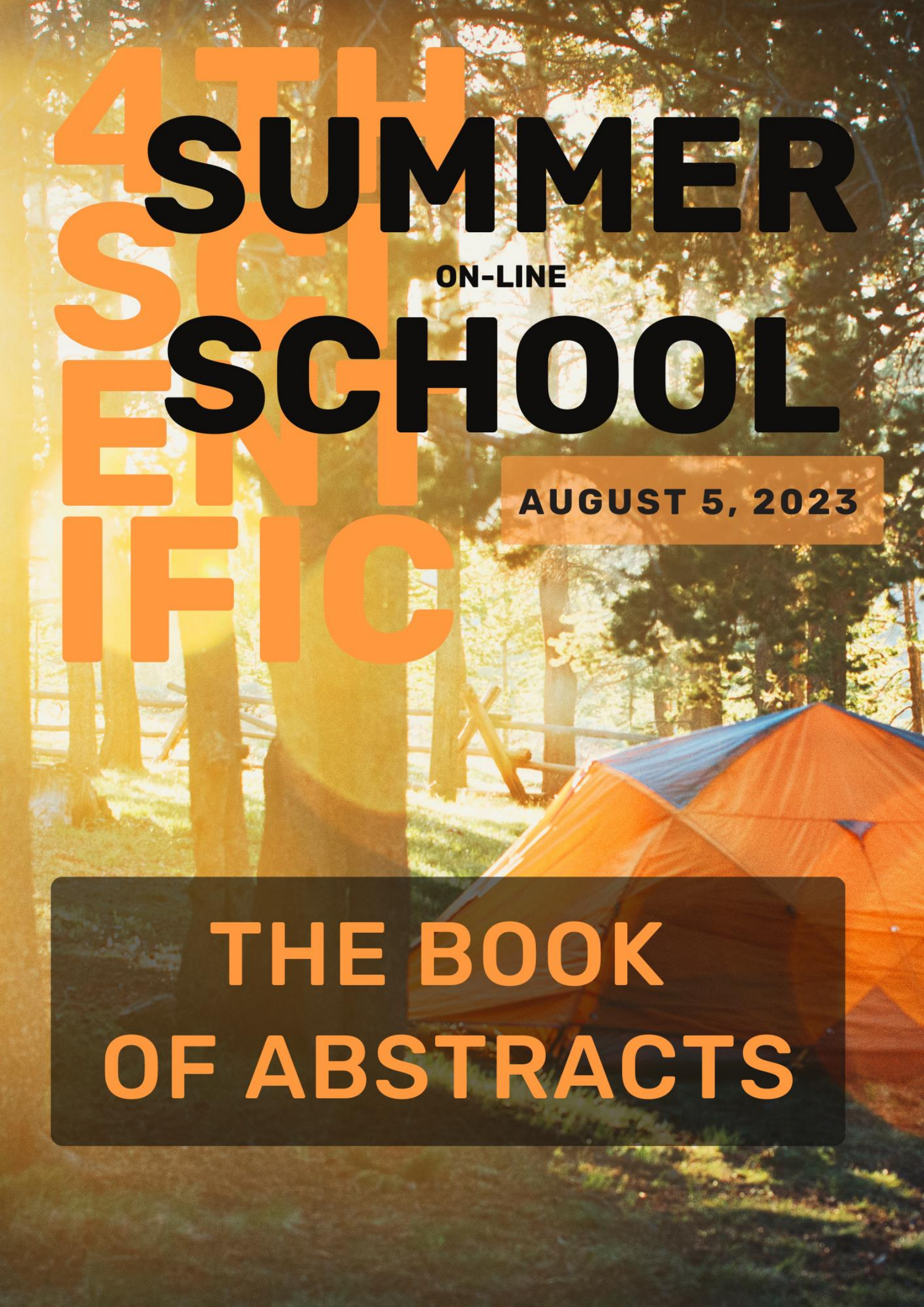
4TH
SCIENTIFIC
SUMMER
ON-LINE
SCHOOL
AUGUST 5, 2023
THE BOOK
OF ABSTRACTS

National Scientific Conference
„4th Summer Scientific On-line School”

The Book of Abstracts

August 05, 2023

Promovendi Foundation Publishing

Address:
17/19/28 Kamińskiego st.
90-229 Lodz, Poland

KRS: 0000628361

e-mail: fundacja@promovendi.pl
www.promovendi.pl

ISBN: 978-83-967915-1-1

Open access

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ABSTRACTS OF

PRESENTATIONS

HUMANITIES
SCIENCES

MULTICULTURALISM IN AVIATION

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A few words about the author(s):

The student graduated with a bachelor's degree in Aviation. Currently studying Logistics on master's studies.

Abstract:

This work aims to provide general information on multicultural issues, but with a particular focus on the multicultural aviation community. As it is well known, aviation is a particularly specific area, both scientific and cultural.

Multiculturalism in aviation is, in order: an overview of the definition of multiculturalism, then an outline of multicultural management, the benefits of using multicultural management, the next stage is the hidden differences and their characteristics resulting from multiculturalism in aviation. Then Crew Resource Management and research on multiculturalism in aviation as well as their opportunities and threats.

This work aims to present both the strengths and weaknesses of multiculturalism in aviation.

Keywords:

aviation, multiculturalism, pilots, cabin crew

THOUGHTS ON APPLYING DISTRIBUTET LANGUAGE THEORIES TO ANIMAL COMMUNICATION

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A few words about the author(s):

I am philosophy student interested in language, philosophy of science and language.

Abstract:

This presentation explores the possibilities of applying distributed language theories to animal communication. While animal communication systems differ from human language, there are notable similarities that suggest the relevance of distributed language theories in understanding how animals communicate.

Keywords:

distributed language, animal communication

THE PROBLEM OF CASCADING GROWTH OF SPACE DEBRIS IN THE BELT OF EARTH'S ORBITS

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A few words about the author(s):

Specialist at the Polish Armament Agency in the area of space and simulation. National Captech coordinator at the European Defense Agency and participant in the NATO Multinational Capability Development Campaign group.

Abstract:

The aim of this paper was to identify and characterize the factors that are the potential cause of the cascading growth of debris in the orbital belt - a phenomenon known as Kessler syndrome, which threatens the space safety of humans, satellite systems and infrastructure in space. An additional goal was to identify engineering and legal solutions that could prevent the occurrence of Kessler syndrome. Achievement of the goal was targeted by the working hypothesis: it is likely that the space security of humans, satellite systems and infrastructure in near space is threatened by the increasing amount of debris in the orbital belt. The solution of the scientific problem posed and the verification of the working hypothesis were carried out in three stages. In the first, the essence of the Kessler syndrome was presented in relation to the space safety of humans, satellite systems and space infrastructure in space using the research literature. Then, in the second stage, factors affecting the risk of Kessler syndrome were identified. Finally, methods and ways to prevent the occurrence of Kessler syndrome were identified.

Keywords:

debris, Kessler syndrome, belt of Earth's orbits

INSOMNIA AND ITS RELATIONSHIP WITH SELECTED PERSONALITY TRAITS

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The researchers are psychology students at the University of Warmia and Mazury in Olsztyn. They are taking their first steps on the academic path and have a particular interest in the application of psychological knowledge in the world of video games.

Abstract:

Sleep is very important for the proper functioning, however, personality traits and some sociodemographic characteristics may be associated with a higher risk of insomnia. The aim of this study was to investigate the relationship between insomnia and personality traits (emotionality and extraversion) and sociodemographic characteristics. Data were collected from 305 adult Poles (232 women, 73 men), aged 18 to 65. Two subscales from the HEXACO Personality Inventory – Revised (60-item version) and the Athens Insomnia Scale were used for measurements. Insomnia was significantly related to extraversion (negatively) and emotionality (positively) but not to age. There were no differences in the level of insomnia by gender or educational level. It is important to consider personality traits when dealing with the problem of insomnia.

Keywords:

insomnia, extraversion, emotionality, personality

RELATIONSHIPS BETWEEN POSITIVE ORIENTATION, GRATITUDE, SOCIAL SUPPORT AND ANXIETY

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A few words about the author(s):

I am Wiktoria Petryszyn, a 3rd year student of psychology and the head of the scientific circle of social psychology "Logos" under the patronage of which I present my work at the National Scientific Conference "4th Summer Scientific On-line School".

Abstract:

The aim of the study was to explore the relationship between positive orientation, gratitude, social support and anxiety. Researchers point out that social support correlate with anxiety (Alnazly et al., 2021; Alyami et al., 2020) and positive orientation (Skalski, 2019). A total of 180 people aged 18 to 60 (M = 25.03; SD = 6.24), including 141 women, 38 men and 1 non-binary person, participated in the study. Positive orientation was measured by The Scale P (Caprara, Steca, 2005), gratitude by The Gratitude Questionnaire (McCullough et al., 2002), social support by The Multidimensional Scale of Perceived Social Support (Zimet et al., 1998), anxiety with The State – Trait Anxiety Inventory (Spielberger et al., 1983) and an own survey was used to collect sociodemographic data. Results shows that there is a relationship between different dimensions of social support and gratitude, positive orientation and most of the severity of anxiety elements. The study also showed moderation role of social support in the relationship of positive orientation and gratitude. The lack of a relationship between the support of a significant other and a low level of anxiety may result from the individual's sense of pressure, because someone is counting on their positive achievements.

Keywords:

positive orientation, gratitude, social support, anxiety, moderation

TRUTH AS THE WAY TO TRUE HAPPINESS

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A few words about the author(s):

Dawid Wojdowski – priest of the Archdiocese of Poznań, Master of Theology, in the years 2021-2022 he completed postgraduate studies in theology, is currently preparing a doctorate in theology in the field of liturgy.

Abstract:

Truth and happiness are virtues that have been the object of scientific research and philosophical consideration since ancient times. Ancient philosophers sought answers to the questions of what is truth and how to get happiness. These and other questions have found their place in the spirituality of almost all world religions, especially in Christianity. For centuries, Christianity has built a definition of truth and happiness, emphasizing that these are two values that build human life.

In accordance with the centuries-old philosophical and theological tradition, in my paper I would like to reflect on the truth as the value of human life, which is the way to achieve true happiness. The starting point will therefore be the ancient philosophy, as well as the teaching of the Catholic Church. In the above paper, a special reflection will be undertaken on the virtue of truth in the teaching of Pope Benedict XVI. This great pope, who was also an extraordinary theologian, taught, among other things, that the pursuit of truth is an expression of human freedom. Truth is also an idea of the value of peace. Benedict XVI also noted that truth is also closely related to morality and the fundamental values of human life. When examining the texts of Pope Ratzinger, it can be concluded that when looking for the meaning of one's life, as well as spiritual order, one must look for the idea of truth, i.e. a value that will be absolute for us.

Keywords:

truth, happiness, faith, human, theology, church, way

THE UTILIZATION OF WATER ENERGY AND ITS POTENTIAL IN RELATION TO THE RELIANCE OF ENERGY AND ENVIRONMENTAL SAFETY ON NATURAL CIRCUMSTANCES AND HUMAN ACTIONS

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A few words about the author(s):

A student of internal security, specializing in economic and energy security of the country.

Abstract:

In my work, I discuss hydroelectric power plants in Poland, including their various types and how they operate. I also cover the pros and cons of high-capacity and MEV power plants, and provide information on the largest power plants in Poland and where they are located. Additionally, I touch on the concept of energy security disturbances. The focus of my presentation is on energy security and the potential risks and benefits associated with the construction and operation of hydropower plants.

Keywords:

hydropower plants, environmental safety

A STORY ABOUT STORIES. CONCEPTUAL BLENDS AND METAPHORICAL AMALGAMS IN "THE AMAZONING MAURICE AND HIS EDUCATED RODENTS"

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A few words about the author(s):

UW graduate (M.A. in English Philology, B.A.s in Polish & English Philology) & current MA Polish Philology student. Scholarly interests include Shakespeare, Conceptual Blending Theory, translation & game studies, Orzeszkowa, Pratchett, fantasy & SF.

Abstract:

The present study presents findings on the applicability of the Conceptual Blending Theory as first established by Gilles Fauconnier in fantasy fiction as exemplified by writings of Terry Pratchett, analyzed on the basis of "The Amazing Maurice and His Educated Rodents" as deconstruction of the rat-catcher myth. The Changeling Clan is chosen for analysis due to its high level of complexity and its dialogue with the Pied Piper of Hamelin legend as crucial to interpretation of the novel. The author summarizes key facts about Pratchett's work with attention centred on the figures of the sapient rats and cat as displaying animal and human traits alike, with select examples of other animal perspective stories. Human characters are juxtaposed against the Pied Piper inspiration for the Discworld deconstruction of the legendary figure. With the findings, the Changelings can be explained as a double-scope conceptual blend in the light of the Conceptual Blending Theory.

