Destination Małopolska

Scientific & Research Potential of Małopolska region Poland

euraxess
RESEARCHERS IN MOTION

POLITECHNIKA KRAKOWSKA

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Destination Małopolska

Scientific & Research Potential
of Małopolska region
Poland

Regional EURAXESS Service Centre for researchers
(Małopolska region)
Cracow University of Technology
Technology Transfer Centre
2011 Kraków

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Ladies and Gentlemen,

I would like to invite you to the Małopolska region, a place where you will find not only appropriate conditions and infrastructure to continue your research activity, constantly develop skills and acquire knowledge, but also qualified researchers you could cooperate with.

This overview presents scientific, research and developmental potential of the Małopolska region and its universities as well as research and educational centres. The detailed information on particular units, including main fields of conducted research, scientific achievements, grants, awarded prizes, practical information on staff and equipment, and full contact information provided in the brochure, will contribute to intensification of contacts and stimulation of exchange of views.

The brochure is intended not only for foreign researchers purposing to visit Małopolska, but also for potential scientists or business partners who want to join in an international consortium.

This is an open and no-time-limit invitation to Małopolska.

Jadwiga WIDZISZEWSKA

Director of Technology Transfer Center
Cracow University of Technology

Małopolska region - overview

The Małopolska region (Województwo Małopolskie – Małopolska Voivodship) is a province in southern Poland with a capital in the city of **Kraków**.
It is part of the broader ancient Małopolska which, together with Wielkopolska and Śląsk (Silesia), formed the early medieval Polish state. At present, it has an area of 15 183 square kilometres, and a population of 3 310 094 (2010). It is divided into 22 administrative powiat units equivalent of counties.
One of the unquestionable advantages of Kraków and Małopolska is their favourable geographic location on the crossroads of important transportation routes. Good transport accessibility of the city is being constantly improved by the ongoing infrastructural investment projects.
Location of Małopolska significantly stimulates development of tourism. In 2010 Małopolska region was visited by 11,4 million foreign tourists (research by PBS DGA) attracted by such tourist areas as the city of Kraków and the neighbouring areas south of the voivodship (nowosądecki, nowotarski, tatrzański). The Tatra Mountains, the highest part of the Carpathian Mountains and the highest mountain range in Central Europe, are undoubtedly one of the must-see places.

Małopolska statistics (2009-2010)

Subject	Data	Poland
Population	3 310 094	8,6%
Area	15 183 km^2	4,9%
Population per 1 km^2	218	122
GDP per capita	9315,00 euro	90% national rate 54% EU rate
Unemployment rate (Q2 2010)	Małopolska 9,5% Kraków 5,7%	10,6%
Average monthly salary (gross)	3136,00 PLN ca. 785,00 euro	91% national rate
Companies	301 000	5th in Poland
Export value per capita	1941,00 euro	2719,00 euro
FDI value	12 billion USD	5th in Poland
Foreign companies	3244	7th in Poland
Employment in foreign companies	84 800 (7%)	5th in Poland
EU founds 2007-2013	1,3 billion euro	67 billion euro

The Małopolska region is one of the leaders in utilizing European funds in the period between 2007 and 2013. One should make every effort to use the effects of that, and influence the whole region. The R&D potential of Kraków, the main academic centre of the Małopolska Voivodship, determines its place among the leaders in the country, giving it second position, next to the Warsaw centre. For many years universities in Małopolska have occupied the very top of the rankings of Polish higher education institutions. In 2003, 28 higher education institutions of the Małopolska Voivodship gathered 167 278 students, accounting for nearly 10% of the total higher education student population in the country. The research staff working in higher education institutions in Małopolska represent 12,7% of the total number of Polish researchers. In terms of expenditure on science and research, the voivodship ranks second in the country. As a result of employing given EU funds, universities and research institutes in Małopolska region are bound to influence the development of region's economic competitiveness, support research, and develop scientific potential.

(The above article is based on materials from The Central Statistical Office: www.stat.gov.pl; www.malopolska.pl; www.politykarozwoju.obserwatoria.malopolska.pl).

EURAXESS Poland

EURAXESS Poland is a part of the European EURAXESS Services network across Europe, which is a joint initiative of the European Commission and the countries participating in the European Union's Framework Programmes for Research.

EURAXESS Poland is an information point for internationally mobile researchers wishing to come to Poland or intending to pursue scientific career abroad. EURAXESS Poland consists of 10 regional contact points in major Polish cities. Visiting the Małopolska region you can benefit from our assistance at the Cracow University of Technology. Generally speaking, it is a gateway to attractive research careers in Europe and to a pool of world-class research talents. By supporting the mobility of researchers, EURAXESS assists in establishing the European Research Area as an area of excellence in scientific research. It provides a single access point to information related to the transnational and intersectorial mobility of researchers across Europe.

Changing jobs is easier when researchers and institutions have an institutional support. EURAXESS Portal offers numerous opportunities for work, international collaboration and funding to researchers in Europe. EURAXESS Services centres provide mobile researchers and their families with customised assistance in legal and practical matters relating to their mobility experience.

The EURAXESS site brings together four key initiatives of the European Commission and European countries which support the mobility of researchers in Europe free of charge: Jobs, Services, Rights and Links.

More details and updated information on various aspects of research and stay in Poland as well as job offers at Polish institutions can be found at: http://ec.europa.eu/euraxess/ and http://www.euraxess.pl/.

If you are a researcher and intend to come to Małopolska, please do not hesitate to contact us:

Regional EURAXESS Service Centre for researchers (Małopolska region)
Cracow University of Technology
Technology Transfer Centre
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31-155 Kraków
room no.2
Contact person: Dorota Markiewicz-Roszak
markiewicz@transfer.edu.pl

Cracow University of Technology (CUT)

Cracow University of Technology has been successfully educating engineers for over 60 years. In May 2008, the university was rated by the Newsweek Poland magazine as Poland's best university according to employers who eagerly hire its alumni on account of their high qualifications. Such a recognition proves that Cracow University of Technology offers attractive, high quality and tailor-made study programmes corresponding to market needs. The university's alumni find employment in public and private companies, national and international enterprises, national and regional government administration, design offices as well as at universities and research institutes.

Many of the university's 1200 scientists and teachers are distinguished specialists participating in intercollegial projects, or international research teams. Their knowledge and competence allow the university to a keep steady position in both Polish and international scientific circles. CUT develops many scientific disciplines, such as: architecture and urban design, civil engineering and transport, electrical engineering and technology, environmental engineering, mechanics, and machine design and operation.

Nowadays, Cracow University of Technology offers studies in Polish and English at 7 faculties:

- Faculty of Architecture,
- Faculty of Chemical Engineering and Technology,
- Faculty of Civil Engineering,
- Faculty of Electrical and Computer Engineering,
- Faculty of Environmental Engineering,
- Faculty of Physics, Mathematics and Computer Science,
- Faculty of Mechanical Engineering.

The Cracow University of Technology is open to research cooperation!

	Cracow University of Technology (CUT)
	Politechnika Krakowska
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	E-mail: sekretariat@pk.edu.pl
	WWW: www.pk.edu.pl English version: www.en.pk.edu.pl/

Faculty of Architecture
Cracow University of Technology

Main fields of teaching:

- architectural design; urban, conservatory, landscape architecture, and regional planning;
- history of architecture, the fine arts, building technology, constructions, building physics, descriptive geometry, computer engineering and other arts and sciences;
- environmental design and planning considering professional ethics and environmental relations;
- solving functional, aesthetic, construction, structural and technological problems of architectural and urban design;
- applying building regulations and other laws of design as well as economic aspects significant for the process of development.

Main areas of research:

- history of architecture, urban planning and preservation of historical monuments in Poland and worldwide;
- theory of architecture and architectural design;
- theory of urban planning and design;
- spatial planning;
- theory of rural planning and studies on settlement;
- architecture of workplace and post-industrial areas revitalization;
- theory and methodology of landscape planning;
- modern techniques and technologies in architecture;
- the fine arts and artistic techniques in architecture and urban planning;
- applications and development of computer-aided techniques as tools in architect's workshop.

	Faculty of Architecture Cracow University of Technology (CUT)
	Wydział Architektury Politechnika Krakowska
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	E-mail: a-0@pk.edu.pl
	WWW: www.pk.edu.pl/arch English version: ---

Faculty of Chemical Engineering and Technology
Cracow University of Technology

Main fields of teaching:
- fine organic technology;
- petroleum and natural gas technology;
- plastics technology;
- pro-ecological inorganic technologies;
- engineering of technological processes;
- engineering of biotechnological processes;
- engineering of renewable energy sources.

Main areas of research:
- methods of analysis of chemical pollution of environment, mainly with polychlorinated dibenzodioxins, dibenzofurans, aromatic hydrocarbons and their derivatives;
- design and modernization of pro-ecological chemical technologies;
- technology of lightweight compounds (cosmetics, surfactants, etc.) production;
- quantum-chemical methods of forecasting the chemical compounds reactivity;
- synthesis and chemical modification of macromolecular compounds;
- modelling of refining processes;
- homo- and heterogenic catalysis;
- metal corrosion;
- renewable energy carriers;
- biochemical reactors engineering, intensification and optimization of biochemical processes.

	Faculty of Chemical Engineering and Technology Cracow University of Technology (CUT)
	Wydział Inżynierii i Technologii Chemicznej Politechnika Krakowska
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	E-mail: wiitch@chemia.pk.edu.pl
	WWW: www.chemia.pk.edu.pl English version: ---

Faculty of Civil Engineering
Cracow University of Technology

Main fields of teaching:

- design, diagnostics and modernisation of structures for general, industrial and public utility, and special engineering, including bridges and underground structures;
- new technologies, modern building materials, energy saving engineering, use of non-conventional, ecological energy sources;
- computer-aided design, information systems, teleinformatic networks, databases, computer graphics, structural optimization;
- design and operation of modern new-generation buildings (so-called intelligent buildings), automatic control over a building;
- management and organization in construction industry (including case studies), managing economic entities, finance and human resources management, shaping of strategy and marketing policy;
- traffic engineering, design of traffic systems: roads, streets and highways, modern railways, tram and underground networks;
- transport infrastructure management, safety and environment protection in transport, management of transport and logistics companies, reliability and safety of air transport, operation of airports.

Main areas of research:

- design of and research on construction materials and structures;
- design of and research on buildings and engineering elements and structures;
- modern methods of repair and reinforcement of buildings and engineering structures;
- energy-saving and environment-friendly building;
- road and railway construction;
- traffic engineering and transport problems;
- organization and management of building and transport processes;
- statics and dynamics of structures, taking into account paraseismic effects and wind factor;
- mechanics of elastic, viscous, and plastic materials taking into account damage or contact;
- computational methods in the theory of structures and materials mechanics;
- describing and solving optimal construction shaping and management issues.

Faculty of Civil Engineering
Cracow University of Technology (CUT)

Wydział Inżynierii Lądowej
Politechnika Krakowska

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English version: www.wil.pk.edu.pl/index.php?option=com_content&view=article&id=191&Itemid=285

Faculty of Electrical and Computer Engineering
Cracow University of Technology

Main fields of teaching:
- computer science in automatic systems;
- automatic control of power electronic drives;
- monitoring and diagnostics of electrical and electroenergetic systems;
- electric traction and traffic control systems;
- computer measurement systems;
- electronic control devices;
- engineering of computer science systems and teleinformatics.

Main areas of research:
- computer methods for electromagnetic fields modelling;
- monitoring and diagnostics of AC electric machines;
- power electronics drives with multi-phase induction motors, drives of electric vehicles;
- control of the matrix converters;
- optimal control structures by different quality coefficients and diagnostics of automatic control systems;
- electromagnetic compatibility in electric traction;
- electrical energy quality optimization;
- unconventional light sources electronics;
- microprocessor systems of dynamic measurements;
- rapid prototyping of IT systems;
- computer networks security.

Faculty of Electrical and Computer Engineering
Cracow University of Technology (CUT)

Wydział Inżynierii Elektrycznej i Komputerowej
Politechnika Krakowska

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English version: www.wieik.pk.edu.pl/en/

Faculty of Environmental Engineering
Cracow University of Technology

Main fields of teaching:
- hydro-and geotechnical engineering for technical infrastructure development;
- water engineering – planning, design and execution, methods and technologies with natural criteria taken into account;
- water resources monitoring, management and protection;
- monitoring, assessment and protection against natural and technological hazards;
- waste management and waste treatment technologies;
- water supply and sewage disposal systems – planning, design and execution methods and technologies;
- water and waste treatment technologies;
- cooling and heating methods, design of air conditioning, refrigeration and heating system instruments and facilities;
- renewable energy sources and fluid combustion technologies;
- use of computer systems, methods and technologies in buildings; environmental engineering, and protection of environment.

