FACULTY OF MEDICINE
Comenius University in Bratislava, Slovakia

MAIN RESEARCH AREAS
FACULTY OF MEDICINE
Comenius University in Bratislava, Slovakia

MAIN RESEARCH AREAS

As for June 2017
Research at the Faculty of Medicine of the Comenius University in Bratislava

The Faculty of Medicine, which has been developing since 1919, is the first and founding faculty of the Comenius University in Bratislava. The Faculty of Medicine in Bratislava is the largest and oldest medical faculty in Slovakia.

From the beginning, the Faculty of Medicine was focused on two tightly interconnected activities, education and research. In 1921 there was established a scientific medical journal Bratislava Medical Journal (Bratisl Lek Listy), which has been published so far as the oldest medical journal in Slovakia.

In the last decade, the research at the Faculty of Medicine is focused on four main research areas:

- Neuroscience
- Cardiovascular diseases
- Oncological diseases
- Metabolic, endocrine, and inflammatory diseases
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Neuroscience research has a long tradition at the Faculty of Medicine. Whereas in the past research was focused mainly on investigation of axonal transport and morphological features of nerve tissue, recently is represented by investigation of optimal therapy of cerebral gliomas, etiopathogenesis of neurodegenerative diseases, multiple sclerosis, depression and other disease.

Principal investigators
Dr. h. c. Prof. Juraj Šteňo, MD, DSc, IFAANS
Prof. Peter Valkovič, MD, PhD
Assoc. Prof. Mária Bucová, MD, PhD
Prof. Boris Mravec, MD, PhD
Prof. Daniela Ostatníková, MD, PhD
Prof. Ján Pečenák, MD, PhD
Assoc. Prof. Andrej Šteňo, MD, PhD, MPH
Prof. Milan Profant, MD, PhD
Prof. Peter Turčáni, MD, PhD
A. Central nervous system tumors

Investigators
Dr. h. c. Prof. Juraj Šteňo, MD, DSc, IFAANS (juraj.steno@fmed.uniba.sk)
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Assoc. Prof. Andrej Šteňo, MD, PhD
Vladimir Holfý, MD
Prof. Viktor Matejčík, MD, PhD
Vítazoslav Belan, MD, PhD
Ľubica Pružincová, MD
Martin Fabian, MD
Anna Perželová, MD
Ivana Siváková, RNDr, PhD
Ivan Bízik, MD

Grants and Funding (in the last 10 years)
• VEGA 1/3430/06: Dynamics of changes of selected metabolic parameters of gliomas and surrounding brain tissue after different therapeutic modalities (2006-2008)
• VEGA 1/3439/06: Immunocytochemical analysis of glia precursor cells in adult brain tissue an in tissue cultures (2006-2008)
• VEGA 1/1166/10: Correlation between expression of cell proliferation markers, immunohistochemical profile, growth features of tumor and patient age with biological features of hormonally active hypophyseal adenoma (2011-2014)

Plans for future research
• Optimization of cerebral glioma therapy based on results of their genotyping, biomarkers determinations, by more precise investigation of their growth dynamics by employing of serial MRI

Devices and methods
• Device for pre- and peri-operative stimulation of brain structures and for neuroimaging
• 3D navigated sonograph
• fMRI, DTI (MR) tractography (imaging of nervous pathways)
• Surgical microscopes (module for 5ALA, module for ICG angiography)
• Endoscope

Selected publications
B. Neuroanatomy, brain mapping, neuromonitoring

Investigators
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Ivan Bízik, MD
Prof. Peter Valkovič, MD, PhD
Zuzana Košutzká, MD

Grants and Funding (in the last 10 years)
• VEGA 1/0959/16: Correlation of imaging preciosity of lenticulostriatal arteries in patients with infiltrative glioma of insula by intraoperative 3D-sonography with imaging by pre-operative 3-Tesla MRI (2016-2018)

Plans for future research
• Verification of reliability of per-operative identification of small arterioles reaching deep brain structures by MRI and 3D-navigated sonography

Devices and methods
• Device for pre- and peri-operative stimulation of brain structures and for neuroimaging
• 3D navigated sonograph
• fMRI, DTI (MR) tractography (imaging of nervous pathways)
• Surgical microscopes (module for 5ALA, module for ICG angiography)
• Endoscope

Selected publications
C1. Neurodegenerative diseases - dementias

Investigators
Prof. Peter Turčáni, MD, PhD (peter.turcani@fmed.uniba.sk)
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Assoc. Prof. Stanislav Šutovský, MD, PhD
Marián Kondáš, MD, PhD
Mária Králová, MD, PhD
Assoc. Prof. Ján Chandoga, MD, PhD
Robert Petrovič, RNDr, PhD
Monika Siváková, MD
Jozef Szabo, MD
Assoc. Prof. Mária Bucová, MD, PhD
Prof. Milan Buc, MD, DSc
Assoc. Prof. Ivana Shawkatova, RNDr, PhD
Juraj Javor, MD, PhD

Grants and Funding (in the last 10 years)
• VEGA 1/0240/16: Immunogenetic markers in Slovak patients with Alzheimer’s disease (2016-2018)

Plans for future research
• Algorithms for early detection of MCI and Alzheimer’s disease
• Monitoring of changes in volume of brain structure
• Cerebral energetic metabolism in neurodegenerative diseases
• Define effects of aeroobe-powerful training and/or carnosine at the level of body and muscle-specific metabolism (in vivo 31P-MRS), physical fitness as well as regulation of GABA/glutamatergic system in the brain (in vivo 1H-MRS) in relationship with intervention in patients with subjective or mild cognitive deficit and in early stages of Alzheimer’s or Parkinson’s disease
• Analysis of miRNA expression in serum, skeletal muscle, and cerebrospinal fluid in relationship with circulating levels of neurotrophins (BDNF), advanced product of glycation (AGEs) as well as with cognitive, motor, and metabolic functions in patients with neurodegenerative diseases
• Differential diagnosis of different types of dementias

Devices and methods
• Computer-assisted evaluation of cognitive functions
• MR spectroscopy
• MR volumetry
• In vivo imaging of amyloid and tau protein
• Expression of miRNA in serum, muscle, and liquor
• Determination of levels of neurotrophins and advanced product of glycation in serum and liquor
Selected publications

C2. Neurodegenerative diseases - Parkinson’s disease

Investigators
Prof. Peter Valkovič, MD, PhD (peter.valkovic@fmed.uniba.sk)
Prof. Ján Benetin, MD, PhD
Michal Minár, MD, PhD
Karin Gmitterová, MD, PhD
Zuzana Košutzká, MD
Jana Martinková, MD
Darina Petrleničová, MD, PhD
Igor Straka, MD
Alice Kušnírová, MD
Prof. Boris Mravec, MD, PhD
Assoc. Prof. Ivan Varga, RNDr, PhD
Andrea Gažová, PharmDr, PhD

Grants and Funding (in the last 10 years)
- VEGA 1/0070/11: Perforation tests of posture in functional diagnostic of sportsmen and individuals with altered motor functions (2011-2013)

Plans for future research
- Detection of new clinical and tissue biomarkers (pre-clinical diagnosis and therapeutical responses)
- Alteration of balance, quality of life, improvement of pharmacotherapy, improvement of criteria and results of surgical treatment

Devices and methods
- Computer-assisted psychometric
- Complex diagnosis of balance
- Imaging methods
- Complex liquor diagnostic
- Histological and immunohistochemical diagnosis

Selected publications
D1. Multiple sclerosis

Investigators
Prof. Peter Turčáni, MD, PhD (peter.turcani@fmed.uniba.sk)
Prof. Branislav Kollár, MD, PhD
Monika Siváková, MD
Pavel Šiarník, MD, PhD
Katarína Klobučníková, MD, PhD
Assoc. Prof. Mária Bucová, MD, PhD
Prof. Milan Buc, MD, DSc
Assoc. Prof. Ďurmanová Vladimíra, RNDr, PhD
Juraj Javor, MD, PhD

Grants and Funding (in the last 10 years)
• VEGA 1/0810/12: Immunogenetic determination of response to biological therapy in patients with multiple sclerosis (2013-2016)
• APVV-0028-10: Interaction of psychological, cardiovascular, neuroendocrine, and metabolic factors: from new animal models to clinical applications (2011-2014)

Plans for future research
• Determination of the role of mitochondrial dysfunction on development of neurodegeneration
• Determination of presence of specific miRNA in liquor and plasma in multiple sclerosis
• Monitoring of changes of brain structures volume
• Genetic determination of sclerosis multiplex, the role of cytokines, chemokines, new inflammatory markers HMGB1 and TREM, miRNA and vitamin D in disease severity monitoring

Devices and methods
• Completely equipped laboratory for processing of biological material (serum, liquor, saliva)
• EndoPAT 2000 (Itamar-Medical), device for determination of endothelial function
• Finometer (Finapres Medical Systems), device for determination of baroreflex sensitivity
• PCR -SSP, PCR-RFLP, sequencing - methods for immunogenetic determination
• ELISA - method for estimation of the level of cytokines and chemokines

Selected publications
D2. Multiple sclerosis

Investigators
Prof. Peter Valkovič, MD, PhD (peter.valkovic@fmed.uniba.sk)
Darina Petrleničová, MD, PhD
Igor Straka, MD
Karin Gmitterová, MD, PhD

Plans for future research
• Determine predictors of therapeutic response and quality of life
• Measurement of balance instability as a marker of Parkinson’s disease

Devices and methods
• Complex psychodiagnostic tools
• Complex analysis of liquor
• Determination of balance alterations

