UNIVERSITY of INFORMATION
TECHNOLOGY and MANAGEMENT
in Rzeszow, POLAND

FACULTY of MEDICINE

University of Information Technology and Management in Rzeszow

ORGANIZATIONAL STRUCTURE |
DESCRIPTIONS of FIELDS of STUDY |
RESEARCH | PUBLICATIONS |
BIOMEDICAL RESEARCH AND SERVICES CENTER |
LABORATORIES |

OCTOBER 2023

FACULTY of MEDICINE

of the University of Information Technology and Management in Rzeszow

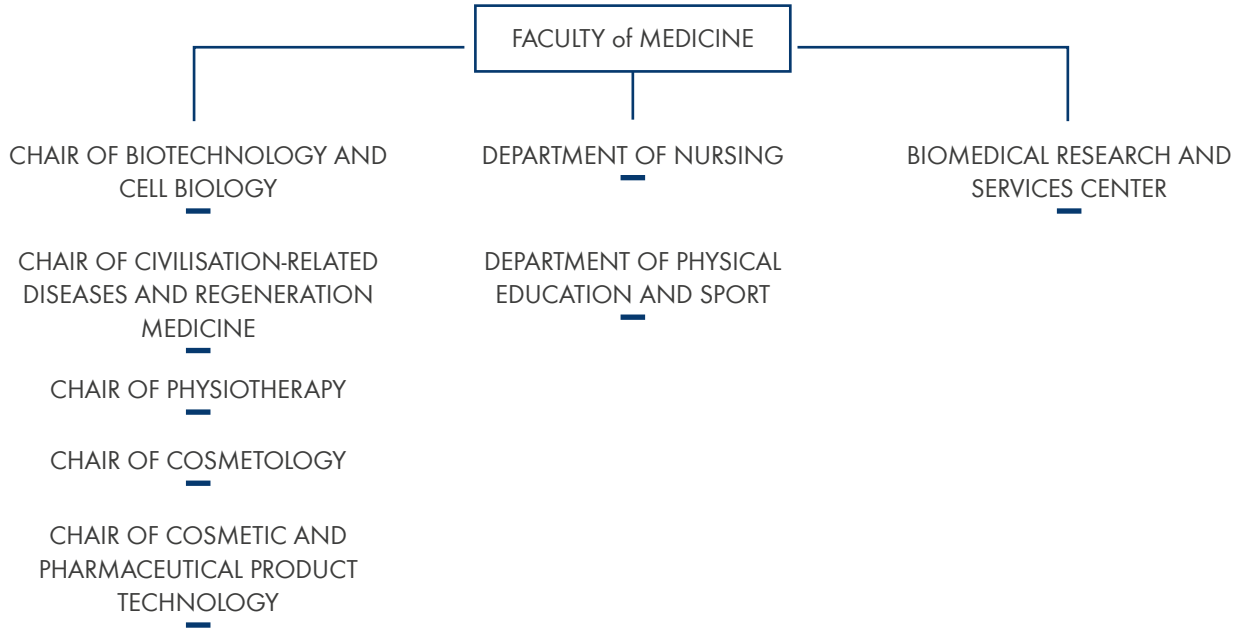
EVALUATION OF SCIENTIFIC ACTIVITIES FOR 2017-2021

Medical Science - scientific **category B+**

The right to confer doctoral and postdoctoral degrees starting in 2022

ORGANIZATIONAL STRUCTURE of the FACULTY of MEDICINE

The structure of the Faculty of Medicine includes research and didactic units (chairs); and strictly didactic units (departments) and centers.



FIELDS OF STUDY AT FACULTY OF MEDICINE

FIRST - CYCLE STUDIES
Biomedical Sciences – full-time studies
Dietetics – part – time studies
Physiotherapy – master's , full-time and part-time studies
Cosmetology – full-time and part-time studies
Nursing – full-time studies

SECOND - CYCLE STUDIES
Cosmetology – part-time studies

DESCRIPTIONS of FIELDS of STUDY

BIOMEDICINE

Biomedicine and its application in the medical world is a milestone in the medical industry. The pharmaceutical market and clinical research market are booming areas that offer broad career prospects.

Education in Biomedicine includes knowledge of human anatomy and physiological processes in the human body, genetics, cell biology, molecular biology, biochemistry, biostatistics, laboratory analysis and experiments, as well as detailed knowledge of medicine, general pathology, diagnosis and treatment of diseases

The Biomedicine studies curriculum covers 6 semesters of full-time, general academic studies, after which the student is awarded a Bachelor's degree.

Almost 50% of the classes in the study plans are conducted in the form of small or large laboratories. This allows for practical preparation of the graduate for working in research laboratories and in clinical research. In addition, students have the opportunity to obtain a Good Clinical Practice (GCP) Certificate, Good Laboratory Practice (GLP) Certificate, and a certificate for those performing experimental procedures involving animals.

The following specialties are offered within Biomedicine studies:

MONITORING AND COORDINATION OF CLINICAL TRIALS

Clinical trials and the introduction of new pharmaceutical products into the medical market are the future of medicine. The participation of patients in clinical trials gives the chance of a better life, and without clinical trials it is not possible to introduce effective and safe medicines into the patient's treatment.

