

NATIONAL SCIENTIFIC CONFERENCE  
"UNDERSTAND THE SCIENCE"

IX EDITION

ON-LINE

SEPTEMBER 20, 2025



What?  
How?  
Why?

THE BOOK  
OF ABSTRACTS



**National Scientific Conference**  
**„Understand the Science”**

**IX edition**

**The Book of Abstracts**

**September 20, 2025**

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What? How? Why?



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ABSTRACTS OF  
**PRESENTATIONS**



**HUMANITIES**  
**SCIENCES**



## **AESTHETICS AND SYMBOLISM IN TRADITIONAL SLOVAK FOLK ART: WOODEN CARVED HORSES BY THREE GENERATIONS OF THE TATARKA FAMILY**

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### **A few words about the author(s):**

Based in Poland, holds a master's degree in Ethnology from the University of Ss. Cyril and Methodius in Trnava. He is dedicated to preserving Slovak culture and pursuing a PhD on the Slovak minority in Poland, while also working as an educator.

### **Abstract:**

The paper delves into the aesthetics and symbolism represented within traditional Slovak folk art, as exemplified by the wooden carved horses and wagons created by members of the Tatarka family over three generations. The Tatarka collection thereby becomes a living record of cultural memory, intergenerational exchange of skills and continuing adoration of both the horse as a working partner and symbol in central Slovakia and the wider world.

The study uses a qualitative interpretive method, analysing the history of the family, the techniques of their handicraft, and the symbolic values of their works. The analysis follows the development of the tradition, beginning in the functional toys and mementos carved by Ján Tatarka Sr., passing through the technically perfect and ornamental advanced models carved by Ján Tatarka Jr., to the role of Ľubomir Tatarka as a introducer and keeper of that tradition. The results show that the Tatarka collection embodies numerous layers of meaning: it enshrines the experience of the shift between agrarian and mechanized society, it retains the memory of craftsmanship in the region, and it presents a metaphorical link between life and art. The paper suggests that the work of the Tatarka family is not just a rare piece of the Slovak folk artisanship but the intangible cultural property that can be used in educational, artistic, and heritage purposes.

### **Keywords:**

folk art; wooden carving; symbolism; Slovak tradition; generational craftsmanship; cultural heritage; horse-drawn carriages; artistic legacy; intangible heritage



## THE INCOME TAXATION OF INTERNET CREATORS FROM ACTIVITIES ON THE TIKTOK PLATFORM

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### **A few words about the author(s):**

The author is a Finance and Accounting student at the University of Business and Administration in Lublin, interested in taxation, accounting systems, and the impact of social media on economic processes.

### **Abstract:**

The growing popularity of social media platforms such as TikTok has led to an increasing number of individuals earning income from online activities. This phenomenon presents new challenges for accountants and tax advisors in ensuring proper handling of such income. During the conference, the concept of an "internet creator" will be discussed in the context of tax regulations. The presentation will cover issues related to the classification of income sources and expenses associated with activities on TikTok. Attention will be given to the forms of taxation applicable to online creative work, as well as the relevant deadlines and tax declarations. Furthermore, the analysis will address matters related to depreciation and the treatment of fixed assets used by creators, along with their obligations towards social security (ZUS).

### **Keywords:**

TikTok; internet creators; taxation; accounting; social security (ZUS)



## RESEARCH AND DEVELOPMENT WORK ON THE AUTOMATION OF LOGISTICS PROCESSES USING INTELLIGENT ALGORITHMS AND DEVICE PROTOTYPES IN A DISTRIBUTED DISTRIBUTION CENTER STRUCTURE

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### Abstract:

The functioning of a company in a complex logistics structure implies a number of problems: processing large amounts of information from various sources (e.g., the use of different IT systems in different “links” of the supply chain), separate management of different parts of the supply chain, insufficient and delayed information about physical events affecting the operational level of processes, difficulty in assessing the significance of events, chaotic information about the physical state of the flow of goods makes it difficult to assess the situation.

The above prompted the company to carry out research and development work on the automation of logistics processes using intelligent algorithms and device prototypes in a distributed structure of distribution centers. The main objective of the project was to increase the efficiency of the integrated supply chain. This objective was achieved through the development and implementation of the results of the research and development project, which are:

- new methods of picking heterogeneous loading units using prototypes of digitally controlled automation devices,
- a modern decision-making module for the WMS system using intelligent algorithms that automate and support the global decision-making process in a distributed structure of distribution centers.

### Keywords:

logistics; automation; machine learning; distribution centers; decision-making



## INNOVATIVE PROTOTYPE OF AN ANALYTICAL PLATFORM USING INTERNET OF THINGS MECHANISMS

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Tomasz Brom – Senior Project Specialist.

### **Abstract:**

The research and development project is a response to the company's ongoing need for growth and the search for innovative, practical solutions. The company identified the issue of DIRP (Data Rich Information Poor), noting that although it receives vast amounts of data from retail points, it lacks effective models to assess the value of this information. It processes large volumes of varied, unstructured data to better understand customer purchasing behaviors. The abundance of data makes it difficult to distinguish valuable, explanatory information from data without market significance.

To address this, the company undertook R&D efforts to create a prototype of an innovative platform for analyzing distributed and heterogeneous Big Data, leveraging Internet of Things (IoT) mechanisms. The platform also supports individualized promotional activities in traditional sales channels, helping the company compete effectively with foreign networked retailers. As a result, the analytical platform was developed with:

- a hardware layer – smart IoT devices (telemetric shelves and modules) for collecting data from various sales channels.
- a software layer – specialized software for analyzing the gathered data.

### **Keywords:**

automation; machine learning; IoT; data analysis; retail



## SMART MEAL PLANNER

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### **Abstract:**

The main expectation of users is personalization, which is a key trend in e-commerce and beyond. According to various reports, personalized activities and content will play a crucial role. Personalization is understood not only as a market need generated by customers and users, but also as an opportunity for marketers. The company conducted a research and development project, which resulted in the Intelligent Cooking Planner (ICP) based on artificial intelligence solutions. The project was carried out with the overarching goal of increasing contact time with the company's brands through the [uwielbiam.pl](http://uwielbiam.pl) website, where the aforementioned result of the project was implemented.

The Intelligent Culinary Planner works on the basis of a machine learning (ML) model developed in the course of R&D work, which is used to personalize and recommend culinary content tailored to the user's preferences and needs. The IPK reduces the time users spend searching for the desired recipe, thus bringing the company a long-term benefit in the form of users returning to the [uwielbiam.pl](http://uwielbiam.pl) website (a place that is attractive to users in terms of satisfaction with personalized content drawn from the website).

Thanks to R&D work, it was possible to develop the architecture of the solution and a machine learning (ML) model for the purpose of customizing (personalizing) culinary content for users of the [uwielbiam.pl](http://uwielbiam.pl) website.

### **Keywords:**

personalization; machine learning; recommendation; culinary platform; user data



## ETHICS OF A PUBLIC OFFICIAL – THE PROSECUTOR

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I am a 2<sup>nd</sup> year student of Forensic Science. I am interested in issues related to law and social sciences. I am eager to broaden my knowledge and develop practical skills that will be useful in my future professional career.

### **Abstract:**

The ethics of a public prosecutor, as a public official, play a key role in building public trust in the justice system. The prosecutor holds a special position within the legal framework – safeguarding the rule of law, conducting preparatory proceedings, and representing the interests of the state. For this reason, the role requires not only high professional qualifications but also strict adherence to the principles of professional ethics. The foundations of ethical conduct include, among others, objectivity, integrity, independence, and respect for human rights. Particular importance is attached to political neutrality as well as the duty to maintain official secrecy. Observance of ethical standards protects against abuses of power and conflicts of interest, while their violation results in disciplinary liability and the loss of social authority. An analysis of the role of ethics in the prosecutor's work demonstrates that it constitutes the very foundation of a fair and impartial justice system.

### **Keywords:**

prosecutor; law; ethics



## PRINCIPLES OF DRAFTING AND PROMULATING NORMATIVE ACTS

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Student of Economics at Jan Grodek State University in Sanok, specializing in Accounting and Taxes. Academic interests include the principles of drafting and promulgating normative acts.

### **Abstract:**

The presentation explores the principles of drafting and promulgating normative acts in Poland. It outlines the hierarchy of legal acts, legislative procedures, and the role of state institutions such as the parliament, president, and constitutional tribunal. Special attention is given to the requirements of clarity, consistency, and proper legal language in drafting. The abstract also highlights the significance of promulgation in official journals as a condition for the entry into force of laws, as well as the importance of *vacatio legis*. The study emphasizes that correct legislative techniques ensure legal stability, protection of citizens' rights, and compliance with constitutional standards.

### **Keywords:**

normative acts; legislative process; promulgation; legal drafting; *vacatio legis*



## **ETHIC OF SCIENTIFIC RESEARCH AND THE LEGAL RESPONSIBILITY OF RESEARCHERS – DO LEGAL REGULATIONS KEEP PACE WITH ETHICAL COMES IN SCIENCE**

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I am a 4<sup>th</sup> year law student at the University of Silesia in Katowice. My Academic interests focus on Civil law and criminal law. I am particularly interested in the partical implications of legal responsibility and its role in contemporary Society

### **Abstract:**

Ethics of Scientific Research and the Legal Responsibility of Researchers – Do Legal Regulations Keep Pace with Ethical Codes in Science?

The dynamic development of modern science poses new challenges not only for researchers themselves but also for the legal systems that regulate their work. While codes of research ethics are constantly evolving to address issues such as data integrity, informed consent, or conflicts of interest, the question arises whether existing legal frameworks adequately reflect these standards and provide effective mechanisms of accountability.

The aim of this paper is to analyze the relationship between ethical norms in scientific research and the legal responsibility of researchers in Poland and the European Union. Particular attention will be paid to the differences between non-binding codes of ethics and binding legal norms, as well as the consequences of breaches in both areas. The presentation will also examine examples from biomedical research, clinical trials, and social sciences, highlighting situations where ethical misconduct may or may not entail legal liability.