Main areas of research:
- monitoring, assessment and forecasting of water resources conditions and dynamics;
- development of modern planning methods, and methods and technologies of construction of water engineering structures and facilities with water ecosystems requirements taken into account;
- development of flood risk and drought hazard assessment methods, and planning of systems and means for mitigating those hazards and providing protection against them;
- methods of safety assessment and selection of repair and retrofitting technologies of water and geotechnical structures and facilities;
- searching for solutions in technical infrastructure development under complex geotechnical conditions, especially in urbanised areas;
- modelling and reliability assessment of water supply and sewage disposal systems; development of methods of renovation of their structures;
- development of renewable energy sources and research into efficiency of their use
- research on the use of fluid combustion methods in waste treatment and energy use of biomass;
- complex waste management;
- development of environment monitoring and control systems;
- application of computer science methods and technologies in environmental engineering and protection, and hydro- and geotechnical engineering.

Faculty of Environmental Engineering
Cracow University of Technology (CUT)

Wydział Inżynierii Środowiska
Politechnika Krakowska

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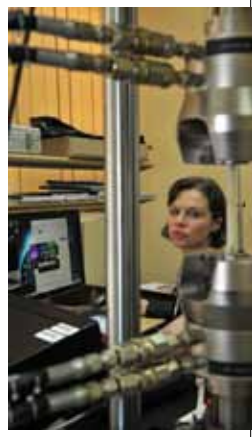
Faculty of Physics, Mathematics and Computer Science Cracow University of Technology



Main fields of teaching:
- parallel large scale computations;
- software engineering;
- project management;
- evolutionary algorithms and global optimization methods;
- methods of computer visualisation of architectural objects and landscape areas;
- strongly correlated fermion systems and dense nuclear matter;
- magnetic properties and phase transitions in systems of intermetallic compounds;
- physical properties of liquid crystals, soft matter, and biological and synthetic polymers;
- equations in Banach spaces and classical functional-differential equations and inequalities;
- functional and complex analysis;
- probability and stochastic processes.

Main areas of research:
- random matrix and quantum chaos;
- analysis and optimal structural design under stability and vibrations constraints;
- many-body theory and strongly correlated fermion systems and dense nuclear matter;
- electronic structure and magnetic properties of intermetallic compounds;
- physical properties of liquid crystals, soft matter, and biological and synthetic polymers;
- ion implantation of glasses and protective coatings;
- equations in Banach spaces and classical functional-differential equations and inequalities;
- probability and stochastic processes;
- set theory and mathematical logic;
- computational methods for fluid- and solid body mechanics and electromagnetism;
- analysis of big deformations of membrane systems;
- methods of computer visualization of architectural objects and landscape domains;
- high performance computing;
- technology of global-logical approach.

Faculty of Physics, Mathematics and Computer Science
Cracow University of Technology (CUT)

Wydział Fizyki, Matematyki i Informatyki
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Faculty of Mechanical Engineering
Cracow University of Technology

Main fields of teaching:

- experimental and technical mechanics, and dynamics of materials arrangements, biomechanics;
- materials science and modern production technologies;
- transport systems and devices, heavy duty machines;
- power engineering, cooling, and air-conditioning systems and devices, environment protection and modern power engineering technologies;
- problems of mass and heat transfer in analytical and numerical approach;
- production systems automation, mechatronics;
- quality, production, company and electronic media management;
- applied information technology, use of IT in technical problems and medicine.

Main areas of research:

- analytical and computer-aided methods of designing and optimizing structural elements;
- structural research of engineering materials;
- research on motor and rail vehicles' properties;
- modern internal combustion engines and application of alternative fuels;
- thermal strength calculations and optimization of power engineering machinery;
- experimental and model research on pumps, compressors, fans and heat exchangers;
- modelling and examining of devices for industry;
- computer-aided design of production processes and systems;
- construction and applications of automatic systems and robots in industry;
- computer modelling methods, computer networks and databases;
- computer graphics and application of image analysis in engineering and medicine.

Faculty of Mechanical Engineering
Cracow University of Technology (CUT)

Wydział Mechaniczny
Politechnika Krakowska

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Jagiellonian University in Kraków

Jagiellonian University's history

In 1364, after many years of endeavour, King Casimir the Great received permission from the Pope to establish a university in Kraków, the capital of the Kingdom of Poland. It was the second university to be founded in Central Europe, after Prague in 1348. Soon afterwards other universities were established in the area (in Vienna – 1365, Pécs – 1367, Erfurt – 1379 and Heidelberg – 1386).

Modern period

The structure of the Jagiellonian University is unique in Poland. Nowadays, three from among the university's 15 faculties comprise the Collegium Medicum. These are the Faculties of Medicine and Dentistry, Pharmacy, and Health Protection. The three faculties were separated from the university in 1950, following the Soviet model, and reincorporated in the Alma Mater in 1993. Until recently, the Jagiellonian University was the only Polish university incorporating medical faculties. Currently also the Nicolaus Copernicus University in Toruń includes them in its structure.

The ancient Jagiellonian University, although covered with the moss of centuries, is simultaneously a young, innovative place. A new, modern campus called the Third Campus, located just 4km from the centre of Kraków, between Zakrzówek and Pychowice districts, is under construction since 1999. In 1999, the Research Centre for the Life Sciences was opened there, and in 2002 the Institute of Molecular Biology and Biotechnology building, with the most up-to-date scientific and technological infrastructure in Poland, and the Institute of Environmental Protection followed. In 2005, a new site for the Institute of Geography and Spatial Management was opened.

The infrastructure in the very centre of Kraków is also being transformed and modernised. In 2005 the Auditorium Maximum – a complex of lecture halls, and the first real conference centre in Kraków, was opened. The construction was financed by the European Regional Development Fund (in the context of Measure 1.3.1) to the order of 29 323 200 zł. With such a facility at its disposal the Jagiellonian University has hosted a range of international conferences and congresses, including the Annual Conference of the European Association for International Education (EAIE), which was held in Krakow in 2005 for the first time in Poland and only the second time in Europe. In October 2006, the JU MC, Faculty

of Medicine opened its Didactic-Conference Centre, located on ul. Św. Łazarza.

The Jagiellonian Centre of Innovation, Ltd., (JCI), founded by the Jagiellonian University, was granted 40 million zł from the Structural Fund (SPO-WKP) to build the Technological and Academic Incubator of Technology Park specializing in Life Sciences. The JCI plan is the first of its type in Central Europe, directed towards the creation and development of hi-tech companies in biotechnology and biomedicine sectors, and development and commercial roll-out of bioproducts in cooperation with industry. The Incubator was switched on in May, 2006. The Cracow Technology Park, initiated by the Jagiellonian University, has been developing systematically, and has already attracted a number of high-profile entrepreneurs, among them Motorola. The construction of other buildings for the life science and hard science faculties as well as the Faculty of Administration and Social Communication continues.

An exceptional collection of old scientific instruments, university memorabilia, and professors portrait gallery, Poland's only permanent interactive exhibition, available for viewing in the unique Jagiellonian University Museum located on Cracovian Latin Quarter reminds us that the Jagiellonian University is Poland's oldest institution existing uninterruptedly despite all the political turmoil Poland experienced.

	Jagiellonian University in Kraków
	Uniwersytet Jagielloński w Krakowie
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Chair of Optimization and Control
Faculty of Mathematics and Computer Science
Jagiellonian University

The Chair of Optimization and Control is a part of the Institute of Computer Science at the Faculty of Mathematics and Computer Science of the Jagiellonian University, Kraków, Poland. The Chair has a dedicated and enthusiastic team with an extensive experience in performing applied mathematical and computer science research at the most prestigious scientific research institutions in Poland and abroad. The team consists of eight faculty members, all PhD degree holders: prof. dr hab. Stanisław Migórski (chair); prof. dr hab. Zdzisław Denkowski, dr hab. Leszek Gasiński, dr Krzysztof Bartosz, dr Maria Forys, dr Piotr Kalita, dr Anna Ochal and dr Maciej Smołka. As of 2008, the Chair is located in a new facility with a modern infrastructure. For further information, see: http://www.uj.edu.pl/ and http://www.ii.uj.edu.pl/~migorski/.

The research in the team has been driven by two factors: the intrinsic beauty of mathematics as well as the necessity of solving practical problems in fields as diverse as computer science and theoretical mechanics. The research interests of the team members cover various areas of Applied Mathematics, Computer Science and Mechanics: Computational Mathematics; Mathematical Modelling in Biology, Engineering and Medicine; Ordinary and Partial Differential Equations; Optimal Control; Nonlinear Analysis with Applications; Nonsmooth Analysis in Contact Mechanics; Numerical Methods for Partial Differential Equations; Optimization Techniques; Software Engineering; and Variational Methods.

Current interests and directions of active research are as follows:

1. Mathematical modelling of various physical systems: applied and industrial mathematics; mathematical theory of contact mechanics; theory of variational and hemivariational inequalities; multivalued laws in mechanics; contact problems in elasticity, viscoelasticity, thermoviscoelasticity, piezoelectricity, etc.
2. Methods and techniques of nonlinear analysis; the calculus of variations in mechanics; nonsmooth analysis; differential equations and applications to mechanics; homogenization and its applications; asymptotic problems in differential equations.
3. Optimal control theory: existence of solutions, sensitivity analysis; theory of G and Gamma convergence; control of mechanical systems described by partial differential equations; optimal shape design problems; approximation of control problems; system modelling and optimization.
4. Identification and inverse problems: techniques and applications;

parameters in models of nonhomogeneous media; inverse problems in engineering mechanics; estimation of coefficients in differential equations.
5. Computational mechanics: numerical algorithms; structures and intelligent machines; numerical methods for partial differential inclusions; finite element and finite difference methods.
6. Modelling of biological and medical systems: models of fast synaptic transmission; neurotransmitters; nonlinear mechanical models of artery walls; dynamics of human central arterial system.
7. Modelling of artificial intelligence and agent systems: optimal scheduling problems for computing agent systems; methods for computing agent framework; multiagent systems; distributed computing; software engineering.

The team is very dynamic and intensively involved in international cooperation with China, France, Greece, Italy, Japan and the USA. The team has participated in European Research within the Sixth Framework Program. In the projects the team has obtained significant results in the study of new, non-standard, modern and challenging problems, and has diffused them within an impressive number of publications in well recognized journals and at international conferences. The team members are internationally recognized for the quality of their scientific production. Keeping in mind the multidisciplinary character of the Chair's research, the team is interested in diversification of its collaborations. It is looking for cooperation with foreign partners in topics of common interest, and would like to attract PhD students from the EU. The research team is open to any initiative of cooperation on interesting projects. All interested parties are kindly asked to contact dr Piotr Kalita.

Chair of Optimization and Control
Faculty of Mathematics and Computer Science
Jagiellonian University

Katedra Optymalizacji i Sterowania
Wydział Matematyki i Informatyki
Uniwersytet Jagielloński

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www.ii.uj.edu.pl/~migorski/

Faculty of Physics, Astronomy and Applied Computer Science Jagiellonian University

Jagiellonian University has an ongoing tradition of research in natural sciences. It is the second oldest (after the Charles University in Prague) educational and research institution in Central and Eastern Europe. The Faculty of Physics, Astronomy and Applied Computer Science consists of the Astronomical Observatory, Smoluchowski Institute of Physics, and Department of Applied Computer Science.

The faculty trains students in physics, biophysics, astronomy and applied computer science on BSc and Master level. It also offers PhD studies in these areas. In collaboration with other faculties in Natural Sciences of Jagiellonian University, it runs interdisciplinary Mathematics and Natural Sciences studies (SMP) and, in collaboration with the Faculty of Chemistry, studies on Nanomaterials and Nanotechnology. There are currently three programs of international PhD studies: Applied Nuclear Physics and Innovative Technologies, Physics of Complex Systems, and Geometry and Topology in Physical Models.

The faculty plays an important and active role in international and local developments in research, education and in application-related projects. The research run in the departments of experimental and theoretical physics covers many fields in nanotechnology and nanoscience, knowledge-based multifunctional materials and new production processes and devices, solid state physics, surface physics, phase transition physics, atomic and molecular physics and molecular dynamics in condensed phases of matter. Other domains of physics represented and extensively developed are investigation of biological systems, nuclear physics of low and high energies, and the structure of hadrons. The departments of theoretical physics perform research on high-energy physics, statistical physics, field theory, theory of relativity, astrophysics and string theory. The Astronomical Observatory carries out solar studies and investigations of space: physics of galaxies, physics of radio sources, extragalactic astronomy, variable stars, observations of comets, relativistic astrophysics and cosmology. The Department of Applied Computer Science carries out extensive applied computer science investigations contributing to the information society technologies. The areas covered in the research include brain-computer interfaces, real-time physics simulations, modelling techniques for games, graph theory and applications, pattern recognition, machine learning, artificial intelligence, intelligent systems in bioinformatics, medicine and biochemistry.

