

Clinical Neurosciences D221
The Leader of the Doctoral School: Dr. Komoly Sámuel

B-1/2005 Clinical neuroimmunology and stroke

Program leader: Dr. Komoly, Sámuel

Dr. Ács, Péter acs.peter@pte.hu	Department of Neurology	Assessment of cognitive functions in multiple sclerosis
<p>Multiple sclerosis (MS) is a chronic disease characterized by the demyelination of nerve fibers and axonal damage. Based on scientific data from the recent years, it is accepted that many of the patients are affected by cognitive decline and other psychological dysfunctions. These additional symptoms can influence the quality of life of patients as much like transitional physical symptoms in the early stage and permanent neurological deficit in the late stage of the disease. Our study aims to explore the neuropsychological status of MS patients from the MS Center in the Department of Neurology, University of Pécs. We plan to perform a long-term follow up of the patients. We also plan in a number of patients special MR investigations (tractography, 31P spectroscopy etc.). Our additional goal is to explore possible predictive cognitive factors and the relationship between disease activity and psychological changes.</p>		
Dr. Czéh, Boldizsár cze.h.boldizsar@pte.hu	Department of Laboratory Medicine	The neurobiology of stress
<p>Stress appears to be increasingly present in our modern, and demanding, industrialized society. Virtually every aspect of our body and brain can be influenced by stress and although its effects are partly mediated by powerful corticosteroid hormones that target the nervous system, relatively little is known about when, and how, the effects of stress shift from being beneficial and protective to becoming deleterious. Decades of stress research have provided valuable insights into whether stress can directly induce dysfunction and/or pathological alterations, which elements of stress exposure are responsible, and which structural substrates are involved. Our aim is to understand the neuropathological and molecular changes in response to stress in different CNS structures.</p>		
Dr. Darnai, Gergely darnai.gergely@pte.hu	Department of Behavioural Sciences	Discovering brain-behavior relationships with fMRI
<p>Recent neuroscientific studies have shown that slowly varying timecourse fluctuations are temporally correlated between functionally related brain areas during cognitive tasks and even at rest. These correlated brain areas form functional networks, that might be altered in various neurological and psychiatric conditions. Moreover, functional connectivity is important as an indicator of normal neuronal activity as well. Thus, the main aim of the project is to investigate brain-behavior relationships with fMRI by characterizing functional connectivity patterns in healthy and patient groups using task-free (e.g. resting-state fMRI) and task-based (e.g. Stroop task, PVT, verbal fluency task) methods.</p>		
Dr. Horváth, Rita rita.horvath@newcastle.ac.uk	Department of Neurology	Clinical and genetic characterisation of hereditary motor neuropathies
<p>Hereditary sensorimotor neuropathy, referred as Charcot-Marie-Tooth disease (CMT) is one of the most common inherited neuromuscular disorders. CMT</p>		

and CMT related disorders are genetic neuropathies manifesting with a clinical continuum from predominantly motor through sensorimotor and predominantly sensory involvement. The pathophysiology based classification enables to differentiate between the demyelinating (CMT1) and axonal (CMT2) phenotype. The clinical diversity might be explained by an underlying genetic heterogeneity. As a result of the increasingly available diagnostic possibilities, such as panel screening of known causative genes and whole exome sequencing, more than 80 disease causing gene mutations have been already identified.

Dr. Kálmán, Bernadette bernadette.kalman@pte.hu	Department of Laboratory Medicine	Clinical characteristics of gliomas
<p>In the studies of gliomas, molecular approaches have become very important, since the molecular characteristics of these tumors provide both prognostic and therapeutic advantages. Although approved personalized therapy is not yet available in gliomas, more and more targeted treatment trials transition from the preclinical phase into the clinical phase, and from these efforts we expect an improvement in the disease course. Therefore, we would like to launch a comprehensive data collection that enables the comparison of clinical, imaging and pathological (and, where available, molecular) characteristics of these tumors in a former retrospective and a prospective cohort. Comparing our results with those in the international literature may point to interventions or practice modifications that can further improve patient survival rates.</p>		