Selected publications
D3. Multiple sclerosis

**Investigators**
Assoc. Prof. Mária Bucová, MD, PhD (maria.bucova@fmed.uniba.sk)
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Assoc. Prof. Vladimíra Ďurmanová, RNDr, PhD
Assoc. Prof. Ivana Shawkatová, MSc, PhD
Beáta Gajdošechová, RNDr
Zuzana Párnická, MD, PhD
Magda Suchánková, MD, PhD
Prof. Milan Buc, MD, DSc

**Plans for future research**
- Immunogenetic determination of inflammation in multiple sclerosis
- Polymorphism of cytokines, chemokines, adhesive molecules, transcription factors, receptors
- New inflammatory markers, cytokines, hormones, miRNA, oxidative status
- Association with clinical stage of patients, EDSS, results of MRI, biologic therapy
- Currently, more than 400 samples are stored, biobanking samples and clinical data

**Devices and methods**
- PCR cyclers, centrifuges
- DNA/RNA spectrophotometer, transilluminator
- ELFO, photo-recording system
- ELISA, flow cytometer

**Selected publications**
E. Cerebrovascular diseases

Investigators
Prof. Peter Turčáni, MD, PhD (peter.turcani@fmed.uniba.sk)
Prof. Branislav Kollár, MD, PhD
Pavel Šiarnik, MD, PhD
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Jozef Szabo, MD
Zoltán Goldenberg, MD, PhD
Vladimír Javorka, MD, PhD
Magdaléna Mižičková, MD
Assoc. Prof. Ingrid Žitňanová, MEng, PhD
Prof. Stanislav Oravec, MD, PhD
Prof. Igor Farkaš, MEng, PhD
Barbora Cimrová, RNDr, PhD

Grants and Funding (in the last 10 years)
• European Regional Development Fund Research and Development Grant (ITMS 26240120015): Establishment of centre of excellence for stroke at Faculty of Medicine in Bratislava (2009-2011)
• European Regional Development Fund Research and Development Grant (ITMS:26240120023): Completion of centre of excellence for stroke at Faculty of Medicine in Bratislava (2012-2014)
• MZ-SR 2012/10-UKBA-10: Oxidative stress and its role in pathogenesis of stroke (2012-2016)
• APVV-0668-12: Interface brain-computer with adaptive robotic arm for rehabilitation (2012-2016)
• MZ-SR 2012/56-SAV-6: Changes of sleep architecture in patients with focal brain ischemia and its influence on cognitive functions (2012-2016)
• APVV-0028-10: Interaction between psychiatric, cardiovascular, neuroendocrin, and metabolic factors: from new animal models to clinical applications (2011-2014)

Plans for future research
• Complex investigation of stroke etiopathogenesis
• New view on the spectrum of risk factors
• Evaluation of drugs effect on brain perfusion
• Establishment of new therapeutic approaches in Slovakia
• Experimental research of mechanisms participating on stroke development and stroke-induced changes in organism

Devices and methods
• Standard equipment of centre focused on stroke therapy
• Complexly equipped laboratory for processing of biological materials (serum, liquor, saliva)
• Device for USG determination of brain circulation with possibility to detect embolus
• Angiograph
• EndoPAT 2000 (Itamar-Medical), device for determination of endothelial functions
• Finometer (Finapres Medical Systems), device for determination of baroreflex sensitivity
Polysomnograph Alice 5 and Alice 6 (Philips-Respironics)
C-Flow (Ornim), determination of non-invasive determination of cerebral blood flow
Agregometer and viscosimeter (Chronolog, A. Paar)

Selected publications

F. Sensory diseases

Investigators
Prof. Milan Profant, MD, PhD (profant@fnorl.sk)
Assoc. Prof. Zuzana Kabátová, MD, PhD
Lukáš Varga, MD, RNDr, PhD
Gabriela Pavlovčinová, MD, PhD
Lívia Majerníková, MD

Grants and Funding (in the last 10 years)
• VEGA 1/0214/16: Wide-exome sequencing in multiplex families with hereditary hearing disorders in Slovakia (2016-2019)
• APVV-0148-10: Screening of hereditary hearing disorders in Slovakia by methods of DNA analysis (2011-2014)
• ASFEU- structural founds of EU (ITMS: 26240220051): TRANSENDGEN (Transfer of genetic knowledge of endocrine research into clinical praxis (2010-2014)
• VEGA 1/0465/11: Incidence, DNA analysis, and phenotype spectrum of most frequent hereditary hearing disorders in Slovakia (2011-2013)
• VEGA 1/4315/07: Diagnostic and rehabilitation of altered swallowing (2007-2009)

Plans for future research
• Experimental audiology and audiologic diagnostic of hearing disorders
• Differential diagnosis of dizziness

Devices and methods
• Audiologic outpatients’ department
• Otoneurologic and surgery section of Department of ORL

Selected publications


G1. Sleep disorders

Investigators
Prof. Peter Turčáni, MD, PhD (peter.turcani@fmed.uniba.sk)
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Pavel Šiarník, MD, PhD
Katarína Klobučníková, MD, PhD
Alžbeta Cvičelová, RNDr, PhD
Monika Siváková, MD
Prof. Igor Farkaš, MEng, PhD
Barbora Cimrová, RNDr, PhD

Grants and Funding (in the last 10 years)
- European Regional Development Fund Research and Development Grant (ITMS:26240120023): Completion of centre of excellence for stroke at Faculty of Medicine in Bratislava (2012-2014)

Plans for future research
- Sleep disturbances in patients with extrapyramidal diseases
- Effect of sleep disturbances on cognitive functions
- Sleep disturbances in patients with intracerebral hemorrhage
- Sleep disturbances in professional sportsmen

Devices and methods
- Polysomnograph Alice 5 and Alice 6 (Philips-Respironics)
- Auto-BiPAP (Philips-Respironics), device for titration of over-pressure ventilation
- EndoPAT 2000 (Itamar-Medical), device for determination of endothelial functions
- Finometer (Finapres Medical Systems), device for determination of baroreflex sensitivity

Selected publications
G2. Sleep disorders

Investigators
Prof. Peter Valkovič, MD, PhD (peter.valkovic@fmed.uniba.sk)
Michal Minár, MD, PhD
Jana Martinková, MD
Darina Petrleničová, MD, PhD
Igor Straka, MD
Zuzana Košutzká, MD

Grants and Funding (in the last 10 years)
• Grant of Boehringer Ingelheim: Eporis epidemiology of RLS in Slovakia (2011-2013)

Plans for future research
• Epidemiology in general population
• Secundarities
• Predictors of therapeutic response
• Quality of life

Devices and methods
• Complex psychodiagnostics
• Complex analysis of liquor
• Neurophysiological diagnosis
• Complex neuroimaging
• Continual EEG monitoring

Selected publications
H1. Depression in adults

Investigators
Prof. Ján Pečeňák, MD, PhD (jan.pecenak@sm.unb.sk)
Ľubomíra Izáková, MD, PhD
Katarína Ondičová, MVD, PhD
Prof. Boris Mravec, MD, PhD

Grants and Funding (in the last 10 years)
• VEGA 1/0258/10: The study of mechanisms of peripheral anti-inflammatory effects of antidepressants (2010-2012)

Selected publications
H2. Depression in children

Investigators
Jana Trebatická, MD, PhD (jana.trebaticka@med.uniba.sk)
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Assoc. Prof. Igor Škodáček, MD, PhD
Zuzana Matzová, MD, PhD
Zuzana Hradečná, PhDr
Assoc. Prof. Jana Muchová, RNDr, PhD
Zuzana Padúchová, RNDr, PhD
Lucia Laubertová, MEng, PhD
Zuzana Deáková, MSc, PhD

Grants and Funding (in the last 10 years)
- VEGA 1/0703/13: Molecular bases of childhood psychiatric disorders (depression, anxiety states), involvement of oxidative stress and the use of omega-3 fatty acids in therapy (2013-2015)

Plans for future research
- Determination of metabolites of neurotransmitters in the blood (HPLC)
- Determination of fatty acids composition in erythrocyte membranes (GC)
- Determination of korticoids in saliva (Elisa)
- Determination of membrane fluidity (fluorospectrometric method)
- Determination of telomere length (molecular biology)
- Determination of oxidative damage to DNA by Comet assay and kinetic of DNA reparation – Comet assay in ADHD children

Devices and methods
- Determination of oxidative damage to DNA by Comet assay and kinetic of DNA reparation – Comet assay
- Spectrophotometric, fluorospectrometric methods, Elisa methods, HPLC and GC methods

Selected publications
I. Schizophrenia

Investigators
Prof. Ján Pečeňák, MD, PhD (jan.pecenak@sm.unb.sk)
Michal Hajdúk PhDr, PhD

Grants and Funding (in the last 10 years)
- APVV-15-0037: Investigation of anatomical-functional differences between the effects of aripiprazole and quetiapine, atypical antipsychotics with similar therapeutic indications, but different impact on brain dopaminergic receptors, in experimental animals (2016-2018)
- Slovak Psychiatric Association Grant 2016: Perception and identification of face expression and their relationship to the functioning of patients with schizophrenia (2016)

Selected publications
J. Autism

Investigators
Prof. Daniela Ostatníková, MD, PhD (daniela.ostatnikova@fmed.uniba.sk)
Katarína Babinská, MD, PhD
Silvia Hnilicová, MD, PhD
Alexandra Tomová, MD, PhD
Aneta Kubranská, MD, PhD
Mária Vidošovičová, MD
Ján Bakoš, RNDr, PhD
Jaroslava Durdiaková, RNDr, PhD
Lenka Siklenková, MD
Assoc. Prof. Peter Celec, MD, Dipl Eng, Dr Rer Nat, DSc, MPH
Assoc. Prof. Mária Bucová, MD, PhD