The permanent staff of the faculty includes 100 senior and 60 young

researchers in physics, astronomy and computer science. In general, our leading staff is well recognised in Europe as high-quality researchers, having continuous cooperation with leading scientific centres in Europe, the USA and Japan. 180 foreign research institutes cooperate with the departments of the faculty. The faculty currently hosts over 50 national and 10 international scientific projects. In recent years, the research potential of the faculty was strengthened by a number of large EU and structural funds projects in the Bio, Techno and Info domains.

One of the funded projects is the National Centre of Electromagnetic Radiation for research applications, associated with the Jagiellonian University in Kraków. The Polish synchrotron is going to be the first research infrastructure of such substantial size and potential constructed in this part of Europe. Collaborations with groups interested in the usage and development of the facility is eagerly foreseen and planned, following the spirit of opening the facility for exploring any sound research ideas with partners from abroad.

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UNESCO Chair for Translation Studies and Intercultural Communication Department of Philology Jagiellonian University

The UNESCO Chair for Translation Studies and Intercultural Communication was established in July 2002 by virtue of an agreement concluded between His Magnificence Professor Franciszek Ziejka, Rector of the Jagiellonian University in Kraków, and Koichiro Matsuura, UNESCO Director-General. Professor Elżbieta Tabakowska of the Jagiellonian University was appointed the first Head of the Chair. The Kraków UNESCO Chair belongs to the worldwide network of over 500 UNESCO Chairs in different countries around the world. November 2002 marked the tenth anniversary of the UNESCO Chairs Programme. In December 2006, the UNESCO Chair – which had previously existed as a virtual unit only – gained the status of a research and didactic institute operating within the structure of the Jagiellonian University. The Chair pursues its objectives within the framework of an integrated research and didactic programme realized on local, national and international grounds. The general aim is to integrate and expand current translator and interpreter training programmes, including all forms of oral and written translation, in order to meet the requirements of the current political, economic and cultural situation in Poland after its accession to the European Union.
Detailed information about the UNESCO Chairs network can be found on the UNESCO portal: www.unesco.org.

Programs

The MA programme offered at the UNESCO Chair of the Jagiellonian University is part of the European Master's in Translation (EMT) project, started by the European Commission. The project aims at creating an integrated system of translator training for the needs of EU institutions. Within the framework of the project a modern, cross-sectional training programme has been worked out in line with the requirements of the translation market in the united Europe. The EMT diploma is valid in all Member States of the EU. The EMT network gathers 93 higher education institutions from 24 EU Member States. The UNESCO Chair of the Jagiellonian University is currently one of the two institutions in Poland participating in the EMT project.

Cooperation
The UNESCO Chair cooperates with domestic and foreign institutions by exchanging experiences, students and teaching staff, sharing teaching programmes and resources, organizing student trainings and internships, conducting joint workshops and seminars, etc.

Partners
The UNESCO Chair cooperates with numerous institutions both in Poland and abroad, such as:
Permanent Delegation of the Republic of Poland to UNESCO (Paris),
European Commission (Brussels),
European Parliament (Brussels, Luxembourg),
Committee for European Integration (Warsaw),
Polish National Commission for UNESCO (Warsaw),
Polish Society of Sworn and Specialised Translators TEPIS,
Znak Social Publishing Institute (Krakow),
TAiWPN UNIVERSITAS (Krakow),
British Council (Krakow),
Book Institute (Krakow).

Facilities
Students at the UNESCO Chair of the Jagiellonian University in Kraków have at their disposal a modern laboratory for practicing conference interpreting, a computer laboratory with computer-aided translation (CAT) software, and a richly-equipped library.
The UNESCO Chair publishes a nationwide semi-annual periodical devoted to translation "Przekładaniec" and organizes open lectures on the theory and practice of translation, delivered by Polish and foreign specialists in the field of translation studies.

Research
The research conducted at the UNESCO Chair in Krakow is mainly aimed at improving all stages of the translator training process, which does not yet have a well-established tradition in Poland. Emphasis is also laid on elaborating and using e-learning methods as well as on creating and hosting terminology online databases.

The UNESCO Chair for Translation Studies
and Intercultural Communication
Department of Philology
Jagiellonian University

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Chair of Medical Biochemistry
Jagiellonian University Medical College

Approximately thirty scholars – research and teaching assistants, associate professors, professors – and PhD students currently employed at the Chair form 5 research groups that officially operate within two units: the Department of Physiological Chemistry, and the Department of General Biochemistry. In cooperation with a number of institutions in Poland and abroad (Austria, Bulgaria, Denmark, France, Germany, Great Britain, Italy, Latvia, Norway, Spain, Sweden, the Netherlands, and the USA), research projects, subsidized by national (the Ministry of Science and Higher Education) and international institutions' funds (EU projects: DLARFID – "Dietary Lipids as Risk Factors in Development. Mechanistic Issues," ESTDAB – "European searchable tumour cell line Data Base," ENACT – "European network for identification and validation of antigens and biomarkers in cancer and their application in clinical tumour immunology") have been carried out in recent years.

Five major areas of research include:

1. Physicochemical, kinetic and functional analysis of enzymatic proteins, i.e. aldehyde dehydrogenase, arylsulphatases A and B, cystathionine gamma-lyase, myeloperoxidase, pyruvate kinase, prostate acid phosphatase, rhodanase and sulfurtransferases.
2. Biology and biochemistry of tumour cells (tumour cell lines of prostate, bladder, intestine, melanoma, etc.), tumour development and progression, and possibilities of inhibition of its proliferation and/or migration, stimulation of apoptosis and modifications in signal transduction (expression of adhesion proteins and their N-glycosylation, steroids and other ligands of nuclear receptors, signalling kinases, etc.).
3. Supramolecular systems in immune reactions and signalization. Synthesis of compounds constituting supramolecular systems with a potential application in immunotargeting techniques. An analysis of reactions with proteins: antigen-antibody and antibody structure modification as determinant of effector functions.
4. Metabolism of low-molecular sulfur compounds in animals: cysteine, glutathion, homocysteine, tiazolidine derivatives, modification enzymes. Sulfur amino acid metabolism in normal and tumour cells. Biological activity of thiols, sulfane sulfur-containing compounds, S-thiolation, S-nitrosilation. Patogenesis of arteriosclerosis – the function of homocysteine and folic acid.
5. The influence of reactive oxygen species (ROS; free radicals) on proteins and lipids. Immunogenicity induction and sources as well as importance of chemiluminescence and granulocytes which accompany inflammation processes.

The Laboratory of Cell and Tissue Culture was initiated in the Chair in the late 1990s. In 2005, thanks to the MILAB Program funds granted by the Foundation for Polish Science, the Laboratory for Molecular Biology was also established. Currently the Chair staff members are involved in continuation and development of research projects in the above-mentioned areas.
The Chair staff also actively partakes in medical education; they teach numerous chemistry and biochemistry courses carried out both in Polish and English (School of Medicine in English) mainly at the Faculty of Medicine, as well as at the Faculty of Pharmacy of the Jagiellonian University Medical College. They also supervise master theses (MSc) of students of the Faculty of Chemistry and the Faculty of Pharmacy of the Jagiellonian University, as well as PhD dissertations carried out either within the Jagiellonian University Medical College Centre for Postgraduate Medical Training, or in cooperation with the Faculty of Chemistry and the Faculty of Biology and Earth Sciences, JU.

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Department of Ophthalmology and Ocular Oncology
Jagiellonian University Medical College

Proton beam radiotherapy of ocular malignancies.

Uveal melanoma is the most common intraocular malignancy in adult patients. The overall annual incidence is about 5–7 cases per million. It is higher among fair-skinned, pale-eyed individuals.

Department of Ophthalmology and Ocular Oncology, Jagiellonian University Medical College is a tertiary referral centre serving patients from Poland and abroad for more than 40 years. The Department employs a variety of therapeutic methods in the treatment of intraocular malignancies, ranging from transpupillary thermotherapy, photodynamic therapy, I-125 and Ru-106 episcleral plaque brachytherapy, surgical resection of tumours, to enucleation with intraorbital implants for volume deficiency. The hadron, namely the proton radiotherapy, is gaining more and more significance as a method of ocular tumour treatment. Radiotherapy with a proton beam of initial energy 55-80 MeV is presently clinically recommended. In February 2011 a new proton beam facility in Kraków, established as a cooperation between Department of Ophthalmology and Ocular Oncology of the Jagiellonian University and The Henryk Niewodniczański Institute of Nuclear Physics, Polish Academy of Sciences, started treatment of uveal melanoma. The facility uses the AIC-144 cyclotron, which accelerates proton beam of 60 MeV achieving the 28 mm range of Bragg peak. The eye therapeutic chair from Schär Engineering AG is used for positioning, and the Varian Medical Systems software (Eclipse Ocular Proton Planning) for therapy planning.

Nine patients with choroidal melanoma were treated between February and April 2011. They underwent first surgical placement of tantalum clips followed by proton beam radiotherapy. There were 4 women and 5 men in a mean age of 56 years (38-72). There were 6 cases in which the tumours occurred in right eye, and 3 cases in which left eye was affected. The mean tumour height was 4.11 mm (1.4-9.3) and the largest basal diameter measured on average 10.6 (8.4-15.1) longitudinally and 10.1 (7.8-14.4) transversally. The patients received a dose of 60 CGE in 4 fractions of

15 CGE. Thereafter, an endoresection of the tumour was performed in 2 patients.
The new facility in Middle Europe should satisfy the demand for proton radiotherapy of ocular tumours in Poland.

Keywords
Proton beam radiotherapy, uveal melanoma, intraocular malignancies.
Co-operation
The Henryk Niewodniczański Institute of Nuclear Physics Polish Academy of Sciences, ul. Radzikowskiego 152, 31-342 Kraków, Poland.
Awards:
On May 12th, 2011, during a festive gala at the Marriott Hotel in Warsaw results of the prestigious *National Leadership in Polish Health Care System Competition* results were announced. The Department of Ophthalmology and Ocular Oncology, Jagiellonian University received the 3rd place in the "Innovative Ideas" category.

On the 2nd edition of Distinctions Gala, June 16th, 2011, Prof. Bożena Romanowska-Dixon received the title of "Patron of Health," which is awarded to professionals for outstanding scientific and academic achievements in the field of medicine, contributions to medicine, as well as for accuracy, reliability and generosity.
Department of Ophthalmology and Ocular Oncology also received the title of "Medical Health Jewel" awarded to medical institutions that develop and implement innovative methods of treatment, care about their development and image, and enjoy great recognition and popularity among patients.

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The Chair and Department of Clinical Biochemistry (DCB) Jagiellonian University Medical College

The Chair and Department of Clinical Biochemistry (DCB) is a structural unit of the Jagiellonian University Medical College in Kraków including the School of Medicine in English, which provides basis for scientific research, clinical studies and teaching for medical students and postgraduate physicians.

DCB provides an outstanding research environment for basic and clinical studies, and development of new skills within:

- The Genetic and Nutrigenomic Unit offering high throughput molecular biology methods (real time PCR, sequencing, several microarray systems, microdissection);
- The Molecular Biology Unit with tissue/cell culture; transfection, high resolution bioimaging, flow cytometry, oxygen electrode; and
- The Department of Laboratory Medicine/ Diagnostics where basic and more advanced tests are carried out, including analysis of cytokines and their receptors, mediators, metabolites, growth factors, adhesion molecules and others.

Well-trained DCB team knows how to operate sophisticated laboratory equipment to isolate and culture human primary cells (including progenitors); it has got extensive experience in experimental, genetic and therapeutic clinical research in nutrigenomics, endothelial dysfunction, genetics and lipidomics of obesity, atherosclerosis, diabetes and diabetic complications. Prof. Dembinska-Kieć's group is experienced in the *in vitro* and *in vivo* methods used to monitor angio- vs. adipogenesis (effect of free fatty acids on progenitor cells differentiation), mitochondrial function regulated by fatty acid-derivatives and RXR/PPARs, expression of markers characteristic of inflammation (adipokines), and cells proliferation and apoptosis (iNOS, eNOS, VEGF, Jagged/Notch, IAP etc).

The group has also demonstrated significant expertise in the clinical, biochemical and molecular techniques valuable in the study of roles of free radicals (i.e. NO) and lipid species in angiogenesis, adipogenesis, apoptosis, and neurodegeneration. DCB also includes The Out-Patient Clinic of Obesity and Lipid Disorders. It closely collaborates with other clinical Departments within the JU MC, such as the Chair and Department of Metabolic Disorders, which investigates genetic background of diabetes and diabetes prevention, or the Chair and Department of Endocrinology, the work of which is focused on the

genetic background of lipodystrophy and analyses of gastrointestinal hormones that trigger off increases in the amount of insulin released from the beta cells.

