration of award in months

48

The project/programme is most relevant to

- Parkinson’s disease

Keywords

Research abstract in English

The overall concept of the 48-month Integrated Project NEUWalk is focused specifically on Objective ICT-2009.3.9 Microsystems and Smart Miniaturised Systems with particular emphasis to c)

Application-specific micro-systems and smart miniaturised systems 1) Biomedical S&T objectives. The technological objective of NEUWalk is to develop novel micro-technology, microelectronics, brain decoding algorithms and smart control interfaces that can be flexibly assembled to address neuro-biomedical issues that not only impact the quality of life in thousands of individuals throughout Europe, but also create a significant economic burden for European countries.

These innovative neurotechnologies will be combined to achieve an integrated cortico-spinal neuro-prosthetic interface. The underlying objective in NEUWalk is to restore motor functions in individuals with severe spinal cord injury (SCI) and to establish a more efficient, less invasive and safer strategy to alleviate Parkinson s disease (PD) syndromes. To achieve this ambitious goal, we will capitalize on recent breakthroughs that demonstrate the impressive capacity of spinal cord stimulations to promote the recovery of full weight bearing walking in paralyzed SCI rats and to alleviate severe Parkinson symptoms in rodents. Elaboration and validation of the NEUWalk concept will be carried out in rats with SCI and non-human primates with PD.

To accelerate the translation towards efficient clinical therapies, preliminary testing will be conducted in humans with SCI. The potential impact of the micro-technology, microelectronics, and treatment paradigms developed in NEUWalk is tremendous. These advances will open avenues for revolutionary clinical applications and will contribute to fill the increasingly wider gap that separates European research on Neuro-prosthetics to similar studies conducted in the United States. Beyond SCI and PD, the NEUWalk concepts will fertilize new designs for the treatment of other neurologic disorders.

Lay Summary