Grants and Funding (in the last 10 years)
• APVV 0254-11: Social, emotional, and cognitive picture of autism in interdisciplinary reflections (2012-2014)
• VEGA1/0141/17: Immunogenetic factors and chronic low grade inflammation in pathomechanisms of autism and their associations with gastrointestinal dysfunction, behavioural and biological markers (2017-2019)
• VEGA1/0086/14: Molecular biological analysis of fecal microflora and its impact on inflammation and gastrointestinal symptoms in autistic children (2014-2016)
• VEGA1/0066/12: Genetic factors as modulators of hormonal influences on cognitive functions (2013-2015)
• VEGA 1/0955/17: Multimodality of emotion regulation development in adolescents with the typical and atypical development. Perspective of complex dynamic interplay of structural and functional biological, psychological and social environmental system changes (2017-2020)

Plans for future research
• Investigation of autism etiology
• Interventional studies
• Investigation of autism epidemiology
• Investigation of the role of inflammation, new inflammatory molecules, cytokines and vitamin D in disease pathology
• Investigation of sleep disorders in autism
• Investigation of proteomic and metabolomic profiles in autism

Devices and methods
• Sysmex – blood cell analyzer
• Centrifuges
• PCR cyclers
• Spectrophotometer
• ELISA reader
• Electrophoresis
• Actigraph – assessment of sleep disorders by actigraphy
• Mass spectrometry - proteomic and metabolomic profiling
Selected publications

- Babinská K, Bucová M, Ďurmanová V, Lakatošová S, Jánosišková D, Bakoš J, Hlavatá A, Ostatníková D. Increased plasma levels of the high mobility group box 1 protein (HMGB1) are associated with a higher score of gastrointestinal dysfunction in individuals with autism. Physiol Res 2014; 63: S613-8.
K. Neurobiology of cancer

Investigators
Prof. Boris Mravec, MD, PhD (boris.mravec@fmed.uniba.sk)
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Grants and Funding (in the last 10 years)
• APVV-0007-10: Neurobiology of cancer: the study of nervous system role in cancer growth and development of metastases (2011-2014)

Plans for future research
• Investigation of innervation of selected human cancers
• Investigation of hypothalamus role in mechanisms of cancer cachexia

Devices and methods
• Stereotaxic apparatus for small laboratory animals
• Surgical microscope
• Cooling plate for microdissection of brain structures

Selected publications
Cardiovascular Diseases
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<td>Cardiovascular</td>
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<td>New pharmacological approaches for protection of hypertension-induced heart damage</td>
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<td>Heart diseases</td>
<td>Heart failure</td>
<td>Early changes in cardiovascular system in arterial hypertension</td>
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<td>Remodeling in cardiovascular system</td>
<td>RAAS and remodeling</td>
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<td>Cardiotoxicity/oncocardiology</td>
<td>Detection of cardiotoxicity of anti-cancer drugs</td>
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<td>Hereditary defects</td>
<td>Genetic polymorphisms and the risk of hereditary heart defects</td>
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<td>Vascular diseases</td>
<td>Varicosity</td>
<td>Investigation of structures of wall of primary varicose veins</td>
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<td>Endothelium</td>
<td>Drug effects on endothelial dysfunction</td>
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<td>Treatment</td>
<td>Pharmacoepidemiology of cardiovascular diseases</td>
<td>Adherence of patients to drugs used for secondary prevention of cardiovascular diseases in elderly</td>
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<td></td>
<td>Drugs for the therapy of hypertension</td>
<td>Role of L-NAME</td>
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</tbody>
</table>
In the field of cardiovascular disease, research at Faculty of Medicine in Bratislava is focused mainly on investigation of etiopathogenesis of hypertension, heart failure and vessels diseases. Original data were obtained from experiments investigating mechanisms of heart failure and remodeling in cardiovascular system.

**Principal investigators**

Prof. Viera Štvrtinová, MD, PhD  
Prof. Beáta Mladosievičová, MD, PhD  
Prof. Jozef Mašura, MD, PhD, FSCAI, FESC, FAEPC  
Prof. Andrej Dukát, MD, PhD  
Assoc. Prof. Ludovít Gašpar, MD, PhD  
Prof. Ján Murín, MD, PhD  
Ludovít Paulis, MD, MSc, PhD  
Prof. Fedor Šimko, MD, PhD  
Prof. Martin Wawruch, MD, PhD  
Assoc. Prof. Jana Poláková-Mištinová, MD, PhD
A. Hypertension

Investigators
Prof. Ján Murín, MD, PhD (jan.murin@sm.unb.sk)
Prof. Martin Wawruch, MD, PhD

Grants and Funding (in the last 10 years)
- VEGA 1/0939/14: Augmentation (augmentation index) of systolic blood pressure and aortal stiffness and therapy of arterial hypertension and its complications (2014-2016)

Selected publications
B. Heart failure

Investigators
Prof. Fedor Šimko, MD, PhD (fedor.simko@fmed.uniba.sk)

Grants and Funding (in the last 10 years)
- VEGA 1/3429/06: Modification of heart hypertrophy and heart failure in NO (nitric oxide)-deficient hypertension in rats by melatonin (2006-2008)
- VEGA 1/0187/09: Modification of heart hypertrophy and heart failure in continuous light-induced hypertension in rats by melatonin and captopril (2009-2011)
- VEGA 1/0227/12: Novel model of experimental hypertension, remodeling of left ventricule and heart failure induced by inhibition of transcription nuclear factor kappa B (NF-kB): protection by melatonin and captopril (2012-2014)
- VEGA 1/0071/15: Protection of hypertensive and failing heart by blocker of I(f) channel, ivabradine: comparison with ACE-inhibition and melatonin (2015-2018)
- NOREG - Centre of Excellence for Research on the regulatory role of nitric oxide in diseases of civilization (2011-2014)

Selected publications
• Simko F, Reiter RJ, Pechanova O, Paulis L. Experimental models of melatonin-deficient hypertension. Front Biosci (Landmark Ed) 2013; 18: 616-25.
C. Remodeling in cardiovascular system

Investigators
Ľudovít Paulis, MD, MSc, PhD (ludovit.paulis@fmed.uniba.sk)

Grants and Funding (in the last 10 years)
- VEGA 1/0380/14: The effect of pharmacological stimulation of AT2 receptors on morphology and functional characteristics of failing myocardium in rats (2014-2016)
- VEGA 1/0831/11: Possible modulation of myocardial and vessels remodeling by pharmacological stimulation of AT2 receptors (2011-2013)

Selected publications


D. Cardiotoxicity

Investigators
Prof. Beata Mladosievičová, MD, PhD (beata.mladosivicova@fmed.uniba.sk)

Grants and Funding (in the last 10 years)
- League against Cancer Slovak Republic: Modern diagnostics of lipoproteins in haematooncologic patients after allogeneic haematopoietic stem cells transplantation (2015)

Selected publications
E. Inherited heart defects

Investigators
Prof. Jozef Mašura, MD, PhD, FSCAI, FESC, FAEPC (masura@dkc-sr.sk)

Grants and Funding (in the last 10 years)
• VEGA 1/0593/11: Polymorphisms in methylentetrahydropholate reductase and risk of inherited heart defects (2001 -2013)

Selected publications
• Venczelova Z1, Tittel P, Masura J. The new Amplatzer duct occluder II: when is its use advantageous? Cardiol Young 2011; 21: 495-504.
F1. Vascular diseases

Investigators
Prof. Viera Štvrtinová, MD, PhD (viera.stvrtinova@fmed.uniba.sk)
Assoc. Prof. Ľudovít Gašpar, MD, PhD

Grants and Funding (in the last 10 years)

Selected publications
F2. Vascular diseases

Investigators
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Robert Vojtko, MD, PhD
Miriam Petrová, MD, PhD
Lukáš Dobiaš, PharmDr, PhD

Grants and Funding (in the last 10 years)
- VEGA1/2293/05: Study of endothelium-protective effects on experimental models of endothelial damage (2005-2007)
- VEGA 1/0314/08: Evaluation of drug effects on endothelial dysfunction in experimental and clinical conditions (2008-2010)
- VEGA 1/0501/11: The role of endothelium-released factors in contraction of isolated vessels in the development of hypertension (2011-2013)

Selected publications

G. Pharmacoepidemiology of cardiovascular diseases

Investigators
Prof. Martin Wawruch, MD, PhD (martin.wawruch@fmed.uniba.sk)
Prof. Jan Murin, MD, PhD
Jan Luha, RNDr, PhD

Grants and Funding (in the last 10 years)
• VEGA 1/0135/09: Specific features of pharmacotherapy in geriatrics and the possibilities of its quality assessment (2009-2011)
• VEGA 1/0886/14: Suboptimal use of drugs in secondary prevention of cardiovascular diseases in elderly patients (2014-2016)
• VEGA 1/0112/17: Adherence with pharmacotherapy – a basic precondition of successful secondary prevention of cardiovascular diseases in elderly patients (2017-2019)

Selected publications
H. Drugs for hypertension therapy

Investigators
Prof. Pavel Babál, MD, PhD (pavol.babal@fmed.uniba.sk)

Grants and Funding (in the last 10 years)
• APVV-51-017905: Molecular mechanisms responsible for effect of new drugs affecting oxidative stress - important etiopathogenetic factor of multiple diseases (2008 - 2009)
• VEGA 2/7064/7: Long-term administration of low dose of L-NAME: possibility for improvement of vessel wall function in borderline hypertension (2007)
• VEGA 1/1171/04: Protective effect of polygenole compounds against endothelial damage (2004 - 2005)