Recent cooperation of the Jagiellonian University, Faculty of Medicine, Faculty of Biotechnology, and The University of Agriculture in Kraków resulted in foundation of the "Center of Advanced Biotechnology of Małopolska" CZT AKCENT. Prof. Dembińska-Kieć is working on integration of research of the EU Polish Platform of Biotechnology with advanced genomics and nutrition studies, to create the Institute of Nutrigenomics in Kraków as the key component of preventive medicine in the future.

In 2001, Prof. Dembińska-Kieć head of DCB, organized a consortium of 10 research Centers from seven EU member states in FW 5 DLARFID "Dietary lipids as Risk Factors in Development Mechanistic Issues." The aim of QLK1-CT-2001-00183 project was analysis of beta-carotene and fatty acid and their role in metabolic disturbances, angiogenesis and cancerogenesis in different disease models. The impact of DNA methylation on the promoters of the angiogenesis-related genes, selected on the basis of earlier microarrays, was investigated. DLARFID consortium used the most advanced molecular biology "omics" techniques and created an international team that has collaborated within several EU projects and actions (i.e. COST Actions that finish this year: "MITOFOOD" and COST BM602 related to muscle, pancreatic beta-cells, adipose tissue interactions in metabolic disorders). DCB team learned a number of methods in transcriptomics, proteomics and metabolomics, beta-cell isolation and culturing (Prof Marcus Niessen, Zurich), and vector-mediated transfection of oxygen stress priming protein p66shc (Prof Francesco Giorgino, Bari). Prof. Dembińska-Kieć gained recognition of European Experts in the field of Nutrigenomics and was invited to The European Network of Excellence, „The European Nutrigenomics Organisation Linking Genomics, Nutrition and Health Research," NuGO (contract nr FP6-2004-506360) as a Board Member. The main goals of NuGO were to create human genetic database with gene expression data, and organize trainings and e-learning courses for the pre- and postgraduate students from the new EU member states and EU candidate countries.

Another EU project in which DCB took part was FP6-2002-FOOD –05944 LIPGENE "Diet genomics, and metabolic syndrome: integrated nutrition, agro-food, social and economic analysis." It was a multi-centre human nutrition intervention study investigating the effects of fatty acid/carbohydrate composition in diet on modification of the insulin resistance markers and inflammatory response in patients representing different genetic backgrounds of metabolic syndrome. The goal of ongoing (to be completed in 2012) LipidomicNET IP FW7 202272, "Lipid Droplets as dynamic organelles of the fat deposition and release: translational research towards human disease" project is to

discover new roles of lipid metabolites in the molecular basis of diseases characterized by pathological lipid metabolism. Another ongoing FW7 IP BIOCLAIMS FP7-KBBE-2009-3-244995 is dedicated to identification of new class of risk biomarkers for insulin resistance endothelial dysfunction by analysis of the postprandial metabolomics in patients with metabolic syndrome. Prof. Dembińska-Kieć's team carried out mechanistic/functional studies using in vitro isolated human cells (adipose tissue stromal vascular fraction preadipocytes, umbilical cord blood progenitors and endothelial cells) for angiogenesis and reconstructive medicine (FW6 SCCR Strep Project). Transgenic animal models (eNOS -/-, BCMO -/-) mice were used to determine the molecular mechanisms that regulate angiogenesis during the adipose tissue differentiation.

The results of the DBC research provided basis for 25 doctoral dissertations in medicine, two habilitations and 15 MSc (biology, analytics) theses. The accumulative number of Prof. Dembinska-Kieć's main publications (in international journals only) since 1992 is above 100 with IF= 210 (with scientific meetings/congresses abstracts in leading journals IF=766,6)

The DBC team's engagement in the genetic (clinical, metabolomics) studies has resulted in an ambitious and challenging vision to deliver new, epigenetics-related family of metabolic risk biomarkers. It is based on the fact that translational biomedical research in metabolic health and metabolism-associated diseases has been identified as a strategic priority in the preventive medicine. The DBC team also provides training to help educate and train clinicians, experienced molecular nutritionists and researchers well up on new research achievements.

The Chair and Department of Clinical Biochemistry (DCB)
Jagiellonian University Medical College

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Chair and Department of Pharmaceutical Botany
Jagiellonian University Medical College

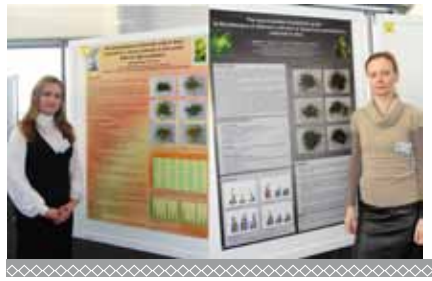
Activities
The department carries out experimental scientific research in the field of plant biotechnology, biotechnology of higher fungi, mycochemistry and phytochemistry.

Research team
Associate Professor, Professor of the Jagiellonian University: 1,
Dr of pharmacy: 5,
MSc of pharmacy: 1.

Key research areas
Plant biotechnology with elements of phytochemistry – establishing and maintaining plant *in vitro* cultures intended as a source of therapeutically important compounds produced either by endogenous accumulation (e.g. phenolic acids, coumarins, flavonoids, lignans, glucosionoletes, lipoic acid) or by biotransformation of exogenous substrates (e.g. biotransformation of hydroquinone into arbutin), comparative phytochemical studies of plants growing *in vivo.*
Biotechnology of higher fungi – establishing and maintaining in vitro cultures (so-called mycelial cultures) of some chosen species of fungi in order to propose methods of obtaining therapeutically important compounds.
Mycochemistry – chemical studies of fruiting bodies of higher fungi, mostly representatives of Basidiomycota, aimed at examining the contents of biologically active metabolites (e.g. non-hallucinogenic indole compounds, phenolic acids, sterols, fatty acids, polysaccharides).

Projects – the chair's research team is currently engaged in many projects, both individual research projects and projects supported by statutory funds.

Innovation – studies at the department are focused on the most up-to-date problems of biotechnology of plants and higher fungi that are solved with advanced research methods. Studies on mycochemistry and biotechnology of higher fungi, may be considered unique.



Achievements and awards
Scientific Award of the Main Board of the Polish Pharmaceutical Society in the category of studies addressing the most important

problems of pharmaceutical sciences was awarded for the thesis qualifying for Associate Professorship (on plant biotechnology). A doctoral thesis on biotechnology of higher fungi and mycochemistry was defended with distinction awarded by the Council of the Faculty of Pharmacy, Jagiellonian University Medical College. Several students were awarded MSc degree with distinction in the area of biotechnology of plants and higher fungi and in mycochemistry.

International cooperation
University in Wurzburg, University in Marburg, Freie Universitat Berlin, Uniwesité d'Auvergne, Clermont Ferrand, Technische Hochschule w Braunschweig.

Laboratories and research equipment
Laboratory for in vitro cultures, basic equipment: laminar flow cabinets, lyophilizer, two liquid chromatographs (HPLC, Merck).

Sought-after research partners
are partners with laboratories for molecular biology and enzymology studies, and/or with expertise in biotechnology of fungi and mycochemistry.

Additional information
organization of scientific conferences: International Conference Eurobiotech 2008 in Kraków, Polish-German Symposium in Dusseldorf.

Chair and Department of Pharmaceutical Botany
Jagiellonian University Medical College

Katedra i Zakład Botaniki Farmaceutycznej
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Chair of Paediatric and Adolescent Neurology Jagiellonian University Medical College

Statistics
1900 children are hospitalized annually in the Paediatric Neurology Clinic of the Chair of Paediatric and Adolescent Neurology. The Clinic includes 6 Laboratories: Video-Electroencephalography and Polysomnography, Electroencephalography, Electromiography and Evoked Potentials, Doppler Neurosonography, Neuropsychology, and Neurorehabilitation. The number of medical advice given by the Outpatients Clinic specialists reaches ten thousand a year. Medical staff includes: 5 academic teachers, 6 physicians, a psychologist, 3 therapists and 2 neurophysiology technicians. Didactic activity of the Chair involves 1050 hours per year. Additionally, 40 individual postgraduate trainings are provided.

The Chair takes the 1st place in the scientific activity among clinical units of Institute of Paediatrics JU MC. Its major scientific programs are:

- paroxysmal sleep disorders in children,
- inflammatory and toxic peripheral nerve diseases,
- cerebral blood flow in syncope and presyncope,
- psychological and neurophysiological parameters in pseudoepileptic seizures,
- assessment of vegetative system in children with migraine.

Collaboration
The Chair collaborates with the Institute of Pharmacology Polish Academy of Science in Kraków.
It seeks for partners to participate in a project on "The impact of the final diagnosis of central and peripheral nervous system disease in children and adolescents on their future individual, family and social life".

Chair of Paediatric and Adolescent Neurology
Paediatric Neurology Clinic
Faculty of Medicine
Jagiellonian University Medical College

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Department of Psychotherapy Jagiellonian University Medical College

The Department of Psychotherapy of the Jagiellonian University Medical College is the first university department in Poland where research, clinical practice and training are primarily concentrated on medical disorders treated with psychotherapy. Scientists and clinicians working at the department are experienced in research and clinical application of psychotherapy, and thus create an environment suitable for conducting research projects in various aspects of psychotherapy. Accurate diagnostic process, well described treatment, stable groups of patients with predictable numbers (approx. 200 patients a year) provide an exceptional setting for researching integrative, intensive, short term group psychotherapy of neurotic (ICD-10 F4 section) and selected personality disorders. Moreover, chosen aspects of individual integrative psychotherapy (predominantly psychodynamic, cognitive and interpersonal) are available for research. Continuous involvement in national and international research projects sustain the research supportive atmosphere.

Current research interests include: effectiveness of psychotherapy, descriptive and qualitative analysis of various aspects of disorders related to traumatic experiences, sexual dysfunctions among patients with neurotic disorders, impact of childhood trauma on effectiveness of psychotherapy treatment, changes in social support in the course of psychotherapy, hypnosis, and psychotherapy training.

Research experience includes (but is not limited to): process and outcome research of integrative psychotherapy (both group and individual), analysis of changes in symptoms in the course of psychotherapy, development of a new personality questionnaire for neurotic disorders (KON-2006), development of symptoms questionnaires for Polish population, translation, adaptation and normalization of psychotherapy-related measures, research on the nature of hypnosis. Moreover, an exceptional research involving patients suffering from war-related PTSD is being performed in the Department of Psychotherapy. The research provides unique data useful in advancing the psychopathologic description of PTSD and enriching understanding of underlying mechanisms of changes in experiencing self and others that emerge as a result of traumatic experience. Comprehensive list of publications is available at:

www.psychoterapia.cm-uj.krakow.pl/. The Department has been actively participating in many international research projects including: SEPTIMUS, EuroPTrain, United Nations Voluntary Fund for Victims of Torture.

The KON-2006 personality questionnaire developed in the department is an innovative tool helpful in diagnosing personality disorders associated with neurotic symptoms, and a unique measure of personality traits, specifically addressed to patients suffering from neurotic disorders. It has been translated into several languages.

The Department of Psychotherapy JU MC is involved in undergraduate and postgraduate psychotherapy training. It hosts approximately 60 new trainees and 70 interns (psychiatrists and psychologists) each year. Furthermore, psychotherapy and psychiatry undergraduate courses hosting more than 200 medical students a year are being continuously performed, and thus the Department of Psychotherapy provides exceptional environment for psychotherapy training research.
Concluding, the Department of Psychotherapy is a productive and research-friendly environment open to cooperation on various psychotherapy-related research projects with national and international partners.

Department of Psychotherapy
Jagiellonian University Medical College

Katedra Psychoterapii
Uniwersytet Jagielloński Collegium Medicum

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Neurosurgery and Neurotraumatology Department
Jagiellonian University Medical College

The Neurosurgery and Neurotraumatology Department conducts a continuing research in the fields of:
"Robotics in Neurosurgery" – This research is conducted jointly with the AGH University of Science and Technology in Cracow. It entails invention of a robot supporting clinical diagnosis and neurosurgical interventions.

"Innovative Polish-made stereotactic device used for the intraventricular catheter insertion" – This project is carried out in cooperation with Cracow University of Technology. A new cost-effective instrument is created on the basis of a Cartesian model, and is used for puncturing ventricles in patients with intracranial hypertension. This model is specifically adapted for patients with traumatic brain injuries who require drainage of the ventricles. This would allow treatment of such patients to occur in Intensive Care Units outside the neurosurgical centres.

"Application of new Computed Tomography techniques in the visualization of laminar and turbulent flow in cerebral arteries after cerebral aneurysm surgery or endovascular procedures" – This research relies on the newest generations of Computed Tomography which is capable of determining changes in blood flow. A positive result would allow for an objective presentation of segmental brain circulation, which may be of importance in discovering patient's underlying pathology, particularly in patients exhibiting turbulent circulation long after invasive treatment.

Should you be interested in obtaining additional information or in joining the department in the research, you are kindly asked to contact dr Mariusz Krupa.