Graduates gain knowledge on the principles of conducting and managing a clinical trial; Good Clinical Practice in clinical trial; documentation in clinical trials; and a detailed knowledge of ethical and legal regulations in clinical research. Graduates are prepared to work in the companies conducting and managing clinical trials in research centers and medical facilities.

The Monitoring and Coordination of Clinical Trials specialty includes courses on the management, monitoring, and coordination of clinical trials; documentation at each stage of clinical trials; ethical and legal considerations of conducting clinical trials in Poland and around the world; and auditing in clinical trials. Graduates of this specialty gain the skills and knowledge necessary to work in the field of clinical research.

Experimental Biomedicine

Preclinical research is a solid foundation for any innovative idea. A graduate of the specialty of Experimental Biomedicine gains knowledge of the functioning of the human and bacterial cell at the level of genetic material and proteins. Students learn state-of-the-art methods used in molecular biology, according to global standards. The skills acquired during their studies allow them to apply for jobs in R&D, research and genetics laboratories.

The specialty of Experimental Biomedicine includes courses on cell and tissue culture, model organisms in preclinical research, cancer cell biology, molecular diagnostics, regenerative medicine with elements of aging biology, pharmaceutical and cosmetic biotechnology, and medical nanotechnology.

Strategic partners of the studies are:

- ICN Polfa Rzeszów S. A.
- Olimp Laboratories Sp. z o.o

Dietetics

In modern society, an increasing interest in diet, healthy lifestyle and food production technology is observed. Dietetics is a scientific discipline that you can discover throughout your life. Knowledge of nutrition is constantly developed and modified, as more and more new reports from the world of science appear. A dietitian combines within one profession the competences of a therapist and a food technologist, acquiring qualifications to work in various places, both in healthcare or hospital management as well as in classic gastronomy.

First-cycle studies in Dietetics last 6 semesters and end with obtaining a Bachelor's degree. Education in this field of study has been conducted since the 2014/15 academic year.

The mission of education in Dietetics is teaching in accordance with EBM (evidence-based medicine). It consists in the ability to use reliable scientific evidence in clinical proceedings. Classes are conducted by renowned scientists, as well as specialists with many years of professional experience: practitioners, clinical dietitians, food technologists and personal trainers.

The University also places emphasis on acquiring solid practical skills within nutrition of healthy and sick people. The courses at first-cycle Dietetics are divided into two blocks: the main one, which is obligatory for all, and an optional one (focused on field-related and specialty areas), within which students have the opportunity to choose courses and specialties.

The following specialties are offered:

DIETETIC COUNSELING

The purpose of this specialty is to educate students to become professional staff prepared to give dietary and nutrition advice.

The graduate will be able to solve specific problems including providing nutritional advice, also in the field of nutritionally-dependent diseases. They will acquire qualifications to skillfully cooperate with doctors and other professional healthcare workers; manage the staff of mass catering establishments; and conduct marketing and managerial activities in this area. They will be able to competently assess the functioning of the food and nutrition market in Poland.

Graduates will be prepared to work in various catering facilities, including mass catering establishments and tourist enterprises. They will also be prepared to start their own healthy nutrition consulting service business. In addition, they would be competent partners for personal trainers and coaches.

DIETETICS IN LIFESTYLE DISEASES

The specialty focuses on the relationship between nutrition and lifestyle (civilization) diseases (obesity, diabetes, neoplasms, cardiovascular diseases, digestive system diseases, arterial hypertension, and osteoporosis) in to two perspectives: how nutrition and lifestyle affect the development of lifestyle diseases, and thus how to minimize the risk of lifestyle disease at the individual and community levels; and nutrition for those suffering from these diseases. It includes, for example, issues of the influence of the environment and other factors on the development of lifestyle diseases; the role of nutrition and lifestyle in the prevention of such diseases; and designing diets for patients with lifestyle diseases.

The literature suggests that for many diseases, a properly selected and targeted diet can often compete with pharmacotherapy and is often the better choice. The condition for successful treatment is adaptation to the dietary regime and the correct selection of foods during and at different stages of the development of the disease.

Graduates will be prepared to work with patients from risk groups and those suffering from lifestyle diseases (both within their own counselling, and within hospitals and other health care units), and to conduct health education.

DIETETICS IN SPORTS AND FITNESS

The aim of this specialty is to prepare dietitians to specialize in nutrition and dietary support for people practicing sports at amateur and competitive levels, as well as people using fitness clubs and biological regeneration centers.

Students improve their practical skills in a professionally equipped exercise test laboratory, which has advanced equipment for examining athletes including a calorimeter, cycloergometer, cardiological treadmill, and spirometer.

A professional program for composing menus, DietetykPro, is used to help students to further develop their skills.

Graduates of the Dietetics in sport and fitness specialty will have the knowledge and skills to plan meals for physically active people at various levels of sport participation.

A graduate of the specialty will be able to prepare a menu with the energy and nutritional content necessary for the body; use professional equipment to perform exercise tests and determine the body's efficiency; consciously support the development of strength and endurance; control the content of muscle and fat tissue in patients; and provide professional advice on proper hydration of the body and supplementations, adapted to a specific sports discipline.

PHYSIOTHERAPY

Physiotherapy is a medical field recognised as one of the five most rapidly evolving in the world. The demand for specialists in the field is constantly growing both in Poland and abroad. Early introduction of physiotherapeutic interventions for existing disorders of body functions and structures, as well as the widespread implementation of preventative measures, ensures the better health of the general society and significant savings for the state.