Keywords:

Conceptual Blending Theory, metaphorical amalgams, fantasy fiction, Terry Pratchett, Pied Piper

ANALYSIS OF THE SPECIFICITY OF THE CHEMICAL HAZARD IN AN INDUSTRIAL PLANT – ITS EFFECTS, CAUSED BY EXTREME WEATHER CONDITIONS, CAUSED BY STRONG WINDS AND A HURRICANE AFFECTING THE STATE OF INTERNAL SECURITY

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A few words about the author(s):

I am a student of the first year of master's studies in the field of Internal Security at the State University in Sanok. I spend my free time reading books. I like to cook and spend my free time actively with my family through walking and cycling.

Abstract:

My work includes an introduction through the definition of wind and qualification of the degrees of threat. It was crucial for the recipient to see how dangerous this phenomenon can be in the context of a chemical hazard in an industrial plant. It will also include the basics of chemical risk assessment and classification of chemical substances. In the next part of the work, the topic of the nuclear industry and the issue of water and soil degradation were discussed. There will also be information on the threats resulting from accidents and chemical and ecological disasters. The work includes wind as the cause of fire and the dissemination of hazardous substances. The catastrophic effects of such sequences of events may then have a negative impact on the entire plant and its vicinity, as well as on the surrounding natural environment and human life and health. I encourage you to read.

Keywords:

wind, risk, nuclear, failures, factors

LOGISTICS MANAGEMENT IN CRISIS SITUATIONS IN POLAND

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A few words about the author(s):

The student graduated with a bachelor's degree in Aviation. Currently studying Logistics on master's studies.

Abstract:

The work aims to present the issue of logistics management in crisis situations in Poland. Definitions necessary to understand the content of the issue have been quoted. Then, the specificity of the implementation of logistics tasks in specific crisis situations was described. For a deeper concept, the composition of crisis management plans was presented and an example of the "Crisis Management Plan for the city of Poznań" was specified. Logistic resources used in crisis situations have been listed and, as an example, preparation in the event of a flood for the municipality of Krapkowice has been presented.

This work aims to show a number of issues covered by logistics management in crisis situations on examples from Poland.

Keywords:

crisis sytuations, logistics management

HUMAN RESOURCE MANA GEMENT IN GENERATIONALLY DIVERSE ENTERPRISES

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A few words about the author(s):

The author of this text works as a production supervisor in a large enterprise, where they manage a team of employees. Simultaneously, they are pursuing studies in Economics at Jan Grodek State University in Sanok. The author is ambitious, creative.

Abstract:

This study focuses on human resource management in generationally diverse enterprises. It consists of three parts: an introduction, methodology, and analysis of own research. The aim of the study is to examine the factors influencing effective human resource management in a manufacturing company and identify generational differences. The own research conducted in a manufacturing company provided insights into the approaches of different generations towards work, motivation, social relationships, and assessment of superiors. The findings from the analysis indicate existing variations in work approaches and needs among different generational groups. The study aims to enhance understanding of these factors and propose solutions that contribute to effective human resource management in manufacturing companies, taking generational differences into account. Lastly, the paper elucidates the elements that influence diversity management and provides reasons for their significance.

Keywords:

human resource management, generational diversity, effective management

PRODUCT PROMOTION AND ITS IMPACT ON BUYERS' PURCHASING BEHAVIOR

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A few words about the author(s):

Dr Ewa Waliczek is a lecturer at the MUP Oświęcim at the Institute of Economics and Security Sciences. Her field of interest is everything related to new products.

Abstract:

The aim of the study was to learn about the preferences of Polish consumers in relation to activities in the field of promoting the sale of food products. The study was carried out in 2023, using the individual interview method, on a sample of 100 respondents aged 25-45. Customers of the Carrefour store were people of different nationalities due to the location of the store on a direct road for visitors to the Auschwitz Museum in Oświęcim. Customer behavior was analyzed through the use of promotional instruments at the point of sale. Buyers were also asked about the most effective instrument of promotion mix (according to the respondents) at the point of sale, and about effective forms of sales promotion.

Keywords:

sales promotion, food market, buyers' preferences

ABSTRACTS OF

POSTERS

HUMANITIES SCIENCES

EMBRACING THE UNKNOWN – THE NEXUS BETWEEN INTOLERANCE OF UNCERTAINTY, PERSONALITY TRAITS AND PYSCHOPATHOLOGY

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A few words about the author(s):

A fifth-year student of Applied Psychology at Jagiellonian University, specializing in the exploration of sexuality among adults on the autism spectrum, with a passion for psychotherapy, mental health of the LGBT+ community, and clinical psychology.

Abstract:

Intolerance of Uncertainty (IU), defined as the experience of anxiety and discomfort resulting from unpredictability, ambiguity, or sudden changes, is a concept coined in the 1990s that serves as a key mechanism related to worry. Individuals with high levels of IU may exhibit difficulties in decision-making when faced with uncertainty, a propensity for avoidance behaviors, and intense anxiety that inhibits action. Empirical evidence substantiates the centrality of IU in comprehending and treating generalized anxiety disorder, while establishing its linkage to the development and perpetuation of psychopathological conditions such as obsessive-compulsive disorder and social anxiety. The following paper focuses on synthesizing existing literature to elucidate the interplay between IU and personality traits, specifically the Big Five dimensions, and its role in moderating or mediating the relationship between IU and psychopathology, providing implications for future research.

Keywords:

Intolerance of Uncertainty, personality traits, psychopathology, big five, literature review

SOCIAL SUPPORT AS A MEDIATOR BETWEEN RESILIENCE AND A SENSE OF QUALITY OF LIFE

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A few words about the author(s):

I am Wiktoria Petryszyn, a 3rd year student of psychology and the head of the scientific circle of social psychology "Logos" under the patronage of which I present my work at the National Scientific Conference "4th Summer Scientific On-line School".

Abstract:

The subject of this study was to analyze the relationship between resilience, quality of life and social support, where the last factor was to act as a mediator. A total of 95 people aged 18 to 53 (M = 24.82; SD = 7.95) and the majority were women (79%), participated in the study. KOP-26 by Gąsior and co-authors, MSPSS by Zimet and co-authors and WHOQOL-BREFF by Zawisza and co-authors were used to collect online data of measured psychological factors and an own survey for sociodemografic informations. Only in the case of the assessment of the quality of social life with a general assessment of resilience, the sense of social support occurred as a mediator ($\beta = 0.56$; $p < 0.001$). The results indicate that in the relationship of resilience and quality of social life, the sense of social support plays the role of an intermediary.

Keywords:

resilience, quality of life, social support, mediation

ATTITUDES OF TEACHERS AND PUPILS TOWARDS STUDENT DIFFERENCE

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A few words about the author(s):

I am a graduate of Polish teacher philology – bachelor's studies and a student of speech therapy at master's studies. On a daily basis, I also fulfill myself as a primary school teacher.

Abstract:

Scientific research is a complex process aimed at understanding a specific aspect of reality. This study focuses on primary school students and teachers' emotions, attitudes, and actions towards individuality and otherness. It aims to identify the nature and intensity of these attitudes and examine their reasons and consequences.

The research investigates whether the school environment promotes overcoming prejudices, breaking stereotypes, and embracing individual uniqueness. Specific objectives include understanding emotions related to others, exploring attitudes towards human diversity and their influencing factors, and examining actions towards others and educators' responses to negative behaviors.

A diagnostic survey method was used, involving questionnaires with closed and open-ended questions administered to students and teachers. The survey was conducted in paper-based and electronic formats in various school settings in Poland.

Data analysis involved descriptive statistics and presentation through charts and tables. The findings provide insights into attitudes and actions towards otherness, highlighting desirable attitudes to promote and problematic ones to address.

This study contributes to understanding attitudes and actions in the school environment, offering valuable insights for educators and policymakers aiming to foster inclusive and accepting communities in schools.

Keywords:

types of attitudes, difference, education

THE IMPACT OF LARYNGOLOGICAL DISORDERS ON SPEECH: THE INFLUENCE OF HEARING LOSS ON SPEECH DEVELOPMENT

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Jagiellonian University in Cracow

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A few words about the author(s):

I am a graduate of Polish teacher philology – bachelor's studies and a student of speech therapy at master's studies. I work as a primary school teacher on a daily basis.

Abstract:

Laryngological disorders, especially hearing loss, have a negative impact on speech development in children. This study focuses on the differences in speech development between hearing children and children with hearing impairments. The analysis includes the periodization of speech development, considering factors such as the timing of the impairment, type of impairment, and degree of hearing loss. Deaf children encounter difficulties in language acquisition, such as a lack of babbling and delayed grammar development. It is important to provide them with appropriate support, speech therapy, and hearing-assistive technologies. Sign language can be a valuable supplement to communication. The conclusion emphasizes the need for special support in the language development of deaf children to enable their full participation in society.

Keywords:

speech therapy, speech, hearing loss

ABSTRACTS OF

PRESENTATIONS

MEDICAL SCIENCES

A MODERN METHOD OF TREATING CANCER – PHOTODYNAMIC THERAPY

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A few words about the author(s):

The student the 6th year of English Division Medicine at the University of Rzeszów. The co-author of scientific articles from the medical field. Participated in many conferences. Her interests: psychiatry, oncology and photodynamic therapy.

Abstract:

One of the most modern methods of treating cancer (such as breast cancer, ovarian cancer, prostate cancer) and non-cancerous diseases (mainly skin lesions such as acne, lichen planus, alopecia areata) is photodynamic therapy. It is very prospective, gives great hope, mainly when it comes to no need to use toxic chemotherapy. Photodynamic therapy consists in the use of three key elements: oxygen, light of the appropriate wavelength in the visible light range, and a photosensitizer in the appropriate concentration. Nowadays, research on new photosensitizers is underway. Scientists strive to create the so-called "ideal photosensitizer", which will not have side effects, and its only action will be the elimination of cancerous cells from the hosts' body.

Keywords:

photodynamic therapy, cancer, oncology

INFANT FEEDING METHOD INFLUENCES SCFA LEVELS

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A few words about the author(s):

The study was conducted by Dietetics Students Research Circle of Pomeranian Medical University under the direction of its supervisor and founder, Prof. Małgorzata Katarzyna Szczuko. The circle takes interest in human nutrition and metabolomics.

Abstract:

Short Chain Fatty Acids (SCFA) are end-products of carbohydrate and protein fermentation by gut bacteria, therefore they are of interest for studies on development of the gastrointestinal microbiome. SCFA have a clinically proven impact on colon function, immunity and metabolism.

Our study aimed to find out whether different infant feeding methods influence the SCFA contents, and how this influence would be modified by age in the first year of life.

Feces samples were collected from the participants in the 1st, 3rd, 6th and 12th month of life (n=100). SCFA were analyzed with gas chromatography: acetic, propionic, butyric, valeric, caproic, and so called branched SCFA: isovaleric, isobutyric and Isocaproic acids. Subsequently, we correlated the SCFA percentages with feeding methods, including breastfeeding, supplementing with infant formula, feeding with formula covering >50% daily caloric needs, exclusively artificial feeding, supplementing with water.

The analysis revealed that in the 1st month artificial feeding was positively correlated with acetic acid levels and negatively with propionic and caproic acids. Artificial feeding was not correlated with any of SCFA in 3rd and 6th months of life. In the 12th month however, artificial feeding was positively correlated with levels of the branched SCFA. In conclusion, infant feeding method has an impact on SCFA synthesis in gastrointestinal tract. Artificial feeding in the 12th month of life provides more protein than mixed diet.

Keywords:

SCFA, branched short chain fatty acids, infant nutrition, gut microbiome, infant formula

COGNITIVE DYSFUNCTION IN THE COURSE OF SARS-COV-2 VIRUS INFECTION, INCLUDING NEUROCOVID, FRONTAL SYNDROME AND CYTOKINE STORM

Jakub Sadowski (1)*, Tomasz Klaudel (1), Agnieszka Rombel-Bryzek (2)

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(2) Department of Clinical Biochemistry and Laboratory Diagnostics, Faculty of Medicine, University of Opole, Opole, Poland

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A few words about the author(s):

Jakub Sadowski, Tomasz Klaudel – student scientific society at institute of medical sciences. Agnieszka Rombel-Bryzek – doctor in biological sciences, assistant in Department of Clinical Biochemistry and Laboratory Diagnostics University of Opole.