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Chair of Microbiology
Jagiellonian University Medical College

1. Description of the institution and its profile of competence

Chair of Microbiology of the Jagiellonian University Medical College is a leading Medical Microbiology institution among Polish medical schools. The Chair is located in the city centre close to many hotels and a conference venue. It is the only European Society of Clinical Microbiology and Infectious Diseases Collaborative Reference Centre in Poland and this part of Europe. The Chair is also a co-organizer of the international scientific conference EUPROBIO 2012 as well as EUPROBIO 2005 and EUPROBIO 2008 conferences (more at: www.euprobio.com).

The Head of the Chair of Microbiology is Professor Piotr B. Heczko, MD, PhD. The Chair is comprised of 4 departments: Department of Bacteriology, Microbial Ecology and Parasitology; Department of Epidemiology of Infections; Department of Virology and Department of Medical Mycology. Besides academic activities with medical, dentistry and nursing students, the Chair's main research activities are primarily devoted to pathomechanisms and epidemiology of infections in the above-mentioned fields.

The Chair has 4 laboratories, among which there is an outpatient diagnostic facility, department labs and the Microbial Ecology Laboratory. Microbial Ecology Laboratory was founded in 1996. It is situated at the Department of Bacteriology, Microbial Ecology and Parasitology on the 1st floor of the Chair building and its Head is Assistant Prof. Magdalena Strus, PhD. The staff includes associate professors, PhD students, medical doctors, technicians, diploma students and accessory personnel who are involved in studies on human and animal microflora. The Chair cooperates with many facilities in Europe (including UK, Germany, Scandinavia) and the USA. Recent scope of research involves *in vitro* and clinical studies on human G.I. tract (IBD), skin and vaginal flora (bacterial vaginosis, intermediate vaginitis), streptococci (GBS), probiotics: characterization of lactic acid bacteria using both *in vitro* and *in vivo* techniques, studies on pathomechanisms of colon cancer, cooperation with the Polish Society of Hospital Infections in the field of hospital epidemiology and nosocomial infections, cooperation with the

Polish Society for Probiotics and Prebiotics in the field of probiotics, low birth infants and necrotizing enterocolitis.

2. Brief outline on what may be expected from a visit to the institution
One-day visit
General presentation of the department and facilities. Opportunity to speak to several of the staff and to see and briefly discuss one or more areas of special interest. Optional brief presentation about visitor's line of work.
One-week visit
General presentation of department and facilities. Detailed discussion of the Chair's organization and structure of services. The visitor is given an opportunity to speak to several of the staff and to discuss and practice one or more areas of special interest. Diagnostic and therapeutic practices and laboratory manuals in pertinent fields are discussed. The visitor should be prepared to give a short presentation of himself/herself and the parent department. The presentation can touch on special fields of interest and provide the audience with an understanding of the visitor's background, especially pertaining to health care system, organisation of CM and/or ID, and to epidemiological peculiarities. Visit to the medical and university museums possible, depending on availability.

For special training or research/cooperation possibilities, please contact Prof. Heczko directly or via Dr Kochan.

3. Staff, total no.
approx. 60

4. Languages spoken by the staff:
English (2nd language),
Polish (1st language),
German,
Afrikaans (1 person),
French.

5. Approximate number of samples per year in microbiological services:
in bacteriology: 25000,
in parasitology: 3000,
in virology: 6000,
in mycology: 2500.

6. Main services (diagnostic):
bacteriology, virology, mycology, parasitology.

7. Scientific societies related to the institution:
Polskie Towarzystwo Zakażeń Szpitalnych/ Polish Society of Hospital Infections (www.ptzs.org.pl),
Polskie Towarzystwo Probiotyczne i Prebiotyczne/ Polish Society for Probiotics and Prebiotics (www.towarzystwoprobiotyczne.pl).

Capabilities and resources of the Chair include classical culture methods and cell line cultures as well as methods like PCR, RT-PCR, FISH, DGGE, PFGE, RAPD, etc.

8. Research interests of the departments:
1. Hospital epidemiology and infection control,
2. Probiotics and prebiotics,
3. Human microbiota with special regards to vaginal and G.I. tract flora,
4. Herpes viruses,
5. Papilloma viruses,
6. Dermatophytes,
7. Toxoplasma.

Selected recent publications:
1)
Wojkowska-Mach J, Bulanda M, Jaje E, Romaniszyn D, Ziolkowski G, Franczuk B, Gazdzik T, Kochan P, Heczko PB. The risk related to surgical site infections after hip endoarthroplasty- surveillance outcome analysis in two polish orthopaedic centres. Ortop Traumatol Rehabil. 2009 May-Jun;11(3):253-63.

2)
Strus M, Pawlik D, Brzychczy-Wloch M, Gosiewski T, Rytlewski K, Lauterbach R, Heczko PB. Group B streptococcus colonization of pregnant women and their children observed on obstetric and neonatal wards of the University Hospital in Kraków, Poland. J Med Microbiol. 2009 Feb;58(Pt 2):228-33.

3)
Kedzierska A, Kochan P, Pietrzyk A, Kedzierska J. Current status of fungal cell wall components in the immunodiagnostics of invasive fungal infections in humans: galactomannan, mannan and (1-->3)-beta-D-glucan antigens. Eur J Clin Microbiol Infect Dis. 2007 Nov;26(11):755-66. Review.

4)
Gilbert DN, Moellering RC Jr, Eliopoulos GM, Chambers HF, Saag MS. Przewodnik Terapii Przeciwdrobnoustrojowej Sanforda 2011 [Sanford Guide to Antimicrobial Therapy 2011]. Bulanda M, Drzewiecki A, Heczko PB, Kochan P. (eds.) Polskie Towarzystwo Zakażeń Szpitalnych, Kraków 2011 (Polish edition)

5)
Kochan P, Chmielarczyk A, Szymaniak L, Brykczyński M, Galant K, Żych

A, Pakosz K, Giedrys-Kalemba S, Lenouvel E, Heczko PB. Lactobacillus rhamnosus administration causes sepsis in a cardiosurgical patient – Is the time right to revise probiotic safety guidelines? Clinical Microbiology and Infection 2011 [in print].

9. Epidemiological characteristics of the area:
- Hospital infections,
- Lyme Disease,
- Viral respiratory tract infections.

10. References:
European Society of Clinical Microbiology and Infectious Diseases Collaborative Centre,
Reference number: 101

Chair Of Microbiology
Jagiellonian University Medical College

Katedra Mikrobiologii
Uniwersytet Jagielloński Collegium Medicum

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Chair of Department of Clinical Pharmacy
Faculty of Pharmacy
Jagiellonian University Medical College

1. Presentation-Objectives-Key points
The main topics cover the study of behavioural pharmacological properties of centrally acting molecules with potential application in treatment of psychiatric diseases, neurodegenerative disorders and epilepsy, and as pain relievers. Also, pharmacological properties of newly synthesized compounds based on molecular mechanism of ligand-receptor interaction are specified in the frame of wide structure-affinity and structure-activity relationships studies.

2. Scientific staff
Associate professor: 1,
Assistant professor: 2,
PhD students: 2.

3. Research Topics
- Pharmacological properties of compounds with potential antidepressant, anxiolytic and antipsychotic activity, targeted on serotonin, dopamine, GABAA and metabotropic glutaminergic receptors.
- Pharmacological characteristics of compounds with potential anticonvulsant activity and GABA uptake inhibitors.
- Vitamin D metabolism and polymorphisms of the vitamin D receptor gene in relation to structure and function of large arteries and left ventricle.

4. Equipment
- HPLC Waters Alliance 2695 Separation Module,
- Tail suspension stations for automatic assay (Campden Instruments Ltd.),
- Aron apparatus (Bioseb),
- Elevated Plus-maze station for rats (Campden Instruments Ltd) and mice,
- Motor monitor automatic system for rats (Campden Instruments Ltd),
- Vogel Test System for rats (TSE),
- Opto-M3 Dual Axis 20 Cage System with 8 inch X axis sensors and 4 inch Y axis sensors for mice (Columbus Instruments),
- Hot plate analgesia for mice and rats,
- Electroshocker generator for mice and rats,
- Catalepsy – bar test for mice.

5. Partners-Innovation-Awards

- Research contracts with National Science Centre and Adamed Ltd., a Polish pharmaceutical company,
- National cooperation: Institute of Pharmacology, Polish Academy of Science (Kraków), Cracow University of Technology, Institute of Psychiatry and Neurology (Warszawa),
- Patents and patent applications: 4,
- Scientific production 2007-2011: 20 publications (in peer review journals), 4 Masters and trainees supervision,
- Awards: Individual Award of Polish Pharmaceutical Society for Habilitation (Assoc. Prof. Anna Wesołowska, 2010).

	Chair of Department of Clinical Pharmacy Faculty of Pharmacy Jagiellonian University Medical College
	Zakład Farmacji Klinicznej Wydział Farmacji Uniwersytet Jagielloński Collegium Medicum
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Chair of Pharmacology
Jagiellonian University Medical College

History

Modern era in the history of the Chair of Pharmacology of the Jagiellonian University Medical College in Kraków started in 1929 when Prof. Janusz Supniewski became the Head of the Department. In 1964, Prof. Ryszard Gryglewski took over the helm of the department. Under his leadership the department focused its scientific efforts on various aspects of cardiovascular pharmacology. Prof. Gryglewski established collaborations with many of the world's best pharmacology researchers, including Sir John Vane, Nobel Prize laureate. The most important themes included discovery of prostacyclin, and role of nitric oxide and free radicals in vascular biology. Since Prof. Gryglewski's retirement in 2003, the Department of Pharmacology has been led by his successor, Prof. Ryszard Korbut.

Essential scientific achievements in chronological order

- Proposal of dissociation between mechanical and metabolic cardiac effects of adrenolytic drugs;
- Discovery that glucocorticosteroids inhibit the release of arachidonate from membrane phospholipids by inhibiting activity of phospholipase A2;
- A hypothesis that atherosclerosis is a disease from prostacyclin deficiency that is caused by overproduction of lipid peroxides;
- Studies on fibrinolytic action of prostacyclin, nitric oxide (NO) and their releasers such as pyridyl-carbinol, kallikrein or camonagrel;
- Discovery that superoxides selectively destroy EDRF (NO) (endothelium-derived relaxing factor);
- A hypothesis on a combined NO/adenosine–mediated mechanism of myocardial reactive hyperemia;
- Studies on bioflavonoids as superoxide scavengers;
- Discovery of endothelial action of thienopyridines leading to their platelet-independent thrombolytic effect;
- Elucidation of the role of coronary artery superoxide production and Nox isoform expression in human coronary artery disease;
- Discovery of anti-thrombotic activity of 1-Methylnicotinamide (MNA), mediated by prostacyclin.;
- Discovery of highly antiatherogenic action of several agents (e.g. MK-886, BAYx1005, montelukast, AVE 0991) on apoE-knockout mice model of atherosclerosis.

Scientific staff: 20 people, including:
Prof. S. Chlopicki, MD, PhD,
Assoc. Prof. J. Jawien, MD, PhD,
Assoc. Prof. R. Olszanecki, MD, PhD,
Dr P. Wolkow MD,
Dr A. Jakubowski MD.

Current topics

- Mechanisms of action of cardiovascular drugs such as statins ACE-I, -adrenoceptor antagonists, flavonoids, thienopyridins and many others.
- Molecular characterization of COX–products in cultured endothelium.
- Interactions between nitric oxide, carbon monoxide and COX products in endothelium.
- Role of endothelial mediators in erythrocyte deformability.
- Mechanisms of endothelial dysfunction in diabetes and hypertriglycerydemia.
- Role of endothelial dysfunction in progression of heart failure and atherosclerosis in genetically modified mice model of these diseases (Tgaq*44, apoE/LDLR-/- mice).
- Role of leukotrienes in atherosclerosis in apoE/LDLR-/- mice.
- Role of NADPH oxidize in endothelial dysfunction in human coronary vessels and in animal model of hypertension.
- Protective effect of endogenous and exogenous NO in septic shock.
- Anti-platelet effect of S-nitrosothiols and CO releasing compounds.
- Pathways of angiotensin I conversion in the vessel wall.
- Genetic determinants of therapeutic response and adverse effects of oral hypoglycemic agents and insulin in patients with type 2 diabetes.
- The beneficial action of 1-Methylnicotinamide (MNA) in several inflammatory models.
- Mechanisms of antiatherogenic action of AVE 0991 (angiotensin 1-7 agonist) on apoE & eNOS – double knockout mice.
- Role of adipose tissue in blood vessels pathology.
- New metabolic pathways of angiotensin metabolism in cardiovascular disease.

