B. CENTER OF NEUROMODULATION

Directors: LORÁND ERŐSS MD, PhD, Associate Professor, neurosurgeon, neurologist, fellow of interventional pain practice; DANIEL BERECZKY MD, PhD, DSc, Professor

Senior clinicians in the different treatment groups of the center: 
Epilepsy Surgery Program: DR. DÁNIEL FABÓ; PROF. DR. PÉTER HALÁSZ; DR. LORÁND ERŐSS  
Pain Program: DR. EDIT RÁCZ; DR. LORÁND ERŐSS  
Deep Brain Stimulation Program for movement disorders: DR. ANNAMÁRIA TAKÁCS; DR. ANITA KAMONDI; DR. MAGDOLNA BOKOR; DR. GERTRÚD TAMÁS; DR. LORÁND ERŐSS 
Intrathecal Drug Delivery Program: DR. LORÁND ERŐSS; DR. LÁSZLÓ ENTZ  
Psychologists: DR. NOÉMI CSÁSZÁR; CSABA BORBÉLY  
Psychiatrist: DR. ÉVA CSIBRI  
Neuromodulation nurses: KATALIN KIRÁLY; BARBARA KOVÁCS  
Senior researchers: DR. ISTVÁN ULBERT; DR. GYÖRGY KARMOS; DR. LUCIA WITTNER  
PhD student: DR. LÁSZLÓ ENTZ

In biotechnological context neuromodulation is a field of science, medicine and bioengineering that encompasses implantable and non-implantable technologies, electrical and chemical with the aim to improve the quality of life for humans suffering from neurological disorders.

The reason of initiation of the first neuromodulation center in Hungary was to create an interdisciplinary hub where clinical medicine, research and medical and infobionic education meets in the field of neuromodulation. In the center, research can have direct influence on medical practice and education on the graduate and postgraduate level in medical school and in information technology.

This will be a place for technology of the neural interface for doctors, bioengineers and the neuromodulation industry.

Our aim is to be a center of excellence in neuromodulation for a broad spectrum of patients with different neurological disorders in Hungary and in the Central European region:

- to support the clinical work of physicians in neuromodulation to create a center of excellence,  
- to introduce neuromodulation in the medical and bionic education at graduate level,  
- to promote animal research in neuromodulation and clinical investigations in the field of neuromodulation,  
- to develop existing and new neuromodulation devices,  
- to give the opportunity to join international multicenter clinical trials and initiate external research sites for neuromodulation companies,
to support incubate spin-off and start-up companies in the field of neuromodulation.

The center was initiated by Loránd Erőss and founded by Professor Tamás Roska from the Pázmány Péter Catholic University and Professor Miklós Réthelyi, Minister of National Resources. The members of the Advisory Board are Gabor Racz the founder of the International Pain Center at Texas Tech University Health Sciences Center, the Dean of the Pázmány Péter Catholic University, Faculty of Information Technology, the Professor of neurology and the Professor of neurosurgery from Semmelweis University. In the supervisory board there are Hungarian and foreign specialists in the field of neuromodulation. The director of the center is Loránd Erőss.

The center incorporate the Pázmány Péter Catholic University, Faculty of Information Technology, the National Institute of Clinical Neurosciences, Functional Neurosurgical Department and the Semmelweis Medical University, Institute of Neurology, Department of Movement Disorders

This is the youngest collaborative center of the Pázmány Péter Catholic University, Faculty of Information Technology. The first research and development project is “Remote telemetrical programming of neuromodulation devices”. The Neuromodulation Center is expanding the remote telemetrical programming of various IPGs and implantable pumps. With help of this new platform and device, the service can be provided regardless the physical location of the patient or the physician. It is important in cases of movement impaired, elderly, or very poor patients who cannot afford to travel for regular clinical controls or in cases of emergencies like pump EOL.

The neuromodulation activity in clinical practice started in 1999 implanting the first ITB pump. 2004 a regular neuromodulation program was introduced and in 2010 the first Functional Neurosurgical Department of Hungary was founded by dr Erőss. In the last 8 years since the neuromodulation program is active in the National Institute of Clinical Neurosciences 120 patient got intrathecal pumps for spasticity and pain, 77 patients went through SCS tests for chronic pain syndromes. The center introduced first in Hungary several new techniques like motor cortex stimulation for thalamic in 2008, and the first Gasserian ganglion stimulator for neuropathic facial pain and a retrograde C1 surgical lead was implanted here for drug resistant atypical facial pain. The Neuromodulation Center is increasing its activity in Deep Brain Stimulation in different movement disorders, since 2004 vagus nerve stimulation and from 2012 DBS in epilepsy.

At present this is the only Neuromodulation Center in Hungary which incorporated a Functional Neurosurgical Department and has a background of bionic research and takes part of the combined graduate and postgraduate medical and bionic education.
Fig. 1 Intraoperative electrophysiological recording, during Deep Brain Stimulator implantation in a Parkinson’s disease patient (Institute of Clinical Neurosciences, Budapest)

Fig. 2 Strip electrode implantation in epilepsy surgery (National Institute of Clinical Neurosciences)
PUBLICATIONS


