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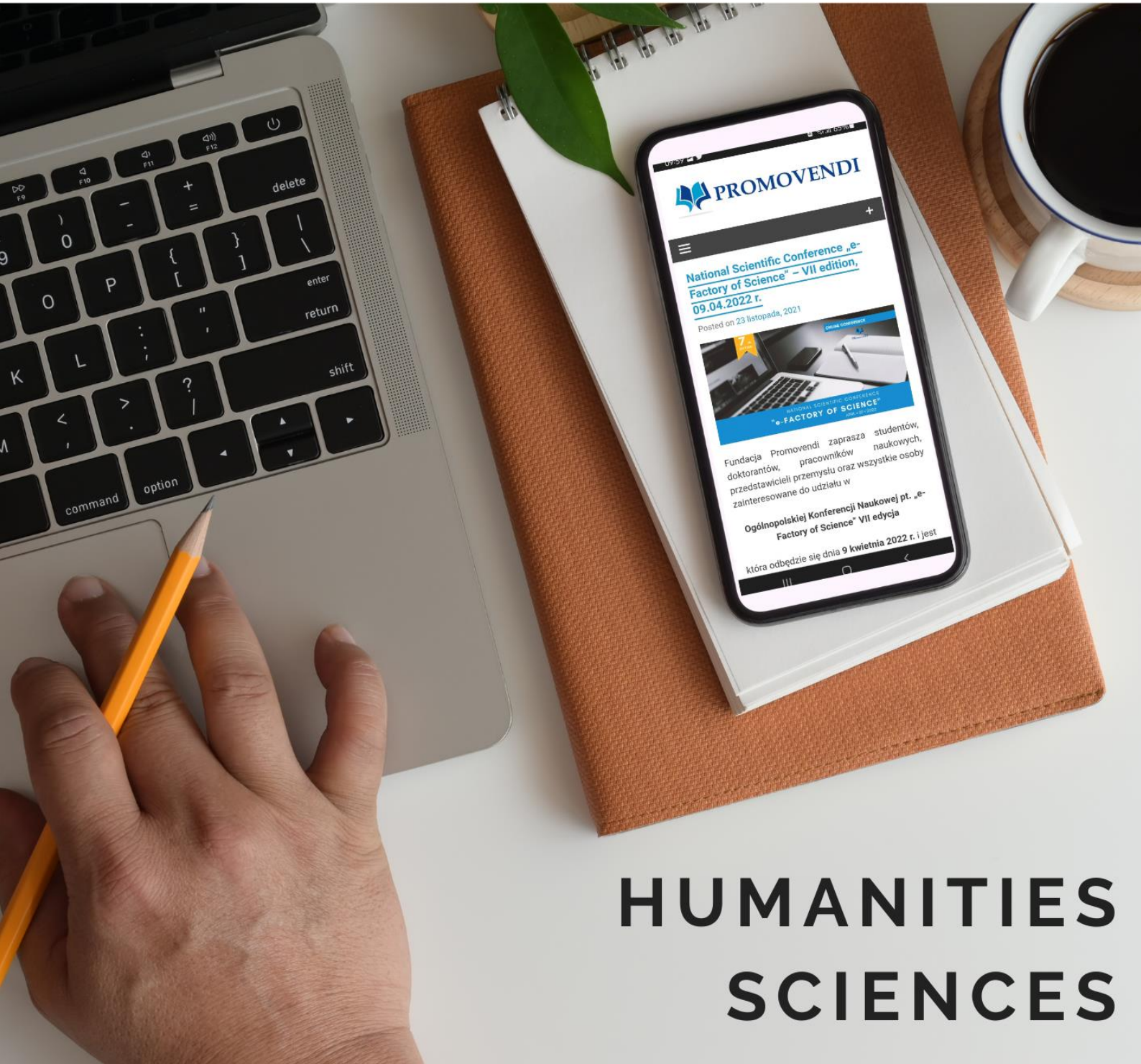

HUMANITIES SCIENCES

ADVANTAGES OF USING THE TRANSLATION METHOD IN FOREIGN LANGUAGE LEARNING

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A few words about the author(s):

A second-degree Romance philology student and postgraduate pedagogical student. English, French, Spanish, and Swedish language teacher. Polyglot and language experimenter.

Abstract:

This article examines the advantages of the translation method (TM), also known as the grammar-translation method, in the context of foreign language teaching. Despite the emergence of innovative language teaching approaches such as the direct method, the audiolingual method, and the communicative approach, TM remains relevant in various educational contexts. The article provides an overview of the history of the translation method, dating back to ancient Rome, and its evolution over the centuries. It then delves into the benefits of TM, including facilitating the learning of vocabulary and grammatical structures, enhancing cultural understanding, fostering creativity and problem-solving skills, and increasing student motivation and engagement. Furthermore, the article explores how the translation method can support students with learning difficulties by examining various strategies and techniques employed in instructional practice. In conclusion, the article highlights the merits and limitations of the translation method in foreign language teaching and suggests directions for future research on the optimal use of this method in educational practice.

Keywords:

translation method, language learning, teaching, TM

INFLUENCE OF VIDEO GAMES ON YOUNG PEOPLE'S MORALITY DEVELOPMENT

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A few words about the author(s):

I have graduated in cognitive science from Pedagogical University of Cracow. I have interest in the field of cognitive science, video games and art. I would like to continue my journey with science and gain more knowledge about brain and IT.

Abstract:

The development of human morality is widely discussed among many thinkers and philosophers around the world. Over the centuries, many factors and concepts were distinguished, thanks to which people developed their own ethics and morality. Factors that seems to have significant influence on how a young person will perceive world and values contained in it adapt along changes taking place in the environment. One of the contemporary products that can influence morality of a still developing human are video games. These programs, which main goal is to entertain it's consumer, are increasingly imitating real world making moral dilemmas even more authentic. Even though values promoted in 21st century by pop culture through movies, books and stories, video games are more interactive medium where young people are agents instead of observers or passive consumers. Main goal of this presentation will be to distinguish area of video games, moral dilemmas contained in them and interactions of young people with them.

Keywords:

morality, video games, dilemmas, youth

THE IMPACT OF USING PHYSICAL PUNISHMENTS ON CHILDREN'S DEVELOPMENT

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A few words about the author(s):

I am a graduate of cognitive science. I am deeply interested in development of children especially those with special needs. In the future I want to study pedagogy in order to work with children.

Abstract:

The upbringing of children in history was a relatively trivial issue. In the past children did not have any rights and were fully dependant on their parents which were using different parenting methods. Until the nineteenth century there was a belief that babies don't remember anything from early stages of their lives so parents have to use it to be able to subordinate their child. Because of that physical punishments were widely used even for minor mistakes. Those punishments were used in order to condition the child not to do or to do the thing indicated by parents or teachers. The negative consequences that physical punishments could have on children's psychic and their functioning in further life were not thought of in the past. Currently this type of parenting method is abandoned because modern science and continuous development of pedagogy made it possible to transform and promote the matter of children's development. The aim of this presentation is to describe the position that children had in society over the centuries and also to show the impact that physical punishments have on their overall development.

Keywords:

physical punishments, children's development, parenting method

PROMOTION OF SCIENCE IN TIMES OF FAKE NEWS, CHAT GPT, AND TINFOIL HATS

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A few words about the author(s):

They are a 2-people team of marketers working in R&D, responsible for science promotion, trying to convince people that science doesn't have to be boring, that it's worth delving into, and all in all, that science is also fun!

Abstract:

We are constantly facing the problem of not counting on science, there are people who find more attractive some conspiracy theories instead. This is not good as it spreads fear and makes people feel less safe and less comfortable in the surrounding world. The only solution to this problem is to start introducing scientists into the science promotion process, but how can we do it if even some of the scientists are reluctant to promote science as „they're more into really important things (that is science itself)"? How can we „get them out of laboratories" and convince them to trust marketers and journalists, to become more active in terms of science promotion?
We know how to achieve it.

Keywords:

science promotion, fake news, conspiracy theories, chat GPT

LEXICAL MANIFESTATIONS OF REFLECTIVE EMOTIONS IN REMINISCENT NARRATIVES FROM THE ARCHIVE OF ORAL HISTORY OF THE WARSAW UPRISING MUSEUM. RESEARCH PROJECT PRESENTATION

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A few words about the author(s):

Beata Duda − PhD, academic interests: discourse analysis, corpus linguistics, memory linguistics. Ewa Ficek – PhD, academic interests: discourse analysis, corpus linguistics, memory linguistics; therapeutic discourse.

Abstract:

The presentation will show the goals, assumptions and examples of analyses of a research project devoted to lexical updates of reflective emotions in reminiscent accounts. Transcripts of narrative interviews developed as part of the Archive of Oral History of the Warsaw Uprising Museum – a valuable source for oral history research will be used as the research material. The affective dimension of memories, aimed at determining the role played by emotions (both positive and negative ones, mainly those relating to the past) in shaping the image(s) of the 1944 events in the collective memory/memory discourses, will be examined using the tools of corpus linguistics and the linguistics of memory.

The results obtained will complement/deepen the observations reported as part of the memory studies thought, and may also contribute to the recognition of the Warsaw Uprising emotional history. Moreover, they fill the gap in linguistically profiled analyses, including analyses profiled discourseologically.

Keywords:

Warsaw Uprising, reminiscent narratives, verbalization of emotions, corpus linguistics, linguistics of memory

IMPACT OF GLOBALIZATION ON NATIONAL SECURITY

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Master's student in internal security. A graduate of bachelor's studies in Economics, specializing in Accounting and Taxes.

Abstract:

Discusses the various ways in which globalization has affected national security. Covers the positive and negative impacts of globalization on national security. National security is a critical concern for governments around the world, as it refers to the measures and strategies taken to protect a country's sovereignty, territorial integrity, and citizens from internal and external threats. These threats can take many forms, including military aggression, terrorism, cyber-attacks, economic espionage, and natural disasters. However, in recent years, the nature of security threats has become increasingly complex and global, with the rise of transnational terrorism, cyber warfare, and the spread of weapons of mass destruction. Globalization has had a profound impact on national security, both positively and negatively. The increasing interconnectedness of the world, facilitated by globalization, has made it easier for threats to cross borders, and for non-state actors, such as terrorist groups and criminal organizations, to operate across multiple countries. This has led to the proliferation of various forms of transnational crime, including terrorism, cybercrime, and the spread of weapons of mass destruction.In conclusion, the impact of globalization on national security is complex and multifaceted, with both positive and negative consequences. While globalization has brought many benefits to societies around the world, it has also created new risks and challenges.

Keywords:

globalization, national, security

ROMANESQUE ARCHITECTURE

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Sandra Paczkowska currently works as an academic teacher at University of Business and Health Sciences in Łódź and Academy of Applied Sciences in Poznań. The author graduated both in English philology and archeology (MA studies).

Abstract:

The presentation highlights certain aspects of Romanesque architecture with the main focus on its characteristic features, such as facades, columns, triforium or towers. The chronological order, but also the explanation of the most important techniques and styles could be found there. What is more, specialized terminology and the examples of given Romanesque architectural parts of buildings are provided in the text.

Keywords:

Romanesque architecture, basilica, triforium, facades

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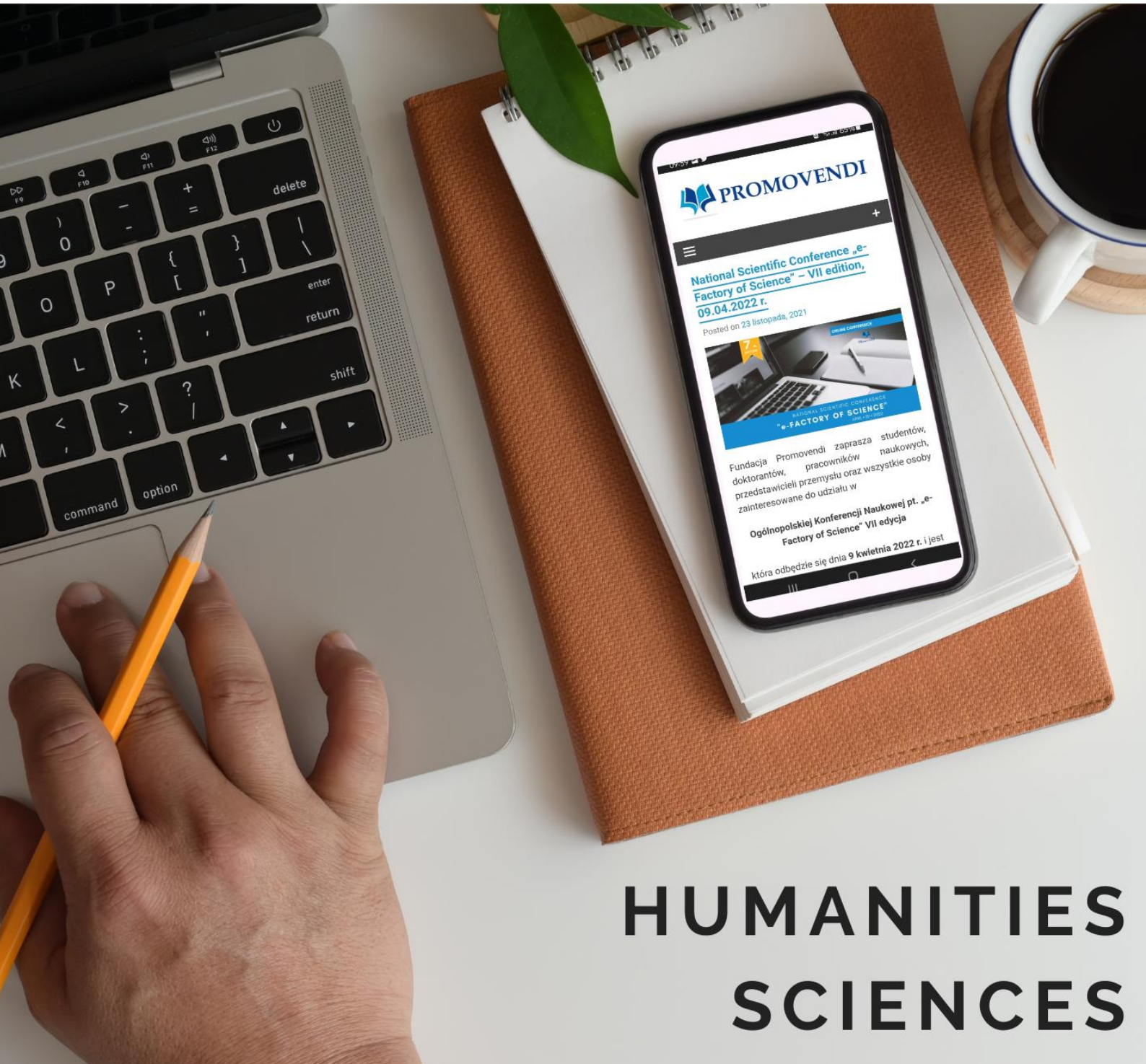

HUMANITIES SCIENCES

TPACK AND SAMR - HOW TO IMPLEMENT TECHNOLOGY IN MY CLASSROOM?

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A few words about the author(s):

I am a student of pedagogy at The Maria Grzegorzewska University in Warsaw and a scout with seven years of experience (also during the pandemic!).

Abstract:

Nowadays, it is impossible to escape modern technology. We can try to avoid it and call it the domain of the young, but we can also learn to use it. That will make our lessons more attractive, and our students will more confidently navigate the modern world. We are not alone in our work – support can be provided by TPACK and SAMR, facilitating the use of technology in education.

Keywords:

technology, education, tpack, samr

EDUCATIONAL EXPERIENCES OF A GROUP OF APS ERASMUS STUDENTS IN RELATION TO THE EDUCATIONAL INSTITUTION PUSZCZYK IN OSOWICZE.

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A few words about the author(s):

Students of The Maria Grzegorzewska University, in the field of Special Education, focused on early intervention for child development.

Abstract:

Today, children are spending less and less time in the natural environment. This is influenced by the development of technology and the social impact of pandemics. Communing with nature is an important part of human development. Kindergartens in the forest education guarantee teaching "outside the classroom" most of the time each day. The conducted research is aimed at finding out the perspective of thinking about forest education in Poland of foreign students in relation to the educational institution Puszczyk in Osowicze. This is a facility in the forest education, which has been certified by the Polish Institute of Forest Kindergartens, emphasizing adherence to the principles of the idea of forest education, high quality and innovation of the facility.

Keywords:

forest education, kindergarten, natural enviroment, child development

ACTIVATION – NOT A JOKE. DO IT! ACTIVATION METHODS IN WORK WITH PRESCHOOL CHILDREN

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A few words about the author(s):

Student of The Maria Grzegorzewska University, in the field of Special Education, focused on early intervention for child development.

Abstract:

Taking into account the changes in the way society thinks about children - their needs, opportunities to support them in their development and their rights - the role of the teacher is also transforming. The teacher's task is to effectively convey his knowledge to pupils, the teacher should follow their interests and fully use their cognitive potential. As a result, in working with children, verbal methods - especially from talks - are being abandoned in favor of activation methods, the intention of which is teaching by doing. The pre-school period is a time of great curiosity among children and the willingness to co-create it, which provides an excellent space for the teacher to introduce these methods at work.

Keywords:

activation methods, preschool children, education

ABSTRACTS OF

PRESENTATIONS

MEDICAL SCIENCES

CHOLINE – THE FORGOTTEN INGREDIENT IN THE DIET OF A MOTHER-TO-BE

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A few words about the author(s):

A Master's student of Dietetics with interests in the fields of nutrition during the periconceptional period and nutrigenomics.

Abstract:

The nutritional status of women during pregnancy can have long-term effects on the brain and cognitive development of children. This is why it is so important for women to ensure an adequate supply of nutrients even before conception. After all, the preconception period represents a critical window in which the mother's health can profoundly affect pregnancy and fetal development.

In recent years, particular attention has been paid to an adequate supply of choline during pregnancy. It is a key component of many prenatal physiological processes, playing a role in membrane biosynthesis and tissue expansion, neurotransmission and brain development, and methyl group donation and gene expression. The human body can produce small amounts of choline through endogenous synthesis, but in order to prevent deficiency symptoms, the ingredient must be supplied with food. Studies indicate that a large proportion of the population, including most pregnant and lactating women, achieve values below the AI for choline. Therefore, there is an urgent need to increase awareness and intake of choline among women of reproductive age.

The purpose of this presentation is to present the state of knowledge about choline – its role and sources in the daily diet.

Keywords:

choline, periconceptional period, fetal programming, preconception diet

THYMOQUINONE – A POTENTIAL PLANT-DERIVED ANTICANCER AGENT AND ITS EFFECT ON THE EXPRESSION OF COLORECTAL CANCER-RELATED GENES

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Natalia Kurowska – PhD candidate in Medical Sciences. Barbara Strzałka-Mrozik – University Professor. The interests of both authors focus on the effect of plant-derived substances on gene expression in cancer cells and personalised therapy methods.

Abstract:

Colorectal cancer (CRC) has a high mortality rate and is one of the most commonly diagnosed cancers worldwide. It is estimated that approximately 6-10% of CRC cases are associated with the occurrence of a known mutation in the genome. Furthermore, the results of numerous studies suggest an important role for changes in gene expression profile in CRC metastasis. Given the above, the search for new substances to support the treatment of this cancer continues. Nigella sativa seeds, contain numerous biologically active compounds, of which thymoquinone (TQ) is the most noteworthy. TQ exerts its anticancer effects by inhibiting the proliferation, migration and angiogenesis of tumour cells and arresting their cell cycle. The anticancer properties are also linked to effects on oxidative stress. Results from animal and cellular models indicate that TQ also shows potential in the treatment of CRC. The aim of this study is to discuss the effect of TQ on gene expression in colorectal cancer cells, both in monotherapy and in combination. Results obtained in cell lines suggest that TQ can modify the expression of genes critical for cancer survival, such as genes related to cell cycle, apoptosis and angiogenesis. Furthermore, TQ has also shown the ability to down-regulate the PI3K/PTEN/Akt/mTOR and WNT/β-catenin signaling pathways, which are crucial in tumourigenesis. The results of the primary studies are promising and suggest that TQ shows potential for complementary therapy of CRC.