Dr. Kálmán, Bernadette bernadette.kalman@pte.hu	Department of Laboratory Medicine	Rare neurological diseases
<p>A significant proportion of rare neurological diseases are associated with hereditary genetic abnormalities. Over the past decade, a remarkable progress has been made in mapping these diseases by using new genome-wide biotechnological methods. However, in clinical practice, there are still many patients and families whose molecular pathologies remain unexplored. Taking advantage of ongoing genomic and bioinformatic developments at the Szentagothai Research Center, University of Pécs, we would like to work up neurological diseases that may be associated with DNA mutations. These studies will include clinical and para-clinical characterization of phenotypes and laboratory exploration of genotypes by a collaborating team of neurologists, geneticists, molecular geneticists and bioinformaticians. As part of this team, the PhD student will help coordinating the clinical examination of and sample collection from patients and their family members, participate in some of the laboratory procedures and the analyses of results. Overall, this program aims not only to provide a scientific degree, but also to train a physician-scientist who should be able to promote molecular medicine.</p>		

Dr. Komoly, Sámuel Dr. Illés Zsolt komoly.samuel@pte.hu	Department of Neurology	Population-based epidemiology of the neuromyelitis optica (NMO) spectrum in Hungary based on a national register; “head-to-head” comparison of NMO epidemiology between Hu
<p>The neuromyelitis optica (NMO) spectrum covers inflammatory demyelinating diseases of the CNS mediated by pathogenic antibodies against the water-channel AQP4 and myelin protein MOG. Despite of diagnostic criteria, the NMO spectrum may be difficult to distinguish from multiple sclerosis (MS). Misdiagnosis can result in flaring up of NMO due to incorrect medication, while NMO misdiagnosis leads to inappropriate treatment of MS. A recent study also indicated that overlapping entities may influence epidemiological data of MS. Recently, several European countries (Austria, France, Germany, and UK) have created a national NMO network, which conduct collaborative studies and set up guidelines. Considering these facts, here we plan (i) to examine the national epidemiology of NMO spectrum in Hungary: we will use an existing national database at Pécs, which is based on results of anti-AQP4 antibody testing provided for the whole country, and also on an existing collaborative national network. (ii) We will create a national database and registry. (iii) In international collaboration, we will compare the NMO epidemiology in Europe using the same database/registry criteria in Hungary and Denmark to establish</p>		

population-based epidemiological data in both countries. The Danish part of the project has been already accepted in Denmark as a PhD project. We will address if NMO prevalence differs among European countries similar to MS. Using these national NMO databases and already available population-based MS epidemiology data in Hungary and Denmark, we will also examine, if higher prevalence of MS is associated with lower prevalence of NMO among European populations, a difference existing among Asian and European populations. (iv) Anti-MOG antibody testing will be established in Odense (University of Southern Denmark) using a cell-based assay, and will be provided for AQP4-seronegative Hungarian and Danish samples: both AQP4 and MOG-seropositive NMO epidemiology will be established and compared between the two countries. The project will contribute to create a national Hungarian NMO network similar to a few European countries. This may help in setting up collaborative international research and developing national guidelines. The study will tighten collaborative research between the University of Southern Denmark and the University of Pecs, and provide a basis for a number of future joint studies.

B-2/2014 Neuromorphology and neuropathology

Program leader: Dr. Ábrahám, Hajnalka

Dr. Ábrahám, Hajnalka hajnalka.abraham@aok.pte.hu	Central Electron Microscopic Laboratory	Neuropathological examination of the tissue surgically removed due to temporal lobe epilepsy
Regarding the etiology, temporal lobe epilepsy can be divided into three groups: mesial temporal sclerosis-, brain tumor- and cortical developmental malformation-related epilepsies. During our work, surgically removed neo- and archicortical (hippocampal formation, subiculum, entorhinal cortex) structures due to therapy of temporal lobe epilepsies will be examined. Examinations will be carried out with light and electron microscopic methods (immunohistochemistry, immunoelectron microscopy). Our aim is to study cell death, cell proliferation, synaptic reorganization and other morphological alterations that indicate abnormal neuronal migration. We search those common morphological changes in epilepsies due to different etiologies which, independently of the cause of the epilepsy, is the consequence of the hyperexcitation. We aim to discover neuropathological changes that may clarify the cause of epilepsy.		
Dr. Ábrahám, Hajnalka hajnalka.abraham@aok.pte.hu	Central Electron Microscopic Laboratory	Morphological examination of the developing human cerebral cortex
Our knowledge about the development of the central nervous system including the cerebral cortex is based mainly on results of studies on experimental animals. Less direct information is available about the development of the human cerebral cortex. Therefore, we plan examination of neuronal maturation, development of synaptic connections and myelination in normal human neo- and archicortex with immunohistochemistry and conventional histological methods. We also study morphological changes that occur during development in the cerebral cortex in aneuploidy. Our aim is to find morphological evidences that may explain the long-lasting cognitive development of healthy humans and the mental retardation found in aneuploidy.		
Dr. Pál, Endre pal.endre@pte.hu	Department of Neurology	Investigation of the pathomechanism of myotonic dystrophy and complex care of patients
Myotonic dystrophy is the most common adulthood hereditary muscle disease. It involves not only the skeletal muscles but other systems (such as heart, endocrine system, eyes) as well, therefore complex care is necessary for patients. The molecular mechanisms of the disease is only partly understood. It		