Selected publications
Oncological Diseases
<table>
<thead>
<tr>
<th>Research area</th>
<th>Topic</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Mammary carcinoma</td>
<td>Circulating tumor cells (CTC)</td>
<td>Prognostic and predictive significance CTC</td>
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<td>Tumor microenvironment and CTC</td>
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<td>CTC and coagulation, CTC and immune system</td>
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<td></td>
<td>Functional breast MRI</td>
<td>Role of biomarkers in prediction of neoadjuvant chemotherapy response</td>
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<tr>
<td>Urologic malignity</td>
<td>Testicular cancer</td>
<td>Treatment of advanced stages, relapses, and refractory diseases</td>
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<td>Identification of biomarkers associated with resistance and late toxicity</td>
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<td>Late toxicity in the treatment of TGCTs, quality of life</td>
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<td>Development of experimental animal model of TGCTs</td>
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<td>Cultivation and characterization of TGCT from cell lines</td>
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<td>Optimization of therapy and follow-up patients with TGCT in I. clinical stage</td>
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<td>Hormonal substitution therapy by testosterone and defects of bone density in patients with TGCT</td>
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<td>Secondary malignity after therapy of testicular tumors</td>
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<td>Other tumors</td>
<td>Tumors of head and neck</td>
<td>Functional consequences of therapy of head and neck tumors</td>
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<td>Immunological and immunogenetic aspects of tumors and other lesion of head and neck.</td>
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<td>The role of HMGB1, TREM-1, and TREM-2 molecules and cytokines.</td>
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<td>Salivary and other molecular markers of head and neck tumors</td>
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<tr>
<td>Nuclear medicine</td>
<td>PET/CT</td>
<td>Innovative clinical applications of diagnostic radiopharmaceuticals</td>
</tr>
<tr>
<td>Late adverse effects</td>
<td>Late toxicity of anti-cancer therapy</td>
<td>Monitoring of late toxicity in pediatric and TGCTs patients</td>
</tr>
<tr>
<td>Probiotics</td>
<td>Probiotics as adjuvant to anti-cancer therapy</td>
<td>Safety of probiotics in oncological patients</td>
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<td>Prevention of irinotekan-induced diarrhea</td>
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<td></td>
<td>Prevention of chemotherapy toxicity and potentiation of its efficiency</td>
</tr>
</tbody>
</table>
Oncological research is currently focused on investigation of etiopathogenesis of mammary, urological, and other malignancies. Outstanding findings were obtained in the research focused on the role of circulation tumor cells.

**Principal investigators**

Assoc. Prof. Jozef Mardiak, MD, PhD  
Prof. Pavel Babál, MD, PhD  
Dr. h. c. Prof. Ján Breza, MD, DSc  
Assoc. Prof. Soňa Balogová, MD, PhD  
Prof. Ludovít Danihel, MD, PhD  
Prof. Štefan Durdík, MD, PhD  
Prof. Michal Mego, MD, PhD  
Prof. Beáta Mladosievičová, MD, PhD  
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Prof. Vanda Repiská, RNDr, PhD  
Prof. Juraj Šteňo, MD, DSc
A1. Mammary carcinoma

Investigators
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Assoc. Prof. Jozef Mardiak, MD, PhD
Prof. Pavel Babál, MD, PhD
Assoc. Prof. Soňa Balogová, MD, PhD
Prof. Ludovít Danihel, MD, PhD
Prof. Štefan Durdík, MD, PhD

Grants and Funding (in the last 10 years)
• VEGA 1/0044/15: Identification of factors participating on release and migration of circulating tumor cells in mammary carcinoma (2016-2018)
• VEGA 1/0724/11: Circulating tumor cells and epithelial-mesenchymal transition (2012-2014)
• APVV-14-0327: Identification of new biomarkers and alternative approaches for analysis of tumor DNA utilizable in diagnostics and prognostics of mammary carcinoma (2015-2018)

Plans for future research
• Genotyping of tumors in relationship with circulating tumor cells
• Evaluation of predictive and prognostic value new subpopulation of circulating tumor cells with epithelial-mesenchymal transition

Devices and methods
• Standard equipment of laboratory
• Laminar box

Selected publications


A2. Mammary carcinoma

Investigators
Assoc. Prof. Viera Lehotska, MD, PhD (viera.lehotska@ousa.sk)
Lucia Vanovcanova, MD, PhD
Prof. Stanislav Spanik, MD, PhD
Prof. Stefan Durdik, MD, PhD, MHA

Grants and Funding (in the last 10 years)
• APVV 0297/10: Early detection of prostate cancer with 3T MRI (2010-2013)

Plans for future research
• Identification of early predictive biomarkers in monitoring of response to neoadjuvant chemotherapy
• Identification of risk patient population non-responding to first-line chemotherapy in breast cancer treatment

Devices and methods
• 3T MR device
• Stereotactic and MR navigated vacuum-assisted biopsy (VAB)
• Stereotactic and US navigated breast lesion excision system (BLES)
• Tumor marking set

Selected publications
B. Testicular cancer

Investigators
Assoc. Prof. Jozef Mardiak, MD, PhD (mardiak@nou.sk)
Prof. Michal Mego, MD, PhD
Prof. Pavel Babál, MD, PhD
Dr. h. c. prof. Ján Breza, MD, DSc
Prof. Beáta Mladosievičová, MD, PhD
Prof. Dalibor Ondruš, MD, DSc
Michal Chovanec, MD, PhD
Viera Miskovska, MD, PhD

Grants and Funding (in the last 10 years)
• APVV-0016-11: Identification of biomarkers associated with resistance on chemotherapy in testicular tumors from germinative cells (TGCTs) (2012-2015)

Plans for future research
• Treatment of advanced stages
• Treatment of relapses and refractory diseases
• Identification of biomarkers associated with resistance
• Identification of biomarkers associated with late toxicity
• Late toxicity in the treatment of TGCTs, quality of life
• Development of experimental animal model of TGCTs
• Cultivation and characterization of TGCT from cell lines

Devices and methods
• Equipment in Department of clinical studies
• Equipment of Unit of translational research at Faculty of Medicine in Bratislava and National Institute of Cancer

Selected publications
C. Tumors of head and neck

Investigators
Patrik Štefanička, MD, PhD (patrikstefanicka@yahoo.com)
Miroslav Tedla, MD, PhD
Prof. Milan Profant, MD, PhD
Lukáš Varga, MD, RNDr, PhD
Matej Babinec, MD
Magda Suchánková, MD, PhD
Assoc. Prof. Mária Bucová, MD, PhD

Grants and Funding (in the last 10 years)
- VEGA 1/4315/07: Diagnostic and rehabilitation of altered swallowing (2007-2009)

Devices and methods
- Molecular-genetic analysis at IMBM Faculty of Medicine, BMC SAV
- ELISA - analysis of new inflammatory markers HMGB1, TREM-1, cytokines, chemokines and TREM-2

Selected publications
D. Innovative clinical applications of diagnostic radiopharmaceuticals

Investigators
Assoc. Prof. Soňa Balogová, MD, PhD (sona.balogova@ousa.sk)

Grants and Funding (in the last 10 years)
• VEGA 1/0196/16: Non-invasive in-vivo prediction of therapeutic response to inhibitors of angiogenesis using 68Ga-RGD PET/CT (2016-2018)

Plans for future research
• Evaluation of innovative clinical applications of diagnostic radiopharmaceuticals for PET in oncology

Selected publications
E. Late toxicity

Investigators
Assoc. Prof. Jozef Mardiak, MD, PhD (mardiak@nou.sk)
Prof. Pavel Babál, MD, PhD
Prof. Michal Mego, MD, PhD
Dr. h. c. Prof. Ján Breza, MD, DSc
Prof. Beáta Mladosievičová, MD, PhD
Prof. Dalibor Ondruš, MD, DSc
Michal Chovanec, MD, PhD
Viera Miskovska, MD, PhD

Grants and Funding (in the last 10 years)

Plans for future research
- Monitoring of late toxicity in patients with testicular cancer from germinative cells

Selected publications
F. Probiotics

Investigators
Prof. Michal Mego, MD, PhD (misomego@gmail.com)
Assoc. Prof. Jozef Mardiak, MD, PhD
Assoc. Prof. Luboš Drgoňa, MD, PhD

Grants and Funding (in the last 10 years)
• VEGA 1/0722/11: Prevention of irinotekan-induced diarrhea by probiotics (2011-2013)
• APVV-0646-11: The role of bacteria in process of carcinogenesis and syndrome of acquired immunodeficiency (2011-2013)

Plans for future research
• Prevention of irinotekan-induced diarrhea by probiotics. Clinical study phase III

Devices and methods
• Equipment of Unit of translational research at Faculty of Medicine in Bratislava and National Institute of Cancer