Abstract:

BACKGROUND: The paper discusses the influence of immunological processes on the structural and functional changes of the CNS and related cognitive disorders.

PURPOSE OF THE STUDY: The aim of this study is to analyze and discuss available information from the scientific literature considering the possible relationship between SARS-CoV-2 virus infection and cognitive impairment, including NeuroCOVID, frontal syndrome and cytokine storm.

MATERIAL AND METHODS: A systematic review of the literature was carried out using: PubMed, Elsevier and the Google Scholar database. A total of 44 articles were included in the study. When searching for materials, keywords were used, such as: "cognitive disorders", „SARS-CoV-2", "NeuroCOVID", "frontal syndrome" "Cytokine Storm".

CONCLUSIONS: The SARS-CoV-2 infection may induce or affect the existing disorders of cognitive functions of various nature and intensity. The influence of immunological factors associated with the response against SARS-CoV-2 on the disturbance of cerebral perfusion, the functioning of nerve cells and the neuroprotective effect has been demonstrated.

Keywords:

cognitive impairment, SARS-CoV-2, NeuroCOVID, frontal syndrome, cytokine storm

VOICE COMMUNICATION IN AN INNOVATIVE, WIRELESS, DIGITAL CALL SYSTEM FOR THE MEDICAL INDUSTRY

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A few words about the author(s):

The author is a researcher at a technical university. His interests include embedded and mobile systems, software. He participated in many projects that ended with the implementation of a ready-made solution for production.

Abstract:

The presented call system is an innovative solution that allows to implement this type of system in medical units without unnecessary renovation works. It is enough to connect the system elements to the power supply and the system is ready to use. The key function of the system is voice communication between the patient and the medical staff while maintaining the privacy of the conversation. Existing systems on the market have loudspeakers for hands-free calls, which does not allow to keep the conversation private. The presented system allows for voice calls between the patient and the staff as well as between the staff. For this purpose, many problems had to be solved, such as the reliability of wireless communication, signal coding, handling multiple connections, etc. During the presentation, solutions to selected problems encountered during the design of the system will be presented.

Keywords:

innovative, wireless, digital call system; voice communication, wireless comunication

THE SOLID DISPERSION OF IBUPROFEN IN POLYMER MATRIX

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A few words about the author(s):

Kinga Biedrzycka – Technology Specialist in pharmaceutical industry and PhD student Poznan Univeristy of Technology.

Abstract:

The problem faced by the pharmacy today is drugs that are insoluble in water. Obtaining a drug form that is assimilable by the patient's body is therefore a challenge. One of the methods to improve this parameter is to obtain an amorphous solid dispersion or a solid solution of active pharmaceutical ingredient (API) in a polymer matrix. The amorphic form of the drug is better absorbed by the body than its crystalline form. However, such an amorphous form of API is thermodynamically unfavorable, therefore recrystallization processes can occur during storage. To prevent this, systems with appropriate glass transition temperature are obtained in which intermolecular interactions occur between the ingredients like hydrogen-bonding interactions, ionic interaction, or other non-specific interactions. Ibuprofen (IBU) can therefore be incorporated into a matrix of methacrylic polymers as there are intermolecular interactions between these ingredients.

Keywords:

ibuprofen, hot- melt extrusion, solid dispersion, Eudragit EPO

A COLLECTION OF TUMOR MARKERS.

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A few words about the author(s):

Implantologist, Surgery Resident in Department of Maxillofacial Surgery, Medical University of Gdansk.

Abstract:

Tumor markers are substances of diverse nature and chemical structures. They are identified at various stages of cancer in the blood, urine, saliva and others.

Within the last 10 years not many new tumor markers have been added to the literature. However, there are still certain groups and their characteristics with which we can identify them, such as: in breast cancer: CEA, CA-15-3, CA125, Her2, Ki67, NLR, in ovarian cancer: HE4, Ki67, CA125, TK1, CA 72-4 , CA19-9, CEA, in liver cancer: AFP, CA19-9, HAS, CEA, in endometrial cancer: CA125, in lung cancer: CEA, CYFRA 21-1, CA19-9, SCCAg, NSE, CA125, TK1, in colorectal and gastric cancer: AFP, CEA, CA125, CA19-9, CA242, EGFR, HER2, HER3, CA72-4, AFF3 or in pancreatic cancer: CEA, CA242, CA19-9, CA125, TSGF.

Various cancers, despite the decreasing morbidity, are still a very serious cause of premature death among women and men, whether due to primary foci, infiltration of adjacent tissues, or distant metastases, most often involving the liver, lungs and bones.

New tumor markers and new monitoring methods that may be useful in the diagnosis and treatment of oncological patients are still being sought.

Keywords:

tumor markers, ovarian cancer, breast cancer, lung cancer, liver cancer

SYNTHESIS OF FATTY ACIDS, TRIACYLGLYCEROLS AND PHOSPHOLIPIDS

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A few words about the author(s):

I am a third-year student of veterinary medicine, at the University of Warmia and Mazury in Olsztyn. My scientific interests are: medical emergencies, diet and nutrition of domestic animals, pets behaviour.

Abstract:

Biochemical synthesis of fatty acids, phospholipids, and triacylglycerols is complicated process that plays a crucial role in the cellular metabolism and energy storage.

In this presentation, I will provide an overview of the key steps of this process, as well as on the structure, functions and characteristics of these lipid molecules.

Fatty acids serve mostly as structural components of cell membranes and energy source. The structure of fatty acids consists of a hydrocarbon chain with a carboxyl group (-COOH) at one end.

The biosynthesis of fatty acids involves a series of enzymatic reactions, primarily occurring in the cytoplasm. Acetyl-CoA is carboxylated and undergoes a series of condensation, reduction, dehydration, and reduction steps, leading to the formation of long-chain fatty acids.

Triacylglycerols are the main storage form of energy in adipose tissue. Moreover, they provide long-term energy reserves and insulation for internal organs. Triacylglycerols are built of three fatty acids esterified to a glycerol backbone.

Phospholipids are essential components of cell membranes and play crucial roles in maintaining membrane integrity and cellular signaling. They contain a glycerol backbone, two fatty acids, and a polar head group.

Understanding the structure, functions, and biochemical synthesis of fatty acids, triacylglycerols, and phospholipids provides insights into their essential roles in cellular processes and overall metabolism.

Keywords:

biosynthesis, fatty acids, phospholipids, triacylglycerols

MITOCHONDRIAL DYSFUNCTION AND MITOCHONDRIAL METABOLISM IN NEUROGENESIS DISORDERS

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A few words about the author(s):

Biotechnologist, neurobiologist. Ph.D. student in Medical Sciences.

Abstract:

Mitochondria play a fundamental role in energy production, maintaining homeostasis or cellular pathways, and regulating neuronal progenitor cells. Mitochondrial dysfunction can be induced by diverse factors, such as the administration of a disabling substance and the aging process, which lead to the disruption of neurogenesis. The phenomenon of neurogenesis is still the subject of scientific research. Recent studies indicate that neurogenesis disorders can cause the development of many neurodegenerative diseases like Alzheimer's disease, Parkinson's disease, Huntington's disease, prion disease, synucleinopathies, motor neuron diseases and spinal muscular atrophy. During mitochondrial dysfunction and mitochondrial metabolism, several deleterious effects occur, including impairment of calcium metabolism or free radical production. Autophagy and mitophagy are involved in the cellular response to reactive oxygen species and mitochondrial dysfunction. Mitophagy is a process of selective autophagy occurring in the mitochondrion that involves the engulfment of damaged mitochondria by the autophagosome. It is followed by the delivery of abnormal and damaged mitochondria to lysosomes, where they are degraded. The main protein involved in mitophagy is PINK1. Mitochondrial dysfunction is crucial to the processes responsible for cell and organ aging.

Keywords:

mitochondria, mitochondrial diseases, neural progenitor cells, neurogenesis

MATERIALS AND TECHNIQUES IN ORTHOSIS MANUFACTURING

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A few words about the author(s):

I am studying engineering in medicine at the Rzeszow University of Technology.

Abstract:

The development of modern technologies and technological advancements has led to the advancement of orthoses, making them more specialized and effective in terms of treatment. With the introduction of materials such as polymers, elastomers, glass fibers, and carbon fibers, it has become possible to create these medical devices with more precise fitting and improved functionality.

In the presentation "Materials and Techniques in Orthosis Manufacturing," various manufacturing techniques and materials used in orthosis production are discussed. These include 3D printing, 3D scanning and CNC machining. The presentation highlights the specific materials used for different types of these medical devices.

The aim of the presentation was to showcase modern materials and manufacturing techniques in orthosis production that contribute to excellent fitting, comfort, and effectiveness of these devices in the field of medicine.

Keywords:

technology

POINCARÉ PLOTS IN THE STUDY OF THE SELECTED BIOMEDICAL SIGNALS

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A few words about the author(s):

Agnieszka Golińska is an assistant professor in the Department of Bioinformatics University of Białystok. She specializes in biomedical signal processing and analysis and application of machine learning methods in biomedical data.

Abstract:

In the study of biomedical signals, we search for new methods of analysis. In this work, we present the application of the nonlinear method – Poincaré plot. Poincaré plots are return maps in which each result of measurement is plotted as a function of a previous one. We show examples of the application of Poincaré plots in the analysis of various kinds of biomedical signals: R-R intervals, EMG, EHG etc. We can also fit an ellipse to the plot shape and, by determining descriptors SD1, SD2 and SD1/SD2 ratio, study the data quantitatively.

Keywords:

Poincaré plots, biomedical signals

ACNE-A PROBLEM NOT ONLY FOR TEENAGERS

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A few words about the author(s):

My name is Ewelina Kaminska. By education I am a technician of cosmetic services. I am interested in the following fields – medicine and cosmetology. I love to pass on the knowledge I have gained to others, which I do by creating many presentations.

Abstract:

Acne is the most common chronic skin disease. It affects adolescents in adolescence as well as adults. Its treatment is extremely complicated, involving both drug treatment and taking care of the skin with well-chosen cosmetics. It requires the acquisition of proper hygiene and dietary habits. Acne, especially in adolescents, can be a big psychological problem, so it is important to make sure that it goes as gently as possible.

Keywords:

medicine, cosmetology, acne, disease, problem

EVALUATION OF PULMONARY FUNCTION IN PATIENTS AFTER COVID-19 INFECTION

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A few words about the author(s):

PhD Student at Doctoral School in Medical and Health Sciences, Jagiellonian University Medical College.

Abstract:

AIM: The purpose of this study was to evaluate the persistent symptoms and pulmonary function in patients after COVID-19 compared to healthy subjects.

MATERIALS AND METHODS: The study group included 26 subjects, 19 women (73%) and 7 men (27%) aged 30 to 85 years (x=56±15.88) with a history of laboratory-confirmed COVID-19 infection (e.g. positive result for RT-PCR test or other). The control group included 26 subjects, 19 women (73%) and 7 men (27%). The parameters evaluated were: FVC (forced vital capacity), FEV1 (forced expiratory volume in first second), FEV1%FVC (pseudo-Tiffeneau index), P0.1 (the airway occlusion pressure), P0.1max (maximum occlusion pressure), PImax (the maximum inspiratory pressure) and PEmax (the maximum expiratory pressure).

RESULTS: There were significant statistical differences between the study and control groups in the parameters of FEV1 (114.2% vs. 105.04%), FVC (120.44% vs. 11.63%) and P0.1 (63.72% vs. 89.90%). Higher FEV1 and FVC values were achieved by those in the study group, while higher P0.1 occlusion pressure values were achieved by those in the control group. No statistically significant differences were found for the other parameters.

CONCLUSION: Statistically significant differences were found between the study and control groups in FEV1, FVC and P0.1 parameters. The preliminary conclusions of the study need to be verified based on a study on a larger group of patients.

Keywords:

respiratory function test, spirometry, COVID-19

DIET – THE BASIS FOR THE TREATMENT OF SKIN DISEASES

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A few words about the author(s):

A student of physiotherapy at the Cracow University of Health Promotion. Member of the Polish Chiropractic Association. In spare time – a violinist. Her passion is a holistic view of the patient, which she uses in her daily practice.

Abstract:

Diet plays a key role in the treatment of skin diseases. Information on supporting the treatment of diseases such as psoriasis, urticaria or common acne with diet can be found in many textbooks or publications. However, the leading role of nutrition in this process is still not emphasized enough. What we eat is often placed in second place – right after strong drugs or steroid ointments. Particularly little is said about this issue in a context of atopic dermatitis, a disease that affects nearly 800,000 people in Poland. The food we eat is the key to recovery or alleviating the illness. By following an anti-inflammatory diet, increasing omega-3 fatty acids intake, and focusing on keeping a healthy gut microbiom we can significantly reduce the flare or lead to a complete disappearance of the rash.