Keywords:

thymoquinone, colorectal cancer, gene expression

ANDROGENETIC ALOPECIA IN MEN – THERAPEUTIC CHALLENGES AND THE USE OF MICRONEEDLING IN COMBINATION THERAPY

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A few words about the author(s):

Doctoral student at the Department of Dermatology in Katowice, Poland. In my doctoral dissertation, I focus on androgenetic alopecia in men. Other medical interests include regenerative medicine, dermatosurgery and venereology.

Abstract:

Androgenetic alopecia is the most common form of non-scarring alopecia. The percentage of people affected by this condition increases with age. It affects more than 70% of men over the age of 70 and up to 40% of women over the age of 50. The disease not only affects the body, but also affects the psyche, especially of young people. There are many treatments available on the market, but unfortunately only some have scientifically proven effects. Another hassle is the unclear treatment algorithm for some of the treatment methods recommended by the Polish Dermatological Society. In this presentation, therapy using minoxidil 5% in monotherapy and in combination with fractional microneedling will be considered. Sample results will be presented so that the clinician can envision possible outcomes in his patients.

Keywords:

androgenetic alopecia, hair loss, minoxidil, microneedling

2-IDOANILINE PICRATE POLYMORPHS STUDY, AS AN EXAMPLE OF APPLICATION OF MOLECULAR MODELLING IN POLYMORPHIC TRANSITION

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A few words about the author(s):

The authors of this work represent the Student Scientific Group 'Free Radicals' associating students passionate about physical chemistry, molecular modelling and drug design.

Abstract:

Active pharmaceutical ingredient (API) appears mostly in form of acids, basis, salts or hydrates and lately gaining in popularity cocrystals. Due to minimal structural differences between salts and cocrystals in special cases they could transform into each other, creating new polymorphic forms with new properties. Such transition could occur as an effect of changes in temperature and pressure agents, typical for solid-state drugs creation. 2-iodoaniline picrate is an example of such case. It appears as three polymorphs that differ also by colour, two of them were registered as salts but the third one was stated to possibly be a cocrystal formed after heating. Such polymorphic modifications can affect bioavailability, solubility and therefore pharmacokinetic profile, influencing even safety of the API. Therefore, the aim of the research was to evaluate the application of periodic density functional theory (DFT) calculations in the modelling of unknown structures and prediction of influence of temperature factor on API. Geometry optimization, calculations of thermodynamic functions and molecular dynamics simulations were performed to determine structures and stability of these three forms. Simulations of IR and VIS spectra were done to compare with experimental data showing promising results. The methodology used in this study can very well be used to predict such transitions in other substances, ensuring the safety of the drugs.

Keywords:

DFT calculations, cocrystal, polymorph, transition

TIN SN-117M A PROMISING REPLACEMENT FOR TECHNETIUM TC-99M - COMPUTER SIMULATION OF DOSES AND COMPARISON OF PROPERTIES OF RADIOISOTOPES USED IN NUCLEAR MEDICINE

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A few words about the author(s):

I am a medical physicist and currently a PhD student at the Doctoral School of the University of Silesia in Katowice in the field of physics. My interests are nuclear medicine and physics.

Abstract:

In this work tests of production of the new radioisotope 117mSn were performed by means of a typical medical linear accelerator used in radiotherapy treatment. This isomer of tin is a promising radioisotope for its application for diagnostic purposes in nuclear medicine because of emitted energy of 158.56 keV close to that emitted by 99mTc. Its provides possibilities to use the same collimators system in gamma camera as it is for 99mTc. The appropriate half-life of 13.6 days and only the gamma transition to the stable state of 117mSn with very small amount conversion electrons make the considered isomer an ideal alternative to 99mTc which in the pharmaceutical form is contaminated with the 99Mo radioisotope undesirable in diagnostic. This contamination is a result of the use of the 99Mo / 99mTc generator. Until now 117m Sn was only suggested to be applied as an effective agent for the palliation of pain from bony metastases. Presently, most of radioisotopes produced in nuclear research reactors that are approaching the end of their life. As a consequence, the regression of 99m Tc production is becoming more and more current. However, it can be produced in nuclear reactors by using two nuclear reactions 116 Sn(n, gamma) 117m Sn and 117 Sn(n,n'gamma) 117m Sn. Preliminary tests indicate the possibility of production of 117m Sn in the reaction 118 Sn(gamma,n) 117m Sn as well as in the reaction 116 Sn(n, gamma) 117m Sn.

Keywords:

radioizotops, nuclear medicine, radiopharmaceutics, tin-117m

MOLECULAR MODELING STUDIES OF THIAMINE HYDROCHLORIDE HYDRATES

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A few words about the author(s):

The authors of this work represent the Student Scientific Group ‘Free Radicals’ associating students passionate about physical chemistry, molecular modeling and drug design.

Abstract:

It is well known that hydration and dehydration of solid API can alter the final product's physicochemical characteristics, such as stability and solubility, which affects the drug's bioavailability and therapeutic efficacy. To model gradual dehydration for thiamine hydrochloride mono and hemihydrate, the crystal structures from the Cambridge Crystallographic Data Centre have been chosen. Thiamine (vitamin B1) is a water-soluble essential component to preserve health. The aim of this research was to evaluate if the molecular modeling methods can be used for prediction of the differences in stability, dehydration behaviour and vulnerability to water loss between two different solvatomorphic forms of thiamine hydrochloride that have been known to have significantly different mechanisms of dehydration. The simulations of NMR spectra have been performed to clarify the experimentally observed differences at the molecular level. The results of this work confirm the advantages and usefulness of application periodic density functional theory (DFT) calculations in the modelling hydrates. Supporting the experimental research by theoretical methods can help to clarify the observations. One strategy for developing novel solid dosage forms of drugs is the formation of hydrates. Hence, analyzing hydration/dehydration mechanisms and hydrate stability using molecular modeling may be a crucial step in the design of new APIs.

Keywords:

DFT calculations, thiamine, hydrates, dehydration

UROMODULIN IN PREVENTION OF URINARY TRACT INFECTIONS

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A few words about the author(s):

Authors of this work are students attending 3rd year of medical faculty. We conduct a great deal of science work in Medical Microbiology Students Research Group supervised by Małgorzata Kozioł, PhD in microbiology.

Abstract:

Urinary tract infections are common forms of nosocomial and community-acquired infections. Many factors affect the development of UTI, from those dependent on the patient to those related to medical procedures. The human body has developed many protective mechanisms. Tamm-Horsfall protein, currently referred to as uromodulin under physiological conditions, in the urine of healthy people, is the most abundant glycoprotein. It is a line of defense against urinary tract infections, acting as a pro and anti-inflammatory factor at the same time. Umod inhibits the adhesion of uropathogenic bacteria to the epithelium of the urinary tract. Higher levels have been associated with a lower risk of developing UTI. Low levels of Umod are associated with an increased risk of kidney disease. Mutations in the Umod gene cause a rare variant of tubular interstitial kidney disease. The aim of the study was to present uromodulin as a potential biomarker in the prediction of infections and kidney damage.

Keywords:

UMOD, UTI, E. coli, Tamm-Horsfall protein, biomarker

ASSESSMENT OF BODY COMPOSITION AND FITNESS LEVEL OF WOMEN IN A 3 LEAGUE CLUB

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A few words about the author(s):

We are members of the Student research club of travellers at the University of Rzeszów in Rzeszów.

Abstract:

The paper dealt with the consideration of the issue of physical fitness and body mass composition. In addition to the analysis of the literature, the paper conducted a study on a group of female volleyball players in the III league, allowing the evaluation of their body mass composition and physical fitness. The purpose of the study was to determine the physical fitness of female volleyball players in a III league club and their body mass composition. Fifteen female volleyball players participated in the research conducted in this regard. The study included analysis of body mass composition and performance of three fitness tests. The study used the case analysis method. The study had a two-stage character. First, the players' body mass composition was analyzed using a TANITA BC418 device. Then they performed tests to determine the level of their: agility, speed and power. The results suggest the existence of a relationship between the various parameters of body mass composition and physical fitness and performance.

Keywords:

physical fitness, bioelectrical analysis, body mass, volleyball, volleyball players, 3rd league club

LYME DISEASE – SYMPTOMS AND TREATMENT

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A few words about the author(s):

I am a laboratory diagnostician. I have graduated from Medical Analitics at The Jagiellonian Universiti Medical Collage in 2008.

Abstract:

The Lyme disease is caused by the infection with bacterium Borrelia sp. All stages of blacklegged tick (egg, nymph and adult) can trasmit bacteria. Early diagnosis and proper antibiotic treatment can help to prevent late Lyme disease. We distinguish two stage- earty and late Lyme disease.

Erythema migrans is a characteristic skin rash that usally appears 3-14 days after the bite. Other symptoms of earty Lyme disease are: fatigue, chils and fever, headache, muscleand and joint pain. Untreated Lyme disease caused late stage that include artihritis, nervous system and cardiac problems. Two- step testing process is recommending. If firs step (Elisa) is negative, no futher testing is needed. If it is positive or equivocal, the second step (Western Blot) should be performed.

Lyme disease can be prevented by avoiding tick bites and prompthy removing ticks.

Keywords:

Borrelia sp., early and late Lyme disease, Erythema migrans

IMMUNOPROPHYLAXIS RH DISEASE

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A few words about the author(s):

I am a laboratory diagnostician. I have graduated from Medical Analitics at The Jagiellonian Universiti Medical Collage in 2008.

Abstract:

The maternal-foetal anti-D alloimmunisation is when a mother with RhD negative blood is exposed to Rh positive foetal blood and develops an immune response to it. As a result, in next pregnancy a haemolytic disease of fetus and newborn (HDFN) can occur. HDFN can cause a serious consequences such as anemia, hypoxia, and kernicterus.

The anti-D immunoglobulin neutralises RhD positive red blood cells that may have entered the mother's blood during pregnancy. In this situation, mother won't produce antibodies that can induce HDFN thus the use of anti-D immunoglobulin can prevent Rhesus disease.

Keywords:

HDFN, anti-D immunoglobulin

AUTOTRANSFUSION, AS AN ALTERNATIVE TO BLOOD TRANSFUSIONS FROM DONORS

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Mgr Agnieszka Samulska – laboratory diagnostician, specialist of laboratory medical transfusiology and medical analitics, head of the Department of Hospital Transfusion Medicine. Mgr Ewa Dziedziech – laboratory diagnostician in the Laboratory of Serology.

Abstract:

Autotransfusion is a process wherein a person receives their own blood for a transfusion, so he dont have to take banked allogenic blood from other donors. It is a metod which limit the risk of alloimmunisation as with donor blood. There are some types of autotransfusions, wchich can be applied depending on situation. Using autologous blood is good way to provide blood for person who have rare antibodies in his plasma and It is difficult to provide him blood from other donors. It also helps in other medical situations for which the use of blood from donors is contraindicated. Contemporary experiences have shown that complications occur rarely after using this metod.

Keywords:

autotransfusion

ALLOANTIBODIES PRODUCED BY PATIENTS OF THE KRAKOW SPECIALIST HOSPITAL JOHN PAUL II IN KRAKOW IN 2020-2022

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Abstract:

Antibodies are most often produced in the recipient's body in response to foreign antigens, which are present in transfused blood. They also can form during pregnancy.

Alloantibodies detected during antibody screening in patient’s plasma have to be identificated.

Laboratory of transfusion immunology at the John Paul II Hospital in Krakow has permission to identify the detected antibodies. Among the antibodies detected in 2020-2022, the most came from the Rh system and had single specificity.

Keywords:

alloantibodies

SELECTED METHODS OF STROKE SPEED AND SERVICE ACCURACY IN TABLE TENNIS BY PURASHWANI – LITERATURE REVIEW

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A few words about the author(s):

Szymon Galas – doctor in the field of physical culture sciences, lecturer at the Academy of Physical Education E. Piasecki in Poznań and Higher School of Banking in Warsaw, sports expert at the Institute of Sport and Education Development in Warsaw.

Abstract:

Table tennis is a sport in which a high level is determined by many factors. Popular tests of special fitness in the world literature are those proposed by Purashwani (2011). The main purpose of the presentation during the scientific conference was to review the literature in the field of research on individual components of special fitness in table tennis and to describe selected 5 attempts to determine the accuracy of services and stroke speed in table tennis according to Purashwani (Target Service Test, Short Service Test, Extreme Side Service Test, Alternate Counter Test, Alternate Push Test). Therefore, a detailed characterization of individual tests was made, indicating their methodology with reference to individual levels of advancement and an attempt to indicate recommendations for trainers in the context of sports training.

Keywords:

service accuracy, stroke speed, literature review, table tennis, special fitness

BIODEGRADABLE POLYMERS AND THEIR USE IN CONTROLLED RELEASE OF MEDICINAL SUBSTANCES AND DRUGS

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Medical Biotechnologist and PhD student at SUM Katowice (thesis about using biodegradable polymers in treatment of wounds). She's interested in experimental medicine, microbiology and surgery. In spare time trampoline trick jumper and rifle shooter.

Abstract:

Biodegradable polymers can degrade in the organism. Due to the method of obtaining, they can be divided into natural and synthetic origin. Natural polymers are polysaccharides (e.g. hyaluronic acid, chitin, chitosan and cellulose) and proteins (e.g. elastin and collagen). Synthetic biodegradable polymers is e.g. polylactide (PLA), polyglycolide (PGA), polyhydroxybutyrate (PHB) or polycaprolactone (PCL).

Biodegradable polymers are used in DDS – Drug Delivery System. They are formed into scaffolds on which other substances are placed. Over time, the polymer biodegrades, releasing compounds in it in a controlled way.

Potential medical polymers should be tested for cytotoxicity, sensitisation, acute toxicity, genotoxicity, haemocompatibility, teratogenicity and carcinogenicity. The material must be safe for the patient and not cause any adverse reactions.

In the treatment of tuberculosis in rat studies, polylactide was used, on which isoniazid was placed. Polylactide and polyglycolide copolymers (PLGA) are also used in the treatment of tuberculosis through the controlled release of rifampicin, isoniazid, ethambutol and pyrazinamide. Polylactide-co-glycolide is also used in the treatment of burn wounds and bedsores. Polyanhydrides are used as carriers of chemotherapeutics and drugs applied to the eyes and in local anesthesia.

The development of medicine allows for constant updates of DDS–based therapies, which gives hope for the treatment and prevention of many diseases.

Keywords:

biodegradable polymers, drugs, polymer scaffolds, treatment

DIET USED IN GESTATIONAL DIABETES AND THE COMPOSITION OF THE VAGINAL MICROBIOTA

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A few words about the author(s):

My name is Kamila Gorczyca and I am a doctor and a 1st year PhD student at the Doctoral School of the Medical University of Lublin. My passion is gynecology, diabetology and microbiology. I decided to combine my interests by working in this field.

Abstract:

Gestational diabetes mellitus (GDM) appears for the first time during pregnancy and is mainly associated with glucose metabolism.Maternal diet seems to be an important factor affecting the composition of the microbiome not only of the mother, but also of the child.

The aim of the study was to investigate the eating habits of pregnant women with GDM in correlation with the composition of the vaginal microbiota.

A survey was conducted in women during the postpartum period at the Department of Obstetrics and Perinatology of the Independent Public Clinical Hospital No. 4 in Lublin among 100 women in the period October – March 2023. The composition of the vaginal microflora in obstetricians, taken during admission to the ward, was also analyzed.

Incorrect dieta and poor eating habits are an increasingly common problem of pregnant women. Only half of the women surveyed changed their habits when they received information about pregnancy. Abnormal vaginal flora is more likely to appear in women who have poor eating habits.

Colonization and establishment of the infant's microflora and its composition play a key role in the metabolic and immune development of the child. Patients should be educated about the risks associated with improper nutrition and lifestyle, as well as the lack of supplementation, for example vitamins or probiotics, which should be used by pregnant women at such an important moment of their lives as pregnancy.

Keywords:

microbiota, Gestational diabetes mellitus, pregnancy, child

RISKS ARISING FROM THE LACK OF FREE TIME DEVOTED TO CHILDREN IN THE AGE RANGE 9-14 YEARS IN THE OPINION OF FAMILY MEMBERS

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A few words about the author(s):

We are students from University of Rzeszów and we belongs to Student Scientific Organisation of Travels.

Abstract:

Free time plays one of the most important roles in shaping the character, attitude and personality in the life of every human being. It is an inseparable element of education for proper functioning in the school environment and in later adult life. The dangers that result from the lack of free time and its improper use will be reflected in the later years of life.

The aim of the study is to present and analyze the risks resulting from the lack of free time that parents should devote to their children in the 9-14 age range in the opinion of family members.

In the presented work, the diagnostic survey method was used, and the questionnaire in the online form served as a tool. In total, 103 people were surveyed using the survey, mainly from the Podkarpackie Voivodeship.

The results of the study showed that parents engage and devote their time to spending it with their children, but they spend it far too little. Parents are aware of the benefits of spending free time together, which is very important in education for proper spending of free time.

Parents, being aware of the benefits of spending free time together with their children, try to devote their free time to them. The main barrier to more time spent together is a large amount of time devoted to work. However, the desire to ensure prosperity and all material goods is not a priority for respondents, because they try to devote their free time to children.

Keywords:

free time, family

ASSESSMENT OF FITNESS AND PHYSICAL ACTIVITY LEVELS IN SCHOOL-AGED CHILDREN

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Abstract:

Physical activity is most often defined as movement enabled by working skeletal muscles. Regular physical activity at an appropriate intensity helps, among other things, to maintain health, body shape and body weight and reduces the risk of many diseases. The aim of this presentation is to assess the incidence of associations between the level of physical activity and physical fitness in school-aged children. Statistically significant differences were found between physical activity level and physical fitness, both when disaggregated by gender and without disaggregation. It was also observed that physical activity levels decreased with age. Girls scored better in all eight fitness tests. In the case of weight and height measurements, only a significant difference was indicated by the height score, which the girls obtained higher. No significant difference was shown for BMI. However, only in the case of body height was a significant difference shown between girls and boys, in which the girls were higher. The differences in fitness levels as well as weight and height measurements may be related to the period of puberty the pupils may have been in. This is a period of intense change, each body has a different rate of development, anatomical structure, also environmental and genetic factors may be related to the results achieved. There were no statistically significant differences between girls and boys in physical activity levels.

Keywords:

physical activity, fitness physical, children

IMPACT OF ISOMETRY BACK SQUAT ON JUMP HEIGHT IN TRAINED FEMALES

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A few words about the author(s):

Dawid Koźlenia, Ph.D. Research interest: sports performance, motor ability development; Jarosław Domaradzki, Associate Professor, Ph.D. Research interest: Auxology, motor ability development.

Abstract:

Post-activation performance enhancement (PAPE) is a phenomenon that allows for temporal improvement of physical performance in response to the high-intensive effort. This study aimed to investigate the effectiveness of the PAPE protocol based on isometry back squats on jump height improvement (JH). The study sample comprehends 27 healthy, trained females between 20-27 years, randomly divided into experimental (EG; n=15) and control groups (CG; n=12). The countermovement jump (CMJ) as baseline measurement was performed. The introduced EG protocol was based on three, 4-second sets with a 1-minute rest interval of high bar isometry back squat with estimated 70% repetition max (RM), whereas CG performed a treadmill run with 6km/h for 4 minutes. Four CMJs were performed in 3rd minute after the PAPE protocol and then after every next two minutes. The two-way RM-ANOVA revealed a statistically significant improvement in JH for the group–minute interaction ($F=3.6$; $\eta 2=0.12$; $p=0.0008$). The post-hoc test showed improvement in JH in the 3rd minute in EG compared to baseline($p=0.0018$), 5th($p=0.0047$), 7th(0.0021), and 9th($p<0.0001$). An unpaired t-test revealed higher improvement in JH (Δ=best results - baseline) in EG compared to CG (EGΔ=1.8cm vs. CGΔ=0.3cm; $t=3.7$; $ES=1.4$; $p<0.0009$). The utilized PAPE protocol is effective in JH enhancement, but a positive effect occurred 3 minutes after the intervention and immediately declined in the next minutes; therefore, its usefulness is limited.