Selected publications
Metabolic, Endocrine, and Inflammatory Diseases
<table>
<thead>
<tr>
<th>Research area</th>
<th>Topic</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Metabolic and endocrine diseases</td>
<td>Diabetes mellitus</td>
<td>Diabetes mellitus and diabetic foot syndrome</td>
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<td>Monogenic disorders of insulin secretion and action</td>
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<td></td>
<td>Osteoporosis</td>
<td>Metabolism - osteology</td>
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<tr>
<td></td>
<td>Metabolism - osteology Investigation of pathophysiology, diagnostic and therapy of osteoporosis</td>
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<td></td>
<td>Growth and Development</td>
<td>Short stature in children</td>
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<td>Disorders of sexual development</td>
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<tr>
<td>General metabolism</td>
<td>Endocrine glands and endocrinopathies with symptoms in ORL area</td>
<td>Thyroidectomy and quality of life</td>
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<tr>
<td></td>
<td>Metabolism - osteology Investigation of pathophysiology, diagnostic and therapy of osteoporosis</td>
<td>Physiology and molecular-genetic characteristics of brown fat tissue in man DNA diagnostics of rare diseases and syndromes associated with ORL diseases (alteration of hearing, malformation in ORL areas associated with endocrinopathies and metabolic disturbances)</td>
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<td>Metabolic syndrome</td>
<td>Metabolic syndrome in children</td>
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<td>Inborn errors of metabolism</td>
<td>Selective screening</td>
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<td>Environmental factors</td>
<td>Nutrition</td>
<td>Nutrition and nutritional status in population</td>
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<td>Effect of selected environmental and psychosocial factors on health and development of children and adolescents</td>
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<tr>
<td>Immunology</td>
<td>Alterations of immunity</td>
<td>Autoimmunity: Rheumatoid arthritis, Sjögren’s syndrome, systemic sclerosis, diabetes mellitus, Crohn disease</td>
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<td>Inflammation in cardiovascular diseases</td>
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<td>Inherited alterations of immunity, bronchial asthma</td>
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<td>Rheumatoid arthritis</td>
<td>Study of combination of immunosuppressive therapy and modulation of redox balance of organism in animal models of rheumatoid arthritis</td>
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<td>Inflammatory bowel diseases (IBD)</td>
<td>New therapeutic options in IBD</td>
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<td>Monitoring disease activity in IBD</td>
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<td>The role of vitamin D in IBD</td>
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<tr>
<td>Infection</td>
<td>Infectious diseases</td>
<td>Legionnaires’ disease, Leptospirosis, Tularemia, nosocomial infections</td>
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<td>Sepsis</td>
<td>Biomarkers of sepsis and SIRS</td>
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<tr>
<td>Morphology</td>
<td>Histology of immune system</td>
<td>Development and evolution of lymphatic organs, focused on thymus</td>
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<td>Microscopic structure and blood microcirculation of spleen</td>
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<tr>
<td>Other</td>
<td>Orphan diseases</td>
<td>Hereditary ciliopathies, RASopathies and tubulopathies</td>
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<td>Extracellular DNA</td>
<td>Role of extracellular DNA in physiological and pathological conditions</td>
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<td>Kidney diseases</td>
<td>Novel biomarkers in chronic kidney disease: from kidney function to kidney damage &amp; from animal model to human kidney</td>
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<tr>
<td></td>
<td>Bioenergetics</td>
<td>Investigation of bioenergetic and anti-oxidative systems of organism in selected diseases</td>
</tr>
</tbody>
</table>
Traditionally, research at Faculty of Medicine in Bratislava is focused on investigation of etiopathogenesis of diabetes mellitus, osteoporosis, thyroid diseases, rheumatoid arthritis, sepsis, and other immune diseases.

Principal investigators
Prof. Juraj Payer, MD, PhD, MPH, FRCP
Prof. Ľudmila Podracká, MD, PhD
Prof. László Kovács, MD, DSc
Assoc. Prof. Tibor Hlavatý, MD, PhD
Assoc. Prof. Mária Bucová, MD, PhD
Assoc. Prof. Peter Celec, MD, Dipl Eng, Dr Rer Nat, DSc, MPH
Assoc. Prof. Katarína Šebeková, MD, DSc
Prof. Mária Šimaljaková, MD, PhD
Prof. Ladislav Turecký, MD, PhD
A1. Diabetes mellitus - diabetic foot

Investigators
Assoc. Prof. Ľudovít Gašpar, MD, PhD (ludovitgaspar@gmail.com)
Prof. Andrej Dukát, MD, PhD
Prof. Stanislav Oravec, MD, PhD
Prof. Viera Štvrtinová, MD, PhD
Assoc. Prof. Ján Lietava, MD, PhD
Matej Bendžala, MD, PhD
Martin Čaprnda, MD, PhD
Marek Kučera, MD, PhD
Peter Sabaka, MD, PhD
Denisa Čelovská, MD, PhD
Andrea Komorníková, MD

Projects realized in the last 10 years
• Management of patient with diabetic foot syndrome
• Diabetic foot - diagnostic and therapy
• Transcutaneous oximetry in diagnostic of diabetic foot
• Determination of amputation level by transcutaneous oximetry
• Orthostatic hypotension in patients with diabetes mellitus
• Effect of therapy by prostaglandin EL on prognosis of patients with diabetic foot syndrome
• Effect of hyperbaric oxygen therapy on lipoprotein sub-fractions in patients with diabetes mellitus
• Differential diagnosis of ulceration on foot of diabetic patients

Plans for future research
• Optimization of diagnosis and therapy of patients with diabetic foot syndrome
• Association between insulin administration by insulin pump and prognosis of patients with diabetes mellitus
• Resistant hypertension in patients with diabetes mellitus
• Diabetes mellitus, dipping status and prognosis of patients
• Incidence of mediocalcinosiss in patients with diabetes mellitus a their prognosis

Devices and methods
• Complex non-invasive cardiovascular diagnostics (Holter EKG, AMTK, ergometric investigation, echocardiography, Laser-Doppler investigation of vessels, transcutaneous oximetry)
• Analysis of spectrum and sub-fractions of lipids by method Lipoprint LDL and HDL
• Spectral analysis of heart rate variability
• Diagnosis of cardiovascular autonomic neuropathy
• Determination of ankle-brachial index by automatic system

Selected publications


A2. Diabetes mellitus - monogenic disorders of insulin secretion and action

**Investigators**
Assoc. Prof. Juraj Staník, MD, PhD (stanik@dfnsp.sk)
Ľubomír Barák, MD, PhD
Daniela Staníková, MD, PhD
Denisa Lobotková, MD, PhD
Lukáš Varga, MD, PhD
Kristína Podoláková, MD

**Projects realized in the last 10 years**
- VEGA 2/0166/14: Prevalence and mutation spectrum of the most common forms of monogenic obesity (2013-2016)
- VEGA 2/0151/11: Prevalence of various types of diabetes type MODY in Slovakia (2010-2014)
- ASFEU - structural funds of EU (ITMS: 26240220051): TRANSENDIOGEN (Transfer of genetic knowledge of endocrine research into clinical praxis (2010-2014)

**Plans for future research**
- Optimization of diagnosis and therapy of patients with monogenic diabetes and congenital hyperinsulinism
- Epidemiology of patients with monogenic diabetes and congenital hyperinsulinism
- Association between insulin administration by insulin pump and prognosis of patients with diabetes mellitus
- Pharmacogenetics of monogenic diabetes and congenital hyperinsulinism
- Genetics of insulin resistance in children
- Optimization of diagnosis and therapy of patients with mitochondrial diabetes

**Devices and methods**
- Molecular-genetic analysis at Biomedical Research Center, Slovak Academy of Sciences
- Clinical diagnostics and management in Children Diabetes Center at the Pediatric Department of Faculty of Medicine in Bratislava

**Selected publications**


B. Osteoporosis

Investigators
Prof. Juraj Payer, MD, PhD, MPH, FRCP (payer@ru.unb.sk)
Assoc. Prof. Zdenko Killinger, MD, PhD
Peter Jackuliak, MD, PhD
Martin Kužma, MD, PhD
Assoc. Prof. Tibor Hlavatý, MD, PhD
Assoc. Prof. Tomáš Koller, MD, PhD
Anna Krajčovičová, MD, PhD
Prof. Ľudmila Podracká, MD, PhD
Ľubica Tichá, MD, PhD

Projects realized in the last 10 years

- Center for Research on Serious Diseases and their Complications. Supported by the Operational Program Research and Development co-funded by the European Union from the European Regional Development Fund, ITMS Code 26240120038 (2013-2015)
- LipidomicNet – 7th Framework Program, European Commission, Brussels, Belgium – Lipid droplets as dynamic organelles of fat deposition and release: translational research towards human disease
- VEGA 1/0613/17: Early diagnosis of osteoporosis in children and adolescents with mental anorexia (2017-2019)
- Effect of selected therapeutic approaches on bone parameters with regards to bone structure assessment
- Secondary osteoporosis in rheumatoid arthritis – bone quality and the effect of biological treatment on bone
- Impact of adult growth hormone deficiency and on bone mineral density, trabecular bone score, and effect of vitamin D as cofactor in the treatment of growth hormone deficiency
- Prediction models of clinical fractures in patients with postmenopausal osteopenia
- The effect of glycemic compensation on bone - bone quality in diabetic patients
- Prevalence of osteoporosis in patients with inflammatory bowel diseases and the effect of treatment on bone parameters

Plans for future research
- Effect of acromegaly on bone parameters and incidence of clinical and morphometric vertebral fractures
- Chronic heart failure and incidence of clinical and morphometric vertebral fractures
- Effect of hydrocortisone treatment on bone in patients with Addison disease
- Association between hyperthyroidism, bone quality and novel bone turnover markers
- Assessment of bone quality in adults with hypophosphatasia
- Prevalence of fractures in patients with rheumatoid arthritis treated with biological therapy.
- Extend existing epidemiological data of osteoporotic fractures in diabetic patients
- Mutual influence of other factors of secondary osteoporosis on incidence of osteoporosis in diabetic patients
- Non-invasive measurement of advanced glycation end-products (AGEs)
• Metabolic consequences of bone disease in children
• New potential biomarkers of bone metabolism
• Assessment of sarcopenia in selected groups with secondary osteoporosis

Devices and methods
• Determination of biochemical markers of bone metabolism
• Determination of vitamin D
• Investigation of calcium-related and calcium non-related effects of vitamin D
• Dual energy X-ray absorptiometry
• Trabecular bone score, hip structure analysis, 3D-DXA
• AGE reader for skin autofluorescence
• Serum CX3CL1/Fractalkine, IL-1Ra, IL-8