Currently, the physiotherapy degree at UITM is taught as a uniform Master's degree. The Act of the 25th of September, 2015, on the profession of physiotherapist regulates the qualifications necessary to practice the profession of a physiotherapist and specifies the principles of practicing it, including obtaining the right to practice the profession, vocational training, postgraduate training, and professional liability. It also specifies in detail the requirements that must be met by a person who is entitled to practice as a physiotherapist. Graduates of Master's degree studies have the right to provide all types of services: they can assess patients for rehabilitation treatments; commission medical devices and orthopedic supplies; and give opinions on the functional state of patients and on the course of the rehabilitation process.

Physiotherapy graduates acquire comprehensive knowledge in physiotherapy and related medical disciplines, which allows them to prepare for independent professional practice and to function in a therapeutic team. Practical classes (classes, laboratories, practical courses and vocational training) are conducted in specialist laboratories and health care facilities under the guidance of teachers of practical classes and supervisors of vocational training. Their aim is to verify the obtained theoretical knowledge and acquire professional skills for working with patients with various dysfunctions. UITM Physiotherapy students have the opportunity to use the University's scientific and teaching premises at the UITM Campus in Kielnarowa, which include educational premises, specialized laboratories, practical classrooms and laboratories, recreational and sports facilities, spa and wellness facilities, tourist sites, playing fields, and sports halls. Thanks to cooperation with hospitals in Rzeszów and nearby rehabilitation facilities, the resorts of Rymanów S.A. and Horyniec Sp. z o.o., and the Reh-Mediq Rehabilitation and Medical Center in Kielnarowa, students can have their vocational training and practical classes in health care units of various profiles.

Strategic partners in the field of Physiotherapy are:

- MEDYK Medical Centre in Rzeszów
- Non-public "RUDEK" Medical Rehabilitation Centre
- Health resort HORYNIEC Ltd.

COSMETOLOGY

Increased public awareness of beauty care, the correction of imperfections, and the available selection of cosmetic preparations has caused a rapidly growing demand for professional cosmetology services, and therefore also for competent, comprehensively trained cosmetologists.

A cosmetologist is a profession in which a graduate is ready to practice after completing their first-cycle studies, but second-cycle studies allow the professional profile of the graduate to be fully shaped by giving them advanced interdisciplinary knowledge in general medicine, and further knowledge and practical skills within their profession. UITM provides comprehensive education for cosmetologists, offering both first- and second-cycle studies. Cosmetology is an interdisciplinary field of study, combining knowledge and skills from medical sciences, pharmaceutical sciences and health sciences. Cosmetology is a field of study with a practical profile. Classes are carried out in specialized laboratories for cosmetology, makeup and styling, Cosmetic Chemistry, Immunology and Biochemistry, General Biology, and Massage. This ensures that they gain manual skills for skin care, beauty, and therapeutic treatments.

First-cycle Cosmetology studies last 6 semesters and can be studied full-time or part-time. The curriculum includes the courses Dermatology, Cosmetic Chemistry, Human Anatomy and Physiology, Care Cosmetology, Beauty Cosmetology, Aesthetic Medicine, and Cosmetic Formulation. Students have the option of choosing courses according to their own interests complementing the block of basic and core courses by the Flexible Study System (FSS). The curriculum includes a total of 960 hours of vocational training.

Specialties in first-cycle studies:

AESTHETIC COSMETOLOGY

The specialty of Aesthetic Cosmetology allows students to enhance their practical skills in giving beauty treatments. These include nail styling and art, eyebrow and eyelash styling, and basic make-up techniques. This specialty prepares a graduate for working in beauty parlors, allowing them to independently plan and perform treatments according to the needs of the customer.

COSMETICS MANUFACTURING TECHNOLOGY

The specialty provides extended practical skills in cosmetic chemistry and cosmetic formulation. It is a unique specialty in Poland, providing the opportunity to acquire skills in developing formulations for basic forms of cosmetics and analyzing their properties. This prepares a graduate for working in cosmetic laboratories, pharmaceutical laboratories, the cosmetic departments of pharmacies, and enterprises engaged in the production and distribution of skin care and color cosmetics.

BIOLOGICAL REGENERATION AND WELLNESS

The specialty of Biological Regeneration and Wellness prepares for professional customer service in spa and wellness centers, and beauty salons in prestigious hotels and spa resorts. It covers planning and execution of care and treatment procedures using massage and various relaxation techniques.

PROFESSIONAL AND ARTISTIC MAKE-UP

The specialty of Professional and Artistic Make-up is aimed at make-up enthusiasts with a sense of creativity. It provides an opportunity to learn advanced make-up techniques and explore the secrets of theatrical and film make-up. During classes, students will learn to make imitations of wounds, burns and other aesthetic defects.

This specialty prepares graduates for working on professional photo and film shoots, advertising campaigns, and fashion shows.

For the best first-cycle Cosmetology students, additional 10-hour workshops are organized within the "I want more" program. These workshops include "Creating a Brand in Media", "Designing Care Cosmetics", "Combined Methods in Anti-cellulite Treatments", and "Anti-aging Treatments".