Equipment

Laboratory of Flow Cytometry (Becton Dickinson FACS CantoII),
Laboratory of Mass Spectrometry and Proteomics (Thermo-LCQ ESI MS HPLC, 2D Electrophoresis),
Laboratory of Biochemistry and Molecular Biology (RT-PCR (qPCR),

Western Blot,
Laboratory of Tissue Culture,
Laboratory of Isolated Organs (perfused lung, perfused heart, organ-bath, small vessels myography, platelet aggregometry, erythrocyte dyfractometry).

Chair of Pharmacology
Jagiellonian University Medical College

Katedra Farmakologii
Uniwersytet Jagielloński Collegium Medicum

Head: Professor Ryszard Korbut, MD, PhD

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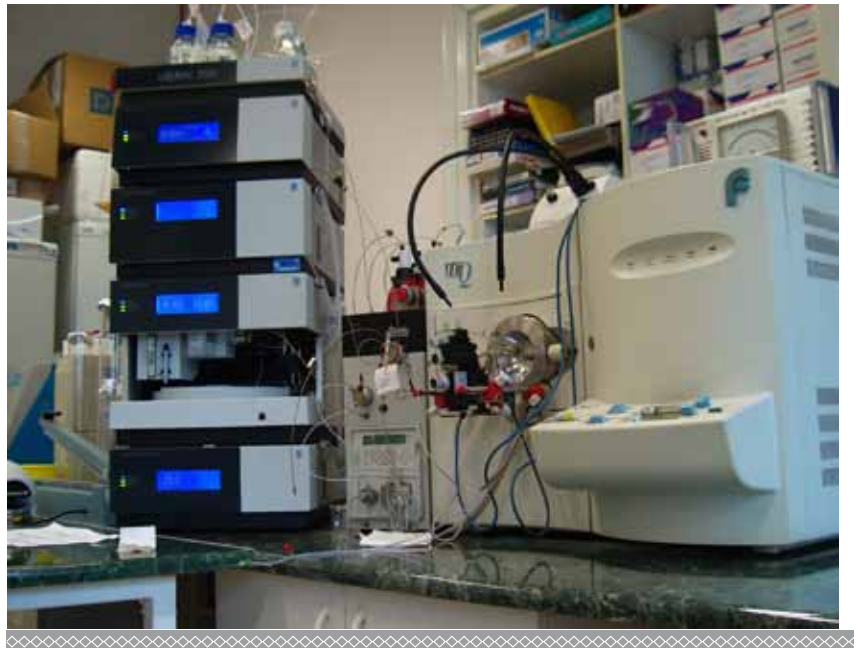
English version : www.katedrafarmakologii.cm-uj.krakow.pl/angindexx.html



Chair of Pharmaceutical Chemistry
Faculty of Pharmacy
Jagiellonian University Medical College

1. Presentation-Objectives-Key points

The main topics cover synthesis, study of physico-chemical, biological and pharmacological properties of biomolecules acting on CNS with potential application in the treatment of psychiatric diseases, neurodegenerative disorders and epilepsy. Structure design and structure-activity relationships of newly synthesized compounds are based on molecular mechanism of ligand-receptor interaction and supported by computer-aided methods.

2. Scientific staff

- Professor: 2,
- Associate professor: 2,
- Assistant professor:9,
- PhD students: 7.

3. Research Topics

3.1. Chemistry

- Chemistry of heterocycles,
- Microwave-assisted synthesis,
- Solid-phase supported organic chemistry,
- Asymmetric synthesis.

3.2. Medicinal chemistry

- Synthesis of compounds with potential antidepressant, anxiolytic and antipsychotic activity, targeted on 5-HT_{1A}, 5-HT_{2A}, 5-HT_{6}, 5-HT_{7}, D_2 receptors,
- Design and synthesis of potential cholinesterases and -secretase inhibitors,
- Design and synthesis of compounds with potential antipsychotic activity targeted on GABAA receptors,
- Synthesis of compounds with potential anticonvulsant activity and GABA uptake inhibitors.

3.3. Analysis

- Molecular modelling: homology modelling of GPCRs, ligand docking, pharmacophore based database search,
- Estimation of cholinesterases inhibition activity with UV spectrophotometry and capillary electrophoresis,
- Determination of newly synthesized compounds structure by means of spectroscopic and combustion analysis,
- QSAR, prediction and determination of physico-chemical properties of organic compounds (i.e. logP, pKa).

4. Equipment

- HPLC Waters 2695 Separation Module,
- Spectrometer LC/MS Waters ACQUITY™ TQD,
- Elemental analyzer (C, H, N, S), Elementar Vario EL III,
- Capillary electrophoresis, Beckman CE System (P/ACE MDQ) with DAD/ UV detector,
- Microwave synthesizer, Discover LabMate CEM,
- Hydrogen generator, $PGXH_2$ 250, Perkin Elmer,
- Spectrophotometer UV, Lambda 12 Perkin Elmer,
- 48 processor computational cluster IBM system x3550.

5. Partners-Innovation-Awards

- Research contracts with National Science Centre and Adamed Ltd., a Polish pharmaceutical company,
- International cooperation: National Institutes of Health, National Institute of the Neurological and Communicative Disorders and Stroke (Rockville, USA), Institut Biomolecules Max Mousseron (Montpellier, France), Ludwig Maximilian University of Munich (Germany), Jullius Maximilian University of Wuerzburg (Germany), Indiana University-Purdue University (Indianapolis, USA),
- National cooperation: Institute of Pharmacology, Polish Academy of Science (Kraków), Cracow University of Technology, Institute of Psychiatry and Neurology (Warszawa), Institute of General and Ecological Chemistry, Technical University (Łódź), Institute of Physical Chemistry, Polish Academy of Science (Warszawa), Collegium Medicum Mikołaj Kopernik University (Bydgoszcz), Faculty of Chemistry, Jagiellonian University (Kraków),
- Patents and patent applications: 5,
- Scientific production 2007-2010: 45 publications (in peer review journals), 60 Masters and trainees supervision, 8 Ph.D., 3 Habilitations,
- Awards: Team Award of The Polish Ministry of Health for Series of Publications (Prof. dr hab. M. Pawłowski, Dr M. Kołaczkowski, 2007), First Degree Award of The Polish Ministry of Health for Dissertation (Dr K. Kamiński, 2009), Team Award of The Polish Ministry of Health for Series of Publications (Prof. dr hab. M. Pawłowski, Dr P. Zajdel, 2010), Team Award of The Polish Ministry of Health for Series of Publications (Prof. dr hab. B. Malawska, Dr K. Kulig, Ms M. Ignasik, 2010).

Chair of Pharmaceutical Chemistry
Faculty of Pharmacy
Jagiellonian University Medical College

Katedra Chemii Farmaceutycznej
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English version:---

AGH University of Science and Technology (AGH UST)

AGH University of Science and Technology is one of the best, most renowned and most modern Polish universities, for years holding top positions in press ratings of state technical institutions of higher education.It is a leading Polish university in the field of modern technologies, rated highly on the international arena. The university's popularity is also determined by its long and rich traditions – it has been educating the most-needed engineering specialists in Poland for over 90 years.

University authorities value and support international collaboration. They have signed nearly 400 agreements of collaboration and co-operation with universities and scientific research institutions worldwide. The university partakes in experiments conducted in particle physics centres of CERN in Geneva and DESY in Hamburg, and centres of synchrotron radiation in Grenoble, Trieste and Hamburg, to name a few.

AGH UST is a member of many Polish and international organizations, which enables it to take part in the activities of working parties, international discussions concerning organization of educational processes and scientific issues, as well as restructuring higher education system in the face of changing external conditions. A significant success of AGH UST has been its incorporation into the Knowledge and Innovation Community "InnoEnergy" of the European Institute of Innovation and Technology (EIT) as the only Polish university. It may be worth emphasizing that on December 16, 2009, the EIT Governing Board approved three Knowledge and Innovation Communities (KICs), including "InnoEnergy." The so-called "collocation centres" in Karlsruhe, Grenoble, Barcelona, Eindhoven-Leuven, Stockholm and Kraków are part of this community. In the Polish centre named CC Poland Plus-Kraków "Clean Coal Technologies" will be the main subject area.

AGH UST is an important centre of the development and transfer of new technologies, and aims at creating mechanisms facilitating and intensifying transfer of innovative technologies from the university to entrepreneurs and other external institutions.

The range of research projects conducted at the university is wide and has always resulted from the structure and contemporary needs.

Among 15 faculties and one multidisciplinary school there are units dealing with traditional yet systematically modernised branches of industry and economy. AGH UST employees and graduates continue to play an important role in the development of Polish industry and other branches of economy.

The university has a large group of independent researchers and scientists: nearly 300 holding a title of professor, and over 200 with postdoctoral qualifications. Without professional teaching and research staff it would not be possible to ensure a high level of education and research works. Numerous and highly-qualified staff are the strength of the university.

The university has at its disposal modern scientific research equipment, which enables it to conduct research at the highest possible level. The equipment includes (but is not limited to): the most powerful in this part of Europe microscopes for testing metals structures, or the so-called "rigid testing machine," which allows to examine processes of rock cracking and crushing, electron microscopes, equipment for complex testing of solid bodies, their surface in particular, mass spectrometers, numerous devices and machines for carrying out environmental tests etc.

Research activity of the AGH University of Science and Technology comprises eight subject areas:

- Information Technologies,
- New Materials and Technologies,
- The Environment and Climatic Changes,
- Energy and its Resources,
- Mining,
- Electrical and Mechanical Engineering,
- Exact and Earth Sciences,
- Social-Economic Sciences and Humanities.

AGH University of Science and Technology

Akademia Górniczo-Hutnicza im. Stanisława Staszica w Krakowie

Head: Rector, Prof. Antoni Tajduś

Contact person: Tomasz Pyrć, MSc
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The Cracow University of Economics (CUE)

The Cracow University of Economics (CUE) is the largest higher education institution of economics and business in Poland. The CUE has four faculties – Faculty of Economics and International Relations, Faculty of Finance, Faculty of Commodity Science, and Faculty of Management. The university educates about 21 000 students of all forms of studies and employs 1200 faculty staff members.

The CUE pays special attention to international academic and educational cooperation. It has about 200 foreign partner institutions – universities and academic organizations from Europe, North and South America, Asia and Australia. Research programmes of the university cover a broad range of areas. In addition to economics, finance, accounting and management, faculty staff is conducting research in technical, biological, and chemical sciences as well as in law and humanities.

The university occupies the leading position in Poland in almost all areas of research and contributes significantly to the international scientific life. The following domains are of particular importance to the CUE – accounting, corporate finance, econometrics, economic history, entrepreneurship, European studies, hospitality management, international economics, international finance, micro- and macroeconomics, all domains of modern management, marketing, public administration, public finance, real estate and statistics.

Research projects in those fields are developed in cooperation with a large variety of institutions, both private and public, from Poland and abroad. Several projects are supported by various funds from the Polish Government, the European Union and other international private and public sources. The topics of recent international research projects include development of accounting standards, banking in transition countries, environment protection, financial econometrics, international management, knowledge management, real estate, small and medium-size enterprises, social economics, statistics, sustainable development and urban regeneration.

The Cracow University of Economics offers a wide variety of educational programmes at all levels in accordance with the Bologna Process rules. In addition to the Polish language studies, the CUE constantly seeks to broaden the international dimension of its teaching. Students have an opportunity to complete entire degree course in English in International Business, or part of the curriculum in English (English Track, Public Administration). Its students have also a chance to receive double diplomas in cooperation with some of the CUE's partners. Recently, the International Doctoral Studies Programme has been launched.

A broad range of postgraduate studies is offered by the Cracow Business School and the Małopolska School of Public Administration (MSAP), which are the post-graduate training units of the Cracow University of Economics. Other educational offers of postgraduate level include the Executive Master of Business Administration Programme, in cooperation with the Stockholm University School of Business, and the International Master of Business Administration – European Multicultural Integrated Management Programme, in cooperation with St. Gallen Business School. The MSAP offers the Master of Public Administration Programme in cooperation with Grand Valley State University, Grand Rapids, Michigan, USA.

Recently, *Applied Informatics* educational project supported by the European Union within the European Social Fund scheme has been opened. The main objective of *Applied Informatics* programme is to deliver IT knowledge to students at undergraduate, graduate and postgraduate level. This field of study focuses on theoretical principles of computer science, computer programming and operating systems.

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The University of Agriculture in Kraków

The University of Agriculture in Kraków provides modern knowledge and skills in agricultural sciences, forestry, biological and economic sciences, and engineering. The Małopolska Centre for Monitoring and Certification of Food operating at the university is considered one of the most modern food laboratories in Europe. It is focused on assessment of the nutritional value of food, presence of contaminants in the agricultural and food articles, and qualitative and quantitative food changes occurring under influence of different treatment technologies.