The conclusions of the analysis suggest that while law often lags behind ethical standards, there is an increasing tendency to integrate ethical principles into legislation. This process raises fundamental questions about the role of law in promoting responsible science and protecting public trust in research.

### **Keywords:**

research ethic; legal responsibility; codes of ethics; law and science



## DEVELOPMENT OF A SOLUTION AUTOMATING THE STORE DISPLAY MANAGEMENT PROCESS

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### **Abstract:**

The main research challenge in the project was to create an application that would recommend the optimal placement of products on store shelves, thereby automating the process of creating planograms, i.e., graphical representations of sales space including store fixtures and the products displayed on them. Planograms are used in retail to optimize display and assortment, usually during product category management projects. Developing an application that recommends the most effective planogram possible is a complex issue.

The work resulted in the creation of a system that automates the store display management process, using artificial intelligence (machine learning) in the decision-making process based on data received from IoT devices. In addition, the developed planograms were visualized in the virtual store space. The use of machine learning helped identify the optimal placement of products by category to achieve the best possible sales.

### **Keywords:**

personalization; machine learning; automation; recommendation; planogram



## NATURAL GEOMETRY IN DESCARTES' DIOPTRICS

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Kazimierz Mrówka, PhD in philosophy, professor at the University of the National Education Commission in Krakow; his research focuses on the history of philosophy and science.

### **Abstract:**

In my presentation, I explore Descartes' concept of "natural geometry," according to which our perception of space arises from the seamless interaction of body and mind. For example, vision, much like measuring angles with sticks by a blind man "seeing with his hands," allows us to gauge the position of objects without any conscious calculation. These innate sensory processes unite mathematics, physiology, and philosophy, revealing how the mind instinctively interprets spatial information.

### **Keywords:**

descartes; dioptrics; geometry; vision; perception



## FALSE MEMORIES

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4<sup>th</sup> year psychology student at Adam Mickiewicz University in Poznań, working at a mental health center. Passionate about psychology, with a special interest in cognitive processes and their practical application.

### **Abstract:**

This paper examines the phenomenon of false memories—recollections that individuals believe with confidence despite never having occurred. Drawing on Frederic Bartlett's classic studies on memory reconstruction, it shows how retellings simplify and distort stories over time. A major focus is the work of Elizabeth Loftus, particularly her experiments on eyewitness testimony. The Loftus and Palmer (1974) study demonstrated how subtle changes in wording can alter people's memory of events, while later research revealed that entirely fictitious episodes, such as being lost in a shopping mall, could be implanted in participants' recollections. Further investigations emphasize the social dimension of memory: research by Edelson, Sharot, Dolan, and Dudai (2001) found that people often conform their memories to group opinions. The paper also explores the Mandela Effect, in which many individuals share the same false memories of cultural events. These findings highlight the reconstructive, fallible, and socially influenced nature of memory, with important consequences for psychology, law, and everyday life.

### **Keywords:**

false memories; eyewitness testimony; cognitive psychology; memory reconstruction; Mandela Effect



## STERNBERG'S TRIANGULAR THEORY OF LOVE

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### **A few words about the author(s):**

4<sup>th</sup> year psychology student at Adam Mickiewicz University in Poznań, working at a mental health center. Passionate about psychology, with a special interest in cognitive processes and their practical application.

### **Abstract:**

This paper presents Robert Sternberg's triangular theory of love, which explains romantic relationships through the interaction of three fundamental components: passion, intimacy, and commitment. Passion refers to physical or romantic desire and the drive for emotional or physical union. Intimacy is based on closeness, trust, and mutual care, reflecting the need for understanding and emotional support. Commitment involves the decision to maintain a long-term bond and responsibility toward the relationship, even in the face of difficulties. Depending on the presence or absence of these three elements, Sternberg distinguished seven types of love: liking, infatuation, empty love, romantic love, companionate love, fatuous love, and consummate love. While some forms are fleeting or incomplete, consummate love—where passion, intimacy, and commitment coexist—represents the ideal yet rare and difficult-to-maintain relationship model. Sternberg's theory provides a comprehensive framework for understanding the dynamics of love, its transformations over time, and its importance for human well-being.

### **Keywords:**

triangular theory of love; passion; intimacy; commitment; relationship types



## **METHODS OF WORKING WITH STUDENTS WITH SPECIFIC EDUCATIONAL NEEDS (DYSEXIA, DYSGRAPHIA, DYSORTHOGRAPHY, DYSCALCULIA)**

**Joanna Zacharska**

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### **A few words about the author(s):**

I am a student of social work. I like to help others and i am fascinated by the ability to support people in everyday difficulties.

### **Abstract:**

The presentation discusses methods of working with students with specific educational needs: dyslexia, dysgraphia, dysorthography and dyscalculia. It indicates the main difficulties faced by children and strategies to support their development. The importance of individualizing teaching, adjusting the pace and forms of work to the student's capabilities, as well as using multisensory methods, teaching aids and modern technologies was emphasized. An important elements is pisitive strengthening, developing motivation and building self-esteem. The role of cooperation between teachers, parents and specialists, which allows to create an environment of educational success by students with difficulties, was also noted.

### **Keywords:**

method; dysgraphia; dysorthography; dyscalculia; dyslection

ABSTRACTS OF  
**POSTERS**



**HUMANITIES  
SCIENCES**



## CO-OPERATIVE ECONOMICS

**Klaudia Bala**

*Krakow University of Economics*

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### **A few words about the author(s):**

My name is Klaudia Bala and I am a student of Finance and Accounting at the University of Economics in Krakow.

### **Abstract:**

The sharing economy is an economic model based on providing goods and services through digital platforms, exemplified by Uber and Airbnb. It reshapes traditional industries by offering consumers greater access and lower prices, but also generates regulatory and social tensions. The rise of the gig economy brings flexibility for workers while removing job stability and social protections. Rapid sector growth outpaces existing legal frameworks, leading to conflicts with authorities and raising ethical questions about data privacy, environmental impact, and urban gentrification. Finding a balance between innovation and the public interest is becoming essential.

### **Keywords:**

economics; impact; consequences



## LYING BY CHILDREN

**Marta Kazmierczak-Kołodziejczyk**

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### **A few words about the author(s):**

The author of the presentation has been studying since 2022 at the Faculty of Social Sciences at Jan Długosz University in Częstochowa. Her field of study is preschool and early childhood pedagogy.

### **Abstract:**

What is a lie? Is lying encoded in human DNA, or do we learn to lie during our lifetime?

There are probably no truthful people and lying begins to accompany us in early childhood. The poster explores the topic of lying in children. The author identifies different types of lies, focuses on the causes of lying, discusses J. Piaget's theory and moral development in early childhood. The author reports on research on lying in children.

### **Keywords:**

lies; children; childhood



**NON-FORMAL EDUCATION AS A RESPONSE TO LOCAL NEEDS:  
AN ANALYSIS OF THE ACTIVITIES OF AN INSTITUTION  
IN SUB-SAHARAN AFRICA**

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**A few words about the author(s):**

Students who are interested in educational activities in other cultures. Those looking for differences and common features between different systems, as well as those interested in non-systemic methods of implementing educational activities.

**Abstract:**

The education system in Ethiopia is characterised by extremes resulting from differences in place of residence, wealth and the multi-ethnic nature of the country. For some children, universal education is not available or is very limited. Mission of Hope is an example of one of the alternative educational institutions operating in Ethiopia. It provides an opportunity for education for children who would otherwise not have such an opportunity in the state education system. Located in south-eastern Ethiopia, the school faces many financial, organisational and curricular challenges. These problems concern both the social functioning of pupils and their parents, as well as the education of teachers and access to teaching materials. The aim of the poster is to present the main aspects of the functioning of the Mission of Hope institution in the context of the general educational situation in Ethiopia.

**Keywords:**

non-formal education; Ethiopia; Sub-Saharan Africa; alternative educational institutions in Africa



## THE ROLE OF MOBILE APPLICATIONS OF COURIER COMPANIES IN SHAPING DAILY CONSUMER PRACTICES IN LOGISTICS SERVICES

**Krzysztof Mościan**

*University of Warmia and Mazury in Olsztyn*

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### **A few words about the author(s):**

My name is Krzysztof and I study logistics at the University of Warmia and Mazury in Olsztyn. I am passionate about logistics, particularly topics related to the functioning and development of the courier industry.

### **Abstract:**

The poster presents the significance of mobile applications of courier companies in the daily use of logistics services. It illustrates the application features most frequently used by users, such as shipment tracking, delivery status notifications, changes in delivery time or location and payment handling.

The poster also highlights barriers and difficulties encountered while using the applications, including technical issues, lack of necessary features and non-intuitive interfaces. Furthermore, it presents questions regarding application usage scenarios and the level of trust in data processing.

The aim of the poster is to demonstrate how mobile applications are employed in everyday practices of using courier services and to identify the aspects that users consider most important for their functioning.

### **Keywords:**

logistics; mobile applications; courier companies; logistics services; user experience



## **CROWDFUNDING – AN INNOVATIVE SOURCE OF CAPITAL FOR ENTERPRISES**

**Sara Wiktoria Partyka**

*Krakow University of Economics*

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### **A few words about the author(s):**

My name is Sara Partyka and I am a last year student of Finance and Accounting at Krakow University of Economics.

### **Abstract:**

1. Introduction – Definition of crowdfunding and its role in supporting startups and small businesses.
2. Types – Reward-based, equity-based, debt-based, and donation-based models.
3. Benefits – Access to capital, market testing, community building, and marketing effects.
4. Development – From creative projects (2000s), through expansion and regulation (2010s), to blockchain integration and COVID-19 acceleration (2020).
5. Real Life Example.
6. Conclusion – Crowdfunding as an innovative and growing source of business financing.

