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7th edition

THE BOOK OF ABSTRACTS



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TECHNICAL AND NATURAL SCIENCES POSTERS

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ABSTRACTS OF **PRESENTATIONS**



**HUMANITIES
SCIENCES**



THE PROBLEM OF KNOWLEDGE REPRESENTATION IN THE THEORY OF ARTIFICIAL INTELLIGENCE

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A few words about the author(s):

Dr. Aleksander Gemel, is an assistant professor in the Department of Contemporary Philosophy at the Institute of Philosophy of the University of Lodz.

Abstract:

Since the 1950s, two main competing paradigms for modeling cognitive representations have developed in the theory of artificial intelligence. One is computationalism, which sees cognition as a computational process on abstract symbols; the second is connectionism, which tries to express it with an aid of artificial neural networks. Both approaches are insensitive to the conceptual and semantic content of mental representations. In my speech, I will try to propose a conceptual-sensitive representation model that can help (1) to solve the problem of knowledge representation in artificial intelligence systems and to (2) bridge the gap between both main AI paradigms.

Keywords:

conceptual spaces, connectionism, computationalism, knowledge representations



THE INFLUENCE OF “KNOWING THE LANGUAGE” ON THE FORMATION OF ASSOCIATIONS WITH WORDS IN FOREIGN LANGUAGES BY BILINGUAL AND MULTILINGUAL LANGUAGE LEARNERS

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A few words about the author(s):

A Bachelor's student of Cognitive Science and Information Architecture with interests in the fields of psycholinguistics, second language acquisition and multilingualism.

Abstract:

The ability to speak a language consists of numerous factors, such as different dimensions of proficiency, language use, linguistic competence, and language intuition and awareness (Jasone & Gorter, 2017, Chaffin, 1997, Gabryś-Barker, 2005, Precosky, 2011). The presented research aims to define “knowing the language” and examine how multilinguals’ abilities to speak more than one language influence their associations with foreign words. The main interest of the study was to verify whether participants who speak the same languages on comparable proficiency levels would make similar types of associations to specific groups of words. The research also aims to investigate whether perceived language proficiency and being bi- or multilingual influence the risk-taking trait based on making associations with unfamiliar words.

53 bi- and multilingual students of English Philology at the University of Silesia (Poland) participated in the study, answering three sets of word association tests (WAT). The WAT sets concentrated on the following: common English words (WAT 1), more advanced English words or English neologisms (WAT 2) and basic (A1-A2 according to CEFR) French or German words (WAT 3). Each set consisted of 20 stimulus words and two tasks assigned to each word: 1. to recognize part of speech of stimulus word and 2. to make an association with the presented word.

In the following presentation, preliminary research results are demonstrated.

Keywords:

language associations, multilingualism, language awareness, language proficiency



MODERN PRESS STATE IN BAHRAIN

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A few words about the author(s):

Arabic philology student at the Adam Mickiewicz University in Poznań. Interested in Arab emancipation movements, especially the relationship between feminism and veiling.

Abstract:

The goal of the slideshow is to present the contradictory views on the state of press in Bahrain. The audience is first introduced to the topic by bringing up basic information about the Kingdom of Bahrain and its news. The governmental news turn out to be a key factor of forming the image of Bahrain as a rich, idyllic state. Various news are discussed as they soon turn out to be heavily censored. Main anti-government newspaper, Al-Wasat, and its history are discussed.

Keywords:

Bahrain, press, journalism, censorship



BINGE-WATCHING AS A HOBBY OR A THREAT? ONE MORE EPISODE SYNDROME

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A few words about the author(s):

Kornelia Kordiak – pedagogue, teacher, deals with adult pedagogy, teaching and learning.

Abstract:

Binge watching is a new phenomenon, which in the era of developing streaming platforms such as Netflix, more and more people are familiar with. It consists of watching two or more episodes of a certain program or series during one session. This paper explored the correlation between binge watching and the locus of control, cognitive closure, perseverance, rhythmicity, self-esteem and extraversion.

Keywords:

binge watching, watching, episodes, session



SALES TACTICS IN RETAIL BANKING

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A few words about the author(s):

Finalist of the "Ethics Challenge 2022" conducted by the Polish Financial Supervision Authority and CFA Poland. Co-organizer (as part of the UEK SC of Banking) of the Santander Universities Academy. Active participation in the SC of Banking; Vice-President. Scholarship holder of the Rector of UEK for scientific achievements for the first year of studies 2021/2022.