seems that the transcribed mRNAs have tri- or tetranucleotid repeats, and those abnormal RNAs sequestre RNA-binding splicing proteins (eg. MBNL1) in the nucleus inhibiting the mRNA development. This study involves histological technics (morphometry, immunohistochemistry, in situ hybridization) that support the diagnostic procedure and allow the differentiation of MD type 1 and type 2. For patient follow-up we use electrophysiologic tests and imaging (muscle MRI). Finally, we try to educe a physiotherapeutic program to improve patients physical condition and slow down the disease progression.

Dr. Pál, Endre pal.endre@pte.hu	Department of Neurology	Investigation of mitochondrial alterations in muscle diseases
<p>Beyond the primary mitochondrial diseases there are several muscle diseases and neurodegenerative diseases, where mitochondrial damage was detected (decreased enzyme activity, presence of abnormal mitochondria in tissues, mitochondrial DNA deletions). The purposes of this study to detect these alterations in different myopathies: quantification of mitochondrial pathology in autoimmune myositis (measuring enzyme activity, finding ragged red fibers /RRF/ and cytochrome-c oxidase /COX/ negative fibers, long-range PCR). Same investigations is planned to be performed in muscle dystrophies and if possible in acquired myopathies pl. statin myopathy, ischemic muscle damage. We test mitochondrial biomarkers suitable for monitor the diseases (eg. FGF21).</p>		

Dr. Pál, Endre pal.endre@pte.hu	Department of Neurology	Investigation of the pathomechanism of muscle degeneration and regeneration
<p>In muscle fibers the atrophy/hypertrophy is determined by the balance of protein degradation and synthesis. The common basis of regulation is the insuline growth factor (IGF) receptor and the associated proteine kinase B (AKT). In active, phosphorilated form AKT inhibits the protein degradation via the inhibition of the ubiquitin-proteosome system (E3 ligases, atrogin-1). In the other patway AKT stimulates muscle fiber hypertrophy through mTOR activation. Investigation of these mechanisms in muscular dystrophies and acquired myopathies (eg. inactivity, steroid myopathy) is possible by histology (immunohistochemistry, in situ hibridisation) and molecular biology methods (mRNS measurement by RT-PCR). The degree of regeneration can be specified on histology samples (eg. satellite cell density). Ther results of above tests might be compared to clinical data, perhaps biochemical markers obtained from blood.</p>		

Dr. Pál, Endre pal.endre@pte.hu	Department of Neurology	Molecular pathology of focal cortical dysplasia (FCD)
<p>The focal cortical dysplasia (FCD) is characterized by a disturbance of the laminar structure of the cortex, which develops during embryonic development and can lead to epilepsy. FCDs can be classified on the basis of morphological differences, and classification is made possible by neuropathological examination of samples removed during neurosurgery. Beyond the disruption of the laminar structure, there are neurons with abnormal structure and size. The aim of the investigation is to analyze the morphological alterations of surgical samples (quantification of cell loss, description of cellular morphological differences), examination of the perineural network (Wisteria floribunda lectin binding of extracellular matrix), assessment of different neuropeptides, calcium binding proteins, expression of excitatory and inhibitory ion channels by immunohistochemistry and RNA analysis. As a result of this work, we may gain further insight into the pathomechanism of cortical developmental disorders.</p>		