The university structure also includes The Technology Transfer Centre established in 2010. The objectives of the Centre consist mostly in:
a) providing consulting, information, training, promotional and other services within the area of intellectual property protection, technology transfer, entrepreneurship and innovation stimulation;
b) performing tasks within the university as well as rendering services to other institutions and businesses;
c) establishing relations between the university and entrepreneurs;
d) protection of the university's intellectual property by patent agents;
e) supporting other university units in their efforts to obtain funding from Structural Funds;
f) cooperation with the university organizational units, local and state authorities, public and private research centres, associations, foundations in the country and abroad.

Innovation projects:
Selected ongoing projects:
1. Human Resources Development Operational Programme:
   a) "R&D project professional manager - postgraduate studies for academics".
   b) "Expertise and experience – basis for research commercialization".
   c) "Innovative educational offer of the University of Agriculture in Kraków".
2. Innovative Economy Operational Programme:
   a) "The Use of White Cabbage for the Purposes of Soil Fitoremediation and Biofumigation (AGROBIOKAP)".
   b) "Biotechnological Tools Used to Obtain Crops of Increased Drought Resistance POLAPGEN".
   c) "Biomass in Production of Environmentally Friendly Polymers".
3. The project is funded by the Ministry of Science and Higher Education under the Innovation Creator programme called: "Innovation Creator – Supporting Academic Entrepreneurship".

Best practices in science-business cooperation:
Participation in the work of the following clusters:
- LifeScience Cluster Kraków,
- Małopolska IT Cluster,
- AKCENT Małopolska,
- Energy Cluster.

Our offer:
Project management
- drafting applications for research and implementation projects,
- R&D project coordination,
- seeking partners for scientific and technological cooperation.

Technology transfer and research commercialization
- market analysis,
- conducting technological audits,
- trainings within the scope of technology transfer,
- registration of projects for which funding is sought,
- assistance in launching new businesses dealing with technology transfer,
- Technological Roadmapping services.

Trainings and conferences
- open and customized trainings,
- rental of training rooms and a lecture theatre intended for conferences, seminars, etc.

	The University of Agriculture in Krakow
	Uniwersytet Rolniczy im. Hugona Kołłątaja w Krakowie
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Andrzej Frycz Modrzewski Krakow University (AFMKU)

Andrzej Frycz Modrzewski Krakow University (AFMKU) is a fully-fledged, accredited, non-public higher education and research-oriented university. It has been recently celebrating the 10th anniversary of its foundation. The history of the university may be short, albeit a rich and unparalleled story of success. It is now a thriving and vibrant academic centre located in the second largest city in Poland, Kraków. Within 9 faculties, it offers 29 fields of study granting academic degrees (BA, MS and doctoral degrees), and extensive research activity. The university has its own state-of-the-art Campus, which comprises the university administration, excellent teaching and scientific facilities, computer labs, library, TV studio, art galleries, biochemical and genetic lab, fitness centre, university hotel and more.

Research area

Information on the university's achievements and activities in various fields is available on the website: www.ka.edu.pl. It provides information on faculties' major multidisciplinary research, publications by university staff in the fields of pedagogy, economy and management, law, international relations, psychology, and political sciences. Much of this faculty-driven research takes place in faculties, departments, and interdisciplinary programs. The synthesis of teaching and research is fundamental to the AFMKU. The AMFKU pays special attention to helping interested students approach different project topics under supervision of faculty mentors. All of the projects can help students to chose appropriate universities for their Erasmus Studies Programme.

The following research and initiatives are at the heart of the AFMKU's efforts:

Faculty of Law and Administration:

Protection against discrimination in the national labour law in the light of the European Union law - Halina Wierzbińska, PhD (hwierzb@poczta.onet.pl);

Abuse of dominant position in the light of the modernized principles of competition law regarding unilateral market practices of entrepreneurs - Konrad Kohutek, PhD (konkoh@poczta.onet.pl);

Statute of limitations for criminality of actions, penalty execution and other measures in the system of written law exemplified by Poland

and Austria and in the common law system illustrated by Great Britain - Katarzyna Banasik, PhD (kbanasik@afm.edu.pl);
New methods of lie detection - Professor Jan Widacki, PhD (jan.widacki@gmail.com);
Improvement of the legislative process effectiveness – Professor Tadeusz Biernat, PhD (tbiernat@afm.edu.pl).

Faculty of International Relations:
Energy security policy of the 21st century Germany – Beata Molo, PhD (bmolo@afm.edu.pl);
Modern Confucianism. History and cultural meaning, adaptation models in modern times and social function in the People's Republic of China – Professor Maria Roman Sławiński, PhD (mrslawinski@poczta.onet.pl);
State in the Muslim Middle East. Genesis processes and permanence factors – Professor Jerzy Zdanowski, PhD (jzdanows@adminpan.waw.pl).

Faculty of Humanities:
The value system of students of public and private tertiary education institutions – Professor Tadeusz Michalczyk, PhD (tmichalczyk@poczta.onet.pl);
Conditions for accomplishment of tasks concerning reintegration of natural families of children brought up in family-based and other social care and education centres - Professor Renata Stojecka–Zuber, PhD (renata-stojecka-zuber@wp.pl);
Academic education and psychological development of students – Associate Professor Stanisław Nieciuński, PhD (snieciunski@op.pl).

Faculty of Political Science and Social Communication:
The axiological status of sexual minorities in the Polish media discourse - Anna Frątczak, PhD (afratczak@afm.edu.pl);
Twenty years of democracy – political activity of the 1989 generation – Professor Katarzyna Pokorna–Ignatowicz, PhD (katarzyna.pokorna@gmail.com).

Faculty of Economics and Management:
Employee Evaluation - Professor Wiktor Adamus, PhD (adamus@uj.edu.pl);
Methodology of multi-factorial comparative analysis - Professor Andrzej Iwasiewicz, PhD (andrzej.iwasiewicz@interia.pl).

Faculty of Psychology and Family Studies:
Evaluation of actions undertaken in an attempt to activate the local community in Kraków – Krystyna Kluz, PhD (kluz.krystyna@gmail.com);
Theoretical and practical aspects of cooperation between the third sector organizations and the local government of Kraków in the field of professional and social rehabilitation of the disabled - Mariusz

Parlicki, PhD (mparlicki@interia.pl);
Biopsychosocial resources for health of children and teenagers – Professor Zofia Dołęga, PhD (zosiadol@wp.pl);
Research on creativity and possibility of its stimulation – Andrzej Mirski, PhD (artmir@o2.pl);

Psychopathy as a risk factor of criminal violence – Anna Czerniak, PhD (aczerniak@afm.edu.pl).

Faculty of Architecture and Fine Arts:
Architecture of passenger terminals at the turn-of-the-century airports – Associate Professor Piotr Wróbel, PhD, Eng (piotrwrobel01@gmail.com);
Types, patterns and techniques related to ceramic flooring in the architecture of the 13th-15th century Kraków – Professor Tomasz Marek Węcławowicz, PhD (tomasz@weclawowicz.pl);
Logics of beauty in Peter Zumthor's architecture illustrated by his recent works – Barbara Stec, PhD, Eng (bara.stec@gmail.com).

Faculty of Security Studies:
Teacher competences in the light of Education for Security – Wiesław Szot, PhD (wiesio27@wp.pl);
National and international security in the changing areas of modern reality – Professor Sławomir Mazur, PhD (smazur@orange.pl).

Faculty of Health and Medical Science: Nursing, Cosmetology, Medical Emergency, Physiotherapy):
Professor Maria Kapiszewska (mkapiszewska@afm.edu.pl):

1. *Influence of genetic polymorphism on DNA damage in lymphocytes isolated from pregnant women's blood, and induced by changes in sex hormones and air pollution.*
2. *Effect of exposure of pregnant women to air pollution on birth outcomes.*
3. *Influence of dietary flavonoids on genetic stability of lymphocytes from pre-menopausal healthy women. Genotype polymorphism of the catechol-O-methyl transferase gene (COMT) and the concentration of estradiol.*
4. *Genetic and physiological trade-offs between women's reproductive effort, quality of life and longevity.*
5. *Ovarian steroid hormones in premenopausal women from populations with different incidence of breast cancer: disentangling the interaction of genetic polymorphism of CYP17 and lifestyle variation.*

Professional and intellectual challenges facing nurses undertaking bridging undergraduate courses – completion of the course of studies in

combination with professional career and private life – Anna Goździalska, PhD (anna.gozdzialska@gmail.com);
Nicotinism-related problems among students of junior secondary schools in the Province of Lower Silesia participating in the "Find the Right Solution" tobacco smoking prevention programme - Mariola Seń, PhD (mariola.sen@onet.eu).

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Entrepreneurship and Management Faculty Wyższa Szkoła Biznesu - National-Louis University (WSB-NLU) Nowy Sącz

WSB-NLU is a university with unique traditions of international cooperation. Since its beginnings, the university's main aim has been to provide students and graduates with possibilities of rich intellectual and practical development.

The university's curriculum, created jointly with teachers and lecturers of National-Louis University in Chicago, is based on the best global formulas. Classes are conducted in small groups, and students solve a lot of case studies in their classes.

Studying at WSB-NLU presents students with a myriad of global opportunities. The university actively cooperates with over 30 universities all over the world, and its students and staff regularly participate in international symposia and conferences.

The Entrepreneurship and Management Faculty maintained high 2nd category of scientific units in 2005-2009. The greatest challenge facing the Faculty is to intensify international cooperation in the following areas:

- **Finance management**;
  1) Application of iterative techniques in income approach (i-DCF method). Coordinator: Wiktor Patena, PhD.

  2) Creating portfolios optimizing growth rate by means of logarithmic utility function. Coordinator: Krzysztof Tokarz, PhD.

- **Process management**;
  Research focuses on organizational conditions of process management, methodology of process classifications, process measures, designing process organizations. Coordinator: Natalia Potoczek, PhD.

- **Inventory management;**
  The aim of the project is to analyze and synthesize contemporary approaches to modelling and optimizing inventory decisions in a global supply chain. Coordinator: Piotr Staliński, PhD.

- **Tax policy**;
  The aim of the research is determining whether harmonization of personal income taxes in the European Union member states is possible and advisable. Coordinator: Tomasz Wołowiec, PhD.

- **Regional studies**;
  The Institute of Regional Studies (Dariusz Woźniak, PhD) is conducting research on methods and techniques of diagnosing the regional potential, and the evaluation of social and economic programmes (such as regional operational programmes, strategies of provinces, etc). Special attention is paid to the situation of spas in Poland.

- **Econometric modelling**;
  The project reviews and tries to construct new algorithmic quantitative models using the bootstrap technique to describe the dynamic development of metropolitan areas and related regions. Coordinator: Jacek Leśkow, PhD (cooperation with ENS-Cachan in Paris).

- **Entrepreneurship and development strategies of the SME sector**;
  Research on the dynamics of development and administrative and financial barriers limiting the development of the SME sector (e.g. in the Małopolska region as a model system). Coordinator: Marta Gancarczyk, PhD.

- **Marketing**;
  The research aims at intensifying relations between administration, entrepreneurs (managers) and universities, and identifying behaviour of the representatives of the above groups shaping friendly relations. Coordinator: Marek Rutkowski, PhD.

- **Knowledge and innovation management**;
  1) Knowledge audit in an enterprise. Coordinator: Anna Ujwary-Gil, PhD.

  2) Research on innovativeness of Polish enterprises is conducted by the Innovation Centre at WSB-NLU (Michał Jasieński, PhD). In its work the Institute is developing a tool created by R. Hackmann and his team - Team Diagnostic Survey (TDS).

- **Strategic management**;
  The aim of presented research is to identify the key factors accounting for the outcome of a strategic choice. The team also plans to work on the construction of a tool supporting this decision-making area. Coordinator: Piotr Czarnecki, PhD.

- **Management in higher education**;
  Since the beginning of 2011, a special research institute (Institute of Research on Higher Education), run by Julita Jabłecka-Prysłopska, has been dealing with the issue of effectiveness of higher education institutions in Poland.

- **Competition and consumer protection**;
  The aim of the research is to analyze the scope and type of unfair market practices employed by enterprises in order to harm competitors and consumers. Coordinator: Jerzy Choroszczak, Ph.D.

Results of some of the research in the above areas may be found in an English-language annual publication of the Faculty: Management-Business-Innovation (www.mbi.wsb-nlu.edu.pl).

	The Entrepreneurship and Management Faculty Wyższa Szkoła Biznesu – National-Louis University Nowy Sącz
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The Oil and Gas Institute

The Oil and Gas Institute (Instytut Nafty i Gazu, INiG) is a research and developmental unit, subordinated to the Polish Ministry of Economy, and working for the benefit of petroleum and natural gas industries.

The register of projects developed in the Institute makes a long and diverse list, which includes expert opinions, monographs on solutions of design and technological problems, significant comprehensive works which contributed to discovering new deposits of petroleum and natural gas, manufacturing and operating tools allowing their exploitation, and implementation of technologies necessary for cleaning, transport, processing and use.

