

EDUCATION OF THE FUTURE

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Pavol Jozef Šafárik University in Košice

The Pavol Jozef Šafárik University was established in 1959 as the second oldest and classical University in Slovakia. At present, the University has five faculties Faculty of Medicine, Faculty of Science, Faculty of Law, Faculty of Public Administration, and Faculty of Arts – which prepare, e.g. physicians and dentists, experts in natural sciences, mathematicians and IT specialists, teachers, lawyers, specialists for public administration and specialists for psychology, philosophy and theory of communication in three main cycles -bachelor's, master's / doctor's, and PhD. The process of education is provided in both, Slovak and English language. The graduates of the University have a very good reputation all over the world. The University has been acknowledged as one of the best universities in Slovakia, which is also confirmed by the latest ranking results in the evaluation of universities. Based on the results of the latest comprehensive accreditation process of the year 2015, our University ranks among the top four universities in Slovakia according to the Academic Ranking and Rating Agency (ARRA). The data of the University Ranking by Academic Performance 2015-2016 suggest that the University has been ranked as second in Slovakia, took the 415th place in Europe and the 1003rd place in the world.

The Pavol Jozef Šafárik University in Košice provides higher education based on the latest scientific findings in a wide international context, and it cooperates very intensively with academic institutions from all over the world. The university has more than 7 400 students, while the number of international students exceeds 1 000, which approximately represents 14 % of the total number of students. 2 915 students study for the bachelor degree at our university, 1 574 study for the master degree, 2 434 students are on the doctor level, and 557 on the PhD level. The number of employees reaches 1 524, from which 852 are researchers. A Botanical Garden is also part of the university, which was established in 1950, and it occupies more than 30 hectares.



The university's excellence rests in the interconnection of study and practice, the city of Košice, and the region. The Pavol Jozef Šafárik University is a member of the IT Valley association, the newly built scientific parks equip the laboratories with the most modern technologies, the students of medicine practice their skills directly in a hospital, our students have the chance to acquire experience in the student radio and student television, and also in the German Student Theatre. The university aims to improve the possibilities of its graduates to prove competence in practice by creating useful partnerships with the employers and with the third sector. As a university that is recognized in the field of research, it wants to continuously identify and strategically support the key scientific and research directions, and to present the results to the public.



The Pavol Jozef Šafárik University in Košice belongs to the recognised research and scientific institutions. The university proves this fact by building new university science parks and scientific and research centres, e.g. MEDIPARK, PROMATECH, and TECHNICOM.



The aim of the project "MEDIPARK, KOŠICE" is to build a university biomedical science and technology park, which would be the top national and international centre for applied research and its transfer into practice in the field of biomedicine.

Our vision is a) to integrate human potential with expertise in biomedical sciences and research infrastructure in four major institutions in Kosice – i.e. P. J. Šafárik University in Košice, University of Veterinary Medicine and Pharmacy in Košice, Technical University in Košice and Slovak Academy of Sciences, Institute of Neurobiology in Košice, b) to build the grounds for scientific interactions between academic institutions and the business sector in biomedical research and development with subsequent transfer of the acquired knowledge and innovative technologies into applications in human and veterinary medicine, pharmacy, biotechnologies and bioengineering.

The research activities will be realized in five CORE research programs:

1. Pharmacogenetics and personalized therapy, 2. Metabolism – atherosclerosis – ageing, 3. Neurosciences, 4. Regenerative and reproductive medicine, 5. Zoonozes and important infectious diseases. The transfer of research results from the CORE research programs into clinical practice is expected mainly in the following areas: development of personalized medicine in the therapy of malignancies; personalized therapy in reproduction; innovative measures in the prevention, diagnostics and therapy of atherosclerosis and its complications, diabetes, sleep apnea, renal failure, endocrinopaties, and neurological diseases associated with ageing; innovative technologies in microsurgery and endoscopic





surgery; innovative therapies of degenerative diseases and injuries of nerve tissues and skeleton; innovative preventive epidemiological strategies and diagnostic measures in limitation of zoonozes and infectious diseases.

In summary, by building MEDIPARK, we will achieve the concentration of scientific potential and experimental infrastructure in the fields of medicine, biology, biochemistry, biophysics, bioengineering and informatics, allowing the integration of biomedical research throughout the region of Eastern Slovakia. The applications of the research results will be reflected in the development of innovative preventive, diagnostic and treatment strategies of serious disorders and improvements in clinical practice. Moreover, the outcomes of the scientific work in MEDIPARK will impact public health procedures, education strategies and the progress in biotechnology.