Dr. Pál, Endre pal.endre@pte.hu	Department of Neurology	Clinico-pathological investigation of small fiber neuropathy
<p>Small fiber neuropathy (SFN) is characterized by the loss and degeneration of Adelta and C fibers, which are responsible for heat, pain and tactile sensation. Clinical symptoms correspond to these complaints, the dominant feature is the presence of neuropathic pain, which significantly affects patients' quality of life. Clinical data of patients at the PTE Neurology Clinic are collected and processed, furthermore prospective assessment is planned: clinical investigation (quantitative sensory tests), biomarker tests (serum neurofilament light chain determination) and neuropathological examinations are performed on patients' biopsy samples (e.g. colocalization of neuropeptides such as VIP, SP and receptors (e.g. TRPV1)). We introduce molecular biological methods for the study of gene expression (RNA and micro RNA measurement). In order to clarify the etiology, screening for Na-channel genes in idiopathic cases is planned. All these studies contribute to a better understanding of the pathomechanism of SFN.</p>		

B-6/2014 Neurology

Program leader: Dr. Pfund, Zoltán

Dr. Pfund, Zoltán pfund.zoltan@pte.hu	Department of Neurology	Dysimmune neuropathies
<p>The dysimmune inflammatory neuropathies are in 30% present of all peripheral neuropathies. By the time course, these neuropathies can be acute (e.g., GBS/AIDP, AMAN, AMSAN), intermediate (e.g., Sjögren's syndrome, malignancies) or chronic (e.g., CIDP, MMN). According to the histological findings, the neuropathology can be demyelination or axonal loss. By the impaired fiber type, the disease may affect the large motor, sensory, autonomic and the small fibers, as well. Almost in all patients, antibodies against the peripheral nervous tissue are detectable. Usually, the treatment is effective, especially in case of early diagnosis. Research of dysimmune neuropathies is a challenge for the participants.</p>		

B-4/2014 Neurosurgery

Program leader: Dr. Büki, András

Dr. Dóczi, Tamás doczi.tamas@pte.hu	Department of Neurosurgery	From the doctrine of Monroe and Kellie towards the realisation of digital neurosurgery
<p>Monroe described the concept on the volume-regulation of intracranial compartments in 1824, and Kellie has tested it in clinical settings in 1873. The pressure-volume relationship between ICP, volume of CSF, blood, and brain tissue, and <u>cerebral perfusion pressure</u> (CPP) is known as the Monro-Kellie doctrine or the Monro-Kellie hypothesis. The original hypothesis states that the cranial compartment is incompressible, and the volume inside the cranium is a fixed volume. The cranium and its constituents (blood, CSF, and brain tissue) create a state of volume equilibrium, such that any increase in volume of one of the cranial constituents must be compensated by a decrease in volume of another as stated first by Burrows in 1846 and employed in clinical practice by Cushing since 1925. The principal buffers for increased volumes include both CSF and, to a lesser extent, blood volume. These buffers respond to increases</p>		

in volume of the remaining intracranial constituents. In the initial era of modern neurosurgery macrosurgical techniques were employed. It was served by indirect diagnostics such as ventriculography, pneumo-encephalography and efficiency was measured by means of mortality rates. Micro-neurosurgery is the gold standard of neurosurgery of our days. It is served by direct diagnostic methods, such as CT, MRI and DSA. Microsurgical technique is based on 5-15 X magnification of the operation field described by microtopography. Surgical target is approached via non-invasive pathways, i.e. the CSF spaces. Operating microscope and specialized micro-instruments have been developed, and therapeutical efficiency has been measured by morbidity data. We have now the “digital era”: neuronavigation (like a GPS system), “key-hole” minimal-invasive craniotomy and techniques, functional neurosurgery, endovascular neurosurgery by means of DSA, stereotactic fractionated radiotherapy or radiosurgery. The program is presenting all of the physiological, anatomical, pathological, biochemical and molecular biological data necessary to the understanding of modern digital neurosurgery.