Second-cycle Cosmetology studies last 4 semesters and are conducted in a part-time mode. The curriculum includes courses such as: Skin Physiology and Pathophysiology, Skin Oncology, Plastic, Posttraumatic and Aesthetic Surgery, Medical Cosmetology, Natural Cosmetic Raw Materials, Cosmetic Product Formulation, Phytocosmetics and Dermocosmetics, Rehabilitation. Students have the option of choosing courses according to their own interests complementing the block of basic and core courses (Flexible Study System – FSS). The curriculum includes 480 hours of vocational training.

Specialties in second-cycle studies:

APPLIED COSMETOLOGY

This specialty prepares for professional performance of advanced cosmetological treatments in accordance with the latest trends, and for effective cooperation with a medical specialist. The program of the specialty includes Taping in Cosmetology and Combination Therapy in Regenerative Treatment.

COSMETIC PREPARATIONS DESIGN

This specialty provides an extension of practical skills in the formulation of cosmetic preparations, considering the design of cosmetics in accordance with modern trends and the principles of the production process, as well as physicochemical analysis of individual cosmetics. The program of the specialty includes Cosmetics Technology and Design, Industrial Cosmetics Production, Physical Chemistry of Cosmetic Forms, and Raw Materials.

The curriculum includes 480 hours of vocational training.

TRICHOLOGY IN COSMETOLOGY

This specialty focuses on knowledge of the diagnosis and treatment of ailments related to the human scalp and hair in cosmetology and medicine. Students acquire practical skills in cosmetological trichology and are prepared to implement specialized procedures and treatment plans to support the therapy of the scalp. The program includes Functional Trichology, Dietetics in Trichology, and Medical Trichology.

Strategic partners of Cosmetology studies are:

- Janssen Cosmetics
- Bielenda Professional
- Aycom - Criss

NURSING

The high demand for educated nursing staff is a result of the deteriorating health of society, the increased incidence of lifestyle diseases, pandemic COVID-19 which are a challenge for the health care system, and the aging population, who often require long-term medical care.

A nurse or nurse practitioner is an independent employee of the health care system, with the required qualifications confirmed by appropriate documents, providing health services: nursing, preventive, diagnostic, therapeutic, rehabilitative and health promotion.

From March 2020, Nursing studies is offered at UITM as part of the Medical Faculty. In 2022, UITM obtained permission from the Ministry of Health to extend the accreditation of the Nursing faculty for 5 years. At present, the Nursing Department offers parallel studies in Polish and in English. Nursing studies lasts 7 semesters. The university has received positive feedback from the National Accreditation Council for Schools of Nursing and Midwifery and from the Polish Accreditation Committee and obtained the right to offer education in Nursing.

Nursing is a profession which the graduate enters after completing their first-cycle studies. These allow them to acquiring comprehensive medical and medicine-related knowledge and practical skills, as well as the necessary social competences which are crucial to performing a nurse's professional activities. The study program for Nursing was developed in accordance with the education standards specified in the regulations of the Ministry of Science

and Higher Education. It allows the development of a nursing graduate capable of providing health services and of recognizing the health and care needs of patients. They will participate in conscious planning and provision of care to the patient, and independent provision of preventive, diagnostic, therapeutic, and rehabilitation services within specified capabilities.

By studying particular blocks of courses (general, basic, social sciences, basic nursing and specialist care), the graduate is prepared to participate in the diagnostic and therapeutic process by professionally cooperating with doctors and other members of the therapeutic team.

Due to the practical profile of Nursing studies, a strong emphasis is placed on the acquisition of knowledge, skills, and social competences of a practical nature. Practical classes total 1100 hours, and there is a total of 1200 hours of vocational training total. A significant number of the classes are conducted in small groups as classes, laboratories, and practical classes, which increases the effectiveness of the teaching process. A graduate of first-cycle Nursing studies has extensive medical, specialist and social knowledge, as well as the skills and competences entitling them to work in public and non-public healthcare facilities. Potential workplaces include hospitals, medical clinics, palliative care and hospice care centers, nursing homes, social welfare homes, sanatoriums, and rescue system units.

SCIENTIFIC RESEARCH

SCIENTIFIC PROJECTS

Characterizing antioxidant and chemopreventive properties of Polish varietal honeys after applying gastrointestinal digestion and using absorption models. Project carried out in consortium with the Cracow University of Economics and Technische Universität Berlin.

Project leader: **Michał Marek Halagarda Assoc. Prof., Ph.D., UEK**

The main objective of the study is to characterize the biological activity, including antioxidant properties and chemopreventive properties of selected Polish varietal honeys, taking into account changes in the structure of compounds caused by processing processes, as well as digestion and absorption in the gastrointestinal tract.

Implementation period: 2023-2026

Financing: National Science Centre (NCN)

Development of innovative natural cosmetics based on a symbiotic complex obtained in a fermentation process using the kombucha tea fungus

Project leader: **Zofia Nizioł-Łukaszewska, Assoc. Prof., Ph.D.,** zniziol@wsiz.edu.pl

The purpose of the project is to develop an innovative series of natural cosmetics based on a symbiotic complex obtained in a fermentation process using the kombucha tea fungus. The proposed line of cosmetics includes three multifunctional products: a creamy face cleansing foam, a soothing tonic mist, and moisturizing probiotic essence.