Keywords:

atopic dermatitis, skin diseases, diet treatement, holistic thinking, topical steroid addiction

ATTEMPT TO ELUCIDATE THE MECHANISM OF ACTION OF METHADONE THROUGH MOLECULAR MODELING OF THE POSTULATED ACTIVE ENOL FORM OF METHADONE AND DOCKING TO MOR RECEPTORS

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A few words about the author(s):

My name is Tomasz Ostaszewski and I would like to describe my research that was done as part of my master's thesis.

Abstract:

The aim of the study was to determine what the relative persistence of the different tautomeric forms of methadone is, and in particular to determine whether the enolic form with a closed nitrogen-containing pseudo-ring can be present in amounts that allow significant effects on the MOR receptor. The research was conducted by using the Gaussian16 quantum chemical calculation program and several different density functionalities and atomic orbital bases. Calculations were performed for both the gas phase and the aqueous environment. An additional objective of the work was to estimate the potency of the different tautomeric forms of methadone on the MOR receptor. Another additional objective of the work was to perform similar calculations for pseudo-ring-containing and non-pseudo-ring-containing drug molecules of tramadol and tapentadol.The most stable tautomeric form (having the lowest Gibbs free enthalpy) of methadone both in the gas phase, aqueous solution and when dispersion is taken into account is the ketone form. The enol form with a pseudo-ring is more stable than the linear enol and only slightly less stable than the ketone form. It follows from Gibbs free energy calculation that the percentage of ring enol form can be estimated as 3.39% which is substantial amount. The main reason is the existence of a very strong intramolecular hydrogen bond in the enol pseudo-ring tautomer.

Keywords:

DFT, in silico methods, keto-enol tautomerism, pain therapy, opioid addiction

DIAGNOSTIC DIFFICULTIES AND TREATMENT OF TINNITUS IN ADULTS – AN INTERDISCIPLINARY ISSUE?

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A few words about the author(s):

I am a 6th-year medical student with a keen interest in otolaryngology. Apart from science, I am interested generally in sport and cooking.

Abstract:

Tinnitus is the perceived sensation of sound in the absence of acoustic stimulation. Due to the complexity of the problem, a multidisciplinary approach is required. They are appearing more frequently and in younger and younger patients, as will be illustrated in this case.

The patient(age 50) has been suffering from unilateral tinnitus for 7 years. It started in 2016 with acute flu and a long plane flight to Asia. After returning to Poland, the tinnitus did not disappear. After several ENT consultations (March 2016 and July 2016), where tonal audiometry as well as impedance audiometry was performed. In addition, an ear lavage was performed. The tests showed no deficits. It was recommended to wait and get used to the situation. After a year(2017), an MRI scan was performed, which also showed no abnormalities. It was not until 2022 that additional laboratory tests were ordered during a visit to the family doctor. They showed a slight elevation in LDL cholesterol. The patient also had home blood pressure measurements, which showed periodic elevations. The following treatment was instituted: Atorvastatin, Ramipril plus preparations with Pinus Maritima extract. After 1.5 months, the patient noticed a significant improvement, and after 6 months the problem disappeared.

As it turned out, this is not solely a laryngological issue, so a broader perspective from an expert team could have resolved this problem earlier.

Keywords:

tinnitus, otolaryngology, adults

THE IMPACT OF OBESITY ON THE DEVELOPMENT OF ENDOMETRIAL CANCER – TREATMENT AND POSTOPERATIVE MANAGEMENT

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A few words about the author(s):

I am a 6th-year medical student. I am mainly interested in otolaryngology. Apart from studying, I am keen on sports and cooking.

Abstract:

Uterine cancer is one of the most common cancers in women. Despite its generally good prognosis, it still poses significant diagnostic and therapeutic challenges. The impact of various factors on the development of endometrial cancer has been proven, including obesity, which has become one of the most significant health problems worldwide. A 73-year-old patient with a BMI of 30.5 kg/m2 presented to a gynecologist in May 2021 due to vaginal discharge and a urinary tract infection. During the examination, endometrial hyperplasia (18.6 mm) was detected. As a result, the patient underwent uterine curettage in June 2021. The results confirmed endometrioid adenocarcinoma. Thanks to an accelerated diagnostic pathway, the patient underwent surgery in July 2021. The procedure concluded with radical hysterectomy without infiltration of adjacent structures. Following surgical treatment, patients should be monitored for disease recurrence and complications. In this case, the monitoring is conducted every three months, including physical and gynecological examinations along with a medical history review. Prompt and appropriate treatment led to a complete cure. It appears that adequate prevention and analysis of risk factors could have prevented the disease and further treatment for the patient. The aim of this study was to illustrate the real impact of risk factors and preventive measures on the patient's health.

Keywords:

adenocarcinoma, gynecology, obesity

SMA AND GENE THERAPY – HOW DOES IT WORK?

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A few words about the author(s):

Mateusz Ścibiorski is a master's student in medical biotechnology at Maria Curie-Skłodowska University in Lublin. His scientific interests include gene editing methods and molecular neurobiology of Spinal Muscular Atrophy and glioblastoma multiforme.

Abstract:

Spinal Muscular Atrophy (SMA) is a neurodegenerative disease of childhood that is inherited in an autosomal recessive manner. It results in the degeneration of α-motoneurons in the anterior horns of the spinal cord.

The molecular basis of Spinal Muscular Atrophy, which results in the development of the disease, is based on reduced levels of the SMN protein, which has key functions in the cell, and its complete absence in the body is lethal.

The SMN protein in a healthy body is a product of the expression of the SMN1 gene. The human body has an additional gene, SMN2, on the basis of which SMN protein is formed in small amounts. Decreased levels of SMN protein are caused by dysfunction of the SMN1 gene. The SMN2 gene present in the body attempts to compensate for the deficiency of SMN protein, but it undergoes an alternative splicing process. This process results in the formation of SMN protein isoforms, which are usually truncated versions of the SMN protein. As a result, the protein becomes non-functional.

The gene therapy used to treat SMA is based on the use of AAV viral vectors into which the correct version of the SMN1 gene is inserted. When Zolgensma is administered to the affected person, a very rapid production of the SMN protein based on the inserted gene occurs. People treated with Zolgensma gene therapy function as healthy individuals and do not develop any symptoms of the disease, despite the presence of an abnormal version of their own SMN1 gene.

Keywords:

Spinal Muscular Atrophy, SMN protein, gene therapy, Zolgensma

ANTERIOR CRUCIATE LIGAMENT (ACL) INJURIES – DIAGNOSIS, TREATMENT METHODS, AND REHABILITATION. DESCRIPTION OF A CASE OF CHRONIC KNEE INSTABILITY

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A few words about the author(s):

I am a sixth year medical student. My field of interest is Orthopaedics and Traumatology. Besides that, I am also interested in Automotive and Sports.

Abstract:

Anterior Cruciate Ligament (ACL) injury is one of the most common musculoskeletal injuries. It can occur in both athletes (such as football players and skiers) and significantly less physically active individuals. The ACL, along with the posterior cruciate ligament, is responsible for stabilizing the knee joint, proprioception, and protecting other intra-articular structures. ACL injury most commonly occurs as a result of a twisting force. A complication of this injury can be chronic knee joint instability, which often leads to the development of early degenerative changes. Treatment can be both non-operative and operative, depending on the extent of intra-articular damage, presence of joint instability, level of physical activity, and age.

This case concerns a 53-year-old patient who, at the age of 23, suffered a left knee injury in a twisting mechanism while skiing, resulting in anterior cruciate ligament damage. For 28 years, following two unsuccessful attempts of conservative treatment, the patient struggled with moderate knee joint instability. At the age of 51, during a dance, the patient experienced a knee dislocation. After an orthopedic consultation and an MRI examination, the patient agreed to undergo the proposed surgical treatment. ACL reconstruction, along with repair of the torn medial meniscus, was performed.

The aim of this presentation is to present the issue of ACL injuries, their diagnosis, treatment and complications of chronic knee joint instability.

Keywords:

ACL injuries, operative treatment, non-operative treatment, knee joint instability

POSSIBILITIES OF USING BOTULINUM TOXIN TYPE A IN MEDICAL PRACTICE

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A few words about the author(s):

I am a fifth year medical student. I am particularly interested in family medicine and obesity. Outside of science, I am interested in volleyball.

Abstract:

Botulinum toxin type A is a well-established substance that has been used in medicine for many years. While it gained recognition primarily for its applications in aesthetic medicine, it also finds use in various other medical fields. This presentation describes therapeutic uses, including the treatment of tension headaches, migraines, pain resulting from temporomandibular joint dysfunction and overactive bladder syndrome. It is important to note that in these medical conditions, botulinum toxin type A is not the first line of treatment. However, its use is considered when alternative methods do not bring the expected results.

Keywords:

botulinum toxin, headaches, overative bladder

METHODS OF TREATING THE MOST COMMON ADDICTIONS OCCURRING IN THE 21ST CENTURY

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I am a fifth year medical student. I am particularly interested in family medicine and obesity. Outside of science, I am interested in volleyball.

Abstract:

Nowadays, there are more and more treatment options for both emerging and long-standing addictions in society. With the increasing availability of treatment options, there is also a rise in addictive substances and behavioral addictions. Pharmacological methods involve medication use to manage withdrawal symptoms and cravings, while psychotherapeutic approaches address psychological and behavioral aspects of addiction. Combining these methods can lead to better outcomes and long-term recovery.

Keywords:

addiction, pharmacological methods, psychoterapeutic

DIAGNOSIS AND TREATMENT OF PROXIMAL FEMUR FRACTURES

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I am a fifth year medical student. I am particularly interested in family medicine and obesity. Outside of science, I am interested in volleyball.

Abstract:

The increasing proportion of elderly people in society and the use of steroid therapy, more and more cases of fractures of proximal femur fractures are observed. Among these fractures, the most common is the fracture of the femoral neck. The presentation explores the classification and treatment options for this type of fracture, as well as the treatment approaches for transtrochanteric femoral fractures.

Keywords:

femur, fracture

COEXISTING CONDITIONS WITH PSORIASIS: EYE DISEASES, STROKE, AND DIABETES

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A few words about the author(s):

The authors are medical students, passionate about healthcare.

Abstract:

Psoriasis, a chronic autoimmune skin disease characterized by inflammatory processes, can lead to various systemic complications beyond skin manifestations. In this presentation, we specifically examine the coexisting conditions associated with psoriasis, including eye diseases, stroke, and diabetes.

Keywords:

Psoriasis, eye diseases, stroke, diabetes

ABSTRACTS OF

POSTERS

MEDICAL SCIENCES

THE MOST FREQUENTLY DESCRIBED MARKERS OF HEAD AND NECK CANCERS

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A few words about the author(s):

Implantologist, Surgery Resident in Department of Maxillofacial Surgery, Medical University of Gdansk.

Abstract:

The complexity of the carcinogenesis processes in head and neck cancers is evidenced by the number of studies and publications devoted to the molecular basis of cancer cell transformation and factors controlling the cell cycle, apoptosis and angiogenesis. A better understanding of these processes will explain the differences in the clinical course of the disease, will allow to plan individual treatment and predict the prognosis. Large differences in the interpretation of the usefulness of the compounds described above indicate the need for further search for substances that, in relation to head and neck cancers, may be better predictors of the course of the neoplastic process in this location. For this reason, it was decided to search for a link between the neoplastic process in the area of the head and neck and the metabolism of nitrogen compounds.

Keywords:

tumor markers, head and neck cancers, CRP, CEA, CYFRA 21-1

TREATMENT OF HALLUX VALGUS: INNOVATIVE SOLUTIONS AND ADVANCES IN ORTHOPEDIC SURGERY

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A few words about the author(s):

I am a student at the Rzeszów University of Technology in the field of Medical Engineering.

Abstract:

Hallux valgus, a common foot deformity, presents challenges for affected individuals due to its progressive nature and associated symptoms. Conservative treatments may provide temporary relief, but surgical intervention becomes necessary in severe cases. There are various surgical techniques that can be implemented such as osteotomies, arthroplasty, and arthrodesis. Additionally, there are different modern tools and technologies which enable personalized and precise approaches to hallux valgus treatment. The use of different materials for implants, including stainless steel, titanium, and bioresorbable polymers, is also examined. Advances in surgical techniques, such as minimally invasive approaches and the use of fixation devices, have revolutionized the management of hallux valgus.