Dr. Dóczi, Tamás doczi.tamas@pte.hu	Department of Neurosurgery	Volume regulation of the brain
<p>The precise adjustment of cerebral water content and brain volume is of critical importance for the normal functioning of the central nervous system (CNS). The brain, surrounded by the bony cranium is highly sensitive to any increase in intracranial volume. Failure of the compensatory mechanisms may result in decreased cerebral blood flow and mechanical tissue damages, the most dangerous of them being cerebral herniation. Although numerous investigations have been performed to elucidate intracranial volume buffering, little is known about the cellular and molecular mechanisms of the volume regulation of the nervous tissue. Constant volume of the nervous tissue is a requirement of action potentials and synaptic activities of neurons. The leader of this program has put forward the concept that brain water and electrolyte content is regulated by a central neuro-endocrine system that is independent of systemic regulation. It has been shown, that the endothelium of the brain vasculature is not freely permeable to water, in fact it exhibits similar water permeability properties as epithelial membranes known to regulate membrane water permeability (e.g. kidney collecting duct epithel. Arginine vasopressin (AVP) and atrial natriuretic peptide (ANP), peptide hormones important in the volume homeostasis of extracerebral tissues, have been suggested to play similar regulatory role in the CNS. These hormones and their receptors have been demonstrated in significant concentration in the brain and it has been shown, that they enter the CSF directly from the brain and not from the systemic circulation, thus plasma vasopressin and ANP levels may not actually reflect their central activity. Vasopressin antagonists and atriopeptin analogues may be useful in combatting raised intracranial pressure. Recent introduction of MRI and proton MR spectroscopy enabled the non-invasive investigation of physiological and also physical water compartments in the nervous tissue. Quantitative clinical measurements of brain water content and that of the free and bound tissue water fraction have opened a new world for the study of brain volume regulation. Participants will be well-served also in the theory and practice of MRI.</p>		

Dr. Dóczi, Tamás doczi.tamas@pte.hu	Department of Neurosurgery	Surgical treatment of vascular malformations of the nervous system
<p>The participants of this program should get mastery of scientific evaluation of the neurosurgical treatment of these complex malformations. They will be introduced to micro-neurosurgical, endovascular and radiosurgical methods. Indications for treatment, and operative techniques will be evaluated. Special attention is dedicated to the pathophysiological details of pressure and flow regulations within the arterial and venous tree. Theoretical program: anatomy and physiology of cerebral circulation; pathoanatomy and pathophysiology of malformations, treatment techniques. Practical program: participation in individual treatments, in operations, video-demonstrations. Participants can perform individual flow-dynamic studies.</p>		

B-5/2014 Clinical and human neurosciences**Program leader: Dr. Janszky, József**

Dr. Fogarasi, András fog.andras@gmail.com	Department of Neurology	Age dependent changes in epileptic seizures
<p>Although the frequency of childhood epilepsy is about 1%, our knowledge is low on this field. We have improved our experiences on seizures, interictal and ictal discharges and their age-depending changes since using long term video-EEG monitoring. Archive data of hundreds of children with epilepsy can help better assessment of ictal signs (motor, autonomic, emotional signs, automatisms and consciousness) and their age dependency. These results can help to understand not only epilepsy but also physiology of the developing brain. Our studies include seizure semiology classification, epileptogenic lesions, structural and functional neuroimages as well as epilepsy surgery results and outcome in temporal and extratemporal lobe epilepsies.</p>		

Dr. Hollódy, Katalin hollody.katalin@pte.hu	Department of Paediatrics	Incidentally discovered brain anomalies on MRI in childhood
<p>The number of brain imaging studies (especially MRI) has increased significantly in the paediatric population in recent years. As a result, the number of discrepancies discovered in the brain has also increased. Incidentally, discovered variations (pineal gland cyst, arachnoid cyst, porencephalic cyst, corpus callosum anomalies, cave of septum pellucidum, mega cisterna magna, etc) can lead to uncertainty and to further unnecessary diagnostic steps. Goals of this research. 1 / to determine the prevalence of the incidentally discovered brain anomalies in different groups of children (children with headache, children with epilepsy, children with intellectual disabilities), 2 / to classify the variations of the different subgroups, 3 / to determine how these incidentally discovered have to be evaluated in the clinical practice.</p>		

Dr. Hollódy, Katalin hollody.katalin@pte.hu	Department of Paediatrics	Childhood absence epilepsy. Does it really have a good prognosis?
<p>Childhood absence epilepsy (CAE) is one of the most common idiopathic generalized epilepsy syndromes (2-8%). It starts at the age of 5-7 years. During the absence seizures the child is not aware or responsive. Every seizure lasts about 5-10 seconds. The EEGs of these children are very characteristic, 3 cycles/second spike-wave can be seen. CAE has been considered as a “benign” epilepsy for a long time because the majority of patients treated with antiepileptic drugs become seizure-free, but there are more and more data about attention and memory disturbances, relapses and other associated, not absence seizures. Our aim is to study the effectiveness of antiepileptic drugs and the prevalence of the later developing other seizure types, to examine the attention and memory functions of the children, to do serial EEG examinations and to find possible prognostic factors for this type of epilepsy.</p>		