PRMATECH

PROMATECH

The Research Centre of Advanced Materials and Technologies - creates a realistic platform for the development of cooperation between the academia and industry in the field of applied material research that can significantly contribute to the enhancement of the overall competitiveness of the Slovak industry by supporting the implementation of new materials and technologies in production processes and products.

The strategic objective of the project is to build a national centre for the research of advanced materials and technologies for current and future applications, and through the coordination of the research activities of the academic institutions significantly increase the efficiency of research, and to create a modern infrastructure of equipment and staff with joint efforts, which would be sufficient enough to deal with any scientific problems. The aim is to also support the implementation of new materials and technologies in the production processes and products, and thus strengthen the competitiveness of the Slovak industry. The research centre will continuously figure as an integrated, interdisciplinary and sustainable centre, that generates scientific and research results with applicative and innovative potential that are rapidly applied in practice. The university aims to study nanoscale magnetic materials for new types of sensors and hybrid materials based on semiconductors and superconductors for the use in information technology.

The Pavol Jozef Šafárik University in Košice cooperates within the project with the Slovak Academy of Sciences (SAS) (the main coordinator of the project), with the Institute of Materials Research of the SAS, with the Institute of Experimental Physics of the SAS, with the Institute of Geotechnics of the SAS,

with the Institute of Materials & Machine Mechanics of the SAS, and with the Technical University in Košice.

The new laboratories of the Pavol Jozef Šafárik University in Košice that were built within the PROMATECH project include a Laboratory for the preparation of powdered and pressed samples (research on progressive soft magnetic materials and on their possible usage in electrotechnical applications), a Laboratory of magnetic features (research on unconventional magnetic materials from the class of low-dimensional magnets, molecule-based magnets and organic magnets), a Laboratory of scanning scope microscopy STM and AFM (research on the mechanical, tribological and electric features of materials with nanometric resolution, with high energy resolution in high vacuum, and with a possibility to prepare, characterise and manipulate with the samples in a closed a system), a Low-temperature nanotechnology laboratory of magnetic features of materials (research on the magnetic features of materials with nanometric resolution, and with high energy resolution in very low temperatures), a Nanotechnology laboratory for the preparation of nanocomponents for electronic devices, sensors, and environmental applications (research on the preparation of nanostructure and thin coatings by electroplating), a Common TEM laboratory for the preparation of samples (research on the correlation between the structure and physical features of amorphous metallic glasses and nanocrystalline metals prepared by primary crystallisation of amorphous metals), and a Low-temperature laboratory (research on the thermal, electric and magnetic features of materials in really low temperature, in high magnetic fields, and under extremely high pressure).



TECHNICON

The Faculty of Science of the Pavol Jozef Šafárik University in Košice cooperates within this project with the University of Prešov in Prešov and with the Technical University in Košice, who is the main coordinator of the project.

The strategic objective of this project is to build the "Technicom" University Science Park, which will be an internationally acknowledged centre of research and transfer of technologies in the field of innovative applications to support knowledge-based technologies. The first specific objective of the project is to ensure the organization and management of building and running the USP through scientific management. The second specific objective is to build a real and functioning park infrastructure as a sophisticated research and technology unit. The third specific objective is to ensure top applied research and development in selected areas of science, including the social and humanitarian dimensions:

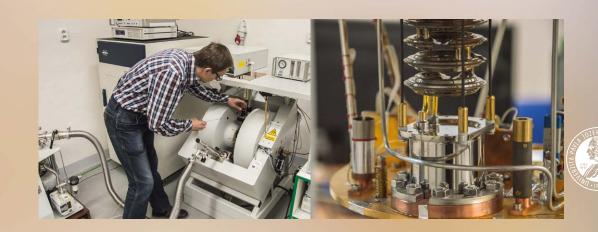
- information and communication technologies
- electrical engineering, automation and control systems
- engineering
- civil engineering (construction, transport, geodesy)
- venvironmental engineering (mining, metallurgy, sciences of water management) including the social and humanitarian dimensions



Science and research at the university is also supported by the activities of our top research teams. The Accreditation Board has classified three scientific teams of the Pavol Jozef Šafárik University in Košice among the top research teams of universities in Slovakia – the Quantum Magnetism and Nanophysics (QMAGNA) at the Faculty of Science, the Research Team of Bioactive Substances for Biomedical Applications (Bioaktiv) at the Faculty of Science, and the Excellent Team for the Research into Atherosclerosis (EXTASY) at the Faculty of Medicine.