Implementation period: **04.2022–09.2022**

Financing: **Podkarpackie Centrum Innowacji (PCI)**

Extracting bioactive substances from Inonotus obliquus in a form applicable to food enrichment

Project Manager: **Konrad Szychowski, Assoc. Prof., Ph.D.** kszychowski@wsiz.edu.pl

The wood parasite Inonotus obliquus has well-described pro-health properties, reported in the literature scientific and in folk medicine. Presently, cancer is the second most common cause of death. Therefore, obtaining the active substances of I. obliquus without losing their biological features, and subsequently developing a food supplement based on the extract, may be crucial, especially when considering social needs. The objective of this project is to obtain an extract from sporophores of I. obliquus and modify it to make it useful as a supporting supplement to be taken during anticancer therapies, or for cancer prevention. The main aims of the project are 1) optimization of the extraction process of active substances of I. obliquus; 2) to obtain a powder of such an extract to facilitates its inclusion in diet supplements and to determine its physicochemical properties; and 3) to evaluate the safeness and optimal dose of such extracts in in vitro cell models.

Implementation period: **02.2022–07.2022**

Financing: **Podkarpackie Centrum Innowacji (PCI)**

An innovative series of liquid crystal emulsions containing micellar dogwood extract

Project Manager: **Zofia Nizioł-Łukaszewska, Assoc. Prof., Ph.D.,** zniziol@wsiz.edu.pl

This project concerns the development of recipes and technology for the production of multifunctional lines of natural cosmetics containing micellar dogwood extract, following the concept of the zero-waste trend. The research will involve obtaining dogwood extracts and analyzing their biochemical properties. The composition and technology for cosmetics will be developed, including testing under real conditions. The result of the research will be ready-to-use technology for producing the extract and an entire line of natural cosmetics.

Implementation period: **04.2021 – 12.2021**

Financing: **Podkarpackie Centrum Innowacji (PCI)**

Elastin-derived peptide VGVAPG as a carrier of cytostatic drugs into cancer cells

Project Manager: **Konrad Szychowski, Assoc. Prof., Ph.D.** kszychowski@wsiz.edu.pl

Elastin is one of the main proteins responsible for tissue elasticity. Studies have shown that a product of its proteolysis is an active peptide characterised by the conserved sequence Val-Gly-Val-Ala-Pro-Gly (VGVAPG). This sequence is easily released from elastin in both physiological and pathological conditions, demonstrating a high affinity for the elastin binding protein of the surface receptor and allowing elastin to enter the cell. The aim of the project is to conjugate selected cytostatics with the peptide and to assess the impact of the obtained complexes on lung and breast cancer cells in vitro. Their mechanism of action will be investigated, including determination of the level of expression of selected genes and the level of protein biosynthesis. The results of the project will allow the comparison of the effectiveness of using the elastin-derived peptide as a drug transporter to the conventional (unconjugated) cytostatic in targeted anti-cancer therapy.

Implementation period: **02.2021 – 07.2021**

Financing: Podkarpackie **Centrum Innowacji (PCI)**

Extracts from Alcea rosea var. nigra with AHA acids as innovative ingredients of chemical peels

Project Manager: **Katarzyna Gaweł-Bęben, Ph.D.** kagawel@wsiz.edu.pl

The aim of the project is to develop an innovative cosmetic raw material from black mallow flowers (Alcea rosea var.nigra), which are rich in natural active ingredients. They have antioxidant, soothing, and brightening properties for the skin, and will be used in the formulation of a prototype cosmetic designed for all skin types, for chemical peeling with anti-hyperpigmentation properties. The unique technology of producing the raw material of the cosmetic will ensure the stability of its active substances. Both the raw material and the cosmetic prototype will undergo in vitro, apparatus, and application tests confirming their safety and effectiveness for use.

Implementation period: **02.2021 – 10.2021**

Financing: **Podkarpackie Centrum Innowacji (PCI)**

The use of a Mongolian herbal blend in comprehensive sun protection for the skin

Project Manager: **Timea Sulenta-Pluta, M.Sc.** tsulenta@wsiz.edu.pl

The aim of the project is to produce a prototype of a protective cosmetic formulation with a high sun protection factor of 50 (SPF 50) which, beside providing direct protection of the skin against negative effects of UV radiation, will inhibit the proliferation of skin cancer cells such as melanoma or basal cell carcinoma cells. The active ingredient of the formulation with such effects is a glycol-aqueous extract from a Mongolian herbal mixture containing powdered fruits of gardenia (Gardenia jasminoides), chebulic myrobalan (Terminalia chebula), and beleric (Terminalia bellirica).

Implementation period: **12.2019–05.2020**

Financing: **Podkarpackie Centrum Innowacji (PCI)**

Cosmetic Valley – International Scientific and Implementation Cooperation at the Cosmetology Department

Project Manager: **Prof. Kazimierz Głowniak, Ph.D.** kglowniak@wsiz.edu.pl

The aim of this project is to establish international cooperation and joint implementation of a research project in the field of natural cosmetology. The research includes, the possibility of using plant species growing in Kazakhstan as raw materials in cosmetic preparations; the use of state-of-the-art methods for the analysis of the biological activity and safety of using the raw materials; and the preparation of prototype cosmetic preparations. An important part of the project is also the preparation of innovative teaching materials, introducing students from partner universities to the secrets of natural cosmetology.