Keywords:

ump height, PAPE, isometry, back squat, female athletes

INFLUENCE OF PTERYGIUM REMOVAL SURGERY ON CORNEAL PARAMETERS

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A few words about the author(s):

Monika Kuśmierz-Wojtasik is a PhD student at the PUM Doctoral School. She is a co-author of a scientific publications in published journals, four congress reports, winner of the PUM Student Scientific Project Grant.

Abstract:

BACKGROUND: The aim of this study was to evaluate the influence of pterygium removal combined with conjunctival autografts in addition to the use of human fibrin tissue glue on changes in corneal parameters.

METHODS: Sixteen eyes with pterygium that qualified for surgical treatment were enrolled in this study. Eye examination, slit lamp, and 3-D AS-OCT (CASIA 2) assessment were performed before the surgery and 7 days, 1 month, and 6 months after pterygium excision and analysed at each follow-up visit.

RESULTS: The gradual decrease in total astigmatism power from preoperative median 2.75 (6.15) D to 1.2 (1.1) D at 6-month follow-up ($p = 0.034$) was noted from the day 7 visit. Values were strongly influenced by variations of anterior cornea astigmatism. In contrast, a gradual total HOA reduction at the 1-month (from median 0.79 (1.3) D to 0.44 (0.27) D; $p = 0.038$) and at 6-month visits (0.25 (0.09); $p = 0.001$) was observed. Similarly, values were strongly influenced by variations of the anterior. Additionally, total average keratometry values increased from preoperative 44.05 (2.25) D to 44.6 (1.9) ($p = 0.043$) 1 month after the surgery.

CONCLUSIONS: Significant steepening of the anterior cornea and a reduction in both astigmatism and HOA were observed after pterygium excision. The anterior corneal surface was an essential component of the total postoperative corneal topography values. 3D AS-OCT imaging seems to be a valuable tool for monitoring effects in pterygium eyes.

Keywords:

astigmatism, conjunctival autograft, pterygium, fibrin tissue glue, swept-source OCT

PHYSICAL ACTIVITY LEVELS AND BODY COMPOSITION OF SCHOOL-AGED CHILDREN

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Student of Tourism and Recreation at the University of Rzeszów, member of the Student Scientific Circle of Travelers.

Abstract:

Physical activity during childhood is an important aspect in everyone's life. Developing correct habits in this aspect should be started from an early age.

The main aim of this study was to find out whether the physical activity levels of children aged 9 to 14 years showed associations with their body composition. Secondary aims included investigating whether the children taking part in the study met WHO recommendations for physical activity and whether the physical activity levels of the subjects were higher at the age of 9-11 years or 12-14 years.

The study was conducted on 21 boys aged between 9 and 14 years. Accelerometers were used in the study to measure physical activity. Body composition was assessed using the bioelectrical impedance method, with the Tanita device. Anthropometric measurements (body height) were taken using a growth meter.

The results indicate that none of the boys met the WHO recommendations for physical activity. Significant correlations occurred between MVPA and moderate-intensity physical activity and body weight.

According to a study conducted by S. U. Cayres et al. skipping breakfast may have a significant association with body fatness.

It can be concluded that the level of physical activity among children is too low. Caregivers of children should be made aware of the consequences of lack of exercise and the benefits of undertaking physical activity at a young age.

Keywords:

physical activity, body composition

USAGE OF REVERSE TRANSCRIPTASES IN MOLECULAR BIOLOGY

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A few words about the author(s):

I am a student of medical biotechnology.

Abstract:

Reverse transcriptases are enzymes in nature used by viruses that have RNA as genetic material - Retroviruses. These enzymes allow retroviruses to synthesise complementary DNA based on RNA template, thus enabling the infection of the host's cells. Reverse transcriptases were discovered in 1970 by Howard Temin during his research on RSV and David Baltimore during his study on retrovirus replication support. They were awarded the Nobel Prize in medicine for the discovery of RNA-dependent DNA polymerases in 1975. For example, reverse transcriptases are used in molecular biology to modify the polymerase chain reaction. RT - PCR is a variant of the polymerase chain reaction used for amplification of a DNA fragment. It additionally allows control of the number of products formed during the reaction cycles. The most important features of reverse transcriptases used in laboratories are, for example, high activity of DNA polymerase processing RNA and reduced RNase efficiency, thermostability or high efficiency of the reverse transcription reaction.

Keywords:

reverse transcriptases, molecular biology, RT-PCR

CURRENT AND FUTURE THERAPIES IN TAM-RELATED CANCEROGENESIS

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A few words about the author(s):

Born in 1985; a graduate of the Poznan University of Medical Sciences in Pharmacy. Currently working as a pharmacist and gaining specialization in Clinical Pharmacy at Wroclaw Medical University.

Abstract:

The TAM family proteins (TYRO3, AXL, MERTK) are transmembrane receptors that bind growth factors and cytokines to activate downstream targets through phosphorylation. TAMs are involved in the regulation of several key biological processes, like cell survival, proliferation, and migration, clearance of apoptotic cells, and immune response regulation. Such broad activity of TAMS leads to their very frequent overactivity in malignant cells, where TAMs activity simultaneously promotes tumorigenesis and suppression of antitumor cell activity. TAM over-expression is reported in several cancer types, most notably in non-small cell lung cancer (NSCLC) and acute myeloid leukemia. This makes the TAM family of receptors a prime candidate for anticancer therapies. Novel strategies are being developed every year, with new small-molecule inhibitors, engineered antibodies, and antibody-drug conjugates designed to inhibit TAM signaling pathways in cancer cells. Now, with the rise of mRNA vaccine technology, new ideas are being developed and implemented to battle cancer. In this presentation, we discuss chemotherapeutics and biologically active molecules currently used to target TAMs and future prospects of mRNA technology application in solid tumor therapy.

Keywords:

TAM, cancer, targeted therapy, mRNA vaccine

PROAPOPTOTIC ACTIVITY OF PROTEASOME INHIBITOR – MARIZOMIB – ON MELANOMA CANCER CELLS

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A few words about the author(s):

Wiktoria Piskorz is a PhD student at the Medical University of Białystok and Marzanna Cechowska-Pasko is her supervisor. Their research focuses on the induction of senescence and apoptosis in cancer cells.

Abstract:

Malignant melanoma – a tumor originating from melanocytes – is characterized by dynamic growth and frequent metastases in the early stage of development. Current therapy methods are still insufficient and there is a need to search for new ways of treating this malady. Induction of apoptosis – physiological cell death – is recognized as an effective method of non-invasive elimination of cancer cells. In our research, we wanted to confirm whether the proteasome inhibitor – marizomib – induces apoptosis in A375 and G361 melanoma cell lines. We performed a MTT test, ethidium bromide staining and examined cell cycle with flow cytometry. We have observed a time- and dose-dependent cytotoxic effect of marizomib and an increase in sub-G1 phase of cell cycle in both investigated melanoma cell lines. Furthermore ethidium bromide staining confirmed the disruption of membrane integrity in A375 cells. The gathered findings suggest that marizomib may induce apoptosis in examined melanoma cancer cells.

Keywords:

melanoma, apoptosis, marizomib, cancer

KNOWLEDGE OF THE POLISH SOCIETY ON CANCER DISEASES TYPICAL FOR WOMEN

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A few words about the author(s):

Students of the second year of second-cycle studies in the field of Nursing and members of the Student Scientific Association: Honorary Blood Donors and Potential Bone Marrow Donors.

Abstract:

Summary: Most cancers of the female genital organs can be effectively treated if the symptoms are detected and diagnosed at an early stage of the disease. Performing preventive examinations plays an important role in prophylaxis.

Objective: To assess the level of knowledge of the Polish society about cancer diseases typical for women.

Material and methods: The study was conducted using a questionnaire consisting of 10 questions and a metric. The material was collected from January to March 2023. The research group consisted of 104 respondents.

Results: Only 49% of respondents claim that breast self-examination once a month, between the 6th and 9th day of the cycle, should be performed in women under 20 years of age. Transvaginal ultrasound examination should be performed every 2 years in women aged 20-30, according to 37.5% of the respondents, and once in women aged 30-40, according to 27.9% of respondents. Also, the low level of knowledge is presented by the answers regarding hormonal tests in the group of women aged 40-50 and >50 years. Typical, popular tests: gynecological examination and cytology as well as breast self-examination enjoy good knowledge of the need for preventive examinations in women of different age groups.

Conclusions: There is a need to further disseminate knowledge about cancers of the female genital organs among the society. Knowledge of preventive examinations in different age groups is good, but still insufficient among the society.

Keywords:

cancer, women, preventive examinations

POPULATION COHORT STUDY OF WROCLAW CITIZENS (PICTURE): BASELINE REPORT FORM HEALTH STATUS OF CHILDREN AND THEIR PARENTS PARTICIPATING IN PICTURE PROJECT

Aleksandra Wolska (1)*, Agnieszka Matera-Witkiewicz (1), Katarzyna Połtyn-Zaradna (2), Alicja Basiak-Rasała (2), Katarzyna Kiliś-Pstrusińska (3), Katarzyna Zatońska (2), Tomasz Zatoński (4)

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A few words about the author(s):

The PICTURE team is conducting a large-scale study of the health of children and their parents. The data and samples collected during the project also enable detailed research in wide-range areas of medicine.

Abstract:

In Poland, despite the rapid economic development and many social changes, there are still significant differences in health and morbidity compared to highly developed countries. PICTURE – Population Cohort Study of Wroclaw Citizens has been created in 2019 and consist the collection, storage and examination of samples from 1,900 representatives. The comprehensive survey study and laboratory analyses in children and their parents concerning their health status with observation of environmental and social factors influencing lifestyle and occurrence of risk factors were performed. Selected data such as obesity, eating habits, parental attitudes to smoking, and the presence of chronic diseases were compared. It was found that 19.4% from the analysed cohort of children do not eat breakfast before school, 14% were overweight and 8% were obese. 12.3% of the adults surveyed currently smoke tobacco and around 11% of children are exposed to tobacco smoke. The main health problems are allergies (35% in children and 20% in adults), emotional problems (35% in children and 20% in adults) and excess weight (20% in children and 45% in adults). Together with the study an unique collection of samples have been stored in the Wroclaw Medical University Biobank, where they can be used for further research. In 2022, a follow-up was launched where participants are planned to be examined after 2 and 4 years from the first examination.

Keywords:

cohort study, health condition, child health, biobanking

MEASLES – EPIDEMIOLOGICAL SITUATION AND MAJOR CHALLENGES

Magdalena Zapalska (1)*, Anna Zielińska (1), Julia Ziemińska (1), Małgorzata M. Kozioł (2)

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A few words about the author(s):

Authors of this work are students attending 3rd year of medical faculty. We conduct a great deal of science work in Medical Microbiology Students Research Group supervised by Małgorzata Kozioł, PhD in microbiology.

Abstract:

Measles is a highly contagious disease caused by RNA enveloped virus. Globally, measles remains the leading death of children even though a safe and effective vaccine exists. It is estimated that 9 out of 10 people without protection will become infected after contact. Measles outbreaks are recorded in many countries. In Poland vaccination is mandatory by using the MMR (measles, mumps, rubella) vaccine. According to the data from last years in Poland in 2016 133 cases were reported; in 2017/63 cases; 2018/339; 2019/1492; 2020/30, 2021/14; 2022/28. In the beginning of 2023 infection reached 9 people per 100,000.

Based on this, it is observed that this virus still can be a serious problem. Seroprevalence plays a crucial role in the fight against the disease and according to the World Health Organization (WHO) around 93–95% is enough to achieve herd immunity. As well, early implementation of the procedures after contact allow to limit transmission of the virus and calculate the risk of potential outbreak. The aim of the study was to present the measles problem by analyzing the epidemiological situation, immunization status of the society and show implementation of the WHO elimination program of this disease in Poland.

Keywords:

MMR, infection, virus, seroprevalence

BACTERIOPHAGE – OUR ALLY IN THE FIGHT AGAINST THE GROWING PROBLEM – ANTIBIOTIC RESISTANCE

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A few words about the author(s):

Master's student in the field of medical biotechnology.

Abstract:

In 1917 Felix d' Hérelle discovered an invisible microbe of an antagonistic nature to dysentery bacillus, which he later called bacteriophage. In the same year, phages were used for the first time in the medical field, eventually leading to the creation of phage therapy. Phage therapy has seen some success back then in treating various diseases such as dysentery, cholera or even plague. Yet, with the discovery of antibiotics in 1928 by Alexander Fleming, the research on phage therapy drastically slowed down. Nowadays, misuse of antibiotics in the treatment of viral infections or widespread routine use of antibiotics in agriculture allows bacteria to adapt to our primary weapon against them. This phenomenon enables bacteria to accumulate antibiotic resistance mechanisms, eventually leading to the emergence of multidrug-resistant (MDR) strains. Moreover, MDR bacteria are likely to pass on resistance genes to other species via horizontal gene transfer. It goes without saying that antibiotic resistance is an ever-growing problem these days. Nonetheless, to combat this problem, various techniques are being researched, including the forgotten phage therapy. Currently, phage therapy is used as an experimental treatment for infections caused by multidrug-resistant bacteria. In the last decade, it has been used successfully to treat infections caused by, i.a.: Pseudomonas aeruginosa or Staphylococcus aureus.

Keywords:

Phage therapy, Antibiotic ressistance, Multidrug-resistance bacteria, Bacteriophage

TREATMENT OF MIGRAINE WITH CALCITONIN GENE-RELATED PEPTIDE RECEPTOR ANTAGONISTS

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A few words about the author(s):

Weronika Ziółkowska is a fifth-year student of pharmacy at Collegium Medicum, Nicolaus Copernicus University; member of Students Research Club of Medical Biology.

Abstract:

Rimegepant and Zavegepant are antagonists of the calcitonin gene-related peptide (CGRP) receptor, which has been shown to be effective and safe in the acute treatment of migraine.

Migraine headache is characterized by unilateral headaches. This is often accompanied by photophobia and phonophobia. Migraine is one of the leading causes of disability in people under the age of 50. Small molecules, which are CGRP receptor antagonists, have evolved from first-generation Telcagepant, which is hepatotoxic, to the new third-generation intranasal Zavegepant. Rymegepant, Ubrogepant and Atogepant have been launched on the market based on successful clinical trials. 747 participants took part in a study of Robert Croop et al. 2021, in which Rimegepant was analysed. 695 people were included in the effectiveness analysis. 348 people assigned Rimegepant and 347 placebo. Rimegepant was shown to be superior to placebo in the primary endpoint of change in the mean number of days with migraine at weeks 9-12. 741 participants were included in the safety analysis. No deaths among participants. Rimegepan taken every other day has been effective in treating migraine. Tolerance was similar to placebo. Zevegepant is another promising drug in the treatment of migraine. Long-term data support the efficacy and safety of CGRP receptor antagonists.

Keywords:

migraine, Rimegepant, Zavegepant, gepants

INFLUENCE OF ENVIRONMENTAL FACTORS ON DRUG PHOTODEGRADATION

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A few words about the author(s):

I am a student of Ph.D. school at the Jagiellonian University. The other authors are employees of the Department of Inorganic and Analytical Chemistry also focus on the subject of antibiotics and their impact on the environment.

Abstract:

Drugs released into the environment may remain unchanged or under the influence of various factors undergo transformation or degradation processes. As a result of these transformations, products may be formed that differ from the parent compounds. One of these phenomena is the process of phototransformation, during which compounds under the influence of UV radiation transform into photoproducts.

There are reports of faster photodegradation processes in the environment due to the content of dissolved organic matter such as nitrates and microorganisms. Such a phenomenon can even result in the undetectability of parent compounds and their metabolites. Jiménez-Holgado et al. observed faster photodegradation processes in natural environments - wastewater and lake water, compared to ultrapure water. In turn, the photodegradation process of sulfamethoxazole was found to be faster in ultrapure water compared to environmental water. An increase in the degradation rate of ibuprofen was associated with the dissolved molecular oxygen content. The process of photodegradation of moxifloxacin was faster at pH=7 than pH=5. Thus, the process of phototransformation can be influenced by such factors as the presence of microorganisms, content of organic and inorganic substances, pH, radiation sources, water depth and even season. When analyzing the phototransformation process and the properties of the resulting products, it is very important to take into account various environmental factors.

Keywords:

phototransformation, water pollution, drugs

ABSTRACTS OF

POSTERS

MEDICAL SCIENCES

THE SIGNIFICANCE OF μ-OPIOID RECEPTORS IN ETHANOL CONSUMPTION IN MICE SELECTED FOR HIGH AND LOW ENDOGENOUS OPIOID SYSTEM ACTIVITY – POSSIBLE IMPLICATIONS FOR ADDICTION

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Bartłomiej Brzozowski is an aspiring pharmacy student at the Medical University of Warsaw. His scientific interests focus primarily on unraveling the neuropathological mechanisms of addiction. Particularly, the involvement of the opioid system.

Abstract:

Molecular mechanisms of excessive alcohol consumption include facilitation of dopamine release or disturbances in inhibitory control in the prefrontal cortex (PFC). Namely, upregulation of μ-opioid receptor signaling in the PFC was evidenced to promote compulsive alcohol seeking behavior. This work aimed to investigate the influence of innate endogenous opioid system function on alcohol preference. For this purpose we assessed the degree of ethanol consumption in two outbred lines of mice divergently selected for high (HA) and low (LA) endogenous opioid system activity. Both lines of mice were exposed to 8% ethanol in a free two-bottle choice paradigm for 30 days. At days 1, 3 and 14, mice were sacrificed and μ-opioid receptor activation and β-endorphin levels were determined. The innate hyperactive endogenous opioid system activity protected against voluntary alcohol intake. Its innately low activity was related to ethanol-induced increase in β-endorphin levels and increased ethanol preference. Stable upregulation of μ-opioid receptor-associated G-protein signaling seen exclusively in the prefrontal cortex (PFC) of LA mice, could account for the possible sustainment of motivational behaviors directed towards alcohol intake. In conclusion, the endogenous opioid system differentially regulates sustained alcohol consumption depending whether enhancement of its activity is hereditary or alcohol-induced.

Keywords:

alcohol, addiction, HA/LA mice, μ-opioid receptor

BACTERIOPHAGES IN THE TREATMENT OF BACTERIAL DISEASES

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A few words about the author(s):

My name is Justyna. I study at the Maria Curie Sklodowska University in Lublin. My interest is biotechnology. Participation in scientific conferences gives me the opportunity to learn more about the world of science.

Abstract:

Treating diseases caused by bacteria is a growing challenge for doctors. The reason for this is the increase in resistance of pathogenic bacteria to the antibiotics we know and use for treatment. As a result, other ways to treat bacterial diseases are being sought. One such method is the use of bacteriophages. Bacteriophages, otherwise known as phages, are viruses that infect bacteria. Bacteriophages infect specific species and even bacterial strains. They belong to the absolute internal parasites. The factors that distinguish bacteriophages from antibiotics are, first of all, their specificity of action, self-replication, high efficacy and also lack of side effects. Phage preparations can be administered in the form of tablets as both oral and external liquids containing infectious phages and bandages containing phage cocktails. Bacteriophage therapies require further research and development to make such therapy fully safe and effective for treated patients. It is necessary to focus on aspects such as the transfer of dangerous genes by bacteriophages or getting rid of phages from the infected person's body too quickly.

Keywords:

bacteriophage, bacteria, treatment

OXIDATIVE STRESS MARKERS IN URINE OF PATIENTS WITH BLADDER CANCER

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Researchers from the Rzeszów University, scientific interests: oxidative stress and urology.