### **Keywords:**

crowdfunding; alternative financing; entrepreneurship; startups; capital acquisition



## **DELIVERY PERSONALIZATION AND FLEXIBILITY IN THE CONTEXT OF LOGISTICS SERVICE QUALITY FROM THE ULTIMATE CONSUMER PERSPECTIVE**

**Patrycja Stańczak**

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### **A few words about the author(s):**

My name is Patrycja and I am a master's student in management at the University of Warmia and Mazury in Olsztyn.

### **Abstract:**

The poster presents the role of personalization, flexibility and self-service in the parcel delivery process and their significance for the quality of logistics services. It illustrates how consumers adapt parcel receipt to their individual needs, daily schedules, and preferences for contactless delivery options.

The poster also presents the results of a study on preferences regarding changes in delivery time and location, the use of parcel lockers and demographic differences in the selection of self-service options. Additionally, it provides information on limitations and barriers that may affect user convenience, such as the lack of flexible delivery options or difficulties in using new logistics solutions.

The aim of the poster is to demonstrate how personalization and flexibility in deliveries shape everyday online shopping practices. Furthermore, it identifies which factors are important for users in terms of service quality and in the context of intelligent and sustainable urban systems.

### **Keywords:**

courier deliveries; parcel lockers; consumer preferences; quality of logistics services

ABSTRACTS OF  
**PRESENTATIONS**



**MEDICAL  
SCIENCES**



## **THE IMPACT OF OCCLUSION TRAINING AND ENDURANCE TRAINING ON MUSCLE ADAPTATIONS IN WOMEN AND MEN – A COMPARATIVE ANALYSIS**

**Katarzyna Dutkowska\*, Karolina Cieślińska**

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### **A few words about the author(s):**

We are 4<sup>th</sup> year physiotherapy students at the University of Opole, Faculty of Health Sciences. Our main interests include modern training methods, and we continue to develop our expertise through participation in research projects.

### **Abstract:**

The aim of this study was to compare the effects of occlusion training and endurance training on muscle adaptations in women and men. Muscle adaptation is influenced by multiple factors, including training modality, sex, and physiological differences in muscle response. Occlusion training, also referred to as blood flow restriction (BFR) training, has been shown to stimulate hypertrophy and strength gains even at low loads, while endurance training primarily enhances oxidative capacity and muscular efficiency. In this comparative analysis, the focus was placed on evaluating changes in muscle mass, strength, and neuromuscular activity following both training approaches in female and male participants. The results of previous studies suggest that men tend to achieve greater hypertrophy responses, whereas women often present improved fatigue resistance and endurance capacity. Understanding these differences is crucial for optimizing training strategies and tailoring exercise programs to individual needs. This analysis highlights the potential applications of both training modalities in sports performance, rehabilitation, and health promotion, emphasizing the importance of sex-specific adaptations.

### **Keywords:**

physiotherapy; physical activity; occlusive training



## NEUROBORRELIOSIS – A LESSER-KNOWN FORM OF A WELL-KNOWN DISEASE

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### **A few words about the author(s):**

Authors of this work are students attending 2<sup>nd</sup> year of medical faculty. We conduct a great deal of science work in Medical Microbiology Students Research Group supervised by Małgorzata Koziół, PhD in microbiology.

### **Abstract:**

Lyme disease (LD) is a well-known and most common tick-borne bacterial disease, caused by the spirochete *Borrelia burgdorferi sensu lato*. While the public is aware of the initial symptoms like i.e., erythema migrans (EM), and the later manifestation known as Lyme arthritis (LA), about other symptoms are not necessarily. Data show that in Poland, 9,134 LD cases were reported in the first half of 2024, and 118 of which were recorded as those with symptoms from peripheral/central nervous systems. Neuroborreliosis (LNB) may initially manifest as paralysis of cranial nerves and/or spinal nerve roots. Radiculopathies can persist later. The patient may experience symptoms of meningitis, encephalomyelitis with spastic symptoms, ataxia, gait disturbances, or even bladder dysfunction. Diagnosing LNB involves several steps and relies on a medical history, physical examination, and laboratory diagnostics (not only serum analysis). Serological examination of cerebrospinal fluid (CSF) is crucial, and molecular methods are also performed in this material. Furthermore, the final recognition should include differential diagnosis of neurological disorders with nonspecific symptoms. The aim of this analysis was to present the current epidemiological situation of LNB in recent years, particularly in terms of the growing tick population and symptoms, and to update on new laboratory diagnostic recommendations, defining differential diagnoses, and available therapeutic options.

### **Keywords:**

Lyme disease; Bell's palsy; tick-borne disease



## **RABIES AS VETERINARY AND HUMANITARIAN THREAT IN BORDER AREAS**

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### **A few words about the author(s):**

Authors of this work are students attending 2<sup>nd</sup> year of medical faculty. We conduct a great deal of science work in Medical Microbiology Students Research Group supervised by Małgorzata Koziół, PhD in microbiology.

### **Abstract:**

The Rabies virus is a major pathogen that poses a significant threat to human and animal health (both domestic and wild animals). It is transmitted through bites or scratches, typically via saliva and affects nerve system. Incubation period can be quite long and symptoms starts from tingling at the bite site and then show up fever, nausea, hydrophobia, photophobia, salivation, seizures, acute encephalomyelitis. Thanks to vaccinations of wild and domestic animals European Union countries were consider almost as a free from virus, and only some cases in wild animals were noted in Eastern part, and vaccination program were keep going especially in Poland (PL). In the light of the war in Ukraine (UA), this situation has changed and rabies cases have increased. PL began supplying vaccines to UA as part of international programs. When the situation becoming alarming, at the end of 2024, mandatory vaccination of cats was introduced in the country's border regions. It is obvious that war conflict caused an increase number of infected animals, although there are no official reports on UA, in public circulating information that cases in humans showed up. The aim of this work was to present the current Rabies epidemiological situation in PL and UA from available sources and to raise awareness of the scale of the problem and the real threat. We wanted as well discuss action which were taken to curb the growing problem in polish border area and analyze whether this is sufficient.

### **Keywords:**

virus; foxes; infection; nerve system



**LOCAL ANESTHESIA AS A COMPONENT OF THE ENHANCED RECOVERY AFTER SURGERY (ERAS) TO IMPROVE SURGICAL OUTCOMES – REDUCING THE ROLE OF CONSCIOUS SEDATION AND GENERAL ANESTHESIA IN AMBULATORY SURGERY**

**Aleksandra Smużniak\*, Angelika Żurawska, Szymon Wolaniuk,  
Dawid Piekarski, Karolina Tomasik**

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**A few words about the author(s):**

Student scientific society at institute of medical sciences.

**Abstract:**

Local anesthesia is a widely used method of anesthesia in many fields of medicine, enabling the performance of surgical and diagnostic procedures while maintaining patient consciousness. It allows for effective pain control while reducing the risk of complications characteristic of sedation and general anesthesia, such as respiratory disorders or prolonged recovery time. This paper presents the current state of knowledge regarding the comparison of the efficacy and safety of local anesthesia and sedation. The analysis included publications based on clinical trials, meta-analyses, and current anesthesiology guidelines. The literature search was conducted using PubMed, Google Scholar, and ResearchGate databases. Particular attention was paid to the pharmacological aspects of local anesthetics, their practical application within perioperative care protocols, as well as the decreasing role of sedation and general anesthesia in contemporary clinical practice. The study also addresses issues related to patient safety and comfort.

**Keywords:**

local anesthesia; sedation; anesthetic safety; regional analgesia; ERAS



## **CIPROFOL VERSUS PROPOFOL – COMPARISON OF EFFICACY AND SAFETY IN GENERAL ANESTHESIA AND SEDATION**

**Angelika Żurawska\*, Szymon Wolaniuk, Dawid Piekarski,  
Karolina Tomasik, Aleksandra Smużniak**

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### **A few words about the author(s):**

Student scientific society at institute of medical sciences.

### **Abstract:**

Ciprofol is a novel intravenous anesthetic agent, structurally related to propofol, with higher potency and a potentially improved safety profile. The aim of this paper is to compare the efficacy and safety of both drugs in anesthesia induction, maintenance, and sedation. A systematic review of the available literature was conducted using PubMed, Google Scholar, Elsevier, and ResearchGate databases. Clinical studies evaluating pharmacokinetics, anesthetic efficacy, hemodynamic stability, and adverse events were analyzed. The findings suggest that ciprofol has a similar onset of action and recovery time to propofol, while demonstrating reduced incidence of hypotension, bradycardia, and injection-site pain. Both agents show rapid metabolism and short half-life, enabling precise control of anesthetic depth. Importantly, no cases of propofol infusion syndrome (PRIS) have been reported with ciprofol. In conclusion, ciprofol may represent a safe and effective alternative to propofol, particularly in patients at risk of hemodynamic instability, although further large-scale studies are warranted.

### **Keywords:**

ciprofol; propofol; general anesthesia; sedation; hemodynamic safety



## NEW ADDICTIONS – THE 21<sup>ST</sup> CENTURY PATIENT

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### **A few words about the author(s):**

Graduate of the Jan Grodek State University in Sanok.

### **Abstract:**

The contemporary world, dominated by digital technologies and a fast-paced lifestyle, fosters the development of so-called new addictions, defined as behavioral. These addictions do not result from the use of psychoactive substances, but rather from excessive repetition of certain activities. They most often involve internet and smartphone use, social media, computer games, online shopping, or excessive professional involvement.

Their consequences affect many areas of life. They can lead to physical disorders (sleep problems, back pain, obesity), mental disorders (depression, anxiety, low self-esteem), and social disorders (isolation, family conflicts). Adolescents are most at risk, but the problem also affects adults and seniors.

As one of the first members of the medical team to encounter a patient, the nurse plays a key role in recognizing symptoms, providing health education, and motivating patients to begin treatment. They are also responsible for providing emotional support to the patient and family and participating in preventative measures, particularly in schools and primary care.

New addictions require adapting nursing practice to the challenges of today. Early diagnosis, education and prevention can limit the scale of the phenomenon and improve the quality of life of patients.

