

NATIONAL LABORATORY OF TRANSLATIONAL NEUROSCIENCE

EXPLORATION OF DEVELOPMENTAL AND ADULT DISORDERS OF THE NERVOUS SYSTEM

The mission of this national laboratory is to comprehensively understand the disease mechanisms underlying pathological changes in the nervous system that occur in the early stages of life, resulting from the multifaceted interaction of genetic and environmental factors, and thereby develop new diagnostic and intervention options. Methodologically improve the prevention and treatment of CNS diseases, with a unique research spectrum covering nervous system developmental disorders and diseases from childhood to adulthood. Using the methods of digital medicine and data-driven health care, the laboratory utilizes the structured national clinical data assets in the therapy of nervous system pathologies through the development of online platforms/registries and analytical programs through the direct integration of real-life data.



MAIN RESEARCH AREAS

- Autism spectrum disorder
- The pathomechanisms of perinatal insults (preterm birth, asphyxia, hypoxic-ischemic encephalopathy)
- Disturbances in childhood social environment
- Inflammatory mechanisms in early nervous system disorders
- Endocrine factors (abnormal changes in hormone levels, endocrine disruptor compounds, microbiome metabolites)
- Stroke
- Skull- brain damage
- Movement disorder (Parkinson's disease)
- Epilepsy
- Schizophrenia

CONSORTIUM LEADER

University of Pécs

CONSORTIUM PARTNERS

HUN-REN Institute for Computer Science and Control

HUN-REN Institute of Experimental Medicine

HUN-REN Research Centre for Natural Sciences

Richter Gedeon Plc.

Semmelweis University

University of Szeged

PROJECT NUMBER: RRF-2.3.1-21-2022-00011

FUNDING PERIOD: 01.06.2022 - 28.02.2026

OVERALL BUDGET: 5.300.000.000 HUF

BENEFITS TO BE EXPECTED FROM LABORATORY RESEARCH

- Scientific basis for new, effective therapies in neonatal conditions (preterm birth and asphyxia), e.g. in the field of neuroprotection, including translational preclinical and clinical investigation of pathomechanisms of brain damage caused by perinatal hypoxic-ischemic encephalopathy (HIE).
- Inflammatory biomarkers in blood and saliva samples from neonatal HIE patients that can be used to infer long-term effects of early nervous system damage.
- Recognition of cellular and synaptic rearrangements and potential target molecules in the neuronal network of brain regions affected by early social stress
- Identification of microbiome metabolites underlying autism and ADHD.
- More accurate understanding of the effects of thyroid, sex hormones and endocrine disruptor (ED) compounds on brain development and behavior
- Neurological disease online platforms/registries and analytical programs;
- Structured neurological disease data assets;
- Neuro-intensive therapeutic decision support software;
- New therapeutic protocols and procedures in the treatment of people living with stroke, Parkinson's disease, and epilepsy, which lead to gains in useful life years; measurable health-economic benefit in the above diseases

THE PROFESSIONAL TEAM

Professional leaders: Tamás Dóczi and Zoltán Nusser

- **Tamás Dóczi**, neurosurgeon. His main research area is the imaging of neurosurgical pathologies and the development of minimally invasive microsurgical procedures.
- **Zoltán Nusser**, neuroscientist. Research area of interest: Revealing the molecular, structural and functional diversity of nerve cells and their chemical synapses. Investigating the structure and function of cortical, hippocampal and cerebellar neural circuits.
- **Ádám Dénes** (inflammatory and microglia-dependent processes in brain diseases)
- **Csaba Fekete** (regulation of hypophysiotrophic thyrotropin-releasing hormone signalisation and thyroid function)
- **Éva Mikics**, (The long-term effects of early-life insults and environmental factors on nervous system mechanisms)
- **Beáta Sperlág** (Mapping purinergic signalling in the central nervous system)
- **Ferenc Domoki** (Pathophysiology of hypoxic-ischemic encephalopathy)
- **Balázs Lendvai** (neuropharmacologist, central nervous system diseases with cognitive symptoms)
- **Miklós Szabó** (clinical researcher, pathomechanisms of neonatal hypoxic-ischemic encephalopathy)
- **Nóra Bunford** (clinical psychologist, adolescent attention deficit hyperactivity disorder (ADHD))
- **Zoltán Vidnyánszky**, (brain imaging methods (MRI, EEG))
- **Ákos Zarándy**, (visual perception, visual medical diagnostic methods)
- **Péter Tóth** (craniocerebral injuries)
- **József Janszky** (epilepsy)
- **Norbert Kovács** (movement disorders, Parkinson's disease)
- **Tamás Tényi** and **Lajos Botz** (psychiatry)
- **Péter Bogner**, **László Szapáry** and **Gábor Lenzsér** (stroke network-diagnostics and invasive therapy)
- **Tibor Héja**, **Péter Hegyi**, **Sándor Kovács** and **Antal Zemplényi** (online register/platform and health economy development)

POSSIBLE PARTNERSHIPS

The Healthy Aging Program aims to become the leading gerontology research of Central Europe that can join as equal the EU-funded innovative research and public health programs and also aims to enable the domestic adaption of good practices along with the international dissemination of the results acquired within the framework of the project.

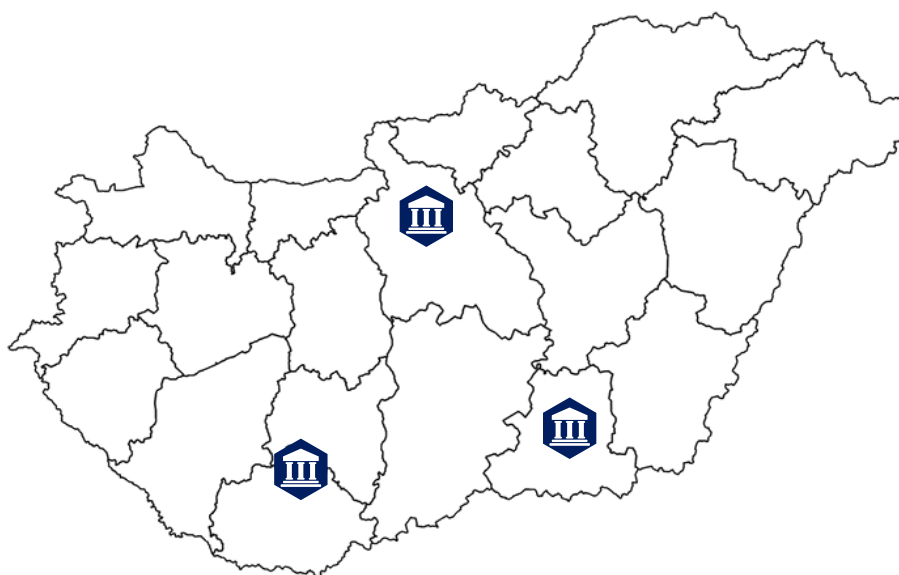
In order to achieve these designated goals, research cooperation will be established with leading European scientific workshops. We are planning the translational, clinical and public health utilization of the developed 'anti-aging' interventions. Regarding the national and international extension the project, the involvement of universities from the Hungarian countryside and the widening of the project to other countries of the Pannonian Basin are high priority objectives of the National Cardiovascular Laboratory.

TARGET GROUP

Target groups: those living with neurological disorders that appeared in childhood or adulthood or suffering from neurological diseases; research and healing community dealing with these pathologies.

PLACES OF IMPLEMENTATION:

- Budapest
- Pécs
- Szeged




PROFESSIONAL CONTACT

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projektek.pte.hu/hu/hazai/rrf/rrf-231-21-2022-00011