Abstract:

The aim of the paper is to present one of the niche sales and marketing tactics in retail banking, namely attribution with MTA [Multi-Touch Attribution]. In addition, lessons learned from the observed actions of attribution platforms in terms of MTA and MMM [Marketing Mix Modeling] will be discussed, such as tactical decisions and reasons for Causal Incremental Contributions.

Keywords:

affiliation, outsourcing, affiliate marketing, attribution



THE THEORY OF EVOLUTION – THE PARADIGM SHIFT

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A few words about the author(s):

Sandra Paczkowska graduated both in MA archeology and English philology studies at UMK in Toruń and UKW in Bydgoszcz, Poland. Nowadays, she works as an English lecturer at two Polish higher education institutions (ANSM in Poznań and WSBiNOZ in Łódź).

Abstract:

The presentation is entitled "The theory of evolution - the paradigm shift". It presents the change in the understanding of evolution through the work created over decades of the main contributors, such as J. B. Lamarck, A. Weisman, C. Darwin, G. G. Simpson, T. Dobzhansky, E. Mayr, N. Eldredge and S. J. Gould. The difference between microevolution and macroevolution is also explained, as well as, the notion of punctuated equilibrium.

Keywords:

the theory of evolution, Charles Darwin, paradigm shift, archeology



PANDEMIC-RELATED LOANWORDS IN THE LANGUAGE OF POLISH FACEBOOK USERS

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A few words about the author(s):

Daria Pańska – Ph.D. student in linguistics at the University of Warsaw, graduate of English Philology (two specializations: teaching and translation) at Nicolaus Copernicus University, teacher and translator of English and Arabic.

Abstract:

The outburst of the COVID-19 pandemic has contributed to an influx of new words of English origin to the Polish lexical system. The impact is present not only in the spoken language but also in texts. One can notice it, for example, on various social media, especially on Facebook, which is identified as the most popular social networking service in the world. The study aims at analysing English pandemic-related loanwords (lexical loans) found in the corpus based on Polish posts and comments published on Facebook in 2019-2021 and verifying their occurrence before 2019 (the whole corpus covers the material from 2014-2021). Only lexical loans not noted in dictionaries of the Polish language are studied. As has been observed, most of the loanwords are at least partly assimilated. Their assimilation occurred within a short period of time so it can suggest that the loanwords were used quite frequently. Moreover, the lexical loans discussed in the study were mainly necessary borrowings because they designated new concepts that had no names in the recipient language.

Keywords:

loanword, English, COVID, Facebook, corpus



CHANGES IN TOURIST MOVEMENT IN TIMES OF PANDEMIC ON THE EXAMPLE OF OLESKO CASTLE IN THE OPINION OF LVIV REGION RESIDENTS

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We are from the University of Rzeszow and belong to the Student Scientific Organisation of Travellers.

Abstract:

For tourism to exist as a phenomenon first and foremost, a tourist, in other words a visitor or day visitor, is necessary. In the era of the COVID-19 pandemic, people have been trapped in their own homes. Since the start of the outbreak in November 2019, later declared a pandemic in March 2020, the world's tourist traffic has changed markedly. This has been influenced, among other things, by a reduction in the movement of tourists and a reduction in the activities of tourist facilities. The article deals with changes in tourist traffic during the COVID-19 pandemic on the example of tourist road "Zolota Pidkova", according to residents of Lviv region. At the time of writing this article, significant differences in tourist traffic were observed, which the authors present and describe in detail. In addition, the authors in the article undertake to confirm or correct the hypothesis on tourism development. The research was conducted among 243 residents in the Lviv region between October-December 2021. According to given data, similar research has not been conducted in the study area to date.

Keywords:

tourism, COVID-19, Zolota Pidkova



BENEFITS OF HAVING LEGAL AND FINANCIAL EDUCATION IN THE CONTEXT OF THE LAWYER CAREER

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A few words about the author(s):

Aleksandra Pilipiuk – lawyer and financier, student of doctoral studies in law in english, 3rd year trainee advocate in Warsaw. A graduate of law, as well as finance and accounting in english with two specialties.

Abstract:

The career of a lawyer is a demanding path, which is based on the constant expansion of one's knowledge, skills and qualifications. It requires knowledge in many different scientific fields that often affect the sphere of finance - for example, disputes over commercial transactions, financing transactions, and even simple loan agreements or divorce with division of the property. All this requires financial knowledge and understanding of the broadly understood business sphere. That is why it is so important that lawyers are not afraid to invest in financial knowledge and want to acquire it and then apply it to the benefit of their clients. I want to present the problem of frequent ignorance of lawyers in strict financial matters and show that a lawyer can successfully combine the sphere of finance and law.