Keywords:

hallux valgus, orthopedic surgery, osteotomy, implant materials

ANTIBIOTIC RESISTANCE – RESISTANCE OF BACTERIA TO ANTIBIOTICS

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A few words about the author(s):

My name is Justyna. I am a student of medical biotechnology. My special interest is microbiology. I like to attend conferences, which give me the opportunity to expand my knowledge in various fields of science.

Abstract:

Nowadays there is a belief among many people that diseases caused by microorganisms are fearless to humans, and that we can cure practically all of them with the help of antibiotics. Are we sure such a claim is correct? A growing problem today is the increase in antibiotic resistance among a great many strains of bacteria. This is due to the increasing number of genes encoding antibiotic resistance mechanisms. Moreover, it is not a matter of resistance to one type of antibiotic, but even to several at the same time. For this reason, certain bacterial strains are equipped with resistance genes to multiple types of antibiotics. These genes can also be transferred between different bacterial species, further increasing the scale of the antibiotic resistance problem. Most genes are transferred by horizontal gene transfer (HGT): conjugation, transformation, transduction or the bacteria's use of mobile genetic elements (MGE). Infections caused by antibiotic-resistant bacteria cause many difficulties in the treatment process. It proves difficult to select an appropriate, effective antibiotic to cure the disease caused by the microorganism. Sometimes resistance affects the so-called antibiotics of last resort, which include, for example, colistin. New recombinant antibiotics or entirely new treatments are needed to effectively treat infections caused by strains resistant to many antibiotics.

Keywords:

antibiotic resistance, resistance genes, horizontal gene transfer

MULTIDRUG RESISTANCE OF CANCER CELLS

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Student of medical biotechnology at the Maria Curie-Skłodowska University in Lublin.

Abstract:

Multidrug resistance (MDR) is the phenomenon of simultaneous insensitivity to drugs, different in chemical structure and mechanism of action. The lack of sensitivity of tumour cells to the cytostatic agents used in chemotherapy prevents effective eradication of the tumour and the micro-metastases arising from it. The development of multidrug resistance results in the need to increase the dose of drugs, which has a toxic effect on healthy cells in the patient's body. MDR in cancer usually manifests itself by blocking apoptosis, increased export of cytostatic molecules from target cells and increased detoxification of therapeutic substances. The development of multidrug resistance in cancer cells is usually associated with overexpression of transport proteins, the main representative of which are proteins belonging to the ABC family. In normal cells, ABC proteins remove toxic substances from the cytoplasm, while in the case of cancer cells, they export molecules of therapeutic substances outwards. MDR is also associated with changes in cell metabolism resulting in enhanced drug detoxification. In drug-resistant cancers, overexpression of glutathione S-transferase π and topoisomerase II α is often observed, leading to lower final drug concentrations in target cells and reduced efficacy. To improve outcomes in the treatment of cancers with MDR, it is necessary to design new therapies that abolish the phenomenon of drug resistance.

Keywords:

cancer, multidrug resistance, ABC proteins

SUPPLEMENTATION WITH GOUTWEED (AEGOPODIUM PODAGRARIA L.) IN THE TREATMENT OF GLUCOSE METABOLISM DISORDERS – A REVIEW OF THE LITERATURE

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A few words about the author(s):

We are students of the Pomeranian Medical University in Szczecin and members of the student scientific society at the biochemistry department.

Abstract:

Extracts from Aegopodium podagraria, the goutweed, has its application in folk medicine.

Review of the literature. The review was prepared by searching the scientific reports in the Medline and Scopus databases.

Available reports about the combined use of tinctures of goutweed and metformin shows that it has an effective hypoglycemic effect, lowers fasting glycemia, improves tolerance of glucose and has beneficial effect on lipid levels. The tincture, rich in hydroxycinnamic acids increases the effectiveness of metformin, possibly by modulating glucose transport. However, it has no such effect on the difference in the amount of glycogen in the liver. In the oral glucose tolerance test, the supplementation of the tincture of goutweed and metformin led to improved glycemic results. Lipid metabolism disorders observed in type 2 diabetes or insulin resistance can be corrected thanks to the action of goutweed extract. The dexamethasone-induced increase the level of plasma triglycerides, which is reduced when goutweed tincture is used in combination with metformin and tends to normalize the lipid profile. Available reports indicate that the use of goutweed tincture with a low dose of metformin increases the effect of metformin on glucose levels and improves insulin resistance. Further studies on the interaction of goutweed preparations with metformin in the treatment of glucose metabolism disorders are needed.

Keywords:

Aegopodium podagraria L., goutweed, dexamethasone, metformin, glucose metabolism

POLYMORPHISM ANALYSIS OF ALVERINE CITRATE

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A few words about the author(s):

Magdalena Janczura has many years of experience as a Technologist and a Qualified Person in the pharmaceutical industry. Currently is a PhD student at Department of Pharmacognosy and Biomaterials, Poznan University of Medical Sciences.

Abstract:

Alverine citrate (ALVC) is a spasmolytic, which has a specific action on the smooth muscle of the alimentary tract and the uterus. ALVC can form different crystalline forms or polymorphs and its solubility in water reaches 12 $mg \cdot mL^{-1}$. Recent reports describe except form I of ALVC also form II, which does not contain crystal water and form B as monohydrate. Polymorphs of the same drug substance can possess different solubility properties, which may lead to variations in local and/or systemic bioavailability and stability. This can present problems when a pharmaceutical manufacturer needs to change the supplier of an active pharmaceutical ingredient or add a second supplier in order to ensure a constant supply. XRPD and FT-IR analysis shows that all ALVC samples from selected producers are in the same polymorphic Form I, despite differences in the synthesis process. Scanning electron micrographs of ALVC from each manufacturer show differences in morphology. The solubility studies confirmed the complete solubility of the highest dose of ALVC in media with a pH of 1.2-6.8. The release studies show that the release of the ALVC, regardless of the manufacturer type, meets the immediate release requirement. Accelerated stability studies confirm the stability of the ALVC from selected manufacturers. As a result, the manufacturer of the final medicinal product may allow their interchangeability during production without compromising the safety or efficacy of the medicinal product.

Keywords:

alverine citrate, polymorphism, solubility, SEM, XRPD

LATE LATENT SYPHILIS AS A CHALLENGING ISSUE IN THE TWENTY-FIRST CENTURY

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A few words about the author(s):

Ada Kaczmarek is a 5-year medical student at Poznan University of Medical Sciences and the chairperson of the Student Scientific Association of Adult Psychiatry.

Abstract:

INTRODUCTION: Syphilis is one of the oldest sexually transmitted diseases caused by the bacterium Treponema pallidum. It is characterized by multiple clinical presentations and a long duration. Acquired syphilis is divided into early (≤ 1 year after infection) and late (> 1 year after infection) stages. Venereal diseases, more often defined as sexually transmitted diseases (STDs), result from behaviours influenced by socio-economic, psychological, and cultural factors. Late syphilis has exhibited an increasing frequency in recent years, posing a significant clinical problem in Poland. This issue holds importance in contemporary epidemiology, regardless of the ongoing COVID-19 pandemic.
OBJECTIVES: The objective of this study was to showcase two cases of women with acquired late syphilis of unknown duration treated at the Dermatology Clinic of a specific university.
MATERIAL AND METHODS: Cases 1 and 2 involved a 72-year-old female patient and a 29 year-old female patient, respectively, both diagnosed with late latent syphilis of unknown duration. The patients exhibited various symptoms, and laboratory tests confirmed the presence of syphilis.
CONCLUSIONS: The incidence of late syphilis has been increasing worldwide, making it a significant clinical concern in dermatology and venereology. When syphilis is diagnosed, appropriate treatment following updated guidelines is crucial.

Keywords:

late syphilis, treatment

THE DIVERSITY OF LIFESTYLE-ASSOCIATED MOLECULAR PATTERNS (LAMPS) AND THEIR IMPACT ON THE DEVELOPMENT OF DISEASES

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Joanna Kubica – sixth-year medical student of the Faculty of Medicine. Łukasz Baraniecki – student of the second year of master's studies in the field of microbiology.

Abstract:

Today's lifestyle, including diet, work and living environment, can stimulate our immune system through molecules defined as Lifestyle-Associated Molecular Patterns (LAMPs). LAMPs interact with Pattern Recognition Receptors (PRRs) present on immune cells, trigger a variety of signal transduction pathways, resulting in the secretion of cytokines, chemokines and the recruitment of more immune cells. These events contribute to the onset and progression of inflammation. The presence of LAMPs impairs the transition from the pro-inflammatory program of the immune system to the regenerative one, so that inflammation is persistent. They cannot be removed from the macroorganism because strategies to eliminate them have not evolved, or are not possible. Unfortunately, this can lead to the development of many diseases, many of which are associated with modern lifestyles. There are endogenous and exogenous LAMPs. Endogenous ones include oxidized LDL, cholesterol crystals, prions and prion-like protein danger signals (e.g. β-amyloid), calcium pyrophosphate dihydrate crystals and sodium urate crystals, while exogenous ones include asbestos, silica and biomaterials. A group of LAMPs and their effects on the development of diseases will be presented.

Keywords:

Lifestyle-Associated Molecular Patterns, LAMP, PRR, inflammation

PROLONGED FEVER AS A MAJOR SYMPTOM OF INFECTIVE ENDOCARDITIS – A CASE REPORT

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A few words about the author(s):

Members of the Scientific Club and employees of the Department of Endocrinology of Pomeranian Medical University.

Abstract:

INTRODUCTION: We present the case of a cardiac patient with prolonged fever and general symptoms, the cause of which appeared to be infective endocarditis.

CASE: A 51-year-old patient was admitted to the Department of Internal Medicine to establish a starting point of fever and abnormal inflammatory parameters lasting for 2 months. The patient was previously diagnosed with multivalvular heart defect and myocardial hypertrophy. On admission, the patient reported weakness, dyspnoea, chest pain and unintentional weight loss. On physical examination, tachycardia with an accompanying systolic murmur was noted. On ancillary investigations, the following abnormalities were observed: leucocytosis, elevated CRP, D-dimer levels and hyponatraemia. Thus, a chest angio-CT was performed, ruling out pulmonary embolism. Chest X-ray and abdominal ultrasound did not visualise potential points of infection. Blood cultures showed the presence of Streptococcus oralis. Transthoracic and transesophageal ECHO showed additional hyperechoic foci around the chordae tendineae and aortic valve, suggestive of infective endocarditis. Ceftriaxone with gentamicin was administered and dental extraction was performed during the dental consultation. After consultation with the Department of Cardiac Surgery, the patient was transferred for surgical treatment.

CONCLUSION: Infective endocarditis should absolutely be considered as a cause of fever in patients with risk factors such as multivalvular heart defect.

Keywords:

endocarditis, fever

VAC THERAPY FOR THE TREATMENT OF CHRONIC WOUNDS AND VENOUS ULCERS

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A few words about the author(s):

I am a 5-year medical student at the Faculty of Medicine of the University of Opole. My area of interest is particularly closely related to surgery. After graduation, I would like to become a specialist in urology.

Abstract:

VAC refers to closing wounds using vacuum. This means that negative pressure is applied to the wound and its surroundings continuously or intermittently. VAC therapy dressings are made of a special sponge fitted and placed precisely in the wound, covered with a transparent coating. A suction system is then connected to collect fluids that accumulate in the wound. The pump connected to the dressing generates pressures from -50 to -175mmHg, which makes the sponge inside reduce its volume by up to 80%. The negative pressure created in the wound accelerates the overall healing process and greatly facilitates it. By removing excess fluid from the wound, the device reduces swelling and supports the fight against bacterial colonization within the wound. The vacuum also supports the natural granulation process by changing the biochemistry of the wound (the level of vascular endothelial growth factor, fibroblast growth factor and collagen levels increases). It also increases blood flow to the wound area, which provides a better supply of factors needed for healing and removal of harmful ones. Also the closed, warm and humid environment inside the dressing is very stable and beneficial for natural healing processes. Supporting the treatment of difficult-to-heal wounds with VAC allows for better functional results than traditional therapy, which translates into patient satisfaction with the treatment results.

Keywords:

VAC, chronic wound, venous ulcer, hard-to-heal wound, Vaccum Assisted Closure

HISTOLOGICAL CHANGES IN THE GLIA OF ADDICTED RATS EXPOSED TO FLUORIDE

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A few words about the author(s):

Medical students who are passionate about science.

Abstract:

INTRODUCTION: Both fluoride and morphine modulate the inflammatory response in the brain. The interactions between these two substances may influence the development of dependence.

AIM: The evaluation of Iba1 and GFAP expression in the brain of fluoirde-exposed and morphinedependent rats.