### **Keywords:**

new addictions; smartphone; social media; video games



## **HOLISTIC MANAGEMENT OF CHRONIC WOUNDS: INTEGRATING CLINICAL ASSESSMENT, TIME STRATEGY AND PATIENT-CENTERED CARE**

**Weronika Grzesiak (1, 2, 3)\*, Michał Kostro (1, 2, 3), Aleksandra Malinowska (1, 2, 3),  
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### **A few words about the author(s):**

All the authors are medical students at the Faculty of Medicine, University of Opole, Opole, Poland.

### **Abstract:**

Chronic wounds pose a significant clinical challenge, necessitating a comprehensive approach that addresses both local tissue factors and the patient's overall health status. This presentation summarizes current evidence on a holistic model for chronic wound care, emphasizing the importance of targeted history taking, thorough vascular assessment, and interdisciplinary collaboration. Key components of the clinical evaluation include systematic measurement of wound dimensions, inspection of wound bed characteristics (granulation tissue, necrosis, fibrin, or eschar), assessment of wound edge morphology, and examination of periwound skin integrity. Early identification of infection—through signs such as increased exudate, malodor, and tissue friability—guides prompt debridement and antimicrobial intervention. The TIME framework (Tissue debridement, Infection and inflammation control, Moisture balance, and Edge advancement) offers a structured algorithm to remove barriers to healing and stimulate re-epithelialization. Equally critical is a patient-centered focus on pain management and quality of life: minimizing dressing changes, enabling self-care when feasible, and addressing psychosocial needs support long-term adherence and functional recovery. By uniting evidence-based wound bed preparation with individualized pain control and psychosocial support, this holistic paradigm enhances healing outcomes and elevates standards of practice in chronic wound management.

### **Keywords:**

chronic wounds; holistic care model; vascular assessment; TIME Concept; pain management and quality of life



## **NEW DIRECTIONS IN FUNCTIONAL BRAIN MAPPING AND THE SAFETY OF NEUROSURGICAL OPERATIONS**

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### **A few words about the author(s):**

A group of medical students interested in neurology and functional brain mapping, emphasizing patient safety and interdisciplinary collaboration in neurosurgery.

### **Abstract:**

Functional brain mapping is essential in modern neurosurgery, particularly for treating brain tumors, epilepsy, and lesions in eloquent areas. Its main goal is to maximize tissue resection while preserving critical neurological functions. Direct cortical stimulation (DCS) has been the gold standard, but its invasive nature limits use to intraoperative settings.

Non-invasive techniques such as functional MRI (fMRI) and diffusion tensor imaging (DTI) provide preoperative insights into motor, language, and sensory networks, though results may vary by patient. Magnetoencephalography (MEG) and navigated transcranial magnetic stimulation (nTMS) offer more precise localization and integration of neurophysiological and anatomical data. nTMS, in particular, aids surgical planning, risk assessment, and patient counseling.

Intraoperative methods are also evolving. Awake craniotomy with real-time functional testing is increasingly applied beyond tumor surgery. Multimodal data integration into neuronavigation systems enhances safety by visualizing functional and structural networks during surgery.

The future of functional mapping relies on interdisciplinary collaboration, standardized protocols, and personalized strategies. Combining advanced imaging with neurophysiological techniques improves surgical outcomes and postoperative quality of life.

### **Keywords:**

functional brain mapping; neurosurgery; preoperative planning; patient safety



## **ANATOMICAL TOPOGRAPHY AND CLINICAL IMPLICATIONS OF ABDOMINAL AORTIC ANEURYSMS WITH EMPHASIS ON RUPTURE RISK**

**Michał Kostro (1, 2, 3)\*, Weronika Grzesiak (1, 2, 3), Aleksandra Malinowska (1, 2, 3),  
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### **A few words about the author(s):**

All the authors are medical students at the Faculty of Medicine, University of Opole, Opole, Poland.

### **Abstract:**

Abdominal aortic aneurysm (AAA) is defined by an infrarenal aortic diameter  $\geq 30$  mm or a focal dilation  $\geq 50\%$  of the adjacent normal segment. Most AAAs remain clinically silent until rupture, which carries up to 90% mortality. Rupture typically occurs through the posterior wall into the retroperitoneum, allowing transient tamponade, whereas anterior breaches lead to rapid intraperitoneal hemorrhage and prehospital death. Inflammatory AAAs, accounting for about 5% of cases, are distinguished by a thickened aneurysm wall, perianeurysmal fibrosis, elevated inflammatory markers and symptoms such as low-grade fever and flank discomfort. Established risk factors include advanced age, male sex, smoking, hypertension, atherosclerosis and family history. Aneurysm growth  $>5$  mm over six months and diameter thresholds ( $\geq 55$  mm in men;  $\geq 50$  mm in women) predict rupture risk and guide intervention. Abdominal ultrasound remains the cornerstone of screening, with CT angiography providing detailed sizing, anatomical mapping and procedural planning. Management spans conservative risk-factor modification—smoking cessation, blood pressure control and statins—to timely repair by open surgery or endovascular aneurysm repair (EVAR) when size or growth criteria are met. Our review synthesizes current understanding of AAA topography, natural history and tailored therapeutic strategies aimed at improving clinical outcomes.

### **Keywords:**

Abdominal Aortic Aneurysm (AAA); Aneurysm Rupture Risk; CT Angiography; Endovascular Aneurysm Repair (EVAR); Inflammatory Aneurysm



## MICROBIOTA OF THE UROGENITAL SYSTEM: FROM PHYSIOLOGICAL HOMEOSTASIS TO PATHOLOGICAL IMPLICATIONS

**Aleksandra Malinowska (1, 2, 3)\*, Weronika Grzesiak (1, 2, 3), Michał Kostro (1, 2, 3),  
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### **A few words about the author(s):**

All the authors are medical students at the Faculty of Medicine, University of Opole, Opole, Poland.

### **Abstract:**

The urogenital system microbiota plays a crucial role in maintaining physiological homeostasis and preventing pathogenic colonization. Under normal conditions, most areas remain sterile, with physiological microbiota present only at the vaginal opening and urethral meatus. Healthy vaginal microbiota is dominated by *Lactobacillus* species, establishing colonization within 6 weeks after birth due to maternal estrogen influence. *Lactobacillus* maintains vaginal health through hydrogen peroxide production with bacteriostatic effects against anaerobic bacteria, organic acid secretion (lactic and acetic acid), bacteriocin production, and maintenance of acidic pH (3.5-4.5). These mechanisms prevent pathogenic colonization causing bacterial vaginosis, vulvovaginal candidiasis, and sexually transmitted infections. Microbiota disruption leads to significant pathological conditions. Bacterial vaginosis, characterized by decreased *Lactobacillus* dominance and *Gardnerella vaginalis* overgrowth, represents the most common vaginal infection in reproductive-age women. *Candida* species, particularly *C. albicans*, cause vulvovaginal candidiasis, especially following antibiotic therapy. Recent detection technologies revealed previously unrecognized bacterial species in the urinary tract, challenging traditional sterility concepts. This emerging understanding opens new therapeutic avenues, including probiotic interventions and microbiome-targeted treatments for recurrent urogenital infections.

### **Keywords:**

Urogenital Microbiota; *Lactobacillus*; Bacterial Vaginosis; Vulvovaginal Candidiasis; probiotic



## **THE PIPAC TREATMENT METHOD (PRESSURIZED INTRAPERITONEAL AEROSOL CHEMOTHERAPY): AN OPPORTUNITY FOR PATIENTS WITH METASTATIC CANCER**

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### **A few words about the author(s):**

We are students passionate about the constant development of medicine. During our clinical rotations, we see firsthand how innovation is reshaping healthcare and improving outcomes of patients with different conditions, especially oncological.

### **Abstract:**

This paper aims to review the current knowledge on pressurized intraperitoneal aerosol chemotherapy (PIPAC), an innovative method for treating locally advanced and peritoneally metastasized cancers. This technique involves administering chemotherapy as a pressurized aerosol to enhance drug penetration into diseased peritoneal tissue while reducing systemic toxicity. A literature review was conducted using the PubMed, Google Scholar, and Elsevier databases. The review focused on publications describing the application of PIPAC in treating gastrointestinal cancers, including gastric, colorectal, and ovarian malignancies. Particular attention was given to the role of this method in patients who are not candidates for radical treatment, for whom therapeutic options are limited. This paper emphasizes the potential benefits of PIPAC, including prolonging survival in palliative patients, improving quality of life, delaying or reducing tumor progression, and, in select cases, enabling subsequent radical therapy. However, PIPAC remains an experimental approach and is still under clinical investigation. While current results are promising, further large-scale, multicenter studies are necessary to confirm PIPAC's efficacy and safety and to define its role in standard therapeutic protocols for peritoneal metastases.

### **Keywords:**

PIPAC treatment; oncological surgery; oncology; chemotherapy



## APPLICATION OF ARTIFICIAL INTELLIGENCE IN THE DIAGNOSIS AND TREATMENT OF URINARY TRACT CANCERS

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### **A few words about the author(s):**

A group of medical students interested in the use of artificial intelligence in medicine, especially in the diagnosis and treatment of urinary tract cancers.

### **Abstract:**

Artificial intelligence (AI) is finding increasing application in medicine, including the diagnosis and treatment of urinary tract cancers. The aim of this paper is to analyze the opportunities, advantages, and challenges associated with the implementation of AI, with particular emphasis on its use in diagnostic imaging and personalized therapy. A systematic literature review was conducted using the databases PubMed, Elsevier, and Google Scholar. The focus was on key AI applications in medical image analysis, such as computed tomography, magnetic resonance imaging, and ultrasound. Urinary tract cancers, including those of the kidney, bladder, and prostate, pose a significant clinical problem due to their increasing incidence and the need for precise diagnosis. This paper focuses on the latest scientific findings, discusses the advantages and limitations of AI, and suggests directions for the further development of this technology in urological oncology.