Keywords:

law, finance, career, knowledge, interdisciplinary



THE MONETARY POLICY OF THE FEDERAL RESERVE SYSTEM DURING THE 2020 ECONOMIC CRISIS

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A few words about the author(s):

Graduate in Finance and Accounting, currently a first-year student of Banking and Risk Management at the Cracow University of Economics.

Abstract:

The work is devoted to the analysis of the monetary policy of one of the most important central banks in the world – the Federal Reserve System during the economic crisis caused by the COVID-19 pandemic, which disrupted the functioning of the entire financial system and economy.

The American Central Bank took a very active stance, using a broad package of non-standard solutions. He expanded his arsenal of monetary policy tools and introduced unconventional assistance programs. FED reacted extremely quickly and provided support to a wide group of beneficiaries. The presentation presents the number, scale and types of actions taken by the FED, as well as the use of experience from previous crises. Noteworthy are the unconventional tools of monetary policy, which turned out to be necessary in dealing with the effects of the collapse.

The research method used is an analysis of documents and statistics published by the monetary authority, mainly press releases.

Keywords:

Monetary policy, Federal Reserve System, economic crisis, COVID-19



FINTECH SECTOR – AREAS OF ACTIVITY AND DETERMINANTS OF DEVELOPMENT

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A few words about the author(s):

My name is Maja Rusek, I am a graduate of Finance and Accounting at the Cracow University of Economics. I am currently studying Banking and Risk Management.

Abstract:

The aim of the presentation is to analyze the areas of activity of FinTech companies and the determinants of FinTech sector development on the example of Poland. It takes into account the issue of technological progress and digitalization, legal and regulatory aspects and all socio-economic factors. The first part of the work defines the concept of FinTech and presents the areas of activity of FinTech companies. Then the financial and regulatory environment in the development of FinTech companies is discussed. The presentation also outlines initiatives and programs proposed by the Polish Financial Supervision Authority to support the development of the FinTech sector.

Keywords:

FinTech sector, FinTech development

ABSTRACTS OF **POSTERS**



**HUMANITIES
SCIENCES**



MODERN BANKING IN THE CONTEXT OF METAVERSE

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A few words about the author(s):

Student of finance and accounting at Cracow University of Economics. Board member of Accounting Science Club and Banking Science Club, member of 5 more Science Clubs. Member of Student Parliament of UEK.

Abstract:

The aim of the poster is to present contemporary development of Metaverse and what impact does it have on modern banking.

Author of the poster refers to recent measures taken by financial institutions to secure their position in rapidly changing reality which is virtual reality called Metaverse. Work also contains suggestions and factors in terms of incoming favorable environment that modern banking needs to acknowledge in order not to be excluded from technology race. Poster also includes future customer expectations that might occur in Metaverse future.

Keywords:

banking, Metaverse, finance, innovation, technology



GREEN PUBLIC PROCUREMENT FROM THE CONTRACTOR'S PERSPECTIVE

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A few words about the author(s):

Karina Szymańska – graduate of engineering and master's studies at the Faculty of Chemistry – Biotechnology. A graduate of master's studies at the Faculty of Management. She wants to spread environmental awareness.

Abstract:

Governments of many countries are trying to prevent climate change. One way of doing this is green public procurement. By implementing these orders, each authority can strive to reduce its carbon footprint. Green public procurement consists in obtaining goods, services and works whose impact on the environment during their life cycle is limited compared to goods, services and works for the same purpose that could have been procured otherwise. Among public institutions, local and regional governments in particular must contribute to the immediate and sustainable reduction of greenhouse gas emissions, as they perform the essential part of public tasks. The main purpose of the work is to show how easy green public procurement is to prepare.

The methods used in the work are literature analysis, statistical research, static analysis and case analysis. The aim was to show that the lack of application of green public procurement results from inadequate management of the public sector and lack of awareness of the benefits of green public procurement.

The article discusses the role of green public procurement, as well as how to manage a public organization, what to do to make green public procurement widely used. Appropriate knowledge of public employees, political will, as well as the fashion for green public procurement are important in the introduction of the above-mentioned procurement.