METHODS: Immunohistochemical staining.

RESULTS: The IHC reaction showed that GFAP immunoexpression in the prefrontal cortex (neocortex) was highest in brains of rats given fluoride and morphine. Generally, the striatum showed almost equal expression of GFAP in rats from control, treated with fluoride and fluoride with morphine; striatum of rats treated only with fluoride showed the highest intensity of GFAP. After exposure to fluoride and fluoride plus morphine GFAP expression was higher than in control rats and rats treated with morphine. The IHC reaction showed that Iba-1positive microglial cells in the prefrontal cortex was low in control rats, higher in rats treated with fluoride and morphine, and the highest in rats treated with morphine alone. The lowest immunoreactivity for Iba-1 was observed in a group of rats treated with fluoride.

CONCLUSIONS: The results obtain in the study indicate that morphine has a diverse effects on inflammatory response and indicate that fluoride pre-exposure may influence this process.

Keywords:

fluoride, GFAP, histology

COMPUTER-AIDED ASSESSMENT OF TRAZODONE METABOLITES PHARMACOKINETICS AND TOXICITY

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A few words about the author(s):

Authors are interested in molecular modeling of potential drug candidates in terms of their pharmacological properties.

Abstract:

Trazodone is a multi-purpose drug with a vast spectrum of use within several psychiatric conditions, e.g. severe depressive episodes, anxiety and insomnia. Sedation, gastrointestinal symptoms and mucosal dryness are the most common side effects while taking trazodone. Others like priapism or suicidal thoughts occur, but they are unusual. Recognition of biotransformation routes of a drug helps with understanding its impact on internal organs. The aim of this study was to obtain selected pharmacokinetic parameters and to classify trazodone metabolites considering their toxicity with in silico tools. Assessment was facilitated by BioTransformer 3.0, SwissADME and Pro-Tox II software. Among investigated set of compounds, two structures presented alarming properties and require further examination.

Keywords:

trazodone, depression, metabolites toxicity, pharmacokinetics

PROBLEMS OF STRESS IN THE STUDENT COMMUNITY

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A few words about the author(s):

The authors of this work are nursing students at the State Academy of Applied Sciences in Krosno.

Abstract:

Stress is a phenomenon that occurs as the body's response to the demands placed on it. The purpose of the poster is to introduce the issue of stress in the student environment. It includes, among other things, the results of the study on the assessment of the frequency of stressful situations, the factors that are the most common source of stress and ways of coping with it. The study included 112 students of the State Academy of Applied Sciences in Krosno. The research technique was the author's survey questionnaire, which consisted of a metric and 16 closed questions. The research showed that stress is a common phenomenon among students, caused not only by situations related to studying, but also by health, family problems. The results of the study should provide a basis for measures to support students in their fight against stress.

Keywords:

stress, students, emotions

DYSFUNCTIONS OF THE TEMPOROMANDIBULAR JOINT: CAUSES, SYMPTOMS, AND THERAPEUTIC STRATEGIES

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A few words about the author(s):

My name is Marcelina Powązka, and I am a physiotherapy student at Wroclaw Medical University. I am actively involved in the student scientific circle Progressio Infantis.

Abstract:

Dysfunctions of the temporomandibular joint (TMJ) are characterized by pain, limited range of motion, and frequent joint clicking. This disorder most commonly affects individuals between the ages of 20 and 40. The primary causes are jaw injuries, excessive muscle use, or inflammation, such as in the case of arthritis. Symptoms associated with TMJ dysfunction include ear, facial, jaw, and neck pain, pain during chewing, TMJ sounds like clicking or popping when opening or closing the mouth, headaches, jaw locking, and restricted TMJ mobility. The goal of physiotherapy is to alleviate musculoskeletal discomfort, reduce inflammation, and restore joint mobility. Available treatment methods include manual therapy, needel therapy, and physical therapy. TMJ manual therapy involves normalizing tension in the TMJ, neck, and head. In our study, we review the causes, symptoms, and therapeutic strategies.

Keywords:

manual therapy, temporomandibular, joint, pain, review

INONOTUS OBLIGUUS SUPPLEMENTATION IN NEURODEGENERATIVE DISEASES

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We are members of the Biochemistry Student Research Club of the Pomeranian Medical University in Szczecin.

Abstract:

Inonotus Obliquus supplementation in neurodegenerative diseases. Inonotus obliquus (Chaga), is a fungus in the family Hymenochaetaceae. Many reports have been published on the health-promoting functions of this mushroom, including neuroprotective, antibacterial, anti-inflammatory, anticancer and antioxidant effects. The aim of the study was to review the current literature on the impact of Inonotus obliguus on the treatment of neurodegenerative diseases. The literature review was made by analyzing scientific papers in the PubMed database.

The exctracts of Chaga decrease the oxidative stress of microglia cells, downregulating the inflammatory processes in the central nervous system. Analysis of papers on the neuroprotective effect of Chaga showed a protective effect of its extracts on Aβ-induced neurotoxicity by significantly increasing cell viability, lowering intracellular calcium levels, and attenuating Aβ-mediated cell apoptosis. It appears to be a possible therapeutic approach to attenuate the progression of Alzheimer's disease. 3,4-Dihydroxybenzalacetone, a catechol-containing compound isolated from Chaga, might also have a possitive effect on Parkinson disease by downregulation of PD-related neurotoxin 6-hydroxydopamine (6OHDA) and increasing the surival of 6OHDA-treated cells.

Chaga extracts may have a beneficial effect on the oxidative state of nervous system cells, and therefore may prove useful in supporting the treatment of neurodegenerative diseases.

Keywords:

Inonotus Obliquus, Chaga, neurodegenerative diseases

ABSTRACTS OF

PRESENTATIONS

TECHNICAL AND NATURAL SCIENCES

THE INFLUENCE OF MODEL COLOR ON ITS REPRODUCTION USING PHOTOGRAMMETRY

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A few words about the author(s):

I am a first-year student pursuing a Master's degree in Biomedical Engineering. My primary area of interest lies in 3D printing and its applications in engineering and medicine.

Abstract:

Photogrammetry is technique of capturing three-dimensional measurements of objects using photographs captured from different planes and angles. Data are processed using software that utilizes mathematical methods and algorithms to measure the distance, shape, and position of objects. The ultimate result is the creation of an accurate 3D model of the real object. There are various methods for modeling using photogrammetry, and one of them utilizes the Big Alice Studio system. Studio is equipped with 64 digital cameras that captures the shape and position of the model from different planes, allowing for precise reproduction of its geometry, as well as providing information about its texture and color.The study focused on examining the influence of the color of the photographed model on its reproduction using photogrammetry techniques. To prepare the models, 3D printing was used. Cubes with dimensions of 15x15x15 cm were printed using PLA material in three colors (white, orange, and purple). Each measurement series consisted of 64 photos, which were then imported into software capable of creating 3D models based on the images. Subsequently, each acquired model was examined using GOM Inspect software to identify any deviations compared to the CAD model. The analysis revealed that the largest deviations from the CAD model were observed in the case of the white-colored cube. The purple and orange cubes exhibited significantly smaller deviation values.

Keywords:

Big Alice, 3D printing, reverse engineering

OPTIMIZATION OF THE UX OF THE USER INTERFACE OF THE IT SYSTEM SUPPORTING THE WORK OF AN ENTERPRISE FROM THE SME SECTOR IN TERMS OF ERGONOMICS AND USABILITY

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PhD student at the University of Bielsko-Biała, she has been thriving in the IT industry since 2015. Her interests lie in UX research, UX/UI design, user-centered design, design thinking, and their application in IT systems for production processes.

Abstract:

This study analyzes an IT system produced by a Polish company, designed to support enterprises from the SME sector. The focus lies on the optimization of the system's user interface (UI) in terms of ergonomics, usability, and accessibility. Evaluations are grounded on Nielsen's heuristics, a set of usability guidelines that help to identify any design issue. The analysis also incorporates core UX laws like Jakob's Law, suggesting users expect consistency across similar interfaces; Hick's Law, denoting decision time grows with the number of options; and Fitts's Law, stating that the time to reach a target depends on the distance and target size.

The analysis elucidates several areas for improvement in the current UI, providing valuable insights for re-designing the interface. Recommendations are based on the findings aligned with design best practices and guidelines, aiming for a more user-centered, ergonomic, and accessible UI. Future research could include further usability testing with users to validate the newly designed interface. This study contributes valuable insights for any SME seeking to enhance their IT systems' usability and user experience.

Keywords:

UX research, UX audit, UX/UI design

METHODS OF OPTIMIZING OPTICAL FIBER SPLICE BETWEEN STANDARD AND SPECIAL OPTICAL FIBERS

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Mateusz Józwicki is a Ph.D. student at the Ph.D. School of Quantitative and Natural Sciences (chemical science) at Maria Curie-Sklodowska University in Lublin. Weronika Józwicka is a student in the chemical faculty at UMCS in Lublin.

Abstract:

Currently, available special fiber optics have an increasingly complex and complex internal structure. This causes problems with optimized connection to standard optical fibers and transmitting and receiving apparatus incorporating optical fibers in its construction standard. With standard fiber connections, the most popular method of thermal splicing is using filament. For standard fibers (SMF) application of the latter method causes an increase in losses of only 0. 02dB. The logical consequence is to use this splicing method as a combination of microstructural optical fibers with standard fiber optics. The internal structure of fiber optics microstructural is associated, inter alia, with the occurrence of: or areas with a different refractive index. The application currently developed and optimized fiber welding programs makes that at the point of connection this structure is not preserved causing significant losses and completely different from the assumed propagation of light. This results in that the fiber does not meet the assumed parameters. Therefore, it turns out necessary the development and optimization of new programs controlling the interconnection of optical fiber microstructural with standard optical fibers. The work discusses the methods of optimizing the splicing of exemplary optical fibers due to the mechanical strength and optical properties of the splice. The optimization consisted of the experimental selection of parameters and monitoring of the PER.

Keywords:

optical fiber, splicing optical fiber, optimization splice optical fiber

CFD AS A MEANS OF SPRING CHARACTERISTICS INDICATOR FOR PISTON CHECK VALVE DESIGN – CASE STUDY

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A few words about the author(s):

R&D engineer and designer of hydraulic systems for white goods, with a Master's degree in reservoir engineering, currently pursuing a Ph.D. in Mechanical Engineering with a focus on flow mechanics; author of multiple international patents.

Abstract:

Piston check valves are crucial components in various fluid systems, ensuring unidirectional flow while preventing backflow. The accurate design of spring forces within these valves is essential to maintain proper valve operation and prevent system failures. Traditional methods for calculating these forces often rely on simplified calculations and empirical correlation of testing, which as a result makes it a lengthy process. This presentation explores the use of CFD in the example of SolidWorks Flow Simulation surface directional force evaluation as a means of mapping the expected stream forces in fixed geometry piston check valve in the function of piston position and water volumetric flow conditions.

Results from the SolidWorks Flow Simulation case study are presented in a form of a system response surface of predicted stream forces under various flow conditions and different opening steps, providing a force-prediction framework for either geometric system optimization or engineering choice of given geometry spring characteristics.

In summary, this presentation showcases the use of SolidWorks Flow Simulation tool for predicting the required spring forces in process of designing piston check valves.

Keywords:

check valve, CFD, engineering

APPLICATION OF FEDERATED LEARNING IN HIGHER EDUCATION IN POLAND

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A few words about the author(s):

The area of my interest are issues related to artificial intelligence. On a daily basis, I create web applications.

Abstract:

The subject of the article is to check the usefulness of federated learning in higher education. The main thesis of the work is the statement that federated learning is able to accurately indicate the chances of timely graduation. The study is based on the analysis of the timeliness of graduation using a neural network using federated learning. The first step was to prepare the data, the next step was to create 10 architectures that were checked for accuracy. After creating the architectures, a solution was created that tested each created neural network and performed tests on it. The tests were carried out by determining values such as accuracy and loss functions, which then determined the selection of the best network.

Keywords:

federated learning, neural network, fuzzy sets

INTERDISCIPLINARY NUMERICAL METHODS AND THEIR APPLICATIONS

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A few words about the author(s):

Wojciech Bańkosz is a PhD student at the Cracow University of Technology. He is mainly involved in research work on the subject of magnetorheological fluids, its innovative applications and the characteristics of MR fluid working in pinch mode.

Abstract:

Numerical methods have revolutionized various scientific and engineering disciplines by enabling the efficient and accurate analysis of complex problems. However, the ever-increasing demand for interdisciplinary research has necessitated the development of numerical techniques that can effectively address challenges across multiple domains. This publication presents an overview of interdisciplinary numerical methods and their applications in diverse fields, highlighting the critical role they play in advancing scientific understanding and facilitating innovative solutions.