### **Keywords:**

artificial intelligence; urinary tract cancers; urological oncology; diagnostic imaging



## THE BEGINNING OF HUMAN LIFE IN A SCIENTIFIC AND SOCIAL CONTEXT

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### **A few words about the author(s):**

I am a medical biotechnologist and bioethicist. I am interested in embryology and the ethical aspects related to assisted reproductive technologies.

### **Abstract:**

Contemporary debates about the beginning of human life are related to the development of reproductive medicine, biotechnology, and social changes regarding abortion. From the perspective of embryology, life begins at the moment of the union of female and male gametes. In a social context, the beginning of life is defined depending on worldview and religion. Acceptance of in vitro fertilization, contraception, abortion, or research on human embryos leads us to recognize a more advanced stage of embryonic or fetal development as the beginning of human life.

### **Keywords:**

human life; embriology; bioethics



## **BIOCHEMICAL MECHANISMS OF CAFFEINE ACTION AND THEIR RELATIONSHIP TO HEART DISEASE AND SLEEP**

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### **A few words about the author(s):**

Dawid Piekarski, Karolina Tomasik, Aleksandra Smużniak, Angelika Żurawska, Szymon Wolaniuk – student scientific society at institute of medical sciences.

### **Abstract:**

Caffeine is one of the most commonly consumed psychoactive substances in the world, and its biochemical effects remain the subject of intense research. The main mechanism of caffeine activity is competitive inhibition of adenosine receptors, which leads to increased sympathetic nervous system activity, increased levels of neurotransmitters such as dopamine and norepinephrine, and modulation of cyclic AMP. These mechanisms have a significant impact on both cardiovascular function and the regulation of sleep and wakefulness. The literature indicates that chronic caffeine consumption may have a cardioprotective effect by improving endothelial function and antioxidant activity, but at the same time, high doses may promote arrhythmias and hypertension. With regard to sleep, caffeine shortens its total duration, prolongs sleep latency, and reduces the proportion of deep sleep, which can lead to circadian rhythm disorders and chronic insomnia. This analysis presents the biochemical basis of caffeine's effects and discusses their complex relationship with the pathophysiology of cardiovascular disease and sleep disorders, pointing to both the potential benefits and risks of its consumption.

### **Keywords:**

caffeine; adenosine receptors; cardiovascular diseases; sleep disorders; biochemical mechanisms



**ASSESSMENT OF THE INTENSITY OF PHYSICAL EXERTION  
AND THE STATE OF PERCEIVED PLEASURE, FLOW AND SENSE  
OF PRESENCE BY USERS OF ACTIVE VIDEO GAMES IN IMMERSIVE  
AND NON-IMMERSIVE VIRTUAL REALITY**

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**A few words about the author(s):**

Jakub Ryśnik, PhD Eng., Lecturer and Researcher at the Department of Tourism and Recreation at the Academy of Physical Education in Katowice (AWF Katowice). Graduate of Management and Marketing. His research focuses on modern technologies, and the use of VR, active video games, and gamification in tourism and recreation. Jacek Polechoński, PhD, DSc, Professor at the Academy of Physical Education in Katowice (AWF Katowice). Graduate of physiotherapy and physical education. Head of the Laboratory of Pro-Health Physical Activity Research and the Department of Health Training at AWF Katowice. His research focuses on physical activity, health promotion, modern technologies, and the use of VR, active video games, and gamification in promoting physical activity and developing motor abilities across different age groups.

**Abstract:**

Active video games (AVGs) and virtual reality (VR) create opportunities for its users to undertake physical activity (PA) in novel way.

The objective of the study was to measure the intensity of PA as well as the level of perceived satisfaction, flow and sense of presence by healthy adults during workouts involving the IVR and nIVR. Forty students were studied. Participants undertook two PA sessions (boxing workouts). One session involving the IVR and another involving nIVR. During each session The Physical Activity Enjoyment Scale was used to evaluate the enjoyment, the flow state was assessed using The Flow State Scale and the state of presence was measured using the Presence Questionnaire. The perceived intensity of exertion during PA was measured with Borg's Scale of Rate of Perceived Exertion. The objective measure of exertion was the average heart rate as percentage of a person's maximum heart rate (HRmax). The study shows that PA during the IVR session was significantly more intensive compared to the IVR session and also in both sessions (IVR and nIVR), the average heart rate exceeded the threshold of 64% of HRmax, which means that these trainings met the WHO guidelines for health-promoting PA. Also higher level of perceived satisfaction, flow and sense of presence was felt by the respondents during boxing in IVR compared to nIVR. Results should prompt reflection by both those involved in planning and promoting PA, as well as the creators of AVGs.

**Keywords:**

virtual reality; physical activity; boxing; intensity; attractiveness



## KLEINE–LEVIN SYNDROME- CHARACTERISTICS

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### **A few words about the author(s):**

Ewa Staszak – medical student of society at Institute of medical sciences. Weronika Witek – medical student of society at Institute of Medical Sciences.

### **Abstract:**

Kleine–Levin syndrome (KLS) is a rare sleep disorder characterized by recurrent episodes of hypersomnia, hyperphagia, mood disturbances, and, in some cases, increased sexual drive. The clinical presentation and severity of symptoms vary between patients. The length of individual episode usually ranges between one week and several months and significantly affects functioning in many areas of patient's life. The frequency of relapses and the duration of remission periods are variable and individual. The etiology of KLS remains unclear; potential triggering factors mainly include infections, less commonly trauma or environmental factors. The pathogenesis is likely related to dysfunction of the hypothalamus or the hypothalamic–pituitary axis. Diagnosis is based on clinical presentation and the exclusion of other neurological and psychiatric disorders. The syndrome most commonly affects adolescent boys. Symptoms usually resolve spontaneously, often after a decade or longer. A patient is considered cured if no episodes occur for at least six years. Treatment is symptomatic and includes the use of mood stabilizers and antipsychotic drugs, along with attention to sleep hygiene.

### **Keywords:**

hypersomnia; KLS; Kleine-Levin syndrome



## NEW STRATEGIES FOR PREVENTING HOSPITAL-ACQUIRED INFECTIONS IN AN ERA OF INCREASING ANTIBIOTIC RESISTANCE

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### **A few words about the author(s):**

A group of medical students interested in the topic of infectious diseases and antibiotic resistance.

### **Abstract:**

Healthcare-associated infections (HAIs) are a significant clinical problem, and antimicrobial resistance limits the effectiveness of treatment. In recent years, the implementation of infection control programs (IPCs) and antibiotic rationalization strategies (AMSs) has significantly reduced the incidence of HAIs. Modern approaches include enhanced hand hygiene, environmental decontamination, patient isolation, the use of electronic surveillance and artificial intelligence, and limiting the transmission of multidrug-resistant pathogens through decolonization and antiseptic therapies. Integrating AMSs with IPCs promotes the rational use of antibiotics and slows the development of resistance. This review focuses on the latest scientific findings, discusses the advantages and limitations of these strategies, and suggests directions for further development in HAI prevention.

### **Keywords:**

healthcare-associated infections (HAIs); antimicrobial resistance (AMR); hand hygiene; rational antibiotic use



**THE ASSESSMENT OF EXPRESSION OF CIRCULATING MIR-9-3P,  
MIR-9-5P, AND MIR-129-3P, CONSIDERING THE EFFECTS OF ETIOLOGY,  
OCCLUSION LOCALIZATION AND  
TREATMENT IN ACUTE ISCHEMIC STROKE**

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**A few words about the author(s):**

Main authors are medical students and future physicians, members of the Student Scientific Association at the Department of Physiology, Medical University of Silesia. The senior author supervises the study and the Student Scientific Association.

**Abstract:**

**BACKGROUND:** MicroRNAs (miRNAs) are emerging biomarkers in acute ischemic stroke (AIS). This study investigated associations between circulating miRNAs and AIS etiology.

**METHODS:** 36 AIS patients (mean age  $69 \pm 11.4$  years) treated with intravenous thrombolysis (Alteplase or Tenecteplase) and mechanical thrombectomy (MT) were included in the study. Serum was collected on day 1 and day 10 post-treatment, and total miRNA was isolated. Expression of circulating miR-9-3p, miR-9-5p, and miR-129-3p was quantified by qRT-PCR. Relative expression changes were calculated using the  $2^{-\Delta\Delta CT}$  method.

**RESULTS:** Patients with atrial fibrillation (AF) showed elevated miR-9-5p levels on days 1 and 10 compared to patients without AF. In anterior circulation strokes, miR-129-3p on day 1 and miR-9-3p on day 10 were higher compared to posterior circulation strokes. At day 10, patients treated with Alteplase/MT showed lower miR-9-3p and higher miR-9-5p expression, while Tenecteplase/MT demonstrated the inverse pattern.

**CONCLUSIONS:** Circulating miRNAs may provide insight into stroke etiology and treatment response. Elevated miR-9-5p levels in cardioembolic strokes and increased miR-9-3p and miR-129-3p levels in anterior circulation strokes, suggests diagnostic utility in AIS etiology. The distinct expression of miRNAs between Alteplase and Tenecteplase, suggests their potential for monitoring reperfusion strategies, supporting the clinical use of these miRNAs in personalized AIS management.

**Keywords:**

acute ischemic stroke; microRNA; reperfusion therapy; stroke etiology; occlusion localization



## **THE BIOCHEMISTRY OF STRESS – HOW CHRONIC STRESS AFFECTS CORTISOL METABOLISM AND THE RISK OF CHRONIC DISEASES**

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### **A few words about the author(s):**

Karolina Tomasik, Dawid Piekarski, Szymon Wolaniuk, Aleksandra Smużniak, Angelika Żurawska. Student scientific society at institute of medical sciences.