The main objective is to reach the following functions:

- to ensure the creation of business incubators for small and for medium "Hi-Tech" businesses, for start-ups, and for spinoff firms, which are generated mainly on the basis of relevant research results and developments, which were carried out within the research and innovating activities and projects of the universities and the institutes of the Slovak Academy of Sciences,
- to support a wide-ranging, effective and mutually beneficial cooperation concentrating on research and development among the institutes of the universities, the Slovak Academy of Sciences, and the organizations from the social and economic spheres,
- to ensure proper conditions for a sustainable development of research with a permanent impact on transfer of knowledge and technologies, and on the innovative practice on regional, national and on international level,
- to become a primary contact for those firms, which are interested in a cooperation with research and development teams from the institutes of the universities



Quantum Magnetism and Nanophysics (QMAGNA)

The team concentrates on the experimental study of fundamental physical phenomena in selected quantum and nanoscopic systems in extreme experimental conditions. The study uses the unique infrastructure that is available at the home university, and the team members regularly visit the so called large-scale facilities of Europe and of other countries as well. The team is also involved in the design and preparation of a new generation of advanced materials with application potential in catalysis, cooling, and imaging techniques.



The Research Team of Bioactive Substances for Biomedical Applications (Bioaktiv)

The team, which consists of two complementary scientific groups, was established gradually after 1990, and it concentrates on the identification of candidate genes encoding the key enzymes of biosynthesis of unique secondary metabolites in the genus Hypericum, and on their mechanisms of action in the target tumor cells. An additional attribute of the team is its multidisciplinary and comprehensive view when solving a particular problem. The team consists of young and ambitious scientists and PhD students mainly, and it represents a suitable starting platform for an academic or other professional career. The Research Team of Bioactive Substances for Biomedical Applications (Bioaktiv) of the Faculty of Science is part of the Institute of Biology and Ecology, which is deployed at two locations – in the buildings of the Faculty of Science (Šrobárova 2), and in the buildings of the Botanical Garden of the Pavol Jozef Šafárik University in Košice (Mánesova 23, 040 01 Košice).

Excellent Team for the Research into Atherosclerosis (EXTASY)

The Centre of Translational Research of Respiratory and Metabolic Diseases of the Faculty of Medicine of the Pavol Jozef Šafárik University in Košice was established in order to ensure the "from the bench to the bedside" (from the laboratory to the patient) approach, and it aims to study the effect of hypoxia on metabolic processes from the level of cells, through the level of tissues and organs, up to the level of the organism (the patient). The uniqueness of the clinical research institute lies in the parallel analysis of numerous physiological functions of an organism while being awake and also during sleep, in their subsequent computer analysis, and in the laboratories of basic research (molecular and biological laboratories and biophysical laboratories). The complexity of the equipment and of the scope of research are unique among the similar institutes of the EU.



UNIQUE LABORATORIES AND EQUIPMENT

- Laboratory of Analytical Cytometry
- Laboratory of Nuclear Magnetic Resonance (NMR)
- Nanolaboratory
- Metallographic Laboratory
- Laboratory of Ferromagnetism
- A joint Laboratory of Transmission Electron Microscopy
- Proteomics Laboratory
- Laboratory of Intelligent Data Analysis (LIDA)
- Laboratory of Experimental Phonetics and Phonology
- Television and Movie Studio
- Laboratory of Structural Analysis
- Laboratory of Stem Cells and Tissue Cultures

- Laboratory of Electron
 Paramagnetic Resonance
- Laboratory of Biomedical and Clinical Microbiology
- Specialised Laboratory of Morphology
- Laboratory of Mass
 Spectrometry and Metabolomics
- Laboratory of Translational Research of Respiratory and Metabolic Diseases
- Laboratory of Genomics and Transcriptomics
- the UHV STM Laboratory
 of the Institute of Experimental
 Physics of the Slovak Academy
 of Sciences and the Institute
 of Physics, Faculty of Science,
 P. J. Šafárik University in Košice

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