Keywords:

numerical methods, interdisciplinary, applications

SARCOIDS IN HORSES

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A few words about the author(s):

I am a fourth year student of veterinary medicine. At this stage of my studies, I still have many interests. I am still looking for my future specialization, but I am currently interested in dermatology and orthopedics.

Abstract:

Sarcoid is a locally malignant skin tumor that can have different characteristics and can be located on different parts of the horse's body (extremities, trunk, genitals). Most often, it is a small lesion covered with ulcerative epidermis, less often it takes an infiltrative form developing from other forms of the tumor, which are often damaged. It can also occur as single or multiple tumors. The pathogenesis of sarcoid is assumed to be related to bovine papillomavirus, possibly transmitted by flies. This lesion can occur in horses of any age, but is most common in horses under 6 years of age. Depending on the type of sarcoid and its advancement, treatment may consist of pharmacotherapy and physiotherapy or excision of the lesion.

Keywords:

sarcoid, skin lesion, horses

CANINE HIP DYSPLASIA

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I am a fourth year student of veterinary medicine. At this stage of my studies, I still have many interests. I am still looking for my future specialization, but I am currently interested in dermatology and orthopedics.

Abstract:

Hip dysplasia in dogs is a disease in which the hip joint is deformed. This abnormality causes pain, may effect loss or worsen motor skills and most of all, can significantly reduce the quality of animal's life. There are many factors that can lead to this disorder, in particular genetic predisposition, an incorrect diet, too little or too much exercise can also contribute to the formation of hip dysplasia. Appropriate education and awareness of the owner can prevent the development of dysplasia if a dog with a predisposition to this type of disorder is provided with a proper diet and exercise that strengthens the muscles and makes the tissues around the joint more flexible. However, treatment after analyzing the possible causes may be limited to the use of an appropriate diet, joint stabilization and physiotherapy. Ultimately, surgery may be necessary.

Keywords:

hip dysplasia, hip joint

METHODS OF PRE-TREATMENT OF TECHNOLOGICAL WASTEWATER IN AN INDUSTRIAL LAUNDRY AS THE SOLUTION OF WASTEWATER MANAGEMENT PROBLEMS RELATED TO THE IMPLEMENTATION OF THE PROJECT "ANTIMICROBIAL REFINED FINISHED PRODUCT IN THE FORM OF A TRANSITION MAT"

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A few words about the author(s):

Ewelina Kowal has many years of experience in conducting research, including textile and water testing.

Abstract:

Laundry wastewater is water used in washing and rinsing baths. The wastewater is generally alkaline, colored and contains soaps, bleaches, fabric softeners, synthetic detergents and surfactants.
The aim of the research was to develop an effective technology for pre-treatment of laundry wastewater, and thus to minimize its impact on the natural environment.
The study results showed a high variability of the quality of wastewater generated in the washing process. The quality of wastewater does not allow for direct discharge into the sewage system due to temporary exceedances of such parameters as pH, COD, sulphides, chlorides and surfactants.
Based on the test results, the greatest issue in wastewater pretreatment are sufrace active agents used in the technological process. The results clearly show that it is possible to pretreat technological wastewater generated in an industrial laundry to the level specified in the relevant legal requirements. It requires the use of a two-stage process including coagulation using natural bentonites. The use of bentonites improve the sedimentation properties of the system and absorb surfactants on their surface.
The research was co-financed by the project "Antimicrobial refined finished product in the form of a transition mat" No. RPPK.01.02.00-18-0025/18.

Keywords:

industrial laundry, wastewater, coagulation, bentonites

BASICS OF TECHNICAL DRAWING

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A few words about the author(s):

Hi, my name is Piotrek, I am 21 years old, and I am a student of mechanical engineering at the University of Warmia and Mazury in Olsztyn. My hobbies are sports, automotive industry, and reading books. My dream is to become an experienced designer.

Abstract:

The topic of the presentation is the basics of reading, understanding, and creating 2D technical documentation - "technical drawings". Many people encounter them every day – in a construction materials store, while working with tools, or when assembling household furniture, refrigerators, or plumbing installations. However, few people know what the notations in these drawings mean. The ability to understand technical drawings can be useful at any point in life. The provided presentation includes the most important and necessary information regarding the understanding of technical documentation, explaining basic concepts such as "dimension," "diameter," "projection," "view," and "axis of symmetry." The included information is presented in the simplest way possible, based on general principles of creating 2D documentation. After carefully familiarizing yourself with the content of the presentation, you will be able to distinguish basic concepts, and technical drawings will no longer be "scary" for you!

Keywords:

technical drawing, 2D documentation, dimensions, engineering

PERIPHERAL VASCULAR ULTRASONOGRAPH

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A few words about the author(s):

My name is Patrycja Leniart. I have recently completed my second year of studies in Medical Engineering at the University of Technology in Rzeszów. I am a member of the X-MED scientific circle, which was created specifically for my field of study.

Abstract:

Peripheral vascular ultrasonography is a diagnostic examination that helps prevent many cardiovascular diseases. Using the Doppler effect, among other techniques, it analyzes blood flow in peripheral vessels, including veins and arteries. The process of ultrasound imaging is non-invasive, and an increasing number of people are opting for this type of examination. In these times, due to the rising prevalence of cardiovascular diseases, vascular ultrasound is being enhanced to benefit a larger population. The aim of this work is to familiarize oneself with the study of peripheral vascular ultrasonography, its principles of operation, equipment structure, phenomena occurring within the device, as well as diseases or dysfunctions of the circulatory system in which peripheral vascular ultrasonography aids in diagnosis.

Keywords:

peripheral vascular ultrasonography

PAPERMAKING ABILITY OF THE PRESENT WASTEPAPER

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Edyta Małachowska is an academic lecturer at Warsaw University of Life Sciences, specializing in the fields of papermaking, printing, and woodworking.

Abstract:

In the 21st century significantly increased paper recycling, which continues to expand due to environmental awareness. However, as the recycling rate increases, the quality of the recycled fibers decreases, which makes that low-quality paper fractions may be included in the process, leading to the overproduction of very low-value papers that cannot be reprocessed. So, paper producers endeavour to take appropriate measures to meet customer requirements and ensure a sufficiently high paper quality with increasing price pressure and reduced quality of recycled fibers. First of all, there shall be a reliable and conscious selection of recycled pulp is imperative. However, the improvement of the quality of the paper can also be achieved, for example, by adding various chemical agents to the pulp, which is discussed in this work.

Keywords:

wastepaper, recycling, fibers, pulp

USE OF OXYGEN THERAPY AND AEROSOL THERAPY IN VETERINARY PRACTICE

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A few words about the author(s):

Highly motivated 5th year student of veterinary medicine. My interests focus on soft surgery and orthopedics, which develop during volunteering and internships. Constantly taking part in veterinary conferences to enrich my knowledge.

Abstract:

Oxygen therapy is a short term treatment, commonly used in veterinary practise, given in order to stabilize the patient. Supplementation of oxygen is dedicated to animal with hypoxia, what refers to low tissue oxygen concentration. The most common signalments of respiratory distress are difficulties in breathing, paleness of mucosal membranes and tachycardia. Exist several ways of providing oxygen therapy, but most important thing is that they can not provide additional stress to the patient.

Keywords:

aerosol therapy, oxygen therapy, veterinary

USE OF FINITE ELEMENT METHODS IN BIOMEDICAL APPLICATIONS

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A few words about the author(s):

Medical Engineering student at Rzeszow University of Technology, attending scientific circle X-Med, passionate about healthy lifestyle and sports.

Abstract:

The finite element method is very widely used and is used to calculate the strength of finished or modelled components. It involves defining a specific geometry of the component, the material used and the boundary conditions so that the analysis can be carried out and strength values, such as tension or compression, can be obtained. The aim of this presentation is to show how the finite element method can be used in biomedical applications. A more detailed outline of how the method works and one of the dedicated analysis programmes will be presented. The choice of material on which the analysis will be based is also important, so biological materials will be presented, as well as the most commonly used materials in implantology, which have to withstand a certain degree of stress. Results can be obtained visually on example components, which will be presented pictorially, as well as in which areas of medicine the method can be applied and what impact it can have.

Keywords:

FEM, biomedicine, strength analysis, durability of the materials

SYNTHESIS AND ASSESSMENT OF ANTICANCER ACTIVITY OF NEW THIAZOLIDIN-4-ONE DERIVATIVES

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A few words about the author(s):

Jacek Szczepański, a young doctoral student who is motivated to deepen his knowledge of structures in organic chemistry that exhibit significant biological activities, including anti-cancer activity.

Abstract:

Cancer is one of the most dangerous health problems in the world. According to the WHO report from 2019, only cancers of the trachea, bronchi and lungs were the sixth leading cause of death worldwide. Therefore, there is still an urgent need to search for new classes of substances that act selectively against cancer cells.

Heterocyclic compounds are the core of many drugs used in the treatment of malignant tumors. Among them, there are also thiazolidin-4-one derivatives. The proposed mechanisms of anticancer activity of thiazolidine-2,4-dione derivatives include induction of apoptosis, as well as inhibition of the cell cycle and cell differentiation.

The purpose of my project is a rational synthesis of new thiazolidin-4-one derivatives, which have not yet been described in the scientific literature, with various groups, acknowledged in the literature as essential for anticancer activity.

The first stage of my work is synthesis of the novel thiazolidin-4-one derivatives.

The next step is to determine the anticancer activity of the newly synthesized compounds against cancer cell lines that are a huge epidemiological and prognostic problem, i.e. lung cancer, breast cancer in women, prostate cancer, gastric cancer, melanoma and glioma. This will be followed by a structure-activity relationship (SAR) analysis.

Keywords:

thiazolidin-4-ones, anticancer, synthesis

SARCOSPORIDIOSIS – PROBLEM IN MEAT AND SLAUGHTER ANIMALS HYGIENE

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A few words about the author(s):

4th year veterinary medicine student at Warsaw University of life Sciences. So far, her scientific research have focused on veterinary microbiology. She has participated in many scientific conferences.

Abstract:

Sarcocystis spp. is a protozoan from the Apicomplexa type with zoonotic potential. It causes a disease called sarcosporidiosis, which in humans can localize in intestines or in muscles. Symptoms in humans usually include mild gastrointestinal distress or muscle pain. Man can be both the definitive and intermediate hosts. In veterinary medicine it is the most important as a parasite of birds, pigs and ruminants. Moreover, there is no obligation to test meat from slaughter animals for sarcosporidiosis and therefore it is estimated that the amount of meat with present sarcosporidiosis is underestimated. In Australia, for example, it is estimated that 90% of sheep and cattle carry sarcoporidiosis. The parasite is also important from the economic point of view due to the fact that meat with macroscopically visible sarcopiridiosis is confiscated. The aim of this review presentation is to present sarcosporidiosis as a problem important in meat and slaughter animal hygiene.

Keywords:

Sarcosporidiosis, hygiene, veterinary medicine

ABSTRACTS OF

POSTERS

TECHNICAL AND NATURAL SCIENCES

DEDICATED CALCULATOR FOR DETERMINING CMC VALUE OF SELECTED NON-IONIC SURFACTANTS

Marta Gawliczek (1)*, Kinga Bartel (1), Oliwia Chojecka (1), Jacek Schneider (2), Natalia Swoboda (1), Konrad Wesenfeld (3), Anna Mielańczyk (1), Artur Bal (3)

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A few words about the author(s):

We are students working on a project supervised by two scientists. Our goal was to create a physiochemical calculator which would enable us to determine CMC using both programming and chemistry, thus it has a interdiscyplinary character.

Abstract:

The goal of our study was to create a physiochemical calculator that would automatically calculate the critical micelle concentration (CMC) value. CMC is the concentration at which micelles begin to form. Processing raw results and calculating CMC values on their basis is a complex process, thus the idea of making a calculator that would ease the calculation was born. The Pandas and NumPy libraries and the Qt framework were used to create Python software. The crossing point of two lines, which approximate the ratio of intensity of the signals I1/I3 of the pyrene emission spectra as a function of the logarithm of the tested compounds` concentration, was used to determine the CMC value. To test the calculator, Tween 20 and Pluronic L35 were chosen as model substances. Sequence of measurements of the pyrene fluorescence emission spectra of solutions were made for each surfactant with differing concentrations. Fluorescence emission spectra (λex=337nm) were measured in the range of 360–420 nm using Camlin fluoroSENS Pro 11 spectrofluorometer. CMC values acquired with the Calculator were comparable with those described in the literature. A developed calculator speeds up the calculations and lowers the chance of error. It is intended to introduce more algorithms for CMC determination in the future.
The research was funded as part of the PBL-IDUB project: “Dedykowany kalkulator do obliczeń fizykochemicznych w analizie polimerów”.