Selected publications
C. Short stature in children

Investigators
Assoc. Prof. Ludmila Košťálová, MD, PhD (kostalova@dfnsp.sk)
Zuzana Pribilincová, MD, PhD
Eva Vitáriušová, MD PhD
Lubica Tichá, MD, PhD
Katarína Prochotská, MD, PhD
Zuzana Blusková, MD, PhD

Projects realized in the last 10 years
• ECOS - Easypod Connect observational Study (2012-2016)
• GeNeSIS - The genetic and endocrinology of Short Stature International Study (2006-2016)
• KIGS - Kabi international growth hormone study (1992-2015)

Plans for future research
• Growth hormone treatment in children with deficit of growth hormone - effect and complications
• Growth hormone treatment in SGA born children - effect and complications
• Growth hormone treatment in Turner syndrome and rasopathies - effect and complications
• Growth hormone treatment children with disorder of sexual differentiation in mosaicism in karyotype - effect and complications
• Genetic causes of short stature (Geleophysic nanism, 3-M syndrome, Silver-Russell syndrome, Deficiency of SHOX gene)
• Onset of puberty in SGA born children

Devices and methods
• Hormonal and metabolic profile
• Body composition
• Genetic assay
• Evaluation of puberty
• Evaluation of bone age

Selected publications
D. Disorders of sexual development

Investigators
Zuzana Pribilincová, MD, PhD (pribilincova@dfnsp.sk)
Assoc. Prof. Ludmila Košťálová, MD, PhD
Prof. László Kovács, MD, DSc, MPH
Eva Vitárušová, MD PhD
Katarina Prochotská, MD, PhD
Peter Bartoň, MD
Jozef Babala, MD, PhD
Zuzana Nižňanská, MD, PhD
Eva Vitáriušová, MD PhD
Katarína Prochotská, MD, PhD
Peter Bartoň, MD
Jozef Babala, MD, PhD
Zuzana Nižňanská, MD, PhD
Judita Puškáčová, MD, PhD

Projects realized in the last 10 years
• MESPE CAH study group, CEEPUS grant (1999-2002)
• VEGA 1/0497/08: Risk factors of metabolic syndrome in population of patients with exogenous obesity, mutation of melanocortin receptor 4 and classic form of congenital adrenal hyperplasia with 21 hydroxylase deficiency (2008-2012)

Plans for future research
• Database of DSD in Slovakia
• Genotype – phenotype correlations in DSD patients
• Evaluating risk of gonadal cancer in DSD patients
• Role of Androstendione in evaluating treatment of CAH and other hyperandrogenic states
• Blood pressure and insulin resistance in paediatric CAH patients
• Surgical outcomes in DSD patients – novel approach

Devices and methods
• Genotyping DSD populatin
• Examination of metabolic status in CAH patients
• Analysis of circadian rhythms of blood pressure in CAH patients
• Immunohistochemistry in operated gonads in DSD patients, correlation with genotype

Selected publications

E. Metabolic syndrome in children

Investigators
Prof. László Kovács, MD, DSc, MPH (kovacebox@gmail.com)
Assoc. Prof. Túdmiila Košťálová, MD, PhD
Zuzana Pribilincová, MD, PhD
Eva Vitáriušová, MD PhD
Katarina Prochotská, MD, PhD
Anna Hlavatá, MD, PhD, MPH
Zuzana Blusková, MD, PhD
Katarína Krivošiková, MD

Projects realized in the last 10 years
• VEGA 1/4278/07: Current state of nutrition and incidence of obesity in 6-15 years old children in selected regions of Slovakia (2007-2011)
• VEGA 1/0497/08: Risk factors of metabolic syndrome in population of patients with exogenous obesity, mutation of melanocortin receptor 4 and classic form of congenital adrenal hyperplasia with 21 hydroxylase deficiency (2008-2012)
• VEGA 1/1267/12: Chronic microinflammation of visceral fat and its role in development of cardiovascular and bone complications in obese children and in children with chronic inflammatory bowel disease (2012-2016)
• VEGA 1/0202/17: Humoral, renal and psychological factors in pediatric obesity and hypertension (2017-2019)

Plans for future research
• Etiology of pediatric metabolic syndrome
• Components of metabolic syndrome and hormonal disturbances in praepubertal and pubertal SGA born children
• Components of metabolic syndrome and hormonal disturbances in Roma SGA born children
• Metabolic syndrome in Slovak Roma population
• Etiology pediatric primary hypertension
• Salt consumption and its influence on blood pressure
• Mineral and electrolyte metabolism in children with metabolic syndrome
• Changes in metabolic syndrome after intervention treatment

Devices and methods
• 24 hour blood pressure monitoring
• Adipokines
• Body composition, bioimpedance
• Examination of renal function and renal salt excretion
• Mineral and electrolyte metabolism
• Biochemical and humoral markers of metabolic syndrome
• Analysis of circadian and ultradian rhythms of blood pressure

Selected publications
• Kovács L, Babinská K et al. Obesity, nutrition and physical activity in children. LF UK 2008.
F. Inborn errors of metabolism

**Investigators**
Assoc.Prof. Vladimír Bzdúch, MD, PhD (bzduch@gmail.com)
Darina Behúlova, MD, PhD
Katarína Brennerová, MD
Anna Hlavatá, MD, PhD
Katarína Juríčková, MD
Miriam Kolníková, MD, PhD

**Projects realized in the last 10 years**

**Plans for future research**
- Application of tandem mass spectrometry to biochemical genetics

**Devices and methods**
- Gas Chromatography mass spectrometry (GC/MS)
- Amino Acid Analyzer
- New biochemical methods for selective screening

**Selected publications**


G. Thyroid gland and ORL

Investigators
Miroslav Tedla, MD, PhD (miro.tedla@gmail.com)
Patrik Štefanička, MD, PhD
Lukáš Varga, MD, PhD
Prof. Milan Profant, MD, PhD

Plans for future research
• Effect of thyroid gland surgery on quality of life (monitoring of voice and swallowing alterations)
• Thyroid gland and obesity

Devices and methods
• Molecular-genetic analysis at BMC SAV
• Surgical unit of ORL department in UNB

Selected publications
H. Nutrition

Investigators
Assoc. Prof. Lubica Argalášová, MD, PhD (lubica.argalasova@fmed.uniba.sk)
Jana Babjaková, MD, PhD
Prof. Jana Jurkovičová, MD, PhD
Prof. Ludmila Ševčíková, MD, PhD
Zuzana Štefániková, MD, PhD
Katarína Hirošová, RNDr
Martin Samohýl, MEng, PhDr

Grants and Funding (in the last 10 years)
• VEGA 1/3433/06: Study of somatic development in children and adolescents in relationship with selected genetic and psychosocial factors (2006-2008)
• VEGA 1/1045/12: Physical activity in relationship to somatic development, physical fitness, and psychical balance (2012 – 2014)
• Project proposal in the framework of the Memorandum of Understanding on Academic Exchanges between School of Medicine Comenius University in Bratislava and New York University School of Medicine No. O-15-101-/0001-00: The Youth and Parents Risk Factor Behaviour Survey in Slovakia (YABS) (2015-2016)

Plans for future research
• Detection of selected environmental, behavioral, and psychosocial risk factors of cardiovascular diseases prevalence in adolescents and undergraduate students
• Analysis of selected cardiometabolic parameters in adolescent for prevention cardiometabolic and other chronic diseases
• Monitoring of distribution of risk factors and biological markers in relation to age, sex, education, regions
• Risk behavior in adolescents

Devices and methods
• Reflotron – automatic device for screening of blood lipids and other biochemical parameters in capillary blood
• FUTREX - NIR method for determination of body fat percentage
• BIA method for determination of body fat and lean body mass content (Omron)
• Caliper method for determination of body fat percentage
• InBody 720 – precision body composition analyzer
• Software for nutrients intake and energy expenditure analysis
Selected publications

I. Autoimmunity and autoinflammation

Investigators
Prof. Milan Buc, MD, DSc (milan.buc@fmed.uniba.sk)
Assoc. Prof. Mária Bucová, MD, PhD
Assoc. Prof. Vladimíra Ďurmanová, RNDr, PhD
Monika Homolová, MD, PhD
Juraj Javor, MD, PhD
Zuzana Párnická, MD, PhD
Assoc. Prof. Ivana Shawkatová, MSc, PhD
Magda Suchánková, MD, PhD
Tomáš Dallos, MD, PhD

Grants and Funding (in the last 10 years)
• VEGA 1/1170/04: Genetic predisposition to autoimmune diseases and graft versus host disease (2004-2006)
• MRTN-CT-2004-005693 EURO-RA: Functional genomic approaches targeting rheumatoid arthritis, research fellow within the „Marie-Curie Research Training Networks (2006)
• Familial Mediterranean Fever in Slovakia – description of first cases
• Biomarkers of Autoinflammatory Diseases (IgD in mevalonate-kinase deficiency)
• Genetic determinants of Paediatric Autoimmune Diseases
• Mimics of juvenile idiopathic arthritis

Plans for future research
• Immunogenetic determination of polymorphisms of genes for cytokines, chemokines, inflammatory markers and biomarkers of disease
• Focus on autoimmune diseases: rheumatoid arthritis and juvenile idiopathic arthritis, Sjögren’s syndrome, systemic sclerosis, juvenile dermatomyositis, diabetes mellitus, Crohn disease
• Focus on autoinflammatory diseases: prevalence of autoinflammatory diseases