Dr. Kovács, Norbert kovacsnorbert06@gmail.com	Department of Neurology	Deep brain stimulation in movement disorders
<p>Parkinson’s disease, essential tremor and dystonia are the most frequent movement disorders. These disorders can be treated by both pharmacological and neurosurgical procedures. In this topic we would like to focus on the evaluation of the pathomechanism, efficacy and safety of deep brain stimulation in movement disorders.</p>		

Dr. Kovács, Norbert kovacsnorbert06@gmail.com	Department of Neurology	The efficacy of repetitive transcranial magnetic stimulation in the treatment of various movement disorders
<p>Repetitive transcranial magnetic stimulation (rTMS) is a unique non-invasive technique capable of stimulating the brain tissue in vivo. Using various rTMS techniques, not only the experimental study of human brain function is feasible but rTMS may play an important role in the treatment of certain syndromes of neurodegenerative disorders (including Parkinson's disease and Alzheimer's disease) and psychiatric problems (e.g. depression). The aim of this research topic is to evaluate the efficacy of rTMS treatment on various movement disorders and to experimentally study the pathophysiological changes associated with neurodegeneration.</p>		

Dr. Kovács, Norbert kovacsnorbert06@gmail.com	Department of Neurology	The role of complex neurorehabilitation in improving the health-related quality of life in Parkinson's disease and other neurological disorders
<p>In advanced Parkinson's disease not only the main motor problems (bradykinesia, ON-OFF fluctuations, dyskinesia and dystonia) can limit the health-related quality of life of the patients, but also the postural instability and gait problems. Similarly, in stroke patients gait and postural problems may be the leading cause of disability despite of even mild paresis. The aim of this research program is to examine the efficacy of complex rehabilitation techniques including traditional rehabilitation, neuropsychological support and repetitive transcranial stimulation in improving the health-related quality of life. Furthermore, we also aim to develop more efficient and clinically useful approaches for the treatment of patients with various neurological disorders.</p>		

B-1/2012 Psychiatry

Program leader: Dr. Tényi, Tamás

Dr. Döme, Péter dome_peter@yahoo.co.uk	SE Department of Psychiatry and Psychotherapy	Clinical relevance of affective temperaments in panic disorder
<p>Panic disorder (PD) is a relatively common anxiety disorder with a life-time prevalence of 2-5%. It is well-known that the comorbidity between different psychiatric disorders is frequent and this rule is also applicable to PD that is frequently associated with other anxiety and mood disorders, such as major depressive and bipolar disorders. Affective temperaments may be considered as subclinical forms or precursors of mood disorders. The objective of our research is to reveal whether there are differences in the distribution of various affective temperaments when comparing the general population and a sample of PD patients.</p>		

Dr. Herold, Róbert herold.robert@pte.hu	Department of Psychiatry and Psychotherapy	Linguistic aspects of mentalization deficits in schizophrenia
<p>Mentalization is the ability to attribute mental states (intentions, desires, beliefs, emotions) to others and oneself. The development of mentalizing skills is strongly dependent on language competence. Primarily the pragmatic language skills show a significant association with the mentalization skills. Mentalization deficits are present in schizophrenia, however it is not clear in what extent this deficits are determined by the language abnormalities characteristic for schizophrenia. The aim of the PhD work is to assess the characteristics of language deficits in schizophrenia, and their effect on mentalizing skills.</p>		