Keywords:

CMC, micelles, physiochemical calculator

WORK RELATED TO THE DEVELOPMENT OF A NEXT-GENERATION POWER BANK

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A few words about the author(s):

R&D employee at CSG S.A.

Abstract:

The demand for power banks has significantly increased in the past decade with the proliferation of mobile devices such as smartphones, tablets, and laptops. Depending on the customer's requirements and the intended applications for which the devices are intended, power banks vary in terms of capacity, charging standard support, output power, and connectors. This paper presents experimental development work related to designing a portable power bank with high capacity and high power while maintaining small size.

The design process involved identifying user requirements and necessary technical parameters such as capacity, charging current, and build quality. The designed power bank features a capacity of 98Wh and four USB ports with a combined power of 128W. The device underwent a series of experiments to test its performance and efficiency.

The results of the research and development work showed that the proposed solution meets the technical requirements and is capable of providing long-lasting power to electronic devices. The power bank is portable and can be carried on board an airplane, allowing for charging of all USB-compatible devices, including laptops.

Keywords:

power bank, development, quality, battery, Li-ion

DIENCEPHALON CYTOARCHITECTONICS IN PAEDOCYPRIS (TELEOSTEI, CYPRINIDAE), THE MINIATURE RELATIVE OF DANIO RERIO

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A few words about the author(s):

The author is Master of Genetics and Experimental Biology with a focus on the neurobiology and neuroanatomy of vertebrates. The author is a candidate for the doctoral school at the Institute of Nature Conservation of the Polish Academy of Sciences.

Abstract:

The Paedocypris sp. is one of the most miniscule vertebrates and the smallest fish described so far. This brings the question how does the miniaturization affect on the structures of the brain and the body of an individual. A reduced size of the entire diencephalon as well as individual centers may facilitate research and contribute to establishing Paedocypris sp. as a model of neurobiological and neuroanatomical research. The main aim of this project is the characterization of the cytoarchitectonics of the Paedocypris sp. interbrain. To achieve this purpose a series of microscopic slides was created. The properly prepared material was fixed in paraffin and then cut into 4 µm wide sections. Nissl's and Loyez's staining and an immunohistochemical method (anti-MAP type II antibodies) were both used to visualize neurons and centers. In the interbrain of Paedocypris sp., the following regions have been distinguished: the preoptic region, the prethalamus, the epithalamus, the thalamus, the pretectum nuclei, the hypothalamic nuclei and the ventricle. The main comparative model in this study was Danio rerio, chosen due to the wealth of data available and the relatedness to Paedocypris sp. Several features of the interbrain of Paedocypris sp. were observed, which may indicate the miniaturization of this organism. The presented research strives to be an initial step towards understanding the detailed cytoarchitectonics and physiology of the Paedocypris sp.

Keywords:

Paedocypris sp., zebrafish, Cyprinidae, diencephalon, miniaturization

SELECTIVE FUNCTIONALIZATION OF BORYLSILYLALKENES BY COUPLING REACTIONS

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A few words about the author(s):

Author is a student of Applied Chemistry at Faculty of Chemistry in Adam Mickiewicz University. Jakub is working on catalytic functionalization of borylsilylalkenes at Applied and Sustainable Catalysis group in Centre for Advanced Technology.

Abstract:

Borylsilylalkenes combine the synthetic potential of boryl and silyl groups bonded to sp2 - carbon [1]. Thanks to their high reactivity, stability and low oxygen sensitivity, as well as their simple, one-step synthesis [2] they are important building blocks in modern organic chemistry. These compounds can be easily modified and their functional groups can be converted into other groups by coupling reactions of boryl-substituted arenes or alkenes with halides (Suzuki-Miyaura reaction) [3] or the silyl-substituted derivatives (Hiyama coupling) [4] or lead to saturated compounds. The different reactivity of these groups allows for the selection of the reaction conditions, enabling the selective modification in the molecule. This wide range of possibilities results in many potential products and gives a real chance to utilitize these compounds in organic synthesis. Development of protocols for the functionalization of these compounds, with preservation of a second group that can be further modified in other transformations, is a challenging task of modern organometallic chemistry.
Financial support from Adam Mickiewicz University - ID-UB grant - 075/39/ID-UB/0011

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Keywords:

demetallation, Suzuki coupling, Hiyama coupling, Heck coupling

METABOLIC INTENSITY IN THE TRAP TISSUE OF NEPENTHES X VENTRATA DURING NITRIC OXIDE-STIMULATED DIGESTION

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A few words about the author(s):

Biology student in the last year of master's studies at the Warsaw University of Life Sciences. In my research work, I explores the secrets of the physiology of carnivorous plants, especially Nepenthes plants.

Abstract:

Nepenthes x ventrata is a carnivorous plant that forms a passive traps called pitchers. The digestive area at the bottom of the trap, called the glandular zone, is covered with glands that produce a viscoelastic fluid, that is designed to retain and digest the attracted prey. The aim of this study was to determine the metabolic intensity in the trap tissue of Nepenthes x ventrata during nitric oxide-stimulated digestion. The digestion was simulated by adding a hen egg white solution (control plants) or hen egg white and NOx donor solution (research plants), to the traps. Unfed and fed traps 24, 48 and 96 h after stimulation were used in this study. The metabolic intensity of the trap tissue was tested using a 2,3,5-triphenyltetrazolium chloride (TTC) solution and the formed formazan was extracted for quantification. Obtained results indicate that the stimulation of the digestion with the NO_x donor caused an almost 3-fold decrease in the activity of mitochondria in the glandular zone of the tissue of the N. ventrata trap after 24 and 96 h from the introduction of the stimulating solution, as compared to the control (feeding with the protein solution). Based on this results, it can be concluded that NO can inhibit mitochondrial activity in the trap tissue. The decrease in metabolic intensity in N. ventrata trap tissue after NO treatment is probably caused by S-nitrosylation of mitochondrial proteins, including dehydrogenases that have the ability to reduce TTC.

Keywords:

carnivorous plants, mitochondrial intensity, NO, TTC, trap tissue

THE INFLUENCE OF SELECTED SOIL BACTERIA ON CROP GROWTH

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A few words about the author(s):

Maria Simpson is a Poznan-born South African who spent over 18 years living Africa. Currently, she is studying a Bachelors in Chemical Engineering in Poznan and has grown involved in scientific research regarding greener agricultural practices.

Abstract:

Bacteria are often used in crop growth improvement and bioremediation processes, such as the breakdown of organic contaminants (ex. herbicides.) The aim of the study was to analyse the influence of selected soil bacteria on the growth of the maize (Zea Mays), in soil contaminated with herbicides. This involved short-term phytotoxicity tests to measure the lengths of both roots and shoots growth. The effects of the bacterial activity were measured in soil containing herbicides (sodium salt of dicamba and iodosulfuron-methyl-sodium) and choline-modified herbicidal ionic liquids. Two bacterial strains were utilised: Bacillus subtilis and Hansschegelia Zhihuaiae. Subsequently, the growth index (GI) and the germination efficacy were measured. The obtained results displayed the herbicidal activity. Moreover, the addition of the bacteria to the soil samples without herbicides increased the growth of roots and shoots of the maize. When the bacteria were added to the soil containing herbicides, the adverse effect of herbicidal activity on the plant growth was limited. Notably, the results obtained for the measured lengths as well as the GI for the samples containing either herbicidal ionic liquids or herbicides, were similar. In conclusion, the effect of microorganisms potentially limits the herbicidal activity. Moreover, the selected microorganisms can have a positive influence on the growth of crops, even if they are grown in an herbicide-contaminated environment.

Keywords:

ionic liquids, agriculture, environmental risk, emerging contaminants, microorganisms

CORROSION INHIBITORS

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A few words about the author(s):

Members of the Student Scientific Circle of the League for Nature Conservation, who actively participate in the research, under the Associate of Scientific PhD. Marlena Musik and PhD. Edyta Kucharska.

Abstract:

Corrosion, which most often refers to the electrochemical oxidation of the metal, is the degradation of a material's qualities brought on by a chemical and/or electrochemical interaction with the environment. Anti-corrosion fluids are one of the many techniques used to stop the corrosion of metals, and they are frequently employed to offer temporary corrosion protection during production, storage, and transit activities.

Corrosion inhibiting fluids are made by combining corrosion inhibitors, film-forming agents, and other additives with a base fluid. Depending on the kind of base fluid, these fluids can be classed as solvent-, oil-, or water-based corrosion inhibitors. Corrosion inhibitors are unquestionably essential to achieving excellent performance. The two primary categories of corrosion inhibitors are inorganic and organic. In different base fluids and for various metals, inorganic inhibitors like nitrites, nitrates, chromates, dichromates, and phosphates are frequently utilized. Contrarily, organic inhibitors are substances with one or more polar groups (with O, N, P, or S atoms) and electrons that efficiently thwart corrosion by adhering to the metal surface. Organic inhibitors include sulfonates, alcohols, ethers, amines, amides, amine salts, carboxylates, heterocyclic nitrogen compounds, phosphates, polymers, natural products, and others based on their account of the polar groups.

Keywords:

inhibitors, corrosion, fluids

NOVEL APPLICATIONS OF NICKEL FOAM

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A few words about the author(s):

The presenting author is a graduate of master's studies in Chemical Technology at the Faculty of Chemical Technology and Engineering, West Pomeranian University of Technology in Szczecin.

Abstract:

Nickel foam is a material characterized by high porosity, low density, and high specific strength. It is commonly used as an electrode in nickel-cadmium and nickel-metal hydride batteries. Currently, research is being conducted to explore new applications of nickel foam. Due to its properties, when combined with a photocatalyst, it shows potential in hydrogen production through water splitting [1]. Another noteworthy application of the combination of foam and photocatalysts is the significant enhancement of certain chemical reactions, such as the decomposition of toluene [2] and formaldehyde [3].

In our study, we focused on the decomposition of acetaldehyde under temperatures ranging from 25°C to 125°C and UV irradiation using TiO_2 doped with metallic Ni powder and TiO_2 on nickel foam. Ni powder was added to TiO_2 in the range of 0.5% to 5.0% by weight. Photothermal decomposition measurements of acetaldehyde showed that the addition of Ni did not improve the photocatalytic properties of TiO_2, unlike the use of nickel foam. The nickel foam increased the decomposition of acetaldehyde at 25°C from 31% to 52% and up to 85% at 100°C. The mineralization of acetaldehyde to CO_2 on nickel foam doubled compared to pure TiO_2.

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Keywords:

thermo-photocatalysis, nickel foam, Ni doped TiO_2, acetaldehyde decomposition

BAKING QUALITY OF WHEAT FLOUR FROM COMMON WHEAT (TRITICUM AESTIVUM L) GROWN IN VARIOUS FARMING SYSTEMS (ORGANIC, INTEGRATED, AND CONVENTIONAL)

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A few words about the author(s):

PhD student in Agricultural Sciences in the discipline of Food and Nutrition Technology. Scientific interests include the study of the impact of farming systems on the quality of cereals. Passionate of nature, traveling and foreign languages.

Abstract:

The quality of the flour is a derivative feature of the grain used for milling. It depends on genotype (variety) and habitat and agrotechnical factors. The aim of the work was to assessment the baking value of wheat flour obtained from four varieties (Harenda, Kandela, Mandaryna and Serenada) of common wheat grain from different farming systems. In the flour samples were determined: the total protein content, wet gluten, falling number, farinographic water absorption and dough yield. Laboratory baking was also carried out and the following parameters were determined: bread capacity per 100g, bread yield and porosity of the crumb via the Dallman scale. The studies showed that the tested flour parameters depended significantly on the farming system. The highest significantly total protein content, wet gluten and falling number was characterized by flour from conventional farming system, while the lowest one from organic. Flour from the integrated system was characterized by the highest significantly water absorption, which in turn also translated into higher dough yield. The highest significantly volume of bread was characterized by bread obtained from flour from the integrated system. The volume of bread made of flour from other farming systems was at a similar level. Nevertheless, regardless of the farming system used in cultivation, it was found that the flour of each of the tested wheat varieties met the quality requirements for raw materials for the food industry.

Keywords:

wheat (Triticum aestivum L.), flour quality, baking quality, farming system (organic, integrated, conventional)

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ISBN: 978-83-967915-1-1

ISBN 978-83-967915-1-1
9 788396 791511