### **Abstract:**

Stress constitutes a natural physiological response, essential for effective adaptation and functioning in a dynamically changing environment. A central component of the stress response is the hypothalamic–pituitary–adrenal (HPA) axis, with cortisol serving as its primary effector hormone. This review presents a comprehensive overview of the current state of knowledge regarding the biochemical mechanisms of cortisol action and its role in the pathogenesis of chronic diseases. The analysis draws upon data from major scientific databases, including PubMed, Elsevier, Google Scholar. The review encompasses the regulation of the HPA axis, the circadian rhythm of cortisol secretion, and the hormone’s impact on carbohydrate, protein, and lipid metabolism. Particular attention is given to the consequences of prolonged exposure to elevated cortisol levels, such as insulin resistance, visceral obesity, immunosuppression, and neurocognitive impairments.

### **Keywords:**

stress; cortisol; HPA axis; chronic diseases; stress biochemistry



## **SLEEP PARALYSIS – BETWEEN DREAM AND WAKEFULNESS**

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### **A few words about the author(s):**

Weronika Witek, Ewa Staszak – medical student society at Institute of Medical Sciences.

### **Abstract:**

Sleep paralysis is a fleeting but unsettling experience that occurs when the mind becomes awake while the body remains in the immobile state typical of REM sleep. In such moments, individuals may find themselves unable to speak or move, often accompanied by vivid hallucinations that tap into deep fear. These hallucinations can include a sense of a presence in the room or pressure on the chest, fostering intense emotional distress. Although the condition is harmless from a physical standpoint, it can be deeply unsettling, especially when it occurs frequently or in individuals predisposed to anxiety, disrupted sleep cycles, or stress. Episodes often resolve on their own within seconds or minutes, but they may leave a lingering sense of dread. For recurrent cases, strategies like improving sleep hygiene, maintaining a regular sleep-wake schedule, and practicing calming routines before bed can help reduce occurrences. Cognitive-behavioral techniques and gentle reassurance about the benign nature of the phenomenon may also provide comfort. Sleeping on one's side rather than the back and managing stress can further lessen the likelihood of these episodes. Ultimately, while sleep paralysis can feel like a nightmare, understanding its roots and applying thoughtful measures can help a person reclaim peaceful rest.

### **Keywords:**

sleep paralysis; parasomnia



## CURRENT STATE OF KNOWLEDGE ON ROSAI-DORFMAN-DESTOMBES DISEASE

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### **A few words about the author(s):**

Szymon Wolaniuk, Dawid Piekarski and Karolina Tomasik – 5<sup>th</sup> year medical students.  
Aleksandra Smużniak and Angelika Żurawska – 2<sup>nd</sup> year medical students.

### **Abstract:**

The aim of this paper is to summarize the current scientific knowledge on Rosai-Dorfman-Destombes disease (RDD). RDD is a rare disease also described as sinus histiocytosis with massive lymphadenopathy. In the clinical course, polyclonal non-Langerhans histiocytes accumulate within the lymph nodes or in extranodal areas. The pathogenesis of RDD still remains unclear, however, recently, an association with disturbances in the MAP-ERK signaling pathways has been found indicating the potentially neoplastic nature of the disease. The disease most commonly affects young Caucasian adults. Familial cases have also been reported suggesting the existence of certain genetic predispositions. RDD is characterized by a varied, mostly mild course, with spontaneous remissions occurring in up to 50% of patients. However RDD may be a potentially fatal condition and result in complications in the form of organ damage. Therefore, proper diagnosis and initiation of appropriate treatment are highly important. A narrative review of the literature was conducted using the PubMed and Google Scholar databases and the ResearchRabbit tool. This review discusses the pathophysiological phenomena in the course of the syndrome, the clinical features, and available therapeutic methods.

### **Keywords:**

Rosai-Dorfman-Destombes disease; Rosai-Dorfman Disease; Histiocytosis; rare disease



## THE IMPACT OF PHYSICAL ACTIVITY ON THE CIRCULATORY SYSTEM

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### **A few words about the author(s):**

I am a 1<sup>st</sup> year dietetics student at the University of Rzeszów. In my presentation, I will discuss the impact of physical activity on the circulatory system.

### **Abstract:**

Physical activity plays a key role in the proper functioning of the circulatory system. Regular exercise strengthens the heart muscle, improves the elasticity of blood vessels, and promotes better oxygenation throughout the body. Studies show that physically active people are less likely to suffer from hypertension, atherosclerosis, and coronary artery disease, and their risk of heart attack and stroke can be reduced by up to several dozen percent. Exercise lowers "bad" cholesterol (LDL), increases "good" cholesterol (HDL), and regulates blood pressure. Adaptive mechanisms, such as the so-called "athlete's heart," will also be discussed, which refers to changes in the function and structure of the heart muscle following long-term training. The aim of the presentation is to demonstrate that regular, moderate physical activity is one of the most effective and simplest ways to prevent cardiovascular disease, as well as an important element of a healthy lifestyle.

### **Keywords:**

physical activity; circulatory system; health

ABSTRACTS OF  
**POSTERS**



**MEDICAL  
SCIENCES**



## URINARY BIOMARKERS MEASURED BY BIOPLEX IN CHILDREN WITH ACUTE KIDNEY INJURY AT ADMISSION AND AFTER ONE WEEK OF TREATMENT COMPARED TO HEALTHY CONTROLS – PRELIMINARY RESULTS

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### **A few words about the author(s):**

Resident in Pediatrics and Nephrology at the Medical University Children's Hospital in Białystok and PhD candidate at the Doctoral School of the Medical University of Białystok.

### **Abstract:**

**BACKGROUND:** Acute kidney injury (AKI) in children carries high morbidity. Conventional serum markers rise late and lack sensitivity. Urinary biomarkers measured by multiplex assays may provide earlier diagnostic information.

**METHODS:** Six children aged 2–17.8 years with AKI and healthy controls were studied. Urine was collected on admission (day 1) and day 7. Biomarkers (calbindin, KIM-1, MCP-1, albumin, B2M, NGAL, osteopontin, TFF3) were assessed using Bioplex. Both non-normalized and creatinine-normalized values were analyzed.

**RESULTS:** Non-normalized concentrations were higher in AKI for calbindin ( $p=0.020$ ), MCP-1 ( $p=0.031$ ), albumin ( $p=0.033$ ), B2M ( $p=0.020$ ), NGAL ( $p=0.005$ ), osteopontin ( $p=0.046$ ), TFF3 ( $p=0.013$ ). Osteopontin decreased from day 1 to 7 ( $p=0.046$ ). After normalization, differences remained for KIM-1/Cr ( $p=0.029$ ), MCP-1/Cr ( $p=0.005$ ), Alb/Cr ( $p=0.013$ ), B2M/Cr ( $p=0.033$ ), NGAL/Cr ( $p=0.005$ ), TFF3/Cr ( $p=0.013$ ); osteopontin lost significance. Correlations were observed between NGAL and creatinine ( $\rho=0.60$ ), KIM-1 and creatinine/urea ( $\rho=0.83$ ), B2M/TFF3 and urea ( $\rho$  up to 0.94), and among biomarkers themselves ( $\rho>0.75$ ;  $p<0.05$ ).

**CONCLUSIONS:** Urinary biomarkers, especially NGAL, KIM-1, MCP-1, B2M, TFF3, albumin, and calbindin, differentiated AKI patients from controls. Osteopontin decreased over time but lost significance after normalization, suggesting dilution effects. Urinary biomarkers are promising tools in pediatric AKI; larger studies are needed.

### **Keywords:**

acute kidney injury; children; urinary biomarkers; Bioplex



## TOOTH JEWELRY – HIT OR KITSCH?

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### **A few words about the author(s):**

Adam Beben – research and teaching assistant in the Department of Prosthodontics at the Medical University of Gdansk. His interests include microbiology of prosthetic restorations.

### **Abstract:**

The study was conducted on a sample of 100 adult Poles to explore opinions on dental jewelry. Statistical analysis was applied (Pearson's chi-square test, Mann-Whitney U test;  $\alpha = 0.05$ ). Most respondents correctly identified dental jewelry, yet assessed it negatively in terms of aesthetics and did not express willingness to wear it. It was widely agreed that the procedure should be performed by a dentist, and the optimal price was estimated at 300–400 PLN. Gender, age, education, and political views did not significantly influence opinions. Only place of residence—residents of smaller towns more often indicated harmful effects—and acquaintance with someone wearing such jewelry, which reduced the belief in its negative impact, proved relevant. The results confirm a lack of social acceptance for this type of adornment in Poland.

### **Keywords:**

tooth jewelry; teeth jewelry; tooth jewellery; tooth gems



## APICAL RESECTION – SAVING A TOOTH

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### **A few words about the author(s):**

Aleksandra Blicharz – dentist, microscopic endodontics. Adam Bęben – research/teaching assistant, Dept. of Prosthodontics, Medical Univ. of Gdansk, owner BaltiCare. Kamil Czarnecki – dentist, dental surgery, academic teacher.

### **Abstract:**

Apicoectomy (root-end resection) is a surgical intervention applied in dentistry, particularly within the fields of endodontics and oral surgery. The procedure involves the removal of the apical portion of the root together with the surrounding pathological tissue (e.g., cyst, granuloma). It is most commonly indicated when conventional root canal therapy fails to achieve satisfactory outcomes or when nonsurgical retreatment is not feasible or proves ineffective. The presented case report demonstrates the clinical condition prior to surgery, the healing phase, and the final restorative outcome of the treated tooth.

### **Keywords:**

apicoectomy; resection; crown



## MODERN DIAGNOSTIC METHODS OF ATHLETES

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### **A few words about the author(s):**

Physiotherapy student, active in scientific circles, passionately developing in therapy and diagnostics. Fascinated by the human body and its potential, she combines research with a lifelong passion for sport.

### **Abstract:**

Today more and more people are interested in their healthiness and fitness. They want to live healthy and they do a lot of sports. Sportsmen are exposed to special loads sometimes do special movements like quick changes of the moving direction. Thereby injuries can occur. Physiotherapist and doctors are more and more faced with injuries like that. It is important to develop further diagnosis systems. Today the new systems should be more accurate, quicker and cheaper. Modern methods can be helpful in diagnosis especially in the following cases. Imbalance between the muscles, deep muscles weakens, chronic muscle injuries, not fully cured injuries, Shifted centre of gravity, condition after reconstruction of soft tissues. In our work, we have reviewed methods such as: electromyography, balance platform, virtual reality and Centre of Pressure.