Abstract:

Oxidative stress is defined as an imbalanced state of the production of reactive oxygen species and antioxidant capacity that causes oxidative damage to biomolecules, leads to cell injury and finally death. Oxidative stress mediates the development and progression of several cancer diseases, including bladder cancer. The aim of our study was to determine markers of levels of the oxidative stress in urine of patients with bladder cancer. Furthermore, we tried to estimate the associations between oxidative stress markers and the type of cancer, its clinical stage and grade in patients with bladder cancer. Sixty-one bladder cancer and 50 healthy volunteers as a control group were included. We determined the urine levels of advanced oxidation protein products, Amadori products, total antioxidant capacity, total oxidant status, oxidative status index, and malondialdehyde. We confirm that almost all markers are higher in urine from patients with bladder cancer than in healthy subjects. Moreover, we did not find differences in the level of oxidative stress markers and the type of tumour, its clinical stage, and grade. Taken together, our results indicate the participation of oxidative stress in the development of bladder cancer. However, the contribution of oxidative stress to tumour progression should be investigated in a larger number of participants, before biochemical markers of oxidative stress find clinical application in the assessment of bladder cancer progression.

Keywords:

oxidative stress, urine, biomarkers

3D BIOPRINTING TECHNOLOGY AND ITS PROSPECTS IN MEDICINE

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Student of medical biotechnology.

Abstract:

3D bioprinting is an emerging technology based on a 3D printing method using a bioink consisting of biomaterials and living cells suspended in them. Bioprinting makes it possible to obtain three-dimensional, biocompatible structures made of living cells that retain their metabolic potential and structure. In addition, the environment of the cells is similar to that of the body, allowing the physiological microenvironment of the cells to be preserved in vitro. Bioprinting is a technology that gives great expectations for the biological and medical sciences. 3D models constructed from living, physiologically active cells allow to in vitro observation of processes naturally occurring in the body. The data obtained are similar to those prevailing in the body, so this allow to avoids the use of animal models. In the biological sciences and medicine, 3D printing of tissue fragments or whole organs is of particular interest. There are currently reports of successful attempts to print simple tissue such as skin, cartilage and bone tissue. Printing whole organs is currently beyond the state of the art because technology does not yet allow the reproduction of the complex vascular structures present in organs. Continued research and improvement of 3D bioprinting technology may allow the creation of structures used in transplantology or regenerative medicine, for example to treat burns.

Keywords:

3D bioprinting, bioink, tissue models

POSSIBILITY OF USING BDNF PROTEIN AS A MOLECULAR MARKER OF LUMBOSACRAL INTERVERTEBRAL DISC DEGENERATIVE DISEASE

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A few words about the author(s):

Dorian Gładysz is a neurosurgeon specialist who has begun efforts to obtain a doctorate in medicine.

Abstract:

The role of neurotrophic factors, such as brain-derived neurotrophic factor (BDNF), has received attention in the etiology of pain of discogenic origin. Given the potential role of BDNF in the etiology of pain during IVDD, the present study aimed to evaluate the changes in the number of nerve fibers of BDNF-positive degenerated intervertebral discs of the lumbosacral spine compared to intervertebral discs obtained from a control group (cadaveric). The study group consisted of 113 Caucasian patients who underwent microdiscectomy. In contrast, the control group included 81 intervertebral discs obtained post-mortem, which were evaluated by eosin-hematoxylin staining. The number of BDNF-positive nerve fibers was determined by immunofluorescence staining technique. Based on the analysis, there were no statistically significant differences between the number of BDNF-positive fibers in the test and control groups (58.99 ± 215.82 vs. 30.70 ± 54.14; p = 0.442). TBDNF is thus a neurotrophic factor whose level of expression is indicative of IVD degeneration, although it does not predict the degree of this degeneration.

Keywords:

intervertebral disc degeneration, brain-derived neurotrophic factor, pain

EXPRESSION OF THE GROWTH-ASSOCIATED PROTEIN 43 IN PATIENTS WITH INTERVERTEBRAL DISC DEGENERATION

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A few words about the author(s):

Marcin Gralewski is a neurology specialist who has begun to pursue a doctorate in medicine.

Abstract:

In adults, Growth Associated Protein 43 (GAP-43) protein expression is generally low, except in neural structures located in areas of enhanced plasticity or synaptic reconstitution. This study aimed to evaluate GAP-43 expression in a group of patients with clinically and magnetic resonance imaging (MRI)-confirmed degenerative lesions of the lumbosacral intervertebral disc compared to intervertebral discs not affected by the degenerative process. The study enrolled 113 patients with degenerative intervertebral disc disease scheduled for disc removal – microdiscectomy. In contrast, the control group comprised 81 intervertebral discs obtained post-mortem (cadaveric). Biological material from the control group was stained by immunohistochemistry (hematoxylin, eosin) before final classification into this group. Immunoenzymatic ELISA determined the evaluation of GAP-43 concentration in both groups. We demonstrated significantly higher GAP-43 concentration in the study group than in controls (3.48 ± 1.03 ng/ml vs. 0.94 ± 0.12 ng/ml; p= 0.00001). The obtained results suggest that in intervertebral disc degeneration, the formation of new nerve endings is intensified, penetrating deep into the intervertebral disc, and GAP-43 protein seems a promising molecular marker of the intervertebral disc degenerative process, as well as an excellent therapeutic target.

Keywords:

Growth Associated Protein 43, intervertebral disc degeneration, pain, cadevers

GLP-1 ANALOGUES AND THYROID TUMORS – REVIEW PAPER

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A few words about the author(s):

We are members of the Student Scientific Society at the Department of Biochemistry of the PUM.

Abstract:

INTRODUCTION: GLP-1 analogues are drugs used to treat, among others, type II diabetes and obesity. They mimic the action of a physiologically produced compound – glucagon-like peptide 1. The effect of their action is, among other things, increased sensitivity of tissues to insulin, regulation of blood glucose levels and a feeling of satiety. GLP-1 receptors are also expressed by thyroid cells, making this tissue susceptible to treatment with these analogues.

OBJECTIVE: The aim of the study was to review the current literature on the use of GLP-1 analogues and the development of thyroid tumors.

METHODS: The literature review was done by searching and analyzing scientific papers in PubMed database.

RESULTS: A statistically significant positive correlation between liraglutide or dulaglutide and thyroid tumours was observed in patients treated with GLP-1 analogues. Approximately 2% of the reported malignancies of this gland were in diabetic patients treated with GLP-1 analogues. Tumours observed in patients included thyroid cancer as well as medularry thyroid cancer.

CONCLUSIONS: Analysis of reports suggests that the use of GLP-1 analogues may affect the functioning of the endocrine system, primarily the physiology of the thyroid gland, which may contribute to the development of tumors. Therefore, regular monitoring of thyroid function and image in patients treated with liraglutide or dulaglutide appears to be important.

Keywords:

GLP-1 Thyroid Tumors

DESIGNING AND GROWING THE NEW FLUORESCENT M. TUBERCULOSIS STRAIN

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My name is Grzegorz Jankowski. I studied "Medical Analytics" at the Medical University of Lublin. Actually, I do a PhD diploma in pharmacy science under the supervision of PhD. Pharm. Rafał Sawicki.

Abstract:

Tuberculosis is a disease with the highest mortality rate among all bacterial infections. Most cases of tuberculosis are observed in poor regions like India or Indonesia, but illness cases are observed all around the world. The main problem with tuberculosis is that in the past 40 years, no new drug was invented, and therefore tuberculosis makes a severe epidemiological threat. Looking for a solution to the tuberculosis disease, our team designed a fluorescent strain of Mycobacterium tuberculosis which hopefully will be used to creation of the new MIC (ang. Minimal Inhibitory Concentration) measurement method for the potential drugs. The fluorescence growth can be observed much sooner than the absorbance of the sample, which gives hope that the new approach will be faster than the classic growth on agar method. The fluorescent gene mNeonGreen was inserted into the genome of M. tuberculosis under the control of a constitutive promotor which provides a constant expression of the inserted gene in M. tuberculosis cells.

Keywords:

Mycobacterium tuberculosis, florescence, tuberculosis

THE ROLE OF OXLDL AS A LAMP IN THE PATHOGENESIS OF ATHEROSCLEROSIS

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Fifth-year student of the Faculty of Medicine at the Pomeranian Medical University.

Abstract:

In 2019, Zindel and Kubes (doi: 10.1146/annurev-pathmechdis-012419-032847) identified a group of lifestyle-associated molecular patterns (LAMPs) that have in common the ability to induce persistent sterile inflammation. They cannot be removed from the macroorganism because strategies for their elimination have not evolved, or are not possible. They are not clearly associated with either pathogen or damage, instead often linked to 21st century lifestyles. LAMPs are recognized by Pattern Recognition Receptors (PRRs) present on immune cells, which triggers various signal transduction pathways, resulting in the secretion of cytokines, chemokines and recruitment of more immune cells. These events contribute to the formation and progression of inflammation that cannot be resolved, thus leading to the development of many diseases. LAMPs include oxidized low-density liporotheins (oxLDL), which are important danger signals in atherosclerosis, which is a chronic inflammatory disease of the arteries driven by an unhealthy lifestyle. The role of oxLDL as LAMPs in the pathogenesis of atherosclerosis will be presented.

Keywords:

LAMPs, atherosclerosis, PRR, oxLDL, sterile inflammation

CAN WE TALK ABOUT POST-PANDEMIC STRESS DISORDER AMONG HEALTH CARE PERSONNEL?

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Abstract:

Frontline healthcare personnel who treat and care for patients who have SARS-CoV-2 infection are at risk of experiencing psychological distress and symptoms post-pandemic stress disorder (PPSD)— depression, anxiety, and stress.

The aim of the study was to the answer to the question whether the risk of PPSD is higher in people who have direct contact with patients with COVID-19.

The study involved 300 medics who were divided into two sections. The first section consisted of staff in direct contact with COVID-19 patients (FR) - 150 people. The second group consisted of healthcare professionals who were not directly involved in helping COVID-19 patients (SR) - also 150 people. The study used original, standardized psychometric tools, such as e.g. PSS-10, FCV19-S.

The PSS-10 is a popular tool for measuring psychological stress related to one's living situation over the past month. The FCV-19S scale allows for assessment of the level of anxiety due to COVID-19 infection.

Analyzes showed that mental health problems that may indicate trauma and PPSD are mainly present in the FR group.

In conclusion, the COVID-19 pandemic has significantly increased the incidence of depression and anxiety disorders among health care personnel. Therefore, medical personnel who are on the direct frontline in the fight against the COVID-19 pandemic should be guaranteed appropriate care and psychological support.

Keywords:

post-pandemic stress disorder (PPSD), SARS-CoV-2, COVID-19, health care personnel

BETULIN AND ITS DERIVATIVES AS NEW TREATMENT OPTIONS FOR COLORECTAL CANCER

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Marcel Madej is a PhD student in the Medical Sciences. Joanna Gola is a professor and head of the Department of Molecular Biology as well as the thesis supervisor. Elwira Chrobak holds a PhD in Pharmaceutical Sciences and is the assistant supervisor.

Abstract:

Advances in medicine and pharmacy are undoubtedly contributing to the development of new therapeutic methods for the treatment of cancers, including colorectal cancer. Therefore, the attention of scientists is focused on substances of natural origin whose biological, physicochemical, as well as pharmacokinetic properties can be improved by chemical modification of their structure. In colorectal cancer research, betulin and its synthetic derivatives are molecules with promising parameters. Betulin as a compound is classified as a pentacyclic triterpene of the lupane type, and due to its chemical structure and the presence of three reactive groups at the C-3, C-19 and C-28 positions, chemical modification is possible. In addition, it exhibits a wide spectrum of biological properties such as anti-inflammatory, anticancer, and antimicrobial activities, which leads to its use in the research of new therapeutic agents for colorectal cancer. The purpose of this paper is to present recent reports on the in vitro effects of betulin and its derivatives on colorectal cancer cells as potential new substances with anticancer activity.

Keywords:

betulin, derivatives, colorectal cancer, cell lines, anticancer activity

SNP NOT SO STRANGE

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We are members of the Student Scientific Circle at the Department of Molecular Biology of the Department of Molecular Biology of the Silesian Medical University in Katowice.

Abstract:

Over the years, many methods have been involved to determine the genetic profile. The development of an optimal method has become particularly important from the point of view of forensic science, which uses these techniques to solve cases based on biological material. Technological progress has resulted in the development of two well-known and used methods of DNA sequence variability analysis into one innovative procedure. SNP-STR is a complex biomarker consisting of a single nucleotide polymorphism (SNP) and a closely related short tandem repeat polymorphism (STR). This method combines the advantages of both SNPs and STRs. Compared to other new solutions, SNP-STR has its own reference database, which makes this technique the simpler method of choice for analysis. The search for new SNP-STR loci and the creation of their extended database may contribute not only to forensics, but also to the multiple use of these markers in areas such as victim identification, determination of kinship and origin. The aim of this work is to present the operation and the possibility of using the SNP-STR method as a future genotyping technique.

Keywords:

SNP, STR, SNP-STR, molecular analysis, genotyping

EPIGENETICS OF SELECTED MENTAL DISORDERS – AN OVERVIEW OF THE LATEST REASEARCH

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Paprzycka Olga is in the course of her master's studies. Barbara Strzałka-Mrozik is a professor of pharmaceutical sciences. Marcel Madej is currently at the doctoral school. They work together in the scientific association of molecular biology.

Abstract:

Mental disorders are currently one of the most afflictive cases known to patients. That is why in recent years, big progress has been made in research on it’s etiopathogenesis and finding potential treatment targets. Significant influence of epigenetic modifications has been shown in pathogenesis of diseases such as depression, schizophrenia, borderline disorders, anxiety disorders and obsessive-compulsive disorder. Results suggest important role of epigenetic modifications – genetic methylation, histone acetylation, reconstruction of chromatin or changing expression of miRNA or lncRNA. Furthermore, associative research on whole genome show considerable changes of methylation pattern of the entire genetic material and encouraged to think that epigenetic changes have polygenic nature. Adversarial, omnigenic model of mental disorders has been also marked out. Allele specific methylation has been put under analysis. The purpose of undermentioned overview is to summarize the latest information about influence of epigenetics on pathogenesis of mental disorders.

Keywords:

epigenetics, mental disorders, pathogenesis, methylation

THE IMPACT OF THE ADMINISTRATION OF THE EXTRACT FROM ARONIA MELANOCARPA L. BERRIES ON THE CONCENTRATION OF GH2AX (DNA HISTONE) IN THE BRAIN – AN EXPERIMENTAL STUDY IN AN ANIMAL MODEL REFLECTING LOW-LEVEL AND MODERATE HUMAN EXPOSURE TO CADMIUM

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Agnieszka Ruczaj – a PhD student in the Department of Toxicology at the Medical University of Bialystok. The tutor of the study is professor Małgorzata M. Brzóska from the same department.

Abstract:

Exposure to cadmium (Cd) results in various toxic changes in the organism, including damage to the nervous system. The mechanism of Cd neurotoxicity seems to be connected with the dysregulation of the oxidative-antioxidative balance resulting in oxidative damage in the brain. The extract from chokeberry fruits (Aronia melanocarpa L.) has already been proven to perform protective action against some effects of the toxic action of Cd. Taking the above into consideration the aim of the study was to assess if low-level and moderate exposure to Cd has an impact on the concentration of GH2AX (DNA histone) in the brain tissue, as a marker of damage to the structure of DNA, and the potential beneficial impact of the chokeberry extract. The research was conducted in an animal model that reflects the low-level and moderate exposure to Cd throughout the whole human life. Female Wistar rats were given Cd (1 or 5 mg Cd/kg of diet) and/or the 0.1% aqueous chokeberry extract for 3-24 months. The concentration of GH2AX in the brain was quantified using the commercial kit, based on the ELISA method. The exposure to the 1 and 5 mg Cd/kg of diet for 24 months decreased the concentration of GH2AX, while the co-administration of the extract protected against this change. Based on the study it can be concluded that low-level long-term exposure to Cd has a negative impact on the structure of DNA in the brain, whereas the administration of the A. melanocarpa extract counteracts this effect.

Keywords:

cadmium, Aronia melanocarpa L., DNA, brain, protection

ANGELICA SINENSIS – HEALTH MESSENGER FOR THE LIVER

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A few words about the author(s):

Robert Sarna and Natalia Świątkowska are medical biotechnology students. Marcel Madej is a PhD student, while Barbara Strzałka-Mrozik is a professor in the Department of Molecular Biology.

Abstract:

Angelica sinensis polysaccharide (ASP) is a promising biomaterial that exhibits a number of biological functions. It has immunomodulatory properties, has the ability to target hepatocytes and has a positive effect on liver regeneration. Studies have shown that ASP is able to stimulate the proliferation of liver cells, and also inhibits their apoptosis process. ASP also shows protective properties against liver cells when conducting chemotherapy targeted at liver cancer or gastric cancer. The whole makes ASP a promising material that can support the treatment of diseases such as non-alcoholic fatty liver disease, liver cancer, stomach cancer, as well as acute alcoholic liver damage. The described properties may therefore be the basis for the development of modern preventive, therapeutic or regenerative drugs. This poster summarizes and presents the most important mechanisms of action of the described polysaccharide and its potential applications in medicine and pharmacy.

Keywords:

Angelica sinensis, biomaterial, drug delivery systems, liver diseases, liver cancer

PROMISING ANTI-ONCOGENES IN THERAPY – PHYTOESTROGENS FOUND IN FOODS

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Abstract:

Cancer is one of the leading causes of human death worldwide. Breast cancer is the most common malignant tumor among women and the second most common in terms of mortality. This cancer is strongly associated with the human sex hormones - estrogens and androgens. Phytoestrogens are a group of compounds naturally occurring in plants, having a high structural similarity to human estrogens and being the subject of research for their anti-cancer effects. Resveratrol is mainly found in grapes and red wine. The anti-cancer effect of resveratrol involves modulating autophagy and apoptosis, thereby mitigating the negative effects of chemotherapy. An example of a phytoestrogen that is a natural isoflavone is genistein, found in soy-rich foods. Therapeutic and chemopreventive properties of genistein have been demonstrated, including induction of apoptosis, inhibition of proliferation, angiogenesis, metastasis and cell cycle arrest. Another example of a phytoestrogen is quercetin – a flavonoid with dose-dependent antioxidant or pro-oxidant properties. These features are conducive to the process of inhibiting the development of cancer. The compound has a therapeutic potential for breast cancer, confirmed by many studies. The sources of quercetin are, among others: nuts, vegetables, tea and herbs. The aim of this paper is to present phytoestrogens present in food as promising compounds in the treatment of breast cancer, on the example of resveratrol, genistein and quercetin.

Keywords:

breast cancer, phytoestrogens, resveratrol, genistein, quercetin

EPIDEMIOLOGICAL EVALUATION OF THE INCIDENCE OF GLIOBLASTOMA IN THE POLISH POPULATION TREATED AT ST. RAPHAEL'S HOSPITAL IN 2015-2018

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Magdalena Stachura is a neurosurgery specialist who has begun to pursue a doctorate in medicine.

Abstract:

The study was conducted in June 2015-April 2018. 219 samples were collected during the study, from 192 patients, including 84 (43.75%) women. In the histopathological examination results, GBL WHO IV was diagnosed in 146 (76.04%) cases. Neoplasms with WHO st III were diagnosed in 12 (6.25%) patients (4 anaplastic astrocytoma, 8 anaplastic oligodendroglioma). WHO st II in 32 (16.67%) patients (23 diffuse astrocytoma, 7 oligodendroglioma, 2 ependymoma). WHO I in two patients (1.04%) (subependymoma, capillary staphyloma). Two patients (1.04%) had intra-compartmental tumors. In 52 patients (27.08%), they exceeded the anatomical area of one lobe (occupied 2 or more lobes of the brain). In 25 patients (13.02%), the tumor infiltrated deep structures, and in 22 patients (11.45%) it occurred in both the right and left hemispheres of the brain. In 7 (3.65%) patients, the lesion was located in the posterior cranial cavity. Macroscopically, 60 (31.25%) patients underwent complete resection of the lesion, 66 (34.38%) had subtotal resection, 33 (17.19%) had partial resection, and 28 (14.58%) patients underwent biopsy only. During further treatment, 101 (52.60%) patients underwent radiation therapy; 69 (35.94%) received chemotherapy. Median survival 7 months; mean 10.49 - 10.93; 67 (34.9%) patients remain in follow-up tut clinic (last visit in 2018).