Dr. Herold, Róbert herold.robert@pte.hu	Department of Psychiatry and Psychotherapy	The treatment of mentalization deficits in schizophrenia
Mentalization is the ability to attribute mental states (intentions, desires, beliefs, emotions) to others and oneself. This ability has a crucial role in social interactions, as it allows the understanding and prediction of social behaviour. Marked and stable mentalization deficits are present in schizophrenia that significantly influence the outcome of the disorder. Some preliminary data suggest that the mentalization performance can be improved by appropriate therapeutic approach. The aim of the PhD work is the study of therapeutic tools that result in an improvement in the mentalization performance in schizophrenia.		
Dr. Herold, Róbert herold.robert@pte.hu	Department of Psychiatry and Psychotherapy	Mentalization deficits in schizophrenia
Mentalization is the ability to attribute mental states (intentions, desires, beliefs, emotions) to others and oneself. This ability has a crucial role in social interactions, as it allows the understanding and prediction of social behaviour. According to the data of recent research now it is clear that mentalization is impaired in schizophrenia, and it fundamentally influences the long-term outcome of the disorder. However it is not exactly known in which way this ability is impaired, and how it is related to the other dimensions of social cognition in schizophrenia. The aim of the PhD work is to explore the nature of the mentalization deficits in schizophrenia in the context of other dimensions of social cognition.		
Dr. Herold, Róbert herold.robert@pte.hu	Department of Psychiatry and Psychotherapy	Neurocognitive and mentalization deficits in schizophrenia
Mentalization is the ability to attribute mental states (intentions, desires, beliefs, emotions) to others and oneself. The prerequisite of the development of the mentalization skills is the appropriate maturational process of the nervous system. It is generally accepted that neurodevelopmental abnormalities are present in schizophrenia resulting in marked neurocognitive deficits, which in turn may significantly affect the mentalization skills. The aim of the PhD work is to assess the neurocognitive deficits in schizophrenia, and their effect on mentalizing skills.		
Dr. Herold, Róbert herold.robert@pte.hu	Department of Psychiatry and Psychotherapy	Imaging methods and mentalization deficits in schizophrenia
Mentalization is the ability to attribute mental states (intentions, desires, beliefs, emotions) to others and oneself. According to the imaging studies of the recent years it seems clear which brain structures and neuronal networks are involved in mentalization. However, only few data are available on the connection of the pathological functioning of these brain networks and the appearance of the mentalization deficits. Schizophrenia is characterised by both neurodevelopmental and neurodegenerative processes resulting in brain abnormalities that could affect the proper functioning of mentalization skills. The aim of the PhD work is to study the structural and functional brain abnormalities responsible for the mentalization deficits in schizophrenia.		
Dr. Herold, Róbert herold.robert@pte.hu	Department of Psychiatry and Psychotherapy	The neurobiology of mentalization
Mentalization is the ability to attribute mental states (intentions, desires, beliefs, emotions) to others and oneself. Recently, significant efforts have been made to clarify the neurobiological background of mentalization. More and more data is available regarding the brain structures responsible for mentalization, but data is also increasing in respect of the underlying neurotransmission dysfunction. It is well known that significant neurobiological abnormalities are present		

in schizophrenia, and these abnormalities may play a role in the development of mentalization deficits, and later in the further deterioration of these skills. The aim of the PhD work is to study the neurobiological differences characteristic for schizophrenia in the light of the mentalization skills.

Dr. Herold, Róbert herold.robert@pte.hu	Department of Psychiatry and Psychotherapy	The effect of digital culture and social networking on mental health
<p>The digital world is an indispensable part of our everyday lives. However, there is very little information on how it affects mental health, what potential role it may play in the development of psychopathological symptoms, and whether or not it can be considered a risk factor for psychiatric illnesses. The available limited data so far suggests that digital life elicit significant changes in the quality of everyday interpersonal relationships and it may potentially affect self-esteem, mood or may provoke anxiety symptoms in proportion to the time spent in digital space. Some case reports also raised the possibility that frequent use of the Internet and social media could play a role in the development of psychotic symptoms. The aim of the research is to clarify whether digital device and social media (e.g Facebook, Instagram) usage can be considered a potential risk factor in the symptom formation of psychotic patients (schizophrenia spectrum disorders, bipolar disorder, delusional disorder).</p>		

Dr. Kelemen, Gábor kelemen.gabor@pte.hu	Department of Psychiatry and Psychotherapy	Processes of recovery from substance abuse
<p>The approaches to primary prevention, therapy and rehabilitation are often rooted in non-reflected theories, what is one of the underlying issues in the recurrent debates on the effectiveness and efficiency of the given programs. The more we explore the processes of recovery the more the biological and psychosocial intervention might be well-grounded both in prevention and recovery. This PhD research plan is concerned with the role of subjectivation and “recovery capital” in the relationships of addict persons and its relation to the addictive processes including craving, representations and health learning that of are related to the brain system. Research questions includes as follows: What are the core processes of subjectivation in the service of one’s recovery? How do recovering persons reconstruct their social environment to build their recovery capital?</p>		