Devices and methods
• PCR cyclers, ELISA-reader, transilluminator, spectrophotometer, photo-recording system
• PCR-based methods (PCR-RFLP, PCR-SSP)
• HLA typing of classical and non-classical genes
• SNP typing of genes coding cytokines, cytokines receptors, adhesive molecules, membrane antigens and other immune-related molecules
• DNA sequencing
• ELISA for protein detections (cytokines, acute phase proteins, pattern recognition receptors, inflammatory markers)
• Flow cytometry (cell surface markers – CDs, cytokines)
• ELFO (agarose and polyacrylamide gels)

Selected publications
• Krivosikova M, Dallos T, Maslinski W, Buc M. B cell activating factor, its role in autoimmunity, and targeting in autoimmune


J. Inflammation in cardiovascular diseases

Investigators
Assoc. Prof. Mária Bucová, MD, PhD (maria.bucova@fmed.uniba.sk)
Assoc. Prof. Jan Lietava, MD, PhD
Prof. Marian Bernadic, MD, PhD

Plans for future research
• Cytokine polymorphism and inflammation in cardiovascular diseases
• Determination of cytokines, chemokines, and new markers of inflammation, gene expression of TREM-1 and HMGB1, adhesive molecules

Devices and methods
• PCR cyclers, PCR-SSP, RFLP, Taq Man, centrifuges
• DNA/RNA spectrophotometer, transilluminator
• ELFO, photo-recording system
• ELISA

Selected publications
K. Rheumatoid arthritis

Investigators
Assoc. Prof. Zdenko Killinger, MD, PhD (killinger@ru.unb.sk)
Prof. Juraj Payer, MD, PhD, MPH, FRCP
Prof. Jozef Rovenský, MD, DSc, FRCP
Peter Jackuliak, MD, PhD
Kristína Brázdilová, MD, PhD
Daniel Čierny, MD, PhD

Projects realized in the last 10 years
• Determination of cellular and molecular mechanisms responsible for pharmacological modulation of activity of phagocytes - neutrophil granulocytes and microglia cells
• Elucidation of effects of drugs affecting production of free oxygen and nitrate species
• Elucidation of changes in neutrophils activity in patients with rheumatoid arthritis

Plans for future research
• Determination of effect of inflammatory rheumatic diseases on bone metabolism, metabolic syndrome and cardiovascular risk
• Evaluation of bone quality in secondary osteoporosis with focus on inflammatory rheumatic diseases
• Effect of biological therapy on bone metabolism and parameters related to bone quality

Devices and methods
• Whole body densitometer (Discovery Wi Hologic) enabling to measure bone density, morphological scan of spine (software IVA, Hologic), Hip structure analysis software - measurement of several indexes characterizing solidity of femoral cervix, whole body composition - ration of fat, muscle and bone
• Non-invasive evaluation of aortal calcifications by DXA method
• Determination of parameters characterizing bone turnover, calcium phosphate metabolism

Selected publications
L. Inflammatory bowel diseases

Investigators
Assoc. Prof. Tibor Hlavatý, MD, PhD (tibor.hlavaty@gmail.com)
Assoc. Prof. Tomáš Koller, MD, PhD
Assoc. Prof. Peter Celec, MD, Dipl Eng, Dr Rer Nat, DSc, MPH
Prof. Juraj Payer, MD, PhD, MPH, FRCP
Anna Krajčovičová, MD, PhD
Igor Šturdík, MD
Zuzana Lešková, MD

Projects realized in the last 10 years
• Grant APVV (APVV-0672-11): The role of vitamin D in inflammatory bowel diseases (2012-2015)
• Ferring international scientific grant: Screening of colorectal dysplasia in IBD patients (2008-2011)
• VEGA (VEGA 1/0007/08): Pharmacogenetics of therapy for inflammatory bowel diseases (2008-2011)

Plans for future research
• Assessment of the optimal therapeutic regimen of vitamin D supplementation
• Investigation of further potential biomarkers of disease activity
• Investigation of prevention of osteoporosis
• Evaluation of the role of therapeutic drug monitoring
• Systematic reviews and meta-analysis

Devices and methods
• Endoscopy department incl, videocolonoscopy, enteroscopy, chromoendoscopy
• Abdominal and small bowel ultrasound
• Infusion unit at the IBD centre
• Investigation of infliximab through levels and antibody formation
• Investigation of calcium related and calcium not related effects of vitamin D
• Dual energy X-ray absorptiometry
• Trabecular bone score, hip structure analysis

Selected publications


M. Legionnaires’ disease, Leptospirosis, Tularemia, nosocomial infections

Investigators
Assoc. Prof. Margita Špaleková, MD, PhD (margita.spalekova@fmed.uniba.sk)
Martina Kotrbancová, MSc
Miriam Fulová MD, MSc
Vanda Výrosteková, MD, PhD
Jana Jareková, MD, PhD
Erika Macháčová, MD, PhD
Jana Perželová, RNDr

Projects realized in the last 10 years
• VEGA 1/0426/11: Epidemiology and diagnostics of selected infectious diseases – tularemia, leptospiroses and legioneloses by classic and molecular biological methods (2011-2014)
• Project of League against cancer: Risk of legionelloses for paediatric oncologic patients (2016)
• VEGA 1/4281/07: Complex epidemiologic investigation of selected infections with natural focality in Slovakia in genomic era (2007 – 2009)
• VEGA 2/7020/7: Species competensis of vectors in circulation of tick-borne transmitted microorganisms (2007 - 2009)
• VEGA 2/0142/10: Importance of ectoparasitic arthropodes (mites, ticks) in circulation of intracellular proteobacteriae (rickettsiae, anaplasmae, Francisella tularensis) in natural focs on infections (2010-2012)

Plans for future research
• Diagnostics of legionelloses (cultivation, detection of legionella antigen in urine -ELISA, PCR), selogical tests (immunofluorescence, agglutination), participation in international external control (ELISA, PCR)
• Investigation of legionellae colonisation in water systems, risk assessment in hospitals, monitoring of legionella in water in hospitals
• Epidemiological investigation and analysis of community and nosocomial cases
• Surveillance of legionelloses in Slovakia – epidemiologic patterns/characteristics of legionella infections in Slovakia
• Cooperation with ECDC –ELDSNet (notification of cases in TESSY, national focal point, collaboration in TALD –travel associated legionella cases)
• Diagnostics of tularemia in human (serological tests (agglutination), cultivation, PCR), investigation of natural focus – sampling animal sera, risk assessment, monitoring of natural focuses of infection
• Epidemiological investigation and analysis of community cases of tularemia and other vector-borne zoonotic infections
• Surveillance of tularemia – epidemiologic characteristics of francisellae infections in Slovakia
• Cooperation with Veterinary Authorities, Slovak Academy of Sciences
• Diagnostics of leptospiroses (serological tests - agglutination-MAT, ELISA), cultivation, microscopy in dark field, detection of nucleic acid ofleptospiare in PCR, participation in international external control (MAT)
• Notification of human leptospira infection to national EPIS
• Investigation of leptospiral infections in foci (association with animal infections), risk assessment, • epidemiological investigation and analysis of community cases
• Surveillance of leptospiroses in Slovakia – changing epidemiologic characteristics of leptospirae infections in Slovakia
• Epidemiology of nosocomial infections, particularly in paediatric wards/hospitals in Slovakia, infections in children with oncologic diseases
• Diagnostics of legionelloses in patients with underlying diseases in hospitals (cultivation, detection of legionella antigen in urine -ELISA, PCR, serological tests (immunofluorescence, agglutination),
• Surveillance of legionelloses in Slovakia – epidemiologic characteristics of legionella nosocomial infections in Slovakia-notification in national EPIS
• Cooperation with ECDC –ELDSNet (notification of nosocomial cases in TESSY, national focal point)

Devices and methods
• PCR termocycler, centrifuges
• Spectrophotometer, transilluminator
• ELFO, photo-recording system
• ELISA reader
• Incubator

Selected publications
• Spalekova M. Epidemiology of legionellosis in Europe and in the Slovak Republic. Bratisl Lek Listy 2006; 107: 221.
N. Sepsis

Investigators
Assoc. Prof. Mária Bucová, MD, PhD (maria.bucova@fmed.uniba.sk)
Michaela Olejárová, MD
Magda Suchánková, MD, PhD
Anna Dobišová, MD, PhD

Plans for future research
• Determination of biomarkers of early diagnosis of sepsis, differentiation from SIRS and for monitoring and prediction of mortality
• New inflammatory markers TREM-1, TEM-2, sTREM-1, sTREM2, CD64, presepsin, IL-6, IL-10, IL-35 and others
• Immunogenetic determination of cytokines polymorphism and polymorphism of TREM and HMGB1 molecules

Devices and methods
• PCR cyclers, PCR-SSP, RFLP, Taq Man, centrifuges
• DNA/RNA spectrophotometer, transilluminator
• ELFO, photo-recording system
• ELISA
• Flow cytometry

Selected publications
O1. Microscopic structure, development and evolution of thymus

Investigators
Assoc. Prof. Ivan Varga, RNDr, PhD (ivan.varga@fmed.uniba.sk)
Prof. Štefan Polák, MD, PhD
Renáta Mikušová, MD, PhD
Paulína Gálfiová, MD, PhD
Ján Liška, MVD, PhD
Michal Miko, MD, PhD

Grants and Funding (in the last 10 years)
• VEGA 1/0902/11: Thymus in human ontogenesis - changes in microscopic structure and ultrastructure of thymus in children with congenital heart defects (2011-2013)
• APVV-0434-12: Morphologic characterization of reparative and regenerative processes in myocardium during chronic diseases (2013-2017)
• VEGA 1/0086/17: Congenital gut motility disorders: histological and molecular biological study of aganglionar parts of colon of pediatric patients with Hirschsprung disease (2017-2021)