Keywords:

gliomas, epidemiology, radiotherapy, chemotherapy, polish population

STUDY ON PHARMACOPOEIAL FOAM INDEX FOR SAPONIN-CONTAINING HERBAL DRUGS

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(2) Department of Pharmacognosy and Herbal Medicines

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A few words about the author(s):

We (KS, KS) were engaged in phytochemical research during our pharmaceutical graduate studies. This poster summarizes the results of our two-year work. Our scientific cooperation tutor (MW) is involved in saponin research.

Abstract:

Saponins are bitter-tasting natural substances that form long-stable foam with water and air. They can be as well as toxic as medicinal or technological agents.

Because of the high diversity of this chemical group, there is still no perfect method for the standardization of saponins content in plants. HPLC-UV assays are not ideal because of the poor absorbance of most saponins. HPLC-MS assays are promising but require single-compound standards. According to the surface activity of saponins, there are also hemolysis or foam-forming-based qualitative and quantitative assays. However, due to the lack of standardization and universal chemical references, these methods are still non-popular. Foam index testing, newly included in European Pharmacopoeia [1], is required only for one herbal drug as before.

Our communication presents the foam indices measured for 31 plant raw materials (mostly only pharmacopoeial) for the first time in a unified form. In addition, a comparison of using A- and B-class laboratory glass is included. Moreover, it was observed that the method described by European Pharmacopoeia requires modifications, such as increasing the volume of the prepared solution to avoid unworkability.

[1] Foam index. In European Pharmacopoeia, 10th ed.; Council of Europe: Strasbourg, 2020; monograph 07/2019:20824

Keywords:

foam index, pharmacopoeial methods, saponins, surface activity

EFFECT OF SUPPLEMENTATION WITH LION'S MANE (HERICIUM ERINACEUS) ON COGNITIVE ABILITIES IN HUMANS – A REVIEW PAPER

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A few words about the author(s):

We are students of the Pomeranian Medical University. Our common passion is biochemistry.

Abstract:

INTRODUCTION: Lion's mane (Hericium erinaceus), is an edible fungus found in Asia, North America and Europe. This mushroom is appreciated not only for its taste qualities, but also has been used for centuries in Chinese folk medicine. It is believed that the erinacin contained in the fungus is responsible for its therapeutic properties. The literature review was done by searching and analyzing scientific papers in PubMed database. Analysis of studies on the effect of taking Lion's mane orally showed that patients improved MMSE (Mini Mental State Examination) after 12 weeks of taking the fungus. It also improves the results of cognitive function tests – HDS-R (Revised Hasegawa Dementia Scale) in patients with mild cognitive impairment aged 50 to 80 years. However, other studies suggest that a 4-week supplementation does not improve cognitive abilities (mental arithmetic tasks, Stroop's colour expression test) in people aged 19-25 years. 49-week supplementation with Lion's mane in patients with mild Alzheimer's disease, however, showed an improvement in the results of the study group in contrast sensitivity tests as well as in the MMSE test.

CONCLUSIONS: Studies suggest that consumption of Lion's mane has a beneficial effect on improving cognitive function, especially in elderly people with mild cognitive impairment, and may also slow down the progression of neurodegenerative diseases. Supplementation with this fungus sill seems to be a safe form of improving brain function.

Keywords:

Lion's mane, Hericium erinaceus, supplementation, brain function

THE IMPACT OF BREASTFEEDING ON INFANT HEALTH

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A few words about the author(s):

My name is Katarzyna Żandarek and I am a second-year nursing student.

Abstract:

Breast milk is a unique substance that is ideally suited to the nutritional needs of an infant.

Its composition changes over time and is determined, for example, by the stage of lactation, health status and diet. In addition to nutrition, it performs a protective function for the immature baby's body, and is therefore, a functional food. Particularly noteworthy is colostrum, i.e. milk produced in the first few days after birth, which is characterized by a higher content of immune components and less fats and carbohydrates.

Breast milk contains the necessary components for the proper development of the child, such as macronutrients: proteins, carbohydrates and fats and micronutrients: vitamins and minerals.

Breastfeeding has a beneficial effect on the child's physical as well as emotional development. It has anti-infectious, anti-inflammatory and immunomodulatory properties. Breastfeeding reduces infections of the upper and lower respiratory tract, gastrointestinal tract and even bacterial meningitis in infants. The World Health Organization has approved breast milk as the only and best food for a baby up to 6 months of age. It recommends breastfeeding from the first hour of life, until at least 6 months of age, and as complementary feeding until about 2 years of age. Prolonged breastfeeding (up to 12 months of age) reduces the risk of obesity in older children, reduces the risk of type I and type II diabetes and has a positive effect on the child's mental development.

Keywords:

breastfeeding, breast milk, infant

ABSTRACTS OF

PRESENTATIONS

TECHNICAL SCIENCES

INFLUENCE OF SECONDARY PARAMETERS OF THE PRESS HARDENING PROCESS OF HIGH-STRENGTH STEEL IN INDUSTRIAL CONDITIONS ON THE MECHANICAL PROPERTIES OF CAR BODY PARTS

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A few words about the author(s):

Dariusz Kuc is an associate professor in Faculty of Materials Engineering of Silesian University of Technology. He is also a thesis supervisor of Konrad Brzyski, who is simultaneously a heat treater in Automotive industry and a PhD student.

Abstract:

Press hardening is one of the modern materials processes, which is gaining on popularity, particularly in Automotive industry. Reinforcement obtained as a result of the correct execution of the process is necessary to meet, dedicated to car body parts, safety requirements, that are constantly becoming more restrictive. Nowadays car body parts essential to the construction's safety must achieve a tensile strength of more than 1.5 GPa. Such an improvement of mechanical properties of high – strength steel is possible through a proper heat treatment of the material. Typical primary parameters of the process are well known from CCT diagrams: temperature, time and chemical compositon of the processed material, which results in the phase equlibrium under particular conditions. However, recent results of the tests confirm, that secondary parameters of the process, not resulting from CCT diagrams, have an influence on the mechanical properties to such an extent, that they may negate the desired reinfrocement effect. Found secondary parameters and their effects are concerned in this paper.

Keywords:

press-hardened steel, hot forming, automotive industry

NEW NON-PROTEINOGENIC FLUORESCENT AMINO ACIDS: BENZOXAZOL-5-YL-ALANINE DERIVATIVES CONTAINING ACETYLENE UNIT

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A few words about the author(s):

Irena Bylińska – active scientist and academic teacher. Main areas of interest are the synthesis and study of the spectroscopic properties of new fluorescent compounds and the use of fluorophores for cellular imaging.

Abstract:

Fluorescence spectroscopy is recognized as one of the most sensitive technique. It allows to work with low concentrations and to notice even very subtle changes in the system under study. Due to the complexity of scientific research, the requirements and expectations regarding fluorophores are increasing. Therefore, it is important to search for new effective fluorophores dedicated to even difficult research tasks. Searching for new effective fluorophores, benzoxazole-5-yl-alanine derivatives containing an acetylene unit were designed and synthesized. Spectral and photophysical properties of all obtained compounds have been determined. Absorption and emission spectra of all obtained compounds were measured in solvents with different polarity and ability to form hydrogen bonds. The obtained compounds are characterized by absorption maxima in the range of 290-350 nm. Their molar absorption coefficient is medium or high. Maxima of emission bands of the studied acetylene benzoxazoles are in the range of 350–475 nm. Analyzed compounds also show high fluorescence quantum yields and brightness [1]. The studied compounds, due to the presence of two functional groups (amino and carboxylic) and satisfactory spectroscopic properties have an extremely high application potential.

[1] I. Bylińska, K. Guzow, J. Wójcik, W. Wiczk, J. Photochem. Photobiol A: Chem, 364, 2018, 679-685

Keywords:

fluorescence, fluorophores, fluorescence spectroscopy, benzoxazole, acetylene derivatives

THE USE OF ARTIFICIAL INTELLIGENCE FOR ADAPTIVE PRODUCTION PLANNING AND SCHEDULING IN THE PROMAN-PROMES APS SYSTEM

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A few words about the author(s):

For over 30 years, we have been specializing in the implementation of an ERP class system, thus supporting enterprises in achieving a competitive advantage. We successfully install the proprietary PROMAN SQL EXTENSIVE system in SMEs.

Abstract:

The currently growing competition in the market causes manufacturing companies to strive to stand out to attract new customers. Among the solutions used, one can distinguish the optimization of the time and cost of fulfilling orders while considering a range of customer requirements already at the production scheduling stage. Given the dynamic changes in the prices of raw materials, energy, worker rotation, forecasting the time and cost of executing technological operations is difficult. Manufacturing companies use production planning support tools to conduct a quick and reliable estimate of the time and cost of fulfilling an order. Among such solutions are advanced APS (Advanced Planning and Scheduling) systems, which automate the planning and scheduling of production using a range of criteria. One such system is the Promes software, which compared to the solutions currently available on the market, uses artificial intelligence algorithms to a greater extent to analyze the impact of selecting workers and machines in the company, taking into account the variable conditions of executing technological operations. This allows for the selection of the appropriate resources to reduce the cost and duration of technological operations. Promes is also an adaptive system that, based on artificial neural networks, allows for real-time data analysis directly from the production environment to be used for more effective production schedule optimization.

Keywords:

APS, MES, Production Scheduling, Proman, Promes

NEW LANTHANIDE-ION-DOPED LUMINESCENT HYBRID MATERIALS: A REVIEW

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A few words about the author(s):

Justyna Czajka – assistant professor at the Faculty of Chemical Technology and Engineering, Bydgoszcz University of Science and Technology. My scientific activity is focused on the synthesis of modern inorganic luminescent materials.

Abstract:

The multifunctionality of new hybrid materials doped with lanthanide ions has contributed to huge progress in the development of many fields of industry and science. The effects of production the hybrid system composed of two or more various materials are improved their optical and magnetic properties. Designing modern hybrid materials by increasing their functionality has expanded the application possibilities. Currently, they are used in optical and thermal sensors, light-emitting diodes, fluorescent probes, anti-counterfeiting materials, bioimaging and nanomedicine. The approach to the methods of synthesis, surface modification, or the possibility of controlling the physicochemical properties through the appropriate selection of the composition of materials has also changed. The subject matter is part of the final stage of my research conducted as part of the implementation of the scientific activity MINIATURA 5 grant number 2021/05/X/ST4/01291 funded by the National Science Centre.

Keywords:

hybrid materials, lanthanides, multifunctional, luminescence, phopshors

DEVICE FOR MOUNTING MODULAR LIFT SHAFTS

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A few words about the author(s):

Employees involved in the research and development project.

Abstract:

The article presents the results of a study on the design of an innovative crane for installing modular lift shafts. Possibility of creating a device for installing shafts in places where conventional crane equipment cannot be used due to space limitations was investigated.

Options of optimizing the crane's design and minimizing its dimensions was analyzed. Varied methods of powering the mechanisms and diverse approaches of controlling the device were tested.

A prototype crane was created as a result. Rotating jib on the main module allows the unloading from transport and installation of another module. Main module moves upward the tower under construction. The crane segment moves along the tower by means of an electric drive, which operates through a gear bar installed on the tower modules. The crane can improve the construction process, speeding up shaft installation and reducing the cost of hiring additional crane equipment.

Keywords:

lifting equipment, lifts, lift shafts, modular lift shafts

THE INFLUENCE OF THE IONIC STRENGTH OF KCL AND $CaCl_2$ BACKGROUND ELECTROLYTES ON STABILIZING AND FLOCCULATING PROPERTIES OF THE AQUEOUS SEPIOLITE SUSPENSIONS IN THE PRESENCE OF CATIONIC STARCH

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A few words about the author(s):

Ewelina Godek – PhD student at the PhD School of Quantitative and Natural Sciences at UMCS. Elżbieta Grządka – assistant professor. Interests include the physicochemistry of the dispersed systems, as well as the stability of the colloidal systems.

Abstract:

The aim of the work was to investigate the effect of the ionic strength of KCl and $CaCl_2$ background electrolytes on stabilizing and flocculating properties of the aqueous sepiolite suspensions (SPT) in the presence of cationic starch (CS). In the experimental part, stability measurements of the CS/SPT suspensions were performed. KCl and $CaCl_2$ with the ionic strengths of 10^{-1}, 10^{-2} and 10^{-3} mol/dm^3 were used as background electrolytes. The adsorption amount of the cationic polymer on the surface of the negatively charged clay mineral was also investigated. In both cases, the spectrophotometric method was used. The obtained data indicate that cationic starch can be used as an effective flocculant in the aqueous sepiolite suspensions. On the basis of the adsorption measurements, it can be concluded that CS adsorbs very well on the SPT surface. The electrostatic interactions are mainly responsible for the adsorption process. Therefore, the most likely flocculation mechanism for the CS/SPT system is bridging flocculation. As the polymer concentration increases, the adsorption amount increases and aggregates of colloidal particles connected by high molecular weight polymer chains are formed. Then they quickly sediment. Research on flocculation has application potential in water and wastewater treatment processes.

Keywords:

adsorption, flocculation, cationic starch, sepiolite

INFLUENCE OF ACID-BASE BALANCE ON ELECTROCHEMICAL PROCESSES OF TRICLOSAN OXIDATION

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A few words about the author(s):

The team that studies the mechanisms of oxidation of environmental pollutants from painkillers, pesticides, antibiotics and cosmetics. The basic working tools are electrochemical, spectroscopic and chromatographic methods.

Abstract:

Triclosan is a chemical compound used primarily in cosmetics, toothpaste, as well as disinfectants and antibacterial agents. From these sources, it goes straight into the environment where it decomposes into highly toxic dioxins. In addition, it easily penetrates into waters and bioaccumulates. For this reason, triclosan is very dangerous for the environment. Triclosan is one of the newly emerging pollutants and its occurrence is not regulated by law in any way, which is why it is so important to know the processes related to the breakdown of this compound. For this purpose we can use e.g. electrochemical and spectroscopic methods. A particularly important technique is cyclic voltammetry (CV), which carries a lot of information about the redox reactions taking place in the measurement system and allows to study these processes in different pH ranges.

Keywords:

triclosan, electrochemistry, oxidation

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:

Considering the developing technology and progress of civilization, more and more importance is given to solving complex engineering and scientific problems. The result of this phenomenon is increasing popularity of computer-based so-called numerical methods. Numerical methods, also known as computational methods, are a way of solving problems in the field of mathematics using operations on numbers. The most widely used computer method for solving electromagnetic field equations is the finite element method (FEM). One of the advantages of FEM over other numerical methods is that simulations can be carried out for multiphase materials as well as for those for which the properties are a function of temperature. In addition, it is possible to take into account nonlinear boundary conditions and the dimensions of elements can be volumetrically different.

Currently, the FEM method is used in many fields of science and technology. The greatest importance of the method can be attributed to engineering sciences and, in particular, to the mechanics of structures and continuous media. Using this method it is possible to determine such parameters as the strength of structures, simulation of deformations and stresses, as well as fluid and heat flow. Innovative applications of the finite element method also include nanotechnology and medicine. Using this method, it is possible, among other things, to determine arterial pressure during thrombosis or chest compression during heart massage.

Keywords:

numerical method, FEM, application

INNOVATIVE DESIGN AND USAGE ON A NATIONAL SCALE, INTEGRATED COMPUTER-CONTROLLED VIBRATING CONVEYOR FOR EFFICIENT TRANSPORT OF VARIOUS SOLID MATERIALS

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A few words about the author(s):

Chief engineer in Ofama Sp. z o.o., M. Sc. Eng. Computer aided machine design and testing at Politechnika Opolska.

Abstract:

Presetnation introduces main problems and benefits from newly designed dual mass vibrating conveyor over conventional single mass vibrating conveyors, wich design is based on multi-variant digital simulations of its 3d model, corrected by results from tests performed on physical prototype. Presentation also describes a fully integrated system (SNIKPUW) wich is designed and built to measure parameters and control performance of vibrating devices, helps in their regulation and allows comprehensive research.

Keywords:

dual mass vibrating conveyor, vibrating conveyor control

INVESTIGATION OF THE INFLUENCE OF SELECTED TRITERPENE SAPOGENINS ON THE PROPERTIES OF LIPID MODEL BILAYERS: INTERFACIAL TENSION AND MICROELECTROPHORETIC STUDIES

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A few words about the author(s):

We study the effect of potential anticancer compounds on model cell membranes made of membrane lipids. Our research on monolayers, liposomes, and spherical bilayers can contribute to a better understanding of natural cell membranes processes.

Abstract:

Sapogenins are a group of compounds isolated from the widely distributed saponins in plants. These compounds rarely occur in the environment in an accessible form, so they are more often obtained by hydrolysis of saponins. Sapogenin, also called aglycone, is the hydrophobic part of the saponin and can have two types of a skeleton: steroid or triterpene. Saponins have their sources in many plant species, roots, stems, leaves, seeds, and fruits. Steroid saponins are more common in plants such as fenugreek, ginseng, and agave, while saponins similar in structure to triterpenoids are more common in crop plants (e.g., soybeans, beans, quinoa). Saponins have many pharmacological properties, i.e., anti-inflammatory, antimicrobial, antioxidant, antiviral, hypocholesterolemic, and anticancer [1-3].

In this study, the effect of triterpene sapogenins: oleanolic acid and asiatic acid on model biological membranes - liposomes and spherical bilayers, composed of 1,2-dipalmitoyl-sn-glycerol-3-phosphocholine (DPPC) was examined.

Literature:
[1] Navarro del Hierro J., Piazzini V., Reglero G., Martin D., Bergonzi M.C., J. Agric. Food Chem. 2020, 68, 5, 1297–1305.
[2] Schreiner T.B., Dias M.M., Barreiro M.F., Pinho S.P., J. Agric. Food Chem. 2022, 70, 22, 6573–6590.
[3] Hernández-Bolio G.I., Ruiz-Vargas J.A., and Peña-Rodríguez L.M., Nat. Prod. 2019, 82, 3, 647–656.

Keywords:

sapogenins, oleanolic acid, asiatic acid, model membranes

PHYGAME – RESULTS OVERVIEW

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A few words about the author(s):

Mariusz Komorowski graduated from the Lodz University of Technology. Experienced in game programming and automation. He's an author of a publication on fractal mapping. He is interested in AI, math, and 3D graph. programming. Lang.: C#, C/C++, Python.

Abstract:

The presentation "Phygame - Results Overview" presents the main achievements in the project Phygame. A breakdown of two products is discussed: a framework and a game prototype (an example of using the framework) for game development, which show what areas have been researched, designed and implemented for the development of a game prototype utilizing a model for the interaction of the environment and wheeled vehicles in real time on mobile platforms based on physical simulation algorithms. They are discussed in turn: realistic simulation of car behavior and its interaction with the environment, possibilities for configuring the behavior of the model of the vehicle, adjusting the external environment in which the simulation takes place, the way of implementing the behavior of the opponent's artificial intelligence (vehicles other than the one controlled by the player), solutions for visualization of some specific parts of the environment (such as simulation of mud and its deformation in real time), real-time visualization of vehicle dirt. Finally, the presentation addresses also the issue of optimization on mobile devices (Android, iOS, which are the project's target platform), juxtaposing popular techniques and presenting their advantages and disadvantages. The project in question was carried out with the financial support of the European Regional Development Fund as part of Measure 1.2 "Sectoral R&D programs" Operational Program Intelligent Development 2014-2020.

Keywords:

physical simulation, vehicle physics, artificial intelligence, optimization, game development

HOW TO IMPROVE NEUROLOGICALLY ACTIVE DRUG DELIVERY SYSTEMS ?