Involvement in bilateral projects with both European and non-European partners (e.g. Russia, Ukraine, Belarus, Switzerland, Norway, France, the USA and Australia) provides valuable references for international cooperation.

INiG, with its operating income growth of 90%, has been ranked among the fastest growing companies in the Małopolska region (voivodship) and awarded the Gepard Biznesu 2009 (Business Cheetah) title.

INiG is also placed high on the POLISH INTELLECTUAL CAPITAL TOP 50 ranking, which lists 50 Polish companies with the greatest intellectual capital.

In 2010, the Chapter of the Polish Promotional Logo awarded the Institute the Teraz Polska prize in the 3rd edition of the *Innovative Ventures* competition for its "Modified, Catalytic Hydrogen Process for Waste Oil Regeneration" technology, which was implemented on industrial scale in the Jedlicze S.A. Oil Refinery in 2008.

INiG also received the prestigious *Great Place to Work* prize awarded to world companies enjoying the greatest confidence of their staff. In 2009, in the first Polish edition of this competition, the Institute was ranked among the 10 most attractive workplaces. The year 2010 saw the Institute take the 2nd place in the category of companies employing less than 1,000 staff.

The Oil and Gas Institute received over 100 medals and awards at exhibitions in Seoul, Kuala Lumpur, Taipei, Geneva, Nuremberg, Moscow and Brussels, to name a few.

It takes pride in having almost 1000 patents registered.

The Institute headquarters is located in Kraków, Poland.

INiG employs for over 400 employees in total.

The directions of the substantive activity of the Institute have become a significant part of the domestic as well as European policy of the sustainable development of power industry:

- evaluation of oil and natural gas prospecting forecasts with methods of geology, geophysics, geochemistry and microbiology,
- exploration and exploitation of hydrocarbon deposits,
- storage, transport, distribution and use of natural gas, crude oil and petroleum products,
- petroleum processing,
- improving and monitoring petroleum products quality,
- using the renewable energy sources,
- environment protection in the oil and gas industry.

A good, constantly supplemented research infrastructure providing modern apparatuses, including unique analyzers, equipment allowing to conduct laboratory and field tests, rich library collection, and buildings and technological halls, enables the Institute to create an interesting and diverse offer of scientific, research, development, and service works for the industry, including small and medium enterprises. It also allows it to be involved in research projects carried out by scientific consortiums.

The Oil and Gas Institute is involved in spectacular successes as well as everyday practices of the industry developed without much publicity.

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The Mineral and Energy Economy Research Institute
Polish Academy of Sciences

The Mineral and Energy Economy Research Institute of the Polish Academy of Sciences was established in 1980.

The Institute has organised and co-organised a number of annual conferences in programmes keeping the national scientific community and practitioners engaged in the fuel and energy sector informed of the progress in their specialist fields. The conferences were devoted to subjects such as: "Issues of energy resources and energy in the national economy" (XXV - 2011), "Natural hazards in mining" (XV - 2012), "School of Underground Mining" (XXI - 2011), "Updates on the economy and prospects for mineral resources" (XXI - 2011), "The use of deposits of useful minerals" (XII - 2010), and "National Geothermal Congress" (III – 2011), to name a few.

In order to disseminate scientific achievements of both their own staff and other scientific and research units, the Institute publishes: "Mineral Resources Management" (quarterly) listed on the Master Journal List; "Energy Policy Journal" (semi-annual), "Geological Exploration Technology. Geothermal Energy, Sustainable Development" (semi-annual), "Bulletin of the Mineral and Energy Economy Research Institute of the Polish Academy of Sciences". The Institute also edits the following series of publications: "Studies Dissertations Monographs", "Mineral Resources Encyclopaedia", "Mineral Resources of Poland", "From the assessment of the value of a deposit to the decommissioning of the mine," "Risk in the mining industry," "Evaluation of waste management". Additionally, the Institute publishes monographs presenting results of its own research, as well as books by scientists from other research institutes.

In order to ensure proper standard of services, meet customers' expectations and protect the environment, the Institute has implemented and constantly improves an Integrated Quality Management System according to EN-ISO 9001:2008 (PN-EN ISO 9001:2009) and EN-ISO 14001:2004 (PN-EN ISO 14001:2005) norms. The scope of certification covers research and development activities as well as testing laboratories.

The Institute conducts research in: mining and engineering geology, power and heat generation, environmental engineering, environmental management, chemical technology, materials engineering, geology and cartography, geophysics, and ecology. The Institute specializes in basic research on geothermal energy and its applications. The Institute also paved the way for the use of geothermal energy by heat supply utilities, and contributed to designing and constructing the first experimental geothermal plant in Poland, located on two boreholes in Bańska – Biały Dunajec, Poland.

The Institute has participated in EU research programmes since 1992. Among the projects of key importance are: CO2 Geological Storage: Research into Monitoring and Verification Technology - CO2ReMoVe (EU FP 6 2006-2011), Design of a pan-European Infrastructure for Large Apparatus studying Grand Unification and Neutrino Astrophysics - LAGUNA (EU FP 7 2008-2011), Geothermal Communities – demonstrating the cascading use of geothermal energy for district heating with small scale RES integration and retrofitting measures - GEOCOM (EU FP 7 2010-2014), Sustainable InteGral Management Approaches for Water areas - SIGMA for Water (INTERREG IVC Structural Fund EU 2010-2013), E-Mobility Accelerator - (INERREG IVC Structural Fund EU 2010-2011), Tools for Integrated Management of Biomass Energy Resources - TIMBER (INTERREG IVC Structural Fund EU 2010-2011), Strategies and technological scenarios of development and use of rock mineral deposits (FORESIGHT 2009-2012).

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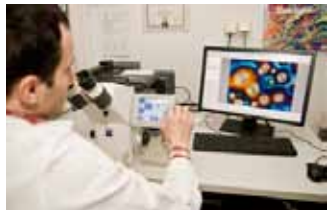
Foundry Research Institute

Foundry Research Institute was established in 1946 as a leading research and development centre of the foundry sector in Poland. With attention focused on problems of, firstly, reconstruction of the national foundry industry, and secondly, on modernisation of this industry, the Institute has had many achievements to its credit in over sixty years of its activity, among which are: successful and original solutions in the field of new materials, foundry technologies, control and measuring apparatus, machines and equipment.

In the late seventies, owing to cooperation with UNIDO, the Foundry Research Institute became an important world-class training centre for foundry staff from the developing countries. Today, the Institute is a research and development centre operating according to the rules of modern market policy, rendering services to the foundry as well as other sectors of industry, and to numerous institutions, offices and foreign partners.

The Institute's representatives, acting as UNIDO experts and specialists, participated in the establishment and commissioning of new foundries in African and Asian countries.
The mission of the Institute is to create new energy-saving and environment-friendly technologies and materials, and to undertake complex, interdisciplinary tasks in various branches of the industry. Its services cover all forms of research and implementation activity from planning and foredesign, to implementation and economic analysis of the obtained results.



The activities of the Institute address a broad spectrum of various problems encountered in the field of foundry engineering, including basic and applied research, development of new foundry materials and technologies, and expertises offered by the staff of high-skilled experts.
The structure of the Institute reflects the scope of its activity.

The Institute's achievements in science and technology are best seen in the following areas of activity:

- cast materials,
- cast structures,
- melting process,
- mould and core manufacture and reclamation of moulding sands,

- special techniques of casting manufacture,
- alloy solidification and cooling,
- simulation of foundry processes,
- services offered by Complex of Research Laboratories accredited by Polish Centre for Accreditation,
- casting design,
- problems of ecology and sozology,
- computer-aided design of castings,
- expert systems.

Foundry Research Institute maintains a vast contact network with foreign institutes and enterprises, mainly in the field of scientific and technical exchange, and joint execution of research projects. It is a member of numerous international organisations.
The research and development activities of the Foundry Research Institute in Cracow are closely related to the application of modern principles of funding under the laws of the market economy. The Institute is a research unit respecting these rules and providing effective services to the foundry industry as well as other industries, institutions, agencies and foreign partners.
The services offered by the Institute are highly praised by the customers, as evidenced by the growing cooperation in the field of economy and science. This is also testified by the fact that in 2009 and 2010 the Institute was granted the „Solid Company" Certificate by the Consumer Economic Programme for timely settlement of all liabilities, and respect for ecology and consumer rights. In 2011, the Institute is also likely to obtain this certificate, as per 210 scores required, it has already gained 500 scores. In 2010, the Minister of Labour and Social Policy rewarded the Institute with the "Sawo Grand Prix" in the category of „Education and Prevention" for the PRO-M computer programme supporting risk assessment at the machine design stage. Modern methods of the Institute management are based on the managerial systems according to PN-EN ISO 9001:2009 (the whole Institute), PN-EN ISO/IEC 17025:2005 (the Complex of Research Laboratories) and BS EN 45011:2000 (Office for Certification and Standardisation).

The financial situation of the Institute is systematically improving (compared to 2008, a fourfold increase in net profit in 2009 and eightfold increase in net profit in 2010 was observed). With a constant number of employees, this generates a significant increase in the average wages (about 48% in 2010 compared to 2008). The development of the Institute in the sphere of intellectual achievements and design of apparatuses is possible due to implementation of numerous projects relating to its statutory activity, its own as well as commissioned research projects, target projects, projects under structural funds, and projects co-financed by the European Union. The development of the Institute's infrastructure,

and thus creation of more favourable conditions for its employees, is possible with a designated subsidy granted by the Ministry of Science and Higher Education to bear the cost of the investment of adapting a part of the laboratory-technical building to extend the laboratory and training facilities, as well as conference, administration and social welfare centre.

The main activity of the Institute is supported by the widely understood scientific information, certification, standardisation, and publishing and training activity carried out for its own staff and for the foundry industry employees. The Institute maintains contacts with foreign institutes of the same or similar business profile and with companies in the sphere of exchange of scientific and technical information, and implementation of joint research projects.

	Foundry Research Institute
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The National Research Institute of Animal Production

The National Research Institute of Animal Production is one of the largest Polish scientific research institutes serving the whole country. It is accountable to the Ministry of Agriculture and Rural Development. The Institute was founded on May 31, 1950 by virtue of the Regulation of the Council of Ministers, on the initiative of Professor Teodor Marchlewski, an eminent animal breeding specialist and geneticist, the then Rector of the Jagiellonian University.

The Institute's mission is to carry out research and conduct developmental work in animal production, and development of agricultural environment. This activity is oriented towards both the current and future production of inexpensive and safe food in animal and environment-friendly conditions, as well as the use of farm animals for biomedical purposes.

The Institute's main and strategic research areas, in view of the changing needs in animal production, are as follows:

- Farm animals genetics and breeding, conservation of genetic resources,
- Livestock nutrition and feed science,
- Biotechnological methods of animal production,
- Technology, ecology and economics of animal production,
- Quality of raw materials and products of animal origin.

The Institute's scientific research activity is implemented by:

- six Research Departments (Department of Animal Genetic Resources Conservation, Department of Animal Genetics and Breeding, Department of Animal Nutrition and Feed Science, Department of Cytogenetics and Molecular Genetics of Animals, Department of Animal Reproduction Biotechnology),
- the Institute's Main Laboratory in Aleksandrowice,
- the National Feed Laboratory in Lublin,
- eleven experimental stations in Poland.

Achievements of the National Research Institute of Animal Production:

- Creation of improved boars of line 990 and 890, and high-value Polish Large White and Polish Landrace gilts characterized by resistance to stress;
- Production of a highly productive population of White Kołuda geese;

- Production of a genetically modified transgenic boar to be used as a source of organs for human transplants;
- Cloning of animals with the use of the Institute's original cloning method (rabbits);
- Mastering of bull semen sexing technology for offspring sex predetermination;
- Elaboration of a molecular method for identification of animal protein in feeds;
- Production of New Zealand White rabbits male and female line characterized by very good reproductive and growth parameters and good trunk muscling;
- Production of a cloned goat kid;
- Team awards from the Ministry of Agriculture and Rural Development for the following implementation work:
  - Identification of animal components in compound feeds – spongiform encephalopathy prevention,
  - Ecological and energy-saving technology of chicken broiler production,
  - Elaboration and implementation of breeding value assessment of sheep using the BLUP animal model for paternal flocks,
  - Elaboration and implementation of a modified method of breeding value assessment in pigs;
- Production of two homozygous piglets with a gene modifying the immunological barrier between humans and pigs. This success was achieved in cooperation with the Institute of Human Genetics of the Polish Academy of Sciences and the Agricultural University in Poznań;
- Establishment of a genetic material reserve for native breeds of farm animals under species protection;
- Acquisition of the status of a State Research Institute.

The National Research Institute of Animal Production cooperates with many international organizations (e.g. FAO), and is a member of numerous organizations operating abroad. It also organizes international conferences. In 2010 it realized two international projects: ERIN and Eureka.
The Institute is interested in cooperation with all scientific research organizations of an agricultural or medical profile.

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