Implementation period: **2018–2021**

Financing: **Program of the Polish National Agency for Academic Exchange (NAWA)**

RESEARCH COMMISSIONS FOR ENTITIES OUTSIDE OF HIGHER EDUCATION

Year 2022

CIEPIELA TECHNOLOGY PROMOTION Sp. z o. o.
Research service consisting in the development of a new innovative product in the form of whitening fluid

Eplatformy.pl Sp. z o.o.
Research service consisting in the development of a new innovative product in the form of fruit peeling set for the body and feet

Estate Opakowania Sp. z o. o.
Research service to develop an innovative cosmetic: Natural two-phase washing cosmetic for men to remove difficult dirt

Stowarzyszenie Społeczno-Ekonomiczne ABSOLWENT
Research service consisting in the development of an innovative recipe for children soap which changes colour during handwashing

TKM-LAB Sp. z o.o.
Research service consisting in the development of an innovative series of organic, detoxifying liquid crystal emulsions with the addition of Moringa tree macerate

Sieć Badawcza Łukasiewicz - Instytut Ciężkiej Syntezy Organicznej "Blachownia"
Safety assessment of model washing baths for fruit and vegetables in terms of their interaction with the skin

SCIENTIFIC RESEARCH FINANCED WITH GRANTS OF THE MINISTRY OF SCIENCE AND HIGHER EDUCATION

Determining the effect of elastin-derived peptide on Alzheimer's disease phenotype in neurons in vitro

Subject Manager: **Bartosz Skóra, M.Sc.** bsora@wsiz.edu.pl

The main goal of the project is to determine the relationship between the formation of the VGVAPG peptide and the increased production of Sirtuin 2 with age, which would explain the development of Alzheimer's disease in human neurons in vitro.

Implementation period: 2023-2026

Innovative raw materials for application in the medical, pharmaceutical, and cosmetic industries

Subject Manager: **Zofia Nizioł-Łukaszewska, Assoc. Prof., Ph.D., Eng.** zniziol@wsiz.edu.pl

The main aim of this project is to assess in detail the mechanisms of action of the tested substances, including their antioxidant, chelating, and anti-inflammatory properties. Raw materials with the most desirable properties will be applied in pharmaceutical, cosmetic, and medical preparations. The project involves the implementation of experimental research in the form of a series of laboratory experiments, followed by a detailed description of their results. The research aims to determine the mechanism of action of selected substances in cell-free and cellular systems. A range of raw materials will be analyzed which may have practical applications in the medical, pharmaceutical, and cosmetic industries.

Implementation period: **2019 – 2023**

Impact of VGVAPG peptide on the process of cell differentiation and aging in human cell lines

Subject Manager: **Konrad Szychowski, Assoc. Prof., Ph.D**. kszychowski@wsiz.edu.pl

The aim of this project is to determine the effect of a short sequence elastin-derived peptide on the process of cell differentiation and aging in human cell lines. The results of the project will serve as the preliminary research for grant applications and will allow the extension of the current knowledge on the basis the mechanism of neurodegenerative diseases at the levels of metabolism and genome due to the presence of an elastin-derived peptide, the amount of which increases significantly with age.

Implementation period: **2021-2025**

Effect of xenobiotics on the activity of endocrine cells

Subject Manager: **Anna Tabęcka-Łonczyńska, Assoc. Prof., Ph.D**. atabecka@wsiz.edu.pl

The aim of the study is to determine the effect of xenobiotics on the cells of the male reproductive and nervous systems. A significant toxic effect of tris (2,3-dibromopropyl) isocyanurate (TBC) on spermatogenic cells has been demonstrated in preliminary analyses. The standard parameters of metabolic activity, i.e., LDH and caspase 3, were altered. Preliminary studies on the mechanism of action of TBC on mouse spermatogenic cells have revealed the involvement of specific receptors in its toxicity at the proteomic level.

Implementation period: **2021 – 2023**

Plant extracts as multifunctional ingredients in skin lightening preparations

Subject Manager: **Katarzyna Gaweł-Bęben, Ph.D.** kagawel@wsiz.edu.pl

The contemporary cosmetic market seeks effective and safe-to-use substances for hyperpigmentation reduction. A particularly interesting source of such substances is plant extracts, which due to the complex composition and synergy of the action of individual components, can provide additional effects of the cosmetic preparation besides lightening. The aim of the research planned in the project is to analyze plant extracts to determine their possible uses as multifunctional components of cosmetics which reduce hyperpigmentation. The research is carried out in cooperation with employees of the Department of Pharmacognosy and the Laboratory of Medicinal Plants at the Medical University of Lublin (Virginia Kukuła-Koch, Ph.D., Assoc. Prof.; Krystyna Skalicka-Woźniak, Ph.D., Assoc. Prof.).

Implementation period: **2019–2023**

New hydrogel materials for dermatological and cosmetological applications: synthesis and structural, physicochemical, and biological evaluation

Subject Manager: **Martyna Zagórska-Dziok, M.Sc**. mzagorska@wsiz.edu.pl

The main goal of this research is to obtain new hydrogels for dermatological and cosmetological applications. Those biomaterials can be used to treat hard-to-heal wounds, delay the aging process of the skin, and support its repair processes after dermatological and cosmetological treatments. For this purpose, attempts are being made to develop hydrogels loaded with compounds of plant origin such as cannabidiol, terpineol, and willow and hemp extracts.

