PRESS RELEASE 2010-07-28

NEUWalk brings hope for paraplegic and Parkinsonian patients

European Research project NEUWalk pioneers neuroprosthetic systems to restore motor functions after spinal cord injury and Parkinson's disease

Leading European research laboratories combine their expertise and knowledge to design novel neuroprosthetic systems that aim to restore the motor functions of individuals suffering from severe spinal cord injury (SCI) as well as alleviating the symptoms associated with Parkinson's disease (PD). The project, partly funded by the EU Seventh Framework Programme for Research and Technological Development with almost 9 million Euros, was launched on June 1st 2010.

SCI and PD affect an estimated patient population of about 6.6 million persons worldwide at an estimated annual cost of 16 billion Euros. At present, there are no proven efficacious treatments to improve the functional capacities of severely paralyzed people. Current surgical treatment of the symptoms of Parkinson's disease relies on complex and invasive deep brain stimulation (DBS) procedures with implanted electrodes.

The goal of NEUWalk is to develop a brain spinal neuroprosthetic interface system to restore voluntary motor functions in people with severe SCI and to establish a less invasive and safer surgical strategy to alleviate PD syndromes. To achieve this objective, NEUWalk will capitalize on recent breakthroughs gained at the University of Zurich, Switzerland, in the Experimental Neurorehabilitation Laboratory, headed by Dr. Grégoire Courtine, scientific manager in NEUWalk. These researchers reported the impressive capacity of pharmacological and electrical spinal cord stimulations to promote full weight bearing walking in paralyzed SCI rats when combined with rehabilitation.

NEUWalk will employ highly advanced decoding algorithms to extract useful locomotor-related information from real-time brain recordings. These cortical signals will allow the voluntary control of spinal cord stimulation protocols to evoke walking. Consortium partners of University of Bordeaux, who originally developed DBS, will evaluate the efficacy of the NEUWalk Neuroprosthetic concept against parkinsonian symptoms.

In order to realize these neuroprosthetic systems, novel technological solutions including flexible multielectrode arrays and neurostimulators combining wireless powering and signal transmission as well as neural stimulating, recording and analysis capacities will be conceived employing leading-edge microtechnology and microelectronics. To accelerate the translation towards efficient clinical therapies, preliminary testing will be conducted in humans with SCI.

Dr. Peter Detemple, head of microstructuring technologies and sensors department at Institut fuer Mikrotechnik Mainz GmbH and co-ordinator of NEUWalk: “The potential impact of the specific microtechnological and microelectronic solutions and the treatment paradigms developed in NEUWalk is tremendous both individually and collectively. These new concepts will open avenues for viable clinical applications and will significantly contribute to advance the field of Neuroprosthetics“.

List of Project Partners

Institut fuer Mikrotechnik Mainz GmbH (IMM), Germany (Co-ordinator)
University of Zurich, Switzerland
Eidgenössische Technische Hochschule Zürich (ETH), Switzerland
Scuola Superiore di Studi Universitari e di Perfezionamento Sant’Anna (SSSA), Italy
University College London (UCL), United Kingdom
Université Victor Segalen Bordeaux II, France
inomed Medizintechnik GmbH, Germany
Mega Elektroniikka OY, Finland
Finetech Medical Ltd., United Kingdom

Press Contact

Dr. Stefan Kiesewalter
Institut fuer Mikrotechnik Mainz GmbH
Carl-Zeiss-Str. 18-20
55129 Mainz, Germany

Tel +49 6131-990 323
Fax +49 6131-990 205
presse@imm-mainz.de