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(2) Department of Science and Technology, Institute of Materials Engineering, Bankowa 14, 40-007 Katowice

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A few words about the author(s):

Sara Krawczyk is a PhD student at the University of Silesia. She works on drug delivery system based on conducting polymers. Sylwia Golba is an Assistant Professor in Institute of Materials Science in University of Silesia in Katowice.

Abstract:

Nowadays drug delivery systems (DDS) are gaining more and more attention. Neurodegenerative diseases are weaken the body and lead to the destruction or death of nerve cells. This diseases result in problems with movement or reduced mental capacity (dementia). To increase the effectiveness of treatment of Alzheimer's disease and the regeneration of damaged nerves, new drug delivery system were proposed. It was showed that it is possible to incorporate phenothiazine derivative into polypyrrole matrix. Such films showed more than 90 % electrochemical stability. SEM microstructures showed chracteristic for PPy spider net with embeded drug substance. AFM images showed changes in roughness of film after desorption process caused by disattached of drug molecules. After potential released of drug substances therapeutic effect was achieved.

Keywords:

drug delivery system, polypyrrole, neurologically active system, conducting polymer, phenothiazine derivative

INVESTIGATION OF THE EFFECT OF KAEMPFEROL ON THE PROPERTIES OF LIPOSOMAL MEMBRANES

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A few words about the author(s):

Dr hab. Aneta D. Petelska, prof. Univeristy in Bialystok is a head of Bioelectrochemistry laboratory in the Department of Physical Chemistry and Paulina Laszuk is a PhD student in the same Department.

Abstract:

The biological membrane is an indispensable element of every living cell. It is a barrier separating the inside of the membrane from the outside environment. Its complex composition and numerous functions it performs in the cells of living organisms prompted researchers to develop artificial models of biological membranes, such as liposomes. Due to the possibility of enclosing many active substances inside, these two-layer spherical structures have been used in medicine, cosmetics, and other fields of science. They are non-toxic, biodegradable, and biocompatible with biological membranes. Liposomes made of sphingomyelin and phosphatidylserine were used in the study, and their properties were modified with kaempferol. This compound is known for its antibacterial, anti-inflammatory, and anti-cancer properties. Its sources are tea, broccoli, apples, strawberries, and beans. Using the microelectrophoresis method, the effect of kaempferol on the surface charge density of liposomal membranes depending on the pH of the electrolyte was investigated. The obtained results may contribute to a better understanding of the properties of cell membranes and mechanisms related to their participation.

Keywords:

liposomes, kaempferol, microelectrophoresis

LIPOIC ACID COMPLEXATION STUDIES EXTENDED TO DIETARY SUPPLEMENT ANALYTICS

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A few words about the author(s):

I am a student majoring in Chemical Analytics at the University of Lodz and my regular field is crystallography, where I look for co-crystals. More recently, chromatographic techniques have become my second passion.

Abstract:

The main aims of my research were to obtain new crystal structures containing α-lipoic acid and to modify the method of determination of this compound in dietary supplements using chromatographic techniques. The study included numerous crystallizations of α-lipoic acid with nitrogenous bases included in RNA or DNA, as well as selected amino acids. The structural parameters of the obtained crystals were determined by X-ray measurements. In addition, it is also planned to modify the method for determination of α-lipoic acid in dietary supplements using chromatographic techniques, mainly high-performance liquid chromatography coupled with UV-VIS detection. The project was focused on the search for new co-crystals containing α-lipoic acid and broadening knowledge about non-covalent interactions in the crystalline state. Additionally, the method of determining this compound in dietary supplements was improved.

Keywords:

α-lipoic acid, crystallization, chromatographic techniques

SALIVA AS A DIAGNOSTIC MATERIAL

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A few words about the author(s):

Urszula Sudomir – 5th year student of Chemical Analytical at the Faculty of Chemistry, University of Lodz. Her scientific interests are concern on separation techniques and their use in bioanalysis.

Abstract:

Currently, the most commonly used biological fluids in bioanalysis are blood and urine. In parallel, scientists have begun to put considerable effort into exploring new sources of biomarkers that can be obtained in a non-invasive and non-intrusive way to facilitate large-scale screening of human diseases. As a result, more attention has been paid on saliva as a clinical trial sample. Saliva contains many compounds whose presence and concentration may be associated with the occurrence or development of pathological conditions in the human body.

This work focuses on discussing the possibilities and limitations of the use of saliva as a material in the context of the determination of selected biologically relevant compounds.

Keywords:

saliva, civilization diseases, material for clinical trials

SYNTHESIS OF NEW INDOLE-URACIL BIOCONJUGATES WITH POTENT BIOLOGICAL ACTIVITY

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A few words about the author(s):

Our reaserch group is focused on the modification of natural, origin compounds, mainly alkaloids with potent biological activity.

Abstract:

New indole and uracil derivatives with triazole rings were obtained. All of them were synthesized by the CuAAC procedure and were characterized by spectral methods. Additionally, theoretical calculations were carried out, showing that newly synthesized compounds could be concerned as a potential pharmaceuticals.

Keywords:

indole, gramine, uracil, click chemistry, spectroscopic analysis

FUNCTIONALIZED POLYOLEFINS AS BITUMEN MODIFIERS – THE APPROACHES TOWARD A MODIFICATION OF VISCOELASTIC PROPERTIES OF ASPHALT ROADS

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A few words about the author(s):

Student of the Gdańsk University of Technology fascinated by the chemistry of polymers and by the metalloorganic chemistry. Full of enthusiasm to share my thoughts and insights.

Abstract:

Bitumen is characterized as a black, highly viscous and sticky liquid form of crude oil, commonly called as asphalt. Bitumen is one of the oldest known engineering materials used as sealant, grease or waterproofing agent or pavement and road binder. Since chemical, mechanical and physical properties of bitumen might be very various depend on place of the crude oil sources and refinery processes, it is crucial to modify the properties of neat bitumen to obtain product with desirable and repeatable properties. Modification of the neat bitumen can be conducted either by chemical reaction or mechanical mixing of bitumen with polymer modifiers. Polymer modified bitumen (PMB) can be characterized by higher stiffness, higher cracking resistance at low temperature or longer fatigue exposition time. Improved rheological and mechanical properties are in tandem with low price and high diversity of types of polymer modifiers. However, a dozen of types of pavements and roads have different demands on capability and appearance of the bitumen. During the presentation, polymer chemistry and bitumen modification approaches will be shown in tandem with the relationship between type of polymer and forces present in polymer modified bitumen. Moreover, future prospects and possibilities will be discussed.

Keywords:

polyolefins, functionalized polyolefins, bitumen, modification

ADJUSTING THE DIFFICULTY LEVEL OF REAL-TIME GAMEPLAY FOR MOBILE GAMES USING PSBGEN TECHNOLOGY

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A few words about the author(s):

S.Szumski is a programmer with 15 years of experience in mobile games. Professionally associated with Vivid Games as a senior programmer. Engaged in developing Real Boxing 2 for iOS and Android on Unreal Engine 4. The languages he uses: C++ and Java.

Abstract:

The presentation "Adjusting the difficulty level of real-time gameplay for mobile games using PSBGEN technology" presents the theoretical assumptions, the result of the work and how the algorithms were implemented, as well as the results of the PSBGEN project. It is discussed how we define the difficulty level in games, its impact on the player and the perception of the game itself. The next aspect is the determination of the level of difficulty and the definition of how this can be done. The audience will learn also what is a learning curve, a general trend curve, a forgetting curve and how these curves define the dynamics and direction of difficulty level changes during gameplay. Also discussed is a naive algorithm for determining the base difficulty level.

The next part of the presentation includes information on how our system works, what data can be collected from players, and how they are further processed to result in information about what difficulty level should be set for a particular player. It is also presented how to configure the system. The project in question was carried out with the financial support of the European Regional Development Fund under Measure 1.2 "Sectoral R&D programs R&D" Operational Program Intelligent Development 2014-2020.

Keywords:

game difficulty, adjust difficulty of level to the player, learning curve, game development, procedural generation

GTF – GAME TESTING FRAMEWORK

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A few words about the author(s):

Jakub Waszak works as a mobile game tester at Vivid Games.

Studied Humanities 2.0 at Kazimierz Wielki University in Bydgoszcz, after which joined Vivid Games. He develops testing skills and focuses on a game design area.

Abstract:

Testing games is a highly manual process, which, due to its inherent repetitivity, very often becomes boring and mentally draining if, and when, done for a long period of time. A Game Testing Framework, or GTF in short, is a project which was developed by Vivid Games S.A. a few years ago, with a goal to solve this issue by providing a way to automate the most repetitive scenarios like stability, performance or localization testing. The most important project results are a comprehensive online system where users can log in and automate any repetitive game-testing scenario using a scenario editor where tests are implemented using Python language, and a so-called "device farm", an IT infrastructure composed of a number of devices from both iOS and Android families, which can be used to automate the tests the system is working on, also available online.

Keywords:

mobile game, gameplay, automation, testing

THE CONCEPT OF AN ENERGY-SAVING MODULAR HYDRAULIC DEVICE THAT INCREASES WORK SAFETY AND REDUCES THE LABOR CONSUMPTION OF BUILDING LARGE-SIZE GROUND STRUCTURES IN FIELD CONDITIONS

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A few words about the author(s):

Deputy head of design department in PONAR Wadowice. PhD student of Joint Doctoral School at the Silesian University of Technology. 10 years of expirience as industial hydraulic designer, responsible for new projects and a team of designers.

Abstract:

The thematic scope of the work includes issues of power hydraulics, energy efficiency and safety of machines as well as issues of devices for construction works of large-size structures. The project is implemented in a joint doctoral school and the PONAR Wadowice company as part of the 6th edition of the "Implementation Doctorate" program. The purpose of the work is to create an energy-saving, modular hydraulic device that increases work safety and reduces the labor intensity of the process of building large-size structures in field conditions. The presentation consist the concept of implementing a new technical device. When lifting the structure, the hydraulic system maintains a constant oil flow rate with dynamic pressure changes, maintaining the synchronous movement of the actuators. After reaching a predetermined level, the device must support the entire structure so that construction workers can start the next stage of construction. The designed device, under which research is in progress, would comprehensively support construction companies and actually increase the safety of performed works. The device is powered by a diesel power generator, an important aspect of research work will be the reduction of CO2 emissions by increasing the efficiency of the device and increasing the precision of work. The advantage of the project is its complexity. Optimization of the design in terms of product life cycle, durability and ergonomics.

Keywords:

industial hydraulics, modular machines, energy efficiency, machine safety, field construction

ABSTRACTS OF
POSTERS

TECHNICAL SCIENCES

AMBIDENTATE LIGANDS AS PLATFORMS FOR EFFICITNE SYNTHESIS OF PD-BASED METALOSUPRAMOLECULAR CAGES

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A few words about the author(s):

Agnieszka Bajer is a 5th year master's student at the Faculty of Chemistry of Adam Mickiewicz University in Poznań. She is currently writing her master's thesis in the Department of Synthesis of Functional Nanostructures.

Abstract:

Ambidentate ligands can be described as organic structure possessing two different types of coordination unit within single molecule. These features enables coordination of two different metal ions, which can directly affect the properties of obtained complexes as well as is further application. In current research, we focused on a β-diketone ligand containing terminally located pyridine units in order to assemble cage-like architectures. This will be possible due to the peculiar geometry of the proposed ligands, called "banana-shape", widely used in the synthesis of sophisticated metallosupramolecular architectures. Each of the coordination units play an important role in cage assembly. Pyridine units enables coordination of square-planar metal ions (Pd^{2+}, Pt^{2+}), forming positively charged cage. On the other hand the β-diketone group provides the possibility of post-modification, including the introduction of additional functional groups with specific properties (sensing, catalytic etc.). Such obtained cages are of great interest due to their application potential, including storage or transport of guest molecules, selective detection/separation of analytes as well as efficient catalytic processes.

Keywords:

ambidentate ligands, β-diketonate complexes, coordination cage

CHARACTERIZATION OF MR FLUID WORKING IN PINCH MODE USING FINITE ELEMENT METHOD

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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:

Magneto-rheological (MR) fluids belong to the group of intelligent materials whose rheological characteristics can be easily controlled by an applied magnetic field. MR fluids are composed of a carrier fluid and active particles suspended within it, e.g. iron oxide or cobalt oxide particles. The most common carrier fluids are silicone oils, chlorinated paraffins or hydrocarbon oils. A characteristic property of MR liquids is large changes in viscosity when a relatively small magnetic field is applied. This phenomenon is related to the change in the orientation of the active particles along the magnetic field lines forming characteristic chains. Depending on the configuration of the magnetic field in the device, we can identify four modes of MR fluid operation: flow, shear, squeeze and pinch modes. Particular attention should be paid to the pinch mode, which has not yet been widely described in the literature. Due to this, the aim of the presented work was to develop and characterise a prototype valve operating in pinch mode. The prototype was designed using the finite element method (FEM). Then, the influence of selected parameters such as the MR gap width and the variable number of coils on the value of magnetic induction in the valve channel was verified.

Keywords:

MR fluids, pinch mode, FEM, magnetic induction

ATTACK GRAPHS

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A few words about the author(s):

Analysis of attack graphs enables the most critical vulnerabilities and attacks to be identified, allowing appropriate security measures to be adjusted to minimise the risk of attack and increase the overall resilience of the system to attacks.

Abstract:

Attack graphs are a tool for modelling and analysing potential threats and attacks on information systems. Attack graphs allow the visualisation of complex relationships between different vulnerabilities and attacks, making it easier to identify the most critical threats.

An attack graph consists of vertices and edges, where vertices represent systems or services and edges represent potential attacks or threats. Each vertex is assigned a certain risk value or threat level and each edge has a certain probability of attack or threat success.

Analysis of attack graphs enables the most critical vulnerabilities and attacks to be identified, allowing appropriate security measures to be adjusted to minimise the risk of attack and increase the overall resilience of the system to attacks. Attack graphs are particularly useful for large and complex IT systems where it is difficult or impossible to identify all vulnerabilities and threats manually.

Keywords:

security, analysis, networks, assessment

USE OF CLUSTERING FOR THE SALESMAN PROBLEM

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A few words about the author(s):

Leszek Kowalik is a graduate of the Silesian University of Technology in Gliwice. He holds a PhD in technical sciences. Stanisław Kowalik is a graduate of the Jagiellonian University (mathematics) and the Silesian University of Technology in Gliwice.

Abstract:

The salesman is to visit n cities. The order of the cities must be arranged so that the road is the smallest. When the number of cities is large, there are trillions of possible permutations of cities. Cities are divided into groups that are close to each other. We use the clustering method for this. The idea behind the calculations is that in small clusters it is easier to find the shortest route connecting individual cities. Matlab has a ready CLUSTER procedure and we use it to create city groups. The order of clusters, i.e. the order of connecting individual sections of the route, should be determined in advance. In addition, you must specify the start city and end city for each cluster. These cities should lie at the junction of clusters. These are places where clusters connect. In each group of cities (in a cluster) we find the shortest route. We use iterative methods to find the shortest path in a cluster. Then we combine these routes into one route for the seller. This is an approximate solution to the seller's problem.

Keywords:

clustering, salesman, route, matlab

DETERMINATION OF MACROELEMENTS IN TAP WATER IN THE UPPER SILESIAN REGION

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A few words about the author(s):

The authors of results are members of a team working in the Laboratory of the Silesian University of Technology. J. Kluczka (project supervisor) and P. Dydo are academic researchers. The rest of the authors are students at the Faculty of Chemistry.

Abstract:

The quality of water and its suitability for consumption has evolved with the progress of civilization, and nowadays, due to its scarcity and the existing contaminants in water, it plays a foreground role in life on Earth. Drinking water consumed by people affects their health and well-being, so it is significant to issue to know the constituents in water, especially the macroelements. Macroelements are the main elements with the highest concentrations in the waters concerned. In the case of tap water in Upper Silesia, most of the watercourses come from surface waters such as Goczałkowice and Dziećkowice reservoirs. This paper presents the results of a study on the content of ions i.e. Ca^{2+}, Mg^{2+}, Na^{+}, K^{+}, Cl^{-} and SO_4^{2-} in tap water in the Upper Silesian Agglomeration. The aim of the study was to analyze water samples taken from 20 residential units located in Upper Silesia. The concentrations of selected ions and the pH of water were determined. The conclusion of the study is high fluctuations in concentrations of most macroelements are observed. Determination of macroelements was carried out using two techniques: optical emission spectroscopy (ICP-OES) and ion chromatography (IC).

Keywords:

macroelements, tap water, drinking water, optical emission spectroscopy determination, ion chromatography

MULTIFUNCTIONAL THERAPEUTIC IN THE FIGHT AGAINST DISEASES OF CIVILIZATION – TRI-ELEMENT PRODRUGS

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A few words about the author(s):

Second year master's degree Chemical Technology student at the Poznan University of Technology and intern at the Institute of Bioorganic Chemistry PAN, participant in international workshops on biomedical engineering and nanotechnology.

Abstract:

From the 19th century, the sudden increase in the prevalence of diseases forced the search for solutions that were initially only supposed to eliminate the side effects of selected diseases.

With the development of medicine and pharmacy, research on innovative therapeutics began, which in a precise and strictly defined way was supposed to remove the problem in the morphological or physiological scope.

The answer is prodrug therapies, which rely on the introduction of a derivative of the active substance, which undergoes biotransformation in the target organ. Tri-element prodrugs, otherwise known as tripartite prodrugs, consist of several potential medicinal substances. They can act as poisoning, stimulating cell growth, enzymatic blocking or accelerating intercellular transport. A large part of them is used in the prevention of cancer, due to the possibility of close interaction of the therapeutic with DNA molecules.

However, despite such a revolutionary and precise approach, these compounds require long-term clinical and laboratory studies to determine how they react with biological material. Tri-element prodrugs are therapeutic agents that in the future may solve many problems of the modern world.

Keywords:

tri-element prodrugs, piwampycilin, cDDP, disease of civilization, specific therapy

PREDICTING THE NUMBER- AND WEIGHT-AVERAGE MOLECULAR WEIGHT OF A POLYMER USING A NEURAL NETWORK

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A few words about the author(s):

The corresponding author's research interests include polymer chemistry.

Abstract:

In the present study, an MLP type neural network was used to predict the values of the number- and weight-average molecular weight of a polymer. The input parameters of the network were the values of the reaction kinetic constants and the monomer conversion. The data set required to train and test the neural network was generated using the Monte Carlo method. The developed model of the copolymerisation process consisted of initiation and propagation reactions. The results obtained indicate that the designed neural network, based on the given input parameters can predict molar mass values close to the simulation values.

Keywords:

neural networks, monte carlo, polymerization

MAGNETIC CONTROL OF A STEERABLE GUIDEWIRE UNDER ULTRASOUND GUIDANCE USING MOBILE ELECTROMAGNETS

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A few words about the author(s):

Anna Shysh is a first-year bachelor's student at University of Lodz at the faculty of mathematics and computer science.

Abstract:

More and more people suffer from vascular diseases such as Atherosclerosis, Peripheral Arterial or Venous Diseases because of society ageing and obesity increase. Endovascular surgery is innovative and more beneficial technique, that is used to clear blocked blood vessels. Unfortunately, it is hard to perform outside the patient's body to reach winding zones. Also, it exposes health-care teams to high-dose radiation. During such operations fluoroscopy is used for continuous X-ray image, that affects patient and medical crew. Because of aforementioned reasons people started looking for new solutions. Recently researches had offered potential cure in the form of magnetically steerable devices under ultrasound guidance and magnetic actuation systems. Ultrasound images are considered safe because there is no ionising radiation exposure.

Using surgical robotics approach, catheters and guidewires promise better remote controllability and more efficient steering that leads to expanding the possibilities of less invasive surgeries.