Implementation period: **2019-2022**

Quality of life and assessment of postural stability of healthy and sick people under the influence of different factors

Subject Manager: **Marlena Krawczyk-Suszek, Ph.D**. mkrawczyk@wsiz.edu.pl

The main aim of this work is to assess the effectiveness of rehabilitation in patients with dysfunctions in the musculoskeletal system using clinical tests, functional scales, standardized tools, and modern diagnostic and therapeutic devices.

Implementation period: **2017–2023**

Improving upper limb function in children with cerebral palsy in the homecare setting

Subject Manager: **Weronika Cyganik, M.Sc.** wcyganik@wsiz.edu.pl

The main aim of this research is to characterize the effects of the implementation of a dedicated exercise program for mobility improvement in the home setting on upper limb function in hemiparetic children aged 6 to 10 with cerebral palsy.

Implementation period: **2019–2022**

PUBLICATIONS

Research findings are published by employees of the Faculty of Medicine in journals indexed in international databases, such as:

Antimicrobial Agents and Chemotherapy, Blood, European Journal of Medicinal Chemistry, European Heart Journal - Cardiovascular Imaging, Frontiers in Immunology, International Journal of Environmental Research and Public Health, International Journal of Molecular Sciences, Journal of American College of Cardiology, Cardiovascular Imaging, Journal of the European Academy of Dermatology and Venereology, Molecules, Scientific Reports.

List of selected publications of employees since 2021:

Yevhenii Novodvorskyi, Roman Lesyk, Igor Komarov, Dmitry Lega, Iryna Zhuravel, Oleh Moskalenko, Volodymyr Sukhoveev, Anatolii Demchenko. Synthesis and evaluation of anti-yellow fever virus activity of new 6-aryl-3-R-amino-1,2,4-triazin-5(4H)-ones. European Journal of Medicinal Chemistry 2023, 248; 115117. ISSN 0223-5234

Publication

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Publication

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CENTRE FOR BIOMEDICAL RESEARCH AND SERVICES

The implementation of technology and the performance of research services in 2017 gave rise to the Implementation and Service Center. In 2022 it was transformed into a Center for Biomedical Research and Services, following an increase in the number of medical tests it performed.

The services provided by the Center for Biomedical Research and Services are mainly aimed at companies involved in the production, distribution, and import and export of cosmetic and pharmaceutical products. They include the development of product formulations, the preparation of comprehensive documentation, and registration of products in the CPNP system. The center's activities are also focused on conducting the necessary tests specified by the Cosmetic Regulation 1223/2009 (e.g., microbiological, dermatological, application, and instrumental tests), as well as a wide spectrum of advanced tests of the biological activity of products such as antioxidant capacity, irritant potential, and UV and blue light radiation protection ability). As part of its activities, the Center offers consulting and advisory services for production technology, registration of new INCI ingredients, and population studies of cosmetics and consumer preferences. Moreover, the Center conducts research and development projects in the design and manufacture of cosmetic preparations and raw materials, as well as research on the activity of biologically active substances. For the above activities, the Center makes use of the University's laboratories and staff.

Contact: mbiesiadecka@wsiz.edu.pl

LABORATORIES

USED IN THE EDUCATION PROCESS, IN RESEARCH AND COMMERCIAL ACTIVITIES IN FIELDS OF STUDY AT MEDICAL FACULTY

The Anatomy and Physiology Laboratory

The laboratory's equipment allows the expansion of knowledge of the anatomy and physiology of the human body, as well as the mechanisms of disease processes and dysfunctions of individual systems. The theoretical knowledge and practical classes enable further study of issues related to the anatomical and physiological aspects of the functioning of the human body. The laboratory is equipped with anatomical models, colorful large-format anatomical diagrams of individual parts of the human body, a set of audiovisual and multimedia teaching materials, and computer programs describing human anatomy and physiology. The laboratory will be used for demonstration classes for Anatomy, Physiology, and Pathology.

Contact: wcyganik@wsiz.edu.pl

General Biology Laboratory

The general biology laboratory is designed to perform a wide range of microbiological analyses. The laboratory enables analysis of various sample types, such as raw materials and cosmetic products, plant extracts, food samples, and biological material collected from patients.

Contact: ekaleniuk@wsiz.edu.pl

Cosmetology Laboratory

The cosmetology laboratory is equipped with the necessary equipment, devices, and professional cosmetic preparations to enable the performance of treatments in the field of care and therapeutic cosmetology. These include cosmetics combined with ultrasound, cavitation peeling, devices used for diamond microdermabrasion treatment, needle-free mesotherapy, equipment equipped with RF waves, dermomassage, and cryolipolysis.

Contact: bmysliwiec@wsiz.edu.pl

Make-up and Stylization Laboratory

This laboratory is equipped with professionally arranged make-up stations containing a full cross-section of color cosmetics and accessories that can be used to conduct color analysis, and to apply various types of make-up.

Contact: bmysliwiec@wsiz.edu.pl

Biochemical and Kinesitherapy Laboratory

The laboratory equipment enables the student to learn basic rehabilitation techniques and perform elementary physiotherapy procedures. The equipment enables simulated classes and the acquisition of practical knowledge in the field of motor rehabilitation and physiotherapy.

Contact: pjazwa@wsiz.edu.pl

Massage Laboratory

The massage laboratory allows the expansion of the theoretical knowledge foundations of kinesitherapy, therapeutic massage, and manual therapy. It is also a place to apply skills for working with patients, both individuals and groups. The laboratory is equipped with the equipment necessary to implement the program and achieve the intended learning outcomes.