### **Keywords:**

diagnostics; physiotherapy; sport



## **BEDSIDE PHYSIOTHERAPY IN THE PERSPECTIVE OF THE POSITIVE IMPACT OF EXERCISE ON THE HEALTH OF A BEDRIDDEN PATIENT**

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*Academy of Applied Sciences Wincenty Pol in Lublin*

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### **A few words about the author(s):**

Master Physiotherapy Janina Danuta Rzeszot.

### **Abstract:**

Osteoarthritis (ChZS) It is now the most common musculoskeletal disorder skeletal and primarily affects the joints loaded with body weight, such as knees and hips. Importantly, ChZS remains multifactorial disease of the entire joint, whose appearance and progress include changes in the articular cartilage, as well as the membrane synovial, subchondral bone, ligaments and muscles through complex pathomechanisms. Differentiated frequency of PTP at the bedside a patient with COVID-19 with originally tacit or moderate the course diseases no Differences in Indicator survival, LoH, ICU referrals or complications in-hospital. PTP SQ safe for patients COVID-19 physiotherapists. Considerable evaluation and monitoring of physiological parameters during PTP are necessary to prevent unpredictable Unwanted Events Physiotherapy and exercise (recreational activity) form the basis of non-pharmacological therapy in axial spondyloarthritis (AxSpA). These are elements of physical activity, though physical activity consists of activities beyond them and also includes professional activity. Not all activities in AxSpA seem to have the same benefits for patients. In fact, you may find that while some activities are extremely beneficial for the activity of the disease, its function and other outcomes, others can be harmful to it.

### **Keywords:**

physiotherapists; physical activity; activities



## SELECTED FOOD INTOLERANCES IN CHILDREN – DIAGNOSTIC AND TREATMENT STRATEGIES

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### **A few words about the author(s):**

I graduated in Nursing from the State University of Jan Grodek in Sanok. Actively involved in the Student Scientific Society of Nurses, I regularly participate in scientific conferences. My research focuses on pediatrics and neonatology.

### **Abstract:**

Food intolerances in children pose a significant clinical challenge, affecting the development and quality of life of young patients and their caregivers. Diagnosis is based on modern laboratory and dietary methods, while treatment requires an individualized approach and continuous monitoring of the child's health and well-being. Pediatric nurses play a key role in family education, symptom observation, and care coordination. This poster presents current strategies for diagnosis and treatment, as well as the importance of nursing care in cases of selected food intolerances.

### **Keywords:**

pediatric nursing; food intolerances; diagnosis; treatment; patient care



## ATOGEPAANT (QULIPTA) – NEW OPTIONS IN MIGRAINE PREVENTION

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### **A few words about the author(s):**

My name is Katarzyna Żandarek. I am a nurse and a master's student at the University of Bielsko-Biala.

### **Abstract:**

Migraine is a common and disabling neurological disorder characterized by recurrent attacks of moderate to severe headache, often accompanied by neurological disturbances. According to the International Headache Society, migraine is defined as a recurrent primary headache disorder with attacks lasting between 4 and 72 hours. Beyond head pain, migraine is frequently associated with symptoms such as photophobia, phonophobia, osmophobia, nausea, and vomiting. Based on attack frequency, migraine is classified into episodic and chronic forms. Atogepant (Qulipta) is an oral tablet (10 mg, 30 mg, 60 mg) developed by AbbVie for the preventive treatment of migraine in adults experiencing at least four migraine days per month. The drug acts by selectively antagonizing the calcitonin gene-related peptide (CGRP) receptor. CGRP is a potent vasodilator and neuromodulator that plays a key role in migraine pathophysiology, with elevated serum levels observed during attacks. By blocking CGRP binding to its receptor, atogepant disrupts this pathway and prevents migraine onset. Clinical studies, including the pivotal PROGRESS trial, demonstrated that atogepant is generally well tolerated. The most common adverse events reported with once-daily treatment were constipation (10%) and nausea (9.6%). Atogepant represents a novel, effective, and well-tolerated oral option for migraine prevention, expanding therapeutic possibilities for patients suffering from this disabling condition.

### **Keywords:**

Atogepant; CGRP Antagonist; migraine

ABSTRACTS OF  
**PRESENTATIONS**



**TECHNICAL AND  
NATURAL SCIENCES**



## PLATINUM GROUP ELEMENTS IN SOIL

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### **A few words about the author(s):**

Authors are members of Laboratory Applied Analytical Chemistry – research group focusing on using an analytical chemistry as a tool in study and protection of natural environment. They are experts in speciation analysis and sample pretreatment.

### **Abstract:**

The platinum group elements (PGEs) are the elements which are necessary to develop advanced technology. The widely use of PGEs in different fields has increased emissions of these noble metals to the environment, the main source is a degradation of catalytic converters [1-3]. The mobility and bioavailability of platinum group metals species can be increased by the interactions of PGEs with soil. The metallic form of the elements because of physical degradation to nano size could be included in the bio-geo-chemical cycle [1]. Ionic forms of platinum group metals are more mobile and bioavailable for plants but there is evidence of NPs uptake by plants [2, 3]. In order to obtain information and reliable evidence, it is necessary to use selective extractions and digestions, and the use of cross-method comparison (TEM, ICP-MS, AdSV). The results obtained during experiments conducted in our laboratory, LAppChem, will be presented.

[1] Kowalska J. et al., Chemosphere 352 (2024) 141331

[2] Kowalska J. et al., Sci. Total Environ. 806 (2022) 151272

[3] Kińska K. et al., Sci. Total Environ. 615 (2018): 1078

### **Keywords:**

platinum group elements; nanoparticles; soil; mobility; bioavailability



## NOVEL PVD COATINGS FOR HAND KNIVES

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### **Abstract:**

This presentation focuses on a novel type of PVD coatings for knives used in the food industry, featuring anti-corrosion, non-stick, and antibacterial properties. The technology was developed within a comprehensive R&D project encompassing the analysis and modification of blade surface treatment processes, the development of CrN–Ag coatings, and their extensive laboratory testing. A validated PVD coater model was established, enabling coating deposition under conditions closely resembling industrial environments. The conducted tests confirmed excellent adhesion and durability of the coatings, even under intensive use and elastic deformation conditions.

This research was conducted as part of the R&D project “Development of functional-coated knives for the food industry.” no. RPLD.01.02.02-10-0067/19-00

### **Keywords:**

PVD; knives; antimicrobial; non-stick



## THE SMALLEST STRUCTURES, THE MOST INTRIGUING QUESTIONS

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### **A few words about the author(s):**

I am an individual who thrives on new challenges. My interests lie in chemistry and mountain hiking. Whether I am conducting experiments in the lab or scaling a new peak, I find joy and fulfillment in overcoming obstacles.

### **Abstract:**

Nanotechnology has become one of the most dynamically developing fields of science. It finds applications in numerous sectors, from medicine to the electronics industry. Nanomaterials encompass structures with dimensions ranging from 1 to 100 nm and are characterized by interesting physicochemical parameters. Rapid advances in the design and application of these materials raise numerous concerns about their safety and impact on the environment and living organisms. The unique properties of nanomaterials, such as shape, size, surface charge, and chemical reactivity, can lead to numerous negative effects, including oxidative stress.

Nanotoxicology plays a key role in assessing the risk associated with exposure to nanoparticles. Understanding the mechanisms of toxicity and developing standards for safety assessment are essential for the sustainable development of nanotechnology.

### **Keywords:**

nanomaterials; toxicity



## MIMICKING EXOGENOUS AMINO ACIDS: RAMAN-BASED TRACKING OF COLON CANCER CELLS METABOLISM

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### **A few words about the author(s):**

Monika Kopec is an Assistant Professor in the Institute of Applied Radiation Chemistry, Faculty of Chemistry at the Lodz University of Technology. Her work focuses on applications of Raman spectroscopy and Raman imaging for cancer diagnostics.

### **Abstract:**

Amino acids (AAs) are fundamental biomolecules that constitute the building blocks of proteins. Monitoring their dysregulation and fluctuations serves as an important indicator of human health. This study aims to explore the role of exogenous AAs metabolism in colon cancer development. Raman spectroscopy (RS) and Raman imaging (RI) were employed to investigate biochemical changes in normal human colon cells (CCD-18Co) and cancerous colon cells (Caco-2), both untreated and supplemented with leucine, threonine, and arginine. Spectroscopic data were analyzed using chemometric methods, specifically Partial Least Squares Discriminant Analysis (PLS-DA). RS, combined with a chemometric approach, identified unique Raman biomarkers-1088/1262, 1444/1660, 1580/1004, and 1630/1444-that correspond to changes in nucleic acids, lipids/lipids+Amide I, proteins, and lipids, respectively, in both normal and cancer cells supplemented with AAs.

These findings underscore the significant potential of RS and RI as powerful tools for investigating the role of exogenous AAs in colon cancer progression. This approach allows for the evaluation of therapeutic effectiveness and facilitates the optimization of treatment strategies based on the patient's current biochemical status.

### **Keywords:**

amino acids; Raman spectroscopy; Raman imaging; colon cancer; biomarkers



## THE MATHEMATICAL FACE OF DATA SECURITY

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### **A few words about the author(s):**

I am studying Applied Mathematics at Białystok University of Technology, Faculty of Computer Science. My interests include cryptography, algorithms, and the mathematical foundations of computer science.