Plans for future research
• Determination of the role of enteric nervous system in the development of immune system, especially in cases of gut aganglionosis (e.g., Hirschsprung disease)
• Microscopic morphological changes of thymus in children in cases of congenital heart defects or sudden infant death syndrome
• The role of thymic Hassall’s bodies in the development of immunity
• Clinical anatomical aspects of congenital anomalies of human lymphatic organs

Devices and methods
• Light and fluorescent microscopy, include immunohistochemistry and histochemistry
• Transmission and scanning electron microscopy
• EDAX analysis

Selected publications
O2. Microscopic structure and blood microcirculation of spleen

Investigators
Prof. Štefan Polák, MD, PhD (stefan.polak@fmed.uniba.sk)
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Simona Polakovičová, MD, PhD
Mária Csöbönyeiová, RNDr
Renáta Mikušová, MD, PhD
Ján Liška, MVD, PhD
Michal Miko, MD, PhD
Michaela Vrabcová, MSc, PhD

Grants and Funding (in the last 10 years)
• VEGA 1/4252/07: The structure of blood microcirculation of human spleen (2007-2009)
• VEGA 1/0902/11: Thymus in human ontogenesis - changes in microscopic structure and ultrastructure of thymus in children with congenital heart defects (2011-2013)
• APVV-0434-12: Morphologic characterization of reparative and regenerative processes in myocardium during chronic diseases (2013-2017)
• VEGA 1/0086/17: Congenital gut motility disorders: histological and molecular biological study of aganglionar parts of colon of pediatric patients with Hirschsprung disease (2017-2021)

Plans for future research
• Determination of the role of enteric nervous system in the development of immune system, especially in cases of gut aganglionosis (e.g. Hirschsprung disease)
• Microscopic morphological changes of thymus in children in cases of congenital heart defects or sudden infant death syndrome
• The role of thymic Hassall’s bodies in the development of immunity
• Clinical anatomical aspects of congenital anomalies of human lymphatic organs

Devices and methods
• Light microscopes
• Fluorescent microscopes
• Electron microscope - transmission and scanning

Selected publications
• Csöbönyeiová M, Danisovič L, Polák Š. Recent advances in iPSC technologies involving cardiovascular and neurodegenerative disease modeling. Gen Physiol Biophys 2016; 35: 1-12.
P. Hereditary ciliopathies, RASopathies and tubulopathies

Investigators
Prof. László Kovács, MD, DSc, MPH (kovacsbox@gmail.com)
Prof. Ludovit Danihel, MD, PhD
Katarína Skalická, RNDr, PhD
Anna Hlavatá, MD, PhD, MPH
Viktor Jankó, MD, PhD
Gabriela Hrčková, MD
Pavol Janega, MD, PhD
Ágnes Baranyaiová, MSc
Anita Vaská, MSc

Projects realized in the last 10 years
• APVV 14/0234: Mutational analysis of genes affecting structure and function of primary cilia and their importance in polycystic kidney disease (2014-2017)
• VEGA 1/0955/11: Mutational analysis, log-term clinical follow-up and therapeutics of autosomal dominant polycystic kidney disease in Slovak children and their family members (2011-2013)
• VEGA 1/0497/08: Obesity in children and metabolic syndrome (2009-2011)
• VEGA 1/4314/07: Screening and mutational analysis of Fabri disease and hyper-IgD syndrome in Slovak population (2007-2009)
• Grant Slovak Ministry of Health 2005/4-DFNsPBA-02: Mutational analysis, early DNA diagnosis and prevention of frequent and severe hereditary diseases of childhood (2005-2008)

Plans for future research
• NGS mutational analysis of genes affecting structure and function of cilia and their relationship to human diseases including polycystic kidney disease and primary ciliary dyskinesia. Pathogenesis of interstitial inflammation at the molecular level and identification of genetic changes along key signal pathways influencing cystic growth and progression of the disease to terminal renal failure. Building and extension of Slovak patient registries for ciliopathies.
• Molecular analysis of causal genes responsible for various inherited forms of diabetes insipidus and renal tubular defects. Development of patient registry for renal tubulopathies.

Devices and methods
• ABI PRISM 3100 Avant genetic analyzer (Applied Biosystems), MiSeq (Illumina),
• Bioanalyzer 2100 (Agilent technologies), AriaMX real-time PCR system (Agilent technologies)
• Covaris ultrasonificator with AFA technology (Covaris), CentriVap DNAVacuum Concentrator (Labconco), Blotting equipments
Selected publications

Q. Extracellular DNA

Investigators
Assoc. Prof. Peter Celec, MD, Dipl Eng, Dr Rer Nat, DSc, MPH (petercelec@gmail.com)
Assoc. Prof. Katarína Šebeková, MD, DSc
Július Hodosy, MD, MSc, PhD, MPH
Roman Gardlík, MD, RNDr, PhD
Barbora Vlková, RNDr, PhD
Ľubomíra Tóthová, RNDr, PhD
Janka Bábičková, MSc, PhD

Grants and Funding (in the last 10 years)
• APVV-16-0273: Deoxyribonuclease activity in plasma and its role in the cleavage of extracellular DNA (2017-2020)
• APVV-0539-12: Salivary steroids and their effects on cognitive abilities according to prenatal testosterone (2013-2016)
• APVV-0447-12: Metabolic syndrome in adolescent children (2013-2016)

Plans for future research
• Plasma deoxyribonuclease activity and extracellular DNA in the pathogenesis of inflammatory diseases
• Metabolic effects of prenatal dietary advanced glycation end products
• Pathomechanisms of neurodevelopmental disorders in animal models
• Molecular biomarkers for point of care testing

Devices and methods
• Animal models of human diseases
• Quantification and characterisation of plasma DNA
• Behavioral phenotyping of experimental rodents
• Analysis of markers of oxidative and carbonyl stress

Selected publications


R. Novel biomarkers in chronic kidney disease

Investigators
Assoc. Prof. Katarína Šebeková, MD, DSc (kata.sebekova@gmail.com)
Prof. Ludmila Podracká, MD, PhD
Assoc. Prof. Peter Celec, MD, Dipl Eng, Dr Rer Nat, DSc, MPH
Kristina Simon Klenovics, MD, PhD
Ľubomíra Tóthová, RNDr, PhD
Alexandra Kovalčíková, MSc
Alžbeta Lencsenyová, MD

Grants and Funding (in the last 10 years)
- VEGA 1/3362/06: Polymorphism of 5,10 MTHR gene and deficiency of folic acid in Slovak pediatric population – incidence and role in multifactorial diseases (2007-2009)
- VEGA 1/0525/10: Defects of folate metabolism in patogenesis of multiple malformations (2010-2011)
- 7FP EC EU, Health-F5-2008-201335, NANOtest - Alternative testing strategies for the assessment of the toxicological profile of nanoparticles used in medical diagnostics (2008-2012)
- VEGA 01/0715/11: Molecular and genetic diagnosis of nephrotic syndrome in children (2012-2014)
- VEGA 1/0613/17: Early diagnosis of osteoporosis in children and adolescents with mental anorexia (2017-2019)

Plans for future research
- Analysis of salivary markers of renal functions
- Pathogenesis of complications of renal insufficiency
- Non-invasive measurement of advanced glycation end-products (AGEs)
- Metabolic consequences of renal diseases
- New potential biomarkers of detecting kidney damage prior to the currently used markers

Devices and methods
- Salivary diagnostics in nephrology
- Non-invasive measurement of oxidative and carbonyl stress
- AGE reader for skin autofluorescence
- Metabolic cages for urine collection from experimental rodents
- Experimental models of renal diseases
Selected publications

S. Bioenergetics and anti-oxidative systems

Investigators
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Jarmila Kucharská, PharmDr, PhD
Olga Uličná, RNDr, PhD
Olga Vančová, MEng
Zuzana Sumbalová, RNDr, PhD
Zuzana Rausová, MSc, PhD
Assoc. Prof. Viliam Mojto, MD, PhD, MHA

Grants and Funding (in the last 10 years)
- VEGA 1/3442/06: Study of damage of bioenergetics and anti-oxidative systems in organism in selected diseases: pharmacological and non-pharmacological approaches in therapy (2006-2008)
- VEGA 2/0173/08: Activation of cellular signaling pathways and transcription factors during adaptation processes in myocardium as alternative approach in protection against ischemia (2008-2010)
- VEGA 2/0090/08: New pharmacological approaches for modulation of rheumatoid arthritis studied on model of adjuvant arthritis (2008-2010)
- VEGA 1/3429/06: Modification of hypertrophy an heart failure in NO (nitric oxide)-deficient hypertension by melatonin (2006-2008)

Plans for future research
- New diagnostic methods for determination of mitochondria features in isolated thrombocytes and lymphocytes in patients with different alteration of mitochondria
- Build up unit of Mitochondrial Medicine

Devices and methods
- Oxygraph-2k (Oroboros Instruments) high resolution respirometry enabling to measure parameters of mitochondrial respiration and complexes of respiratory chain of mitochondria
- Oxygraph 5/6 H Gilson enabling measurement of parameters of oxidative phosphorylation in mitochondria
- High-performance liquid chromatograph with programmed UV detector
- Programmed UV-VIS spectrophotometer Biochrom 4060
- Cooled centrifuges

Selected publications
- Labienec M, Ulicna O, Vancova O, Kucharska J, Gabryelak T, Watala C. Effect of poly(amido)amine (PAMAM) G4 dendrimer


- Mikulecký M, Gvozdjaková A, Kucharská J, Mojto V, Mikulecký M, Singh RB, Cornelissen G. Are mitochondrial energetic in the rat under control of the solar (24 hours) and/or lunar (24.8 hours) day? World Heart J 2015; 7: 119-27.


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