Contact: wcyganik@wsiz.edu.pl

Nursing Skills Laboratory

The Nursing Skills Laboratory has a structure re and equipment adapted to the needs of teaching in the field of Nursing. The laboratory offers equipment that allows simultaneous practice at a minimum of 3 stands. It provides training for skills used in the care of both adults and children, and inpatient and outpatient conditions. The phantoms, trainers, and disposable and reusable equipment in the laboratory allow students to learn to plan, organize, and implement care, diagnostic procedures, preventive interventions, and therapeutic and rehabilitation treatments. The equipment of the laboratory also allows students to learn how to conduct a physical examination of the patient, including auscultation of heart sounds, lung fields, and the sounds of intestinal peristalsis.

Contact: mszczech@wsiz.edu.pl

Medical Rescue Laboratory Emergency Medical Services Laboratory

In the Emergency Medical Services Laboratory, students can acquire practical skills in first aid and medical emergency operations. The laboratory is equipped with the necessary equipment for demonstrations and practical exercises of life-saving and health-saving procedures for people in emergency conditions.

Contact: bmartowska@wsiz.edu.pl

Gastronomic Technology Laboratory

The gastronomic technology laboratory is intended for use for theoretical and practical classes for students of Dietetics. The laboratory is equipped with independent stands and the equipment necessary to prepare dishes and beverages. The consumer service room has modern waiter and bartending equipment, which allows students to develop their practical skills.

Contact: gkolodziej@wsiz.edu.pl

Sports Dietetics Laboratory

A laboratory created for the practical education of students of Dietetics at the specialization "Dietetics in Sport and Fitness". It has advanced equipment for the exercise testing of athletes, including a calorimeter, cycloergometer, cardiological treadmill, and spirometer.

Cell and Tissue Culture Laboratory

According to the criteria of the European Union and WHO, the cell and tissue culture laboratory has BSL2 status, ensuring sterile working conditions protecting both the employee and biological material. Cell cultures are currently one of the most important techniques commonly used in biomedical research. The Cell and Tissue Culture Laboratory gives the opportunity to conduct a variety of research on processes occurring both in normal cells and tissues as well as in cells in pathological conditions.

Contact: kagawel@wsiz.edu.pl

Immunology and Biochemistry Laboratory

The Immunology and Biochemistry Laboratory allows biochemical and immuno-enzymatic analyses to be performed on samples obtained as a result of experiments carried out on cell lines, or samples from patients.

Contact: plechwar@wsiz.edu.pl

Regenerative Medicine Laboratory

The Regenerative Medicine Laboratory is adapted to culture human stem cells in vitro. The laboratory maintains the BSL2 standards required for research and microbiological laboratories. It allows studies of biochemistry and morphology at the cellular level, both in primary and immortalized cell lines. The laboratory specializes in conducting research on the differentiation of human mesenchymal stem cells hMSC-human mesenchymal

stem cells and determining the influence of selected xenobiotics and naturally released peptides on metabolism (hMSC). An additional area of interest is the receptor-dependent process of endocytosis. During classes in the laboratory, students have the opportunity to learn techniques related to sterile work on cell lines. This includes techniques used to work with primary and immortalized cell lines, the methods used in regenerative medicine, basic techniques of molecular biology, research methods in cell biology and biochemistry, and the principles of confocal fluorescence microscopy.

Contact: bskora@wsiz.edu.pl

Biochemistry, Toxicology and Clinical Genetics Laboratory

The laboratory is designed to perform a variety of biochemical analyses of biological material collected from patients (blood, serum, urine), plant extracts, food samples, and samples obtained in experiments using cell cultures.

Contact: bskora@wsiz.edu.pl

Molecular Biology Laboratory

The Molecular Biology Laboratory offers modern equipment that allows to comprehensive research at the molecular level to characterize the mechanisms responsible for the occurrence and course of selected lifestyle diseases.

Contact: bskora@wsiz.edu.pl

Cosmetic Chemistry Laboratory

The Cosmetic Chemistry Laboratory is equipped with apparatuses which are used to obtain biologically active substances from plant materials. Moreover, the laboratory enables elaboration of the formulas of various forms of cosmetics, as well as complex quality analysis of the obtained products. The laboratory equipment allows classes to be conducted on cosmetic chemistry, cosmetic prescription, and cosmetic raw materials.

Contact: kklimczak@wsiz.edu.pl

Center for Biomedical Research and Services

The laboratory offers equipment and devices that enable the synthesis of chemical compounds and biologically active substances to be obtained from plant raw materials, as well as the identification and determination of selected substances. In addition, the laboratory equipment facilitates the production of innovative cosmetics, the determination of the possibilities of applying the obtained substances and raw materials in cosmetic products, and a comprehensive analysis of the quality of the obtained products.

Contact: mbiesiadecka@wsiz.edu.pl

Dermatological and Application Tests Laboratory

The dermatological laboratory is prepared for research, development, and quality control of new cosmetics before commercial implementation on the market. Our equipment allows the analysis of the effects of products on human skin characteristics such as pH, transepidermal water loss, sebum production, and skin hydration. Our team is composed of scientists, cosmetologists, and dermatologists. We are therefore also able to perform dermatological tests (such as the Patch test) to characterize the skin irritating and allergological properties of substances and cosmetics.

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