### **Abstract:**

I am a student at Białystok University of Technology, Faculty of Computer Science. This presentation explores mathematical methods of attacking asymmetric cryptographic systems, with a particular emphasis on the RSA algorithm. The talk begins with an introduction to key cryptographic concepts, including the distinction between symmetric and asymmetric encryption, followed by a detailed overview of how RSA works. The core of the presentation focuses on common vulnerabilities arising from poor implementation practices, such as the use of small or closely related prime numbers, and how these mistakes can be exploited using specific factorization techniques. Algorithms like Fermat's factorization and Pollard's  $p-1$  method will be explained and illustrated here with examples. The presentation concludes with a look at attacks involving the discrete logarithm problem, such as the Baby-Step Giant-Step algorithm, which highlight the importance of strong cryptographic parameters. The goal is to raise awareness of the mathematical weaknesses in cryptographic implementations and stress the importance of secure key generation.

### **Keywords:**

RSA algorithm; asymmetric cryptography; factorization techniques; cryptographic vulnerabilities; secure key generation



## INVESTIGATION OF GROUND TEMPERATURE DYNAMICS ACROSS VARIOUS SITE CONDITIONS

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### **A few words about the author(s):**

2<sup>nd</sup> year students of Engineering Geology and Hydrogeology at Adam Mickiewicz University in Poznań. Project leader: Antonina Kałuża. The project is funded by BESTStudentGRANT (IDUB No. 157) and supervised by Dr. Eng. Daniel Zawal.

### **Abstract:**

The aim of the project is to investigate how soil temperatures vary depending on site conditions, primarily determined by location, type of substrate, and exposure to sunlight. Two measurement locations were selected to highlight potential differences. The first area is situated close to a building and exposed to direct sunlight. The second location, in contrast, is located in a nearby forest and is characterized by the presence of vegetation. For the purpose of the experiment, probes were installed to measure soil temperature at different depths, as well as air temperature and humidity and pluviometers. The results of these measurements may prove useful for setting an optimal depth of ground-coupled heat exchangers and for verifying the actual ground freezing point in the Greater Poland region. This project is financed through the BESTStudentGRANT competition (IDUB No. 157) at Adam Mickiewicz University in Poznań.

### **Keywords:**

soil temperature variability; site conditions; geotechnical soil investigations; ground-coupled heat exchangers



**CONDUCTING RESEARCH AND DEVELOPMENT WORK:  
OPTIMIZATION OF BIOLOGICAL TREATMENT OF MUNICIPAL  
AND INDUSTRIAL WASTEWATER FOR THE PURPOSE  
OF REUSING TREATED WATER IN A CLOSED CYCLE  
AT TYMBARK-MWS SP. Z O.O. SP.K.**

**Sebastian Duciak, Danuta Ciechańska, Maria Pyrc, Jakub Stuglik\***

*Tymbark MWS Sp. z o.o.*

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**A few words about the author(s):**

Sebastian Duciak – research worker, specialist in chemistry. Danuta Ciechańska – research worker, circular economy specialist. Maria Pyrc – head of the research team. Jakub Stuglik – project manager.

**Abstract:**

The increasing and variable nature of production on production lines, social and economic conditions such as drinking water shortages, energy production from renewable sources, and the development of the circular economy have led the Company to optimize the process by setting the following research directions for the project: stabilizing the operation of the IC bioreactor and the aerobic reactor in the context of changing operating conditions determined by high and low loads of wastewater flowing into the treatment plant, reduction of sulfate ions, and biogenic compound deficits during the wastewater treatment process.

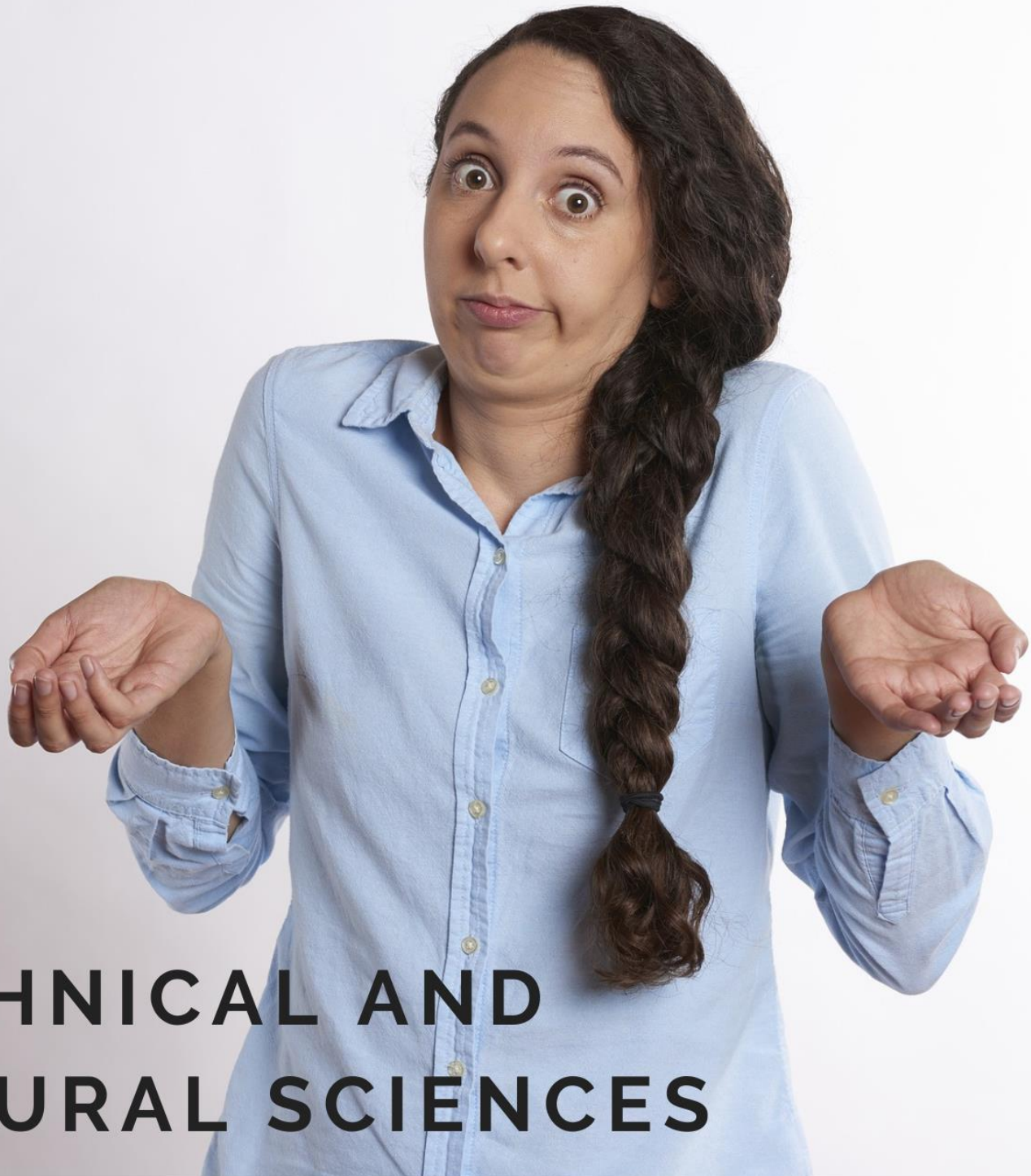
The R&D work carried out made it possible to optimize the wastewater treatment process by:

- stabilizing the operation of the IC anaerobic bioreactor and the aerobic reactor in the context of changing operating conditions – control of the COD load directed to the IC reactor was achieved,
- achieving the optimal ammonium ion concentration to keep the IC reactor in a state of continuous excitation, ensuring the acceptance of large loads of pollutants,
- reduction of sulfate ions flowing into the treatment plant with wastewater. The reduction contributes to a change in the structure of the IC reactor sludge granules, thus affecting the quality of the reactor's operation, the amount of biomass growth, and the amount of biogas produced.

**Keywords:**

circular economy; anaerobic bioreactor; biomass

ABSTRACTS OF  
**POSTERS**



**TECHNICAL AND  
NATURAL SCIENCES**



## OXYGEN – THE DOUBLE-EDGED SWORD OF LIFE

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### **A few words about the author(s):**

I am currently pursuing a Master's degree in Analytical Chemistry. Driven by a scientific passion for cosmetics and cosmetic procedures, I am further developing my research interests in electrochemistry.

### **Abstract:**

Oxygen – an element that gives life, and then lurks to take it away. Without it, the existence of many living organisms would end within minutes. It constitutes 53.8% of the atoms in the Earth's crust and accounts for  $\frac{3}{4}$  of our body weight. So why is it toxic to us at the same time?

The beneficial properties of oxygen are used in hyperbaric oxygen therapy (HBO). This is a treatment that involves supplying the patient with a mixture consisting of almost 100% oxygen under increased pressure. In this way, cells with oxygen deficiency receive several times more oxygen. HBO is used for many diseases such as gas gangrene and multiple sclerosis. It also helps to save patients affected by carbon dioxide poisoning. Oxygen is used in cosmetology on a daily basis. Oxygen infusion is a treatment that helps to oxygenate and nourish the skin.

When it comes to the percentage of oxygen in the air, more is not necessarily better. Aerobic organisms exposed to high concentrations of oxygen will suffer tragic consequences after just six hours. The longer an aerobic organism is exposed to unnatural oxygen levels, the more serious the damage to its health becomes. Why these negative effects? The toxicity of oxygen is due to its reactive forms and their unpredictable nature.

### **Keywords:**

oxygen; dual nature



## WHAT IS A "BUBBLE CURVE"?

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### **A few words about the author(s):**

3<sup>rd</sup> year student of Mathematical Methods in Data Analysis, passionate about mathematics and computer science, an active member of the Mathematical Student Research Club, and a participant in national mathematical conferences.

### **Abstract:**

What does sorting look like when we visualize it step by step?

Can a simple algorithm create a meaningful mathematical curve?

The bubble curve, derived from the classical bubble sort algorithm, shows how values gradually "bubble up" to their correct places, forming a characteristic pattern. Though bubble sort is known for its simplicity rather than efficiency, its visual aspect offers surprising insights into algorithmic thinking.

Visit the poster to see how mathematics meets programming in action!

### **Keywords:**

bubblesort; curve; programming; mathematics



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