Dr. Osváth, Péter osvath.peter@pte.hu	Department of Psychiatry and Psychotherapy	Quality of life in old age
<p>In the aging Western societies, preserving and, where possible, improving the functionality and quality of life of the elderly is becoming increasingly important. The quality of life of the elderly is influenced by a number of specific factors, including various physical and mental illnesses and other important psycho-socio-cultural factors. In our research, we want to examine the quality of life of the elderly population in a multifactorial model, especially with regard to the assessment of common mental disorders such as minor and major cognitive disorders, and depression. According to our hypothesis, early recognition and effective management of these can help to preserve and improve the quality of life.</p>		

Dr. Osváth, Péter osvath.peter@pte.hu	Department of Psychiatry and Psychotherapy	Problems of treating mental disorders - adherence - ineffectiveness - side effects - quality of life
<p>Nowdays, in addition to the continuous expansion of the psycho-pharmacotherapy methods, the emphasis is also on the cooperation of our patients, which is key to the effectiveness of treatment. However, according to the literature, this is far from problem-free, with almost half of those suffering from mental disorder only partially cooperate with the treatment. According to recent research, a lot of factors play a role in this, among which the patient, the physician,</p>		

the doctor-patient relationship, the mental disorder and the medication used are of particular importance. In our research, using this complex model, we examine the most important underlying factors of adherence, especially with regard to cognitive functions, insight, and the modern pharmacotherapeutic possibilities, the role of the relationship between side effects and quality of life.

Dr. Osváth, Péter osvath.peter@pte.hu	Department of Psychiatry and Psychotherapy	The role of computer games in early recognition and treatment of cognitive decline in the elderly
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It is now well-known that modern information and communication tools can be used successfully in order to preserve and restore health, not only among young people but also among elderly. A very important question is how different infocommunication tools can be used to measure mental functions and to identify and improve cognitive decline early. In our research, we want to explore the possibilities of using a well-known memory game among the elderly. In order to assess the potential role in the evaluation and monitoring of the cognitive function, the data obtained during the memory game are compared with validated cognitive tests, looking for the correlations between the individual cognitive domains. In our research, we are looking for the answer to how these results can be used in early detection and tracking of cognitive decline. According to our hypothesis, the rapid investigation and adequate treatment of the background of decline is a significant step forward in slowing down cognitive deterioration as well as in maintaining activity and autonomy.

Dr. Osváth, Péter osvath.peter@pte.hu	Department of Psychiatry and Psychotherapy	Psychopathology - culture - media – (literature and movies)
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The development of psychiatry has always been closely related to the social sciences (psychology, philosophy, sociology, etc.) and to the various arts (fine arts, music, literature, film). Literature is one of the best mediators for presenting and socio-cultural attitudes to suicide and nowadays cinema and media have become more and more prominent. In our frontier research, we examine the development of these cultural mediators in order to get to know the reflections of different time and cultures, looking at the present and future messages of the development of psychiatric trends.

Dr. Simon, Mária simon.maria@pte.hu	Department of Psychiatry and Psychotherapy	The effect of early life stress on structural and functional brain alterations in depression
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The relationship between stress and depression is more and more in the focus of current research. Special attention is paid to the early life stress that affects the developing nervous system and results in structural and functional brain alterations affecting the emotional and affective regulation in adults. Several studies have proved that early life stress makes the individual more vulnerable to stressful life situations later in adulthood. Both clinical experiences and clinical research support that psychosocial stress is one of the most typical triggering factors of major depressive disorder. The research topic aims the magnetic resonance brain imaging research of patients with major depressive disorder focusing on structural and functional brain alterations.

Dr. Simon, Mária simon.maria@pte.hu	Department of Psychiatry and Psychotherapy	Social cognition and mentalization in patients with major depressive disorder exposed to early-life stress
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The lifetime prevalence of major depressive disorder (MDD) is 15.5% nowadays. Fifty percent of patients experience more than 1 episode during their lives, and frequent recurrences can result in chronic depression. In 2010, MDD ranked second as the leading cause of global disability. Patients with MDD present various deficits of social cognition and mentalization, which can predict a poor functional outcome of the disease. This research aims to investigate the relationship between early-life stress and deficits of social cognition and mentalizing in patients with MDD along with clinical variables.