Keywords:

magnetic actuation, steerable guidewire, electromagnet, micro-robot

DESIGN OF AN IT SYSTEM FOR DATA PROCESSING IN THE SHEET METAL CLINCHING OPERATION IN THE MANUFACTURING OF ROOF ACCESSORIES

Jakub Majda (1), Adrian Mróz (2), Przemysław Zawadzki (1)*

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A few words about the author(s):

Jakub Majda – specialist in the impementation of new products and technology. Adrian Mróz – an expert in field of materials engineering. Przemysław Zawadzki – specialist in industrial computer science.

Abstract:

The aim of the work was to design and verify an IT system for collecting and analyzing data in the operation of sheet metal clinching in the process of manufacturing elements of roof communication and snow protection systems. As part of the work, the structure of the IT system was developed, and an experimental stand for the clinching operation was built, equipped with sensors for measuring the thickness of the input material and tools for determining the volume of the deformed material at the joining point. The system has been equipped with an HMI panel that allows for ongoing control of the values from individual sensors. As part of the tests, a series of clinching operations were carried out, verifying the correctness of process data collection in the system.

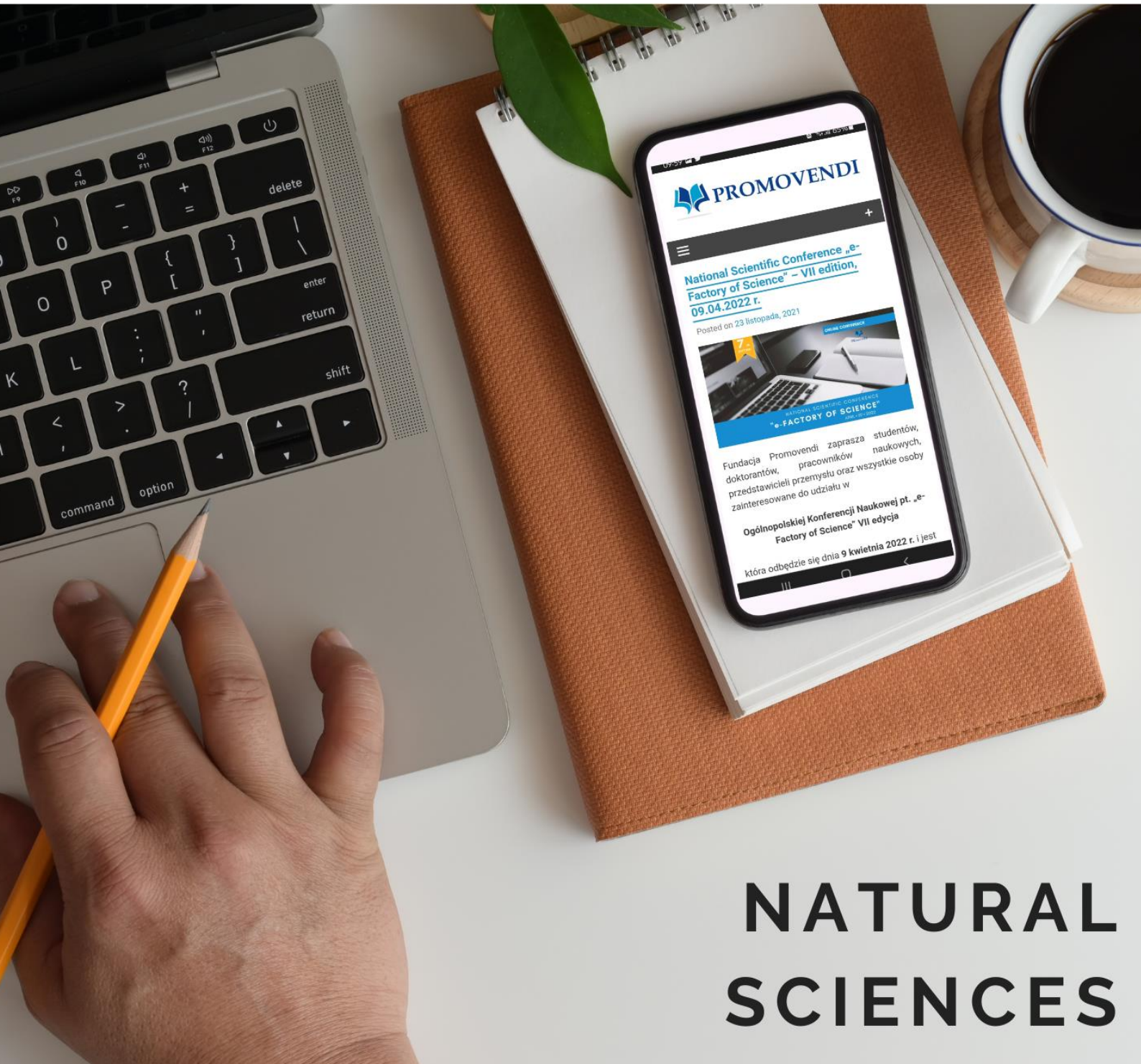
The research was carried out under the project no. POIR.01.01.01-00-0832/21, co-financed by the National Center for Research and Development under the European Regional Development Fund under the Smart Growth Programme.

Keywords:

SCADA system, process data acquisition system, sheet clinching process

ABSTRACTS OF

PRESENTATIONS



NATURAL SCIENCES

GLYPHOSATE-INDUCED ALTERATIONS IN THE GALANIN-LIKE IMMUNOREACTIVE ENTERIC NEURONS IN THE PORCINE SMALL INTESTINE

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A few words about the author(s):

My name is Stanisław Ciechanowski and I am a 2nd year student of Veterinary Medicine at the Faculty of Veterniary Medicine at the UWM in Olsztyn. I belong to scientific club of clinical physiology at my faculty. I am keen on music and fantasy books.

Abstract:

The present study was created to establish the effect of glyphosate supplementation on population of galanin-like immunoreactive (GAL-LI) intramural neurons in the porcine small intestine. Glyphosate is the main active component of Roundup. Glyphosate-based herbicides (like Roundup) have been one of the most intensively used pollutants worldwide and food products containing glyphosate are an essential component of human and animal diet. Previous studies suggest that its may be carcinogenic. The obtained results suggest that GAL may play an important role in the protection of enteric nervous system neurons against the harmful effects of glyphosate.

Keywords:

glyphosate, galanin, enteric nervous system, pig

PLANT AND MICROALGAE-DERIVED COMPOUNDS AS FUNCTIONAL ADDITIVES IN HYDROGELS IN FOOD APPLICATION

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A few words about the author(s):

Authors are working on interdisciplinary research in the field of biotechnology and bioprocess engineering. Currently concerning preparation and practical application of hydrogel materials with different functionalities.

Abstract:

Due to increased consumer awareness of food additives, an idea known as a ‘clean label’ has emerged. It forces food manufacturers to utilize natural substances and as few ingredients of the final product as possible. The plant or microalgae-derived raw materials can replace chemically synthesized compounds and improve the quality or shelf life of the product. Moreover, mixing natural blends and hydrogels introduces new possibilities for creating functional food with a high concentration of protein, polyphenols, antioxidants, vitamins, and micro and macroelements. The study is focused on hydrogel formulations with bioactive ingredients in the dried form: acai, matcha, maca, moringa, and the microalgae chlorella and spirulina in various combinations. Importantly, majority of applied combinations showed antimicrobial properties for two tested types of bacteria: Staphylococcus aureus (G (+) bacteria) and Escherichia coli (G(-) bacteria). Samples also performed well during compression testing and 10-day storage test. Thus, the developed biofunctionalized hydrogel formulations possess suitable properties to be used as animal product substitutes or edible coatings.

Keywords:

edible hydrogels, functional food formulations, bioactive compounds, food additives

ASSESSING THE EFFECTS OF GLYPHOSATE SUPPLEMENTATION ON THE POPULATION OF IMMUNOREACTIVE (LI) VIP-TYPE INTESTINAL NEURONS IN THE PORCINE ILEUM

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A few words about the author(s):

My name is Adrianna Michniewicz and I'm a fourth year student of veterinary medicine at the Faculty of Veterinary Medicine at UWM in Olsztyn. In my free time, I am a member of scientific club in clinical physiology and pathomorphology at university.

Abstract:

The aim of the present study was to investigate the effects of glyphosate supplementation on the population of immunoreactive (LI) VIP-type intestinal neurons in the porcine ileum. VIP, or vasoactive intestinal peptide, is an inhibitory neurotransmitter known for its neuroprotective properties. . Glyphosate, is a component of organophosphate herbicides, its mechanism of action is to inhibit the activity of the enzyme 5-enolpyruvate-3-phosphate synthase (EPSPS) , a key enzyme of the shikimate pathway, found in plants, fungi and microorganisms. Because this acid pathway does not occur in animals, glyphosate was for many years considered non-toxic to animals and humans. However, numerous toxicological studies have shown adverse effects of glyphosate exposure in many living organisms. Previous studies have confirmed its teratogenic and carcinogenic effects. Despite, many studies, the effects of glyphosate on the gastrointestinal tract of mammals, has not yet been fully evaluated.

Keywords:

glifosat, VIP, pigs,roundup, digestive tract

SELENIUM AND VITAMI E DEFICIENCY IN CATTLE – A CASE REPORT

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A few words about the author(s):

My name is Adrianna Michniewicz and I am a fourth year student of veterinary medicine at the Faculty of Veterinary Medicine at UWM in Olsztyn. In my free time, I am a member of a scientific club in clinical physiology and pathomorphology at university.

Abstract:

The aim of this article is to present a clinical case describing a calf given a post-mortem examination that showed signs of nutritional muscular dystrophy, caused by a deficiency of selenium and vitamin E. These compounds are essential nutrients in cattle nutrition, and the presented clinical case shows what consequences their deficiency can cause. In the presentation, I would like to highlight, the numerous aspects of the physiological role of selenium and vitamin E, covering many interactions, including their very important antioxidant effects on the body, the protective functions of these compounds against tissues, and many others. Due to the widespread low concentration of selenium in Polish soils and the deficiency, vitamin E in nutritional rations, it is extremely important to know about the abnormal content of these compounds.

Keywords:

selenium, vitamin E, cattle, deficiency, muscle atrophy

XENOBIOTICS AND MICROPLASTICS – TOXIC EFFECT ON ALGAE

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A few words about the author(s):

I am a student of the fourth year of doctoral studies, biological sciences. I am interested in issues that mainly concern pollution in the aquatic environment, affecting the organisms living in it, mainly algae.

Abstract:

Xenobiotics and microplastics are present in various forms in water, air and soil. Xenobiotics are substances foreign to a given ecosystem and can be harmful to the living organisms. These can include various types of chemicals, pharmaceuticals, pesticides, plastics and microplastics, industrial wastewater and waste.

Microplastics are small pieces of plastic less than 5 mm in size. It can come from a variety of sources, such as packaging, clothing, and the breakdown of large plastic particles. The most common polymers found in seawater are polyethylene (PE),polypropylene (PP), polystyrene (PS), polyvinyl chloride (PVC),polyamide (PA),polyethylene terephthalate (PET) and polyvinyl alcohol (PVA). Plastics also contain additional substances, for example bisphenol A (BPA), which, when released into the environment, can cause hormonal disorders of aquatic organisms, including algae. The presence of this type of micropollutants is a significant problem in the aquatic environment, affecting the living organisms. In addition to the toxicity of the polymers, microplastics are capable to interact with other pollutants, including pesticides.

Microplastics can also interact with algae, through physical damage: it can mechanically damage the algae, which can impair their function and make them more susceptible to pathogens.

Issues related to the very large number of pollutants and the interaction of these compounds with microplastics, there is a need to undertake research in this field.

Keywords:

xenobiotics, microplastics, algae

EFFECTS OF DRUG INDUCED ENVIRONMENTAL POLLUTION ON FLORA AND FAUNA

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A few words about the author(s):

I am a fourth year biotechnology student at the Maria-Curie Skłodowska University in Lublin. I am a member of the Student Scientific Club of Biochemists where I build up my passion for science.

Abstract:

The aim of this paper is to familiarize with the effects of drug induced environmental pollution on flora and fauna.

A xenobiotic is a chemical substance, not included in or synthesized by living organisms. Xenobiotics are primarily drugs and poisons. Non-steroidal anti-inflammatory drugs, such as ibuprofen, acetylsalicylic acid or diclofenac, are among the most frequently purchased over-the-counter drugs, which account for 26% of the pharmaceutical market. When they get into the natural environment, they affect flora and fauna in a negative way: they change clams' immunological system, cause an increase in the disproportion in the number of females and males fish, cause an increase in the number of bacteria strains resistant to antibiotics and many more. There are a lot of methods of removing the pharmaceuticals from the environment but at the moment none of them are fully effective.

Keywords:

flora & fauna, pollution, anti-inflammatory drugs

THE EFFECT OF NATURAL AND BIOLOGICAL PESTICIDES ON DEGRADATION OF SYNTHETIC PESTICIDES

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A few words about the author(s):

I work at University of Rzeszow, Institute of Biotechnology. I am interested in the biodegradation of persistant pollutions.

Abstract:

The Integrated Plant Protection (IPP) is a method for protecting plants against harmful organisms, giving priority to the use of non-chemical methods: biological, physical and other non-chemical methods ensuring protection against pests. At the same time, it uses the accumulated knowledge on biology and harmful effects of those organisms, as well as on antagonistic microorganisms, to safely remove pests from the environment. The use of natural and biological agents in environmental protection is associated with a number of advantages, including the prevention of development of pest resistance to chemical PPPs, an increase in yield, an increase in biodiversity, and faster decomposition of toxic pollutants. The effects of these agents result, amongst the others, from the phenomenon of antibiosis, competing for space and nutrients, antagonism, and stimulation of host's natural resistance mechanisms. Biological pesticides contain microorganisms such as bacteria, yeasts or fungi and other natural substances as active substances. Microorganisms can accelerate the degradation of chemical plant protection products and various persistent environmental pollutants, present in the environment and agricultural products. The most important and most perspective in Integrated Pest Management (IPM) are Bacillus spp. and Trichoderma spp. because their effectiveness in pesticide degradation and the large number of commercial preparations containing these microorganisms available on the market.

Keywords:

pesticides, effective microorganisms, biodegradation

ASSESSMENT OF THE AGRICULTURAL PRODUCTION SPACE OF CEREALS IN THE DISTRICTS OF THE PODKARPACKIE VOIVODESHIP IN 2010-2020 YEARS

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University of Rzeszow, College of Natural Sciences, Institute of Agriculture:
(1) Environmental Protection and Management, Departament of Plant Physiology and Biotechnology
(2) Environmental Protection and Management, 2nd degree studies in Agriculture
(3) Environmental Protection and Management, Departament of Plant Production

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A few words about the author(s):

I graduated biotechnology at the University of Silesia in Katowice. Currently, I work at the Department of Plant Physiology and Biotechnology of the University of Rzeszów.

Abstract:

The Podkarpackie Voivodeship has generally favorable natural conditions for agricultural production. In order to assess the agricultural production space of cereals in the Podkarpackie Voivodeship, an data analysis of the National Agricultural Census was carried out for 2010 and 2020 y. In 2010 y., 723.6 thous. ha was in the possession of agriculture farms. Whereas, in 2020 y. there were a decrease tendency observed. In the structure of land use in 2010-2020, the area for sowing was dominated. An increase of the area for sowing in 2020 was observed in the: Jarosławski, Krośnieński, Leżajski, Lubaczowski, Przemyski, Przeworski, Ropczycko-Sędziszowsko and Tarnobrzeski districts. Whereas in 2010 y., the highest values of sowing of cereals in the total area of sowing were recorded in in the Mielecki, Łańcucki, Ropczycko-Sędziszowski and Kolbuszowski districts. Equally high values, were obtained for the Mielecki, Kolbuszowski, Stalowo-Wolski and Tarnobrzeski districts in 2020 y. Simultaneously, in the 2010-2020 y. an increase of the medium-sized area of agricultural land in the agriculture farm was observed. The increase in the production of most cereal products affects the development of the chain supplies and investments in cereal processing. Despite the increase in the number of larger agriculture farms, the structure of agricultural farms of the Podkarpackie Voivodeship still remains crushed, which affects the logistics of products from the farmer to the recipient.

Keywords:

Podkarpackie Voivodeship, National Agricultural Census, chain supplies, logistic

INFLUENCE OF C2 AND C9 GENE POLYMORPHISMS ON MASTITIS RESISTANCE IN BLACK-AND-WHITE HOLSTEIN COWS

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A few words about the author(s):

The authors of the abstract are engaged in research into identification of the most important SNPs that could be used for the selection of marker assisted dairy cattle.

Abstract:

Bovine mastitis is an inflammation of the mammary gland caused by the invasion of pathogens that enter the udder through the teat canal. Mastitis is one of the most common diseases of dairy cows and generates high costs due to a decrease in milk production, treatment of the disease or the need to early culling sick animals. The response to the ongoing inflammation consists in the activation of individual cells of the immune system and other components including the complement system. The components of the complement system are protein complex, and their associated receptors present in plasma and other body fluids. Activation of complement leads to robust and efficient proteolytic cascades, which terminate in opsonization and lysis of the pathogen as well as in the generation of the classical inflammatory response through the production of potent proinflammatory molecules. The C2 and C9 genes encode the complement elements of the same name. C2 and C9 are involved in classical activation of the complement system. In addition, C9 is a common element for each of the three pathways of complement activation. The aim of the study was to determine whether there are associations between polymorphisms of selected genes and mastitis resistance in Polish Holstein-Friesian Black-and-White cattle.

Keywords:

bovine, mastitis, polymorphism

POLYMORPHISM IN EXON 4 OF THE SLC35A2 GENE IN REFERENCE TO THE MILK YIELD IN POLISH HOLSTEIN-FRIESIAN CATTLE

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Abstract:

Expanding the knowledge of the transcriptional and post-transcriptional regulation of genes encoding proteins involved in lactose in the mammary gland could affect both the milk characteristics and the health status of dairy cattle. The SLC35A2 encodes the X-linked UDP-galactose transporter 2 which is involved in glucose transport and regulation of lactose synthesis.

The objective of this study was to investigate associations between genotypes of polymorphisms in exon 4 of the SLC35A2 gene and milk yield in Polish Holstein-Friesian cattle. In this study were analyzed six polymorphisms (rs437633966, rs477238079, rs460343714, rs452180575, rs471192683 and rs132920701) responsible for missense mutations. Single nucleotide polymorphisms were identified using the PCR-RFLP method. Statistical analysis was aimed at estimating the effect of individual genotypes on analyzed milk production trait. Significant associations ($p < 0.05$ and $p < 0.01$) were found between five SNPs and milk yield.

This study is a prelude for deeper investigations into the linkage with milk production traits and inflammatory responses in dairy cattle. The obtained results could provide useful information about the potential genetic markers for the genetic improvement of milk production traits in dairy cattle.

Keywords:

SLC35A2, lactation, single nucleotide polymorphisms, Polish Holstein-Friesian cattle

ABSTRACTS OF
POSTERS

NATURAL SCIENCES

INTORDUCTION TO MICROBIAL AND SUSCEPTIBILITY IDENTIFICATION WITH ML METHODS

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Abstract:

Microorganisms that are widespread in nature and the human body over time have learned to avoid our treatment methods, leading to a worrying epidemiological state.

Diseases caused by microorganisms are becoming more frequent and difficult to treat, leading to the development of new methods for their identification. Thanks to the development of artificial intelligence (AI), including machine learning (ML), we are getting closer to fast, accurate and economical identification of microorganisms as well as their sensitivity to antibiotics, for example from clinical samples, thanks to which patient treatment will not only take place faster, but will be individually tailored to of the organism that caused the disease.

Keywords:

machine learning, microbiology, AMR, identification, artificial interlligence

SURFACTANTS AND THEIR IMPACT ON THE NATURAL ENVIRONMENT

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Nikola Dłużniewska is a student in the field of quality and product development at the University of Economics and Business in Poznan. She works in the Student Scientific Association NEXUS, where she develops its interests related to ecology.

Abstract:

Surfactants are otherwise known as amphiphilic surfactants, having the ability to lower the surface tension at the interface of a liquid system. Based on the nature of the hydrophilic group, surfactants are divided into: anionic, cationic, non-ionic and amphoteric. These are chemicals that are used in household and industrial cleaning products, disinfectants and personal care products. Surfactants are widely used because of their ability to reduce surface tension and their ability to dissolve water-insoluble compounds.

Annual global consumption of surfactants continues to increase day by day. The size of the global surfactant market is more than 18 million tonnes per year. Surfactants are considered one of the major and most undesirable pollutants detected in the environment. An analysis of the literature has shown that approximately 60% of surfactants used by humans enter the aquatic environment. Domestic detergents are among the most influential aquatic pollutants, with an estimated 2 billion kg per year of production worldwide. Surfactants are harmful to humans, fish, and vegetation.

The aim of this study was to review literature sources on surfactants, their structure, classification and properties. The main uses of surfactants and the environmental risks associated with them, such as the accumulation of surfactants in the environment and biodegradation, were also analysed.

Keywords:

surfactants, environment, environment protection, ecology

A NEW FOLIAR PREPARATION THAT STIMULATES THE GROWTH OF COMMON WHEAT (TRITICUM AESTIVUM L.)

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Abstract:

It has been proven that foliar fertilization can compensate an insufficient nutrition from the soil, as long as the foliar surface is well developed and the fertilizer is added in a apropriate concentration. Moreover, waste products of natural origin such as collagen or keratine can be used with much higher efficiency to replace some of the synthetic nutrients. Biostimulators are that kind of products, having the role of promoting the growth, the development and the productivity of plants. The aim of this work is to develop the composition of a new biostimulating preparation with double action, providing protection against fungal pathogens and stimulating plant growth. The novelty is the combination of collagen and keratin hydrolyzate obtained from tannery waste and selected bioactive substances. The results of preliminary tests in grow boxes clearly showed that the combined use of selected biostimulators with a fungicide increases the yield of winter wheat. In the case of this plant species, all the tested preparations increased the length of seedlings and the fresh and dry weight of shoots.

Keywords:

biostimulats, protein hydrolyzate, wheat

MOTIVATOR AND DEMOTIVATOR AS A STRESS FACTOR IN WORKING WITH AFRICAN PORCUPINE AT THE ZOO

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PhD Eng Dominika Gulda – researcher and creator of medical behavioral training programs for wild species animals kept at the zoos. Anna Górska – zookeeper in section of small mammals at the zoological garden.

Abstract:

The natural defense mechanisms of the African porcupine (Hystrix africaeaustralis) in response to the threat, the animals are ruffing quills. Porcupine shake quills, produce a loud sound. The endangered animal turns to the predator with its back. These animals move well backwards, turn quickly and attack the predator with their body and tail. The presentation of such an attitude and its intensity (measured as duration, rate of attack, level of sounds made by the animal) was described as stress.

The aim of the study was to analyze stress levels by assessing responses and presenting porcupines' natural defenses in response to unknown environmental stimuli.

Keeping animals in captivity is associated with the absolute provision of basic welfare needs, but also the need to combat boredom by stimulating animals to exhibit species-specific behavior.

The motivator was extra food, additional enrichment of the environment, enabling the animal to explore a new area. Demotivator indicated limitation of using the enclosure, no extra food.

Both motivation and demotivators are equivalent in eliminating too high levels of stress in animals kept in zoos, help fight apathy and properly implemented in the life of animals create a substitute for life in nature.

Determining the level of stress of skittish animal is essential in safe work with them.

Keywords:

African porcupine, zoo, wild animal behavior, welfare

THERMOGRAPHIC ASSESSMENT OF THE LEVEL OF ADAPTIVE STRESS OF THE SOMALI WILD ASS – CASE REPORT

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Abstract:

The Somali wild ass (Equus africanus somaliensis) is a critically endangered species. The stallions are animals attached to the territory for which they fight with other males.

A method of differentiating the intensity of the level of reactivity into a change in the environment of a year-old Somali wild ass stallion is described, which was transported between zoos and placed on a enclosure combined with a zebra male.

During the first 30 days, a thermal imaging camera recorded dynamic changes in the thermal temperature of the animal's body surface to create individual heat maps. Thermograms were divided into records of stay in the stable, feeding behavior, behavior in the enclosure, interspecies interaction, play and rest. The result is 180 thermograms in 6 categories.

During the thermal assessment, an increase in thermal emission in the distal parts of the limbs, the head and rump of the animal relative to the back, belly was clearly noted.

This is a mechanism of thermal reaction based on the "run or flight" instinct, which, through the rapid expansion of the vessels of the limbs, skeletal muscles, allows the animal to react violently.

An interesting fact are thermograms, whose intensity and growth rate of surface thermals, as well as their almost immediate return to the pre-reaction value, is above average compared to other equidae. Nevertheless, this is only an introduction to the research and observations for a larger number of individuals should be repeated.

Keywords:

Somali wild ass, termographic, zoo, thermograms

FUNGI DEGRADING PLASTICS – CHARACTERISTICS OF SELECTED SPECIES AND PROSPECTS FOR THEIR USE IN COMBATING ENVIRONMENTAL POLLUTION

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I am a fourth-year student of biotechnology at Maria Curie-Skłodowska University in Lublin. I am an active member of science clubs and I am interested in biotechnology in general, especially in the field of molecular biology and microbiology.

Abstract:

The rapid increase in the production and consumption of plastics is generating an enormous amount of waste, and its effective biodegradation exceeds society's technological capacity. Much of this waste accumulates in forests, seas or oceans, posing a serious threat to the health and life of living organisms and disrupting the functioning of ecosystems. Consequently, scientists around the world are developing effective biodegradation methods using, among other things, fungi. One polymer is polyurethane (PUR), which can be biodegraded by the endophytic fungus Pestalotiopsis microspora (Speg.) G.C. Zhao & Nan Li. It uses PUR as a carbon source while producing the enzyme serine hydrolase, which probably catalyses the PUR degradation reaction. This organism is able to degrade polyurethane in just a few days. Another interesting example is the white wood rot fungus, Bjerkandera adusta (Willd.) P. Karst, which is able to degrade high-density polyethylene (HDPE) in the presence of a lignocellulosic substrate that accumulates the production of the enzyme laccase. A number of other fungal species have also been studied for the degradation of plastics, and the results shed promising light on the prospect of biodegradation of polymers, which is particularly important in terms of minimising their negative impact on the environment. This paper aims to provide an overview of recent scientific reports on the biodegradation of plastics using selected fungal species.

Keywords:

biodegradation, fungi, polymers, enzymes

EFFECTS OF GUT MICROBIOTA ON STRESS AND DEPRESSION

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I am a fourth-year biotechnology student at the Faculty of Biology and Biotechnology at Maria Curie-Sklodowska University in Lublin. Microbiology is a fascinating field of science for me. I enjoy expanding my knowledge and sharing it with others.

Abstract:

The purpose of this study is to provide insight into the impact of the gut microbiota on stress and depression. Both stress and depression are a growing cause of disability in the world. world. One factor in the deterioration of mental health in humans may be a poor diet that negatively affects the gut microbiome. The bacteria populating the gut affect the functioning of the immune system and the central nervous system through the gut-brain axis. The gut-brain axis is involved in bidirectional communication between the gut and the brain through neural, immune, endocrine and metabolic pathways. Microbes residing in the gut produce many microbial components such as vitamins, amino acids and lipids. The neurological active substances produced by the microbiome, such as short-chain fatty acids (SCFAs) and gamma-aminobutyric acid (GABA), affect immunity and the intestinal barrier. Chronic low-grade inflammation is common in people with depressive symptoms and may be correlated with low levels of SCFAs that reduce inflammation. A thorough understanding of the relationship between the microbiome and the nervous system may support standard treatments for depression and long-term stress in humans.

Keywords:

gut microbiota, stress, depression

NEW PROSPECTS FOR COUNTERACTING REDUCED FERTILITY OF BULLS

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Students from Department of Physiology, Cytobiology and Proteomics at West Pomeranian University of Technology in Szczecin. Members of the Student Scientific Society of Animal Physiology under the supervision of Assoc. Prof. Katarzyna Michałek Ph.D.

Abstract:

One of the biggest challenges of large-scale animal husbandry is the constant improvement of the efficiency of animal production, which affects its final profitability. In recent years, a progressive decrease in male fertility has been observed, the cause of which in nearly 30% is unknown, which prompts the search for new indicators that would allow precise determination of the male's reproductive potential and would improve further reproduction. The 1D SDS-PAGE technique was used to analyse the testicles and epididymal head of Holstein-Friesian black-and-white bulls in three age groups: calves aged 5-6 weeks (n=6), bulls aged 3-5 months (n=6) and breeding bulls aged 3-4 years (n=6). Its main purpose was to find differences in the expression of proteins potentially involved in the development of reproductive organs. As a result of the conducted research, characteristic protein bands of different molecular weights were observed, the expression of which increases or decreases with the age of the animals. Selected bands were subjected to additional LC-MS analysis.

This work was funded in whole or in part by National Science Center, Poland, grant no. 2021/43/B/NZ9/00204

Acknowledgments:

The authors would like to thank all co-workers of the scientific project Opus-22 for collecting and preparing biological samples for the presented research. The authors would like to also thank Assoc. Prof. Małgorzata Ożgo Ph.D for identification of proteins using LC-MS analysis.

Keywords:

male infertility, electrophoresis, animal husbandry

NEW TECHNOLOGIES AS AN OPPORTUNITY FOR TOURISM DEVELOPMENT IN THE MIEDZYZDROJE MUNICIPALITY

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Master of Tourism and Recreation. Currently a Ph.D. student at the Doctoral School of Natural Sciences at Adam Mickiewicz University in Poznań.

Abstract:

Information and communication technologies (ICTs) are changing the way society and the economy function and are of great importance in the development of the tourism market. They are used as a marketing tool by local government units, tourism enterprises, among others, and are also a major source of information among customers of tourism services. ICT technologies, e.g.: QR codes, virtual and augmented reality technologies, preferred applications, social media can dramatically improve the functioning of the tourism market.

The use of modern ICT in the tourism market in Poland is currently not widespread. There is also a lack of strategy and a coherent concept for implementing these technologies.

The aim of the study was to make a preliminary analysis of the study area in terms of the current state and forms of tourist information, the possibility of using modern ICT in the study area, and to determine the potential interest of tourists in their introduction in the municipality.

In order to obtain reliable results, indicators of tourist traffic and tourism development dynamics were calculated first. In order to determine the potential impact of the use of new technologies on tourism development in the study area, a SWOT analysis of the introduction of new technologies was also conducted. A tourist survey was also conducted among tourists visiting the Miedzyzdroje municipality, which also included questions about new technologies.

Keywords:

tourism, Międzyzdroje municipality, new technologies, social media

Q-LEARNING: A NOVEL APPROACH TO UNDERSTANDING BIOLOGY

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Data Scientist with passion to all kinds of data and science branches.

Abstract:

Q-learning, an established reinforcement learning algorithm, has found a unique application in the field of biology. By using Q-learning to model and predict biological processes, researchers have gained new insights into complex cellular mechanisms and made progress in areas like drug discovery and personalized medicine. Q-learning discovers new analytical possibilities in many aspects such as genetic research, chemical analysis, and ecology. Providing knowledge in these aspects can facilitate related procedures and change the approach to treatment and prevention in the case of medicine. In addition, the development of QL can make scientific research methods more efficient. The advantages of Q-learning are speed, accessibility and effectiveness.

Keywords:

Q-learning, machine learning, science

INTRODUCTION TO BIOPYTHON

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Abstract:

Biopython is a powerful and widely used open-source software library for computational biology. It provides a comprehensive set of tools for processing biological data, including DNA and protein sequences, alignments, phylogenetic trees, and more. Biopython is written in Python, which makes it easy to use and extend for researchers and developers. This work provides a brief introduction to Biopython, including its key features, how to install it, and some basic usage examples.
Populatity of Biopython due to the wide range of functionality it provides for biological data analysis.
With Biopython, researchers can read, write, and manipulate DNA and protein sequences, perform translation, reverse complementation, and comparison, and extract features like annotations and GC content.
Another area where Biopython excels is phylogenetics. Biopython can construct, manipulate, and analyze phylogenetic trees using distance-based or maximum-likelihood methods.
Biopython is also useful in structural biology, where it can be used to analyze and manipulate protein structures. Biopython has tools for parsing PDB files, calculating structural properties, and visualizing structures using tools like PyMOL.
In conclusion, Biopython is a versatile and powerful tool that is essential for anyone working with biological data. With its comprehensive set of functions and modules, ease of use, and active community, Biopython is sure to remain a go-to tool in computational biology for years to come.

Keywords:

bioinformatics, biopython, programming langauges, computational biology

BIOINFORMATICS IN FOCUS

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Klaudia Lewita – student who is fascinated by nature and biology, but with a modern approach. Tymoteusz Miller – data scientist with passion to all kinds of data and science branches.

Abstract:

Bioinformatics is an interdisciplinary field of science that combines biology, computer science, mathematics and statistics to analyze and interpret biological data using computer tools. It has applications in many areas of biology, such as genetics, genomics, proteomics, metabolomics and many others. One of the key tasks of bioinformatics is the analysis of DNA, RNA and protein sequences, which makes it possible to identify genes, predict protein structure, study the evolution of organisms and many other applications. Within bioinformatics, machine learning and artificial intelligence algorithms are also being developed to analyze and interpret biological data with increasing precision and efficiency.

Keywords:

bioinformatics, biology

DO IONIC LIQUIDS EXHIBIT INDEPENDENT CATIONIC AND ANIONIC BEHAVIOUR WHEN SORBED IN A SOIL CONTAINING MICROPLASTICS?

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Abstract:

Herbicides have presented a lot of adverse effects on the environment due to their elevated mobility, volatility, or unintended acquisition of herbicidal resistance to plants. Therefore, scientists have focused much attention onto ionic liquids, a novel group of chemicals which are still a big unknown in science today.

In this research decided to investigate the behaviour and integrity of the ionic pair in the soil environment with microplastics (MNPs) which are considered pollutants. Thus, this study focuses on the behaviour of herbicidal ionic liquids with 2,4-D anion, in varying concentrations, in an OECD soil containing the microplastic (PS). Two cations were chosen, both having different hydrophobicity: choline [Chol] and [C12Chol]. Therefore, the behaviour and sorption of the anions and cations were studied in order to assess if they display independent behaviour of one another.

From the experiment, it is clear that the [Chol] and [C12Chol] display independent behaviour to the herbicidal 2,4-D anion. The integrity of the ionic liquid is not maintained during sorption in the soil. Moreover, the higher the concentration of the PS, the more the sorption of the cations increases. This means, that some substances can excessively accumulate in the soil which can cause adverse effects on the biodiversity of the soil.

The work was carried out under the OPUS 15 grant funded by the National Science Center on the basis of decision 2021/41/B/NZ9/03981.

Keywords:

sorption, microplastic, herbicides

INFLUENCE OF VINYL PHENOLIC DERIVATIVES ON THE QUALITY OF COLD-PRESSED FLAXSEED OIL WITH DIFFERENT WATER CONTENTS DURING STORAGE

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Abstract:

The research material was a commercial cold-pressed flaxseed oil with different water contents (FO-WC of 700, 1000, and 3000 ppm) stored under natural conditions (exposed to light) for 3 months at room temperature with 800 ppm of vinyl phenolic derivatives: 4-vinylsyringol (4-VS), 4-vinylguiacol (4-VG), 4-vinylphenol (4-VP). The oil samples were taken every 5-15 days and used for the assessment of their quality: acid value, peroxide value, and content of dienes.

The results indicate that the vinyl phenolic derivatives affect the course of hydrolysis and oxidation processes of the tested oils. All additives had a protective effect on the stored FO-WC of 700 ppm; but 4-VS and 4-VP were more effective. The additives significantly reduced the hydrolysis in the FO-WC of 1000 and of 3000 ppm (at least a 4% lower acid value). The oxidation in oils was varied; 4-VS and 4-VP inhibited this process in the FO-WC of 1000 ppm (at least a 6% lower peroxide value). 4-VG in the FO-WC of 1000 ppm and 4-VS and 4-VG in the FO-WC of 3000 ppm initially reduced peroxide formation, but it was accelerated after 45 days of storage. The addition of 4-VG decreased dienes formation during storage in the FO-WC of 1000 ppm, while in the FO-WC of 1000 with 4-VS and 4-VP, and in the FO-WC of 3000 ppm with 4-VS, 4-VG, and 4-VP, its formation was faster.

This study was funded by the National Science Centre, Poland (Project No. 2018/31/N/NZ9/01273).

Keywords:

flaxseed oil, water content, oxidation, hydrolysis, vinyl phenolic derivatives, storage test

INVESTIGATION OF THE EFFECT OF PROTEIN BIOSTIMULATORS ON THE GROWTH OF WINTER WHEAT USING PHYTOTESTS

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Abstract:

In modern agriculture, along with chemical plant protection products, various products classified as plant growth stimulants are used. Biostimulants contribute to better seed germination and induce biological activity of plants. One type of natural biostimulants are preparations based on collagen and keratin proteins which can be obtained from waste products in the tanning industry. It has been proven that these waste products can be used as a foliar preparation to promote plant growth. The aim of this work is to investigate the influence of protein biostimulators (collagen and keratin) on winter wheat plant growth. The results of preliminary tests in phytotest clearly showed that the use of protein biostimulators increases the yield of winter wheat. In the case of this plant species, all the tested protein biostimulators increased the length of seedlings and the chlorophyll concentrations in the leafs.

Keywords:

protein biostimulants, phytotest, collagen, keratin, wheat

FUNCTIONAL PROPERTIES AND DIRECTIONS OF APPLICATION OF HEMP OIL

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Karolina Pakuła is a second-year student in the field of quality and product development at the University of Economics and Business in Poznan. She works in the Student Scientific Association NEXUS.

Abstract:

Plant raw materials are now widely used as a major source of organic compounds of natural compounds, which are also used for medical purposes or as ingredients in various cosmetic preparations. Increasing demand and a growing market for phytopreparations have led to hemp oil being used particularly widely for its antioxidant, antibacterial and anti-inflammatory properties. Hemp oil is obtained by steam distillation of fresh or dried inflorescences, the so-called hemp panicles. Hemp oil contains approximately 58 monoterpenes and 38 sesquiterpenes, which give the product its characteristic properties and aroma. Hemp oil contains 4% γ-linolenic acid, GLA and a large amount of linoleic and α-linolenic acid, as well as an optimal ratio of omega-6 to omega-3 polyunsaturated fatty acids of 3:1. This composition makes hemp oil frequently used in the food, pharmaceutical, and cosmetic industries. Important issues in the use of hemp oil are its low toxicity and the legal aspects involved.

The aim of this paper is to present the current state of knowledge regarding the functional properties of hemp oil and methods for its extraction. In addition, the paper presents directions for the use of hemp oil in various industries.

Keywords:

fibrous concesses, hemp oil, antioxidant properties, antimicrobial properties

THE STUDY OF CORDYCEPS MILITARIS ON BREEDING HELIX POMATIA

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A few words about the author(s):

My name is Maciek and I am student of veterinary medicine. Me and my friends are interested about parasitic fungus and others.

Abstract:

Cordyceps militaris is a parasitic, ascospore-producing fungus belonging to the coryneaceae family. This fungus is a parasite of most invertebrates, affecting both adults, and their larvae. Infection occurs through the penetration of spores into the body cavity. Then it spreads inside the host's body, penetrating most organs, particularly muscles, leaving the nervous system intact. Using nutrients, the fungus develops for about 3 weeks inside the body, forming mycelium, and eventually leads to the death of the organism, in which it resides. After death, the body cavity is punctured and the rootstock (mycelium) grows to form an envelope, with further spores capable of infecting other organisms.

The aim of the research is to optimize Cordyceps growth and snail breeding conditions for the experiment.

Keywords:

Parasitic fungus

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