Keywords:

public procurement, green public procurement, environmental protection, eco-innovation

ABSTRACTS OF **PRESENTATIONS**



**MEDICAL
SCIENCES**



ASSESSING THE IMPORTANCE AND EFFECTIVENESS OF STEM CELLS IN THE TREATMENT OF NEURODEGENERATIVE DISEASES

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Izabela Kiebała is a medical student of the College of Medical Sciences of the University of Rzeszów, member of the Student Scientific Circle of Physiology "NEURON".

Abstract:

Neurodegenerative diseases are a heterogeneous group of conditions (congenital or acquired) associated with the progressive loss of function, structure or number of neurons in the central nervous system, resulting in the progression of motor and/or cognitive impairment. These include Alzheimer's disease, Parkinson's disease, Huntington's disease and amyotrophic lateral sclerosis, among others. The complexity and dissimilarity of their underlying mechanisms make it much more difficult to develop effective therapies.

Stem cells (SCs), due to their unlimited ability to self-replicate and differentiate into different cell types, have raised hopes for the development of new, effective treatments for neurodegenerative diseases. Classification of SCs, due to the way they are derived and the direction of differentiation, there are 4 main types, namely embryonic stem cells (ESCs), induced pluripotent stem cells (iPSCs), mesenchymal stem cells (MSCs) and neural stem cells (NSCs). Each type has certain characteristics and their use depends on the desired applications and expected results. The goals of therapy using SCs usually focus on replacing cells or providing environmental enrichment.

The subject of this presentation will be a critical analysis of the examples available in the literature of the derivation and use of SCs in the treatment of neurological disorders, as well as a consideration of the key issues that must be resolved for SCs to become a useful therapeutic tool.

Keywords:

stem cells, neurodegenerative diseases

ASSESSMENT OF THE EFFECTS PRODUCED BY REHABILITATION IN OBESE CHILDREN WITH MILD INTELLECTUAL DISABILITY

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Aleksandra Kiper is PhD student at the Doctoral School of the University of Rzeszów. Agnieszka Guzik and Andżelina Wolan-Nieroda work at the Department of Physiotherapy, Institute of Health Sciences, College of Medical Sciences, University of Rzeszów.

Abstract:

The relationship between obesity and rehabilitation outcomes in children with intellectual disability (ID) has not been sufficiently investigated. This study compared the effectiveness of re-habilitation, reflected by physical fitness, static balance, and dynamic balance measurements, in children with mild ID presenting with obesity or normal weight. A total of 70 children with mild ID enrolled for the study and were divided into two equal groups based on their body mass index (BMI) percentile, reflecting obesity or normal weight. Physical fitness was assessed using the Eurofit Spe-cial Test, whereas balance was evaluated with single-leg stance and timed up and go tests. The examinations were performed twice: At the beginning and at the end of a six-month therapy pro-gramme. Improvements were shown in the muscle strength of the upper limbs ($p < 0.001$) and lower limbs ($p = 0.001$), flexibility ($p = 0.005$), and static balance ($p < 0.001$) for the entire cohort. The effects of rehabilitation did not differ significantly between the children with obesity and those with a normal weight. These results may be important from the viewpoint of clinical practice and pre-ventive measures, as they present evidence showing that rehabilitation is equally effective in both obese and normal weight children with mild ID. Therefore, these findings may be of assistance to those designing therapeutic programmes in special education centres.

Keywords:

obesity, children, intellectual disability, rehabilitation programme



ASSOCIATION BETWEEN PATHOGENS AND ALZHEIMER'S DISEASE DEVELOPMENT

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A few words about the author(s):

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

Abstract:

Currently, about 55 million people suffer from dementia. It is believed that 1/3 of patients are undiagnosed. Estimations have shown that this number will have increase to 139 million by 2050. In recent years, the number of cases before the age of 65 has increased. The etiology is unknown, but recent studies have shown a significant association between bacterial, fungal and viral infection and AD (Alzheimer disease). It is known that spirochetes *Treponema pallidum* and *Borrelia burgdorferii* play an important role in amyloid formation. From viruses HSV-1 is the most commonly detected in people with AD, while in fungal infetctions six different species play a role. According to the research results there is a strong likelihood that infections have an impact on AD development. The aim of the work was to analyze the latest papers/clinical studies and present the spectrum of pathogens consider in AD, and disseminate the newly gained knowledge.

Keywords:

AD, infection, amyloid, neurological dissorder, dementia



MUSHROOMS AS A SOURCE OF BIOACTIVE AGENTS WITH NEUROPROTECTIVE PROPERTIES

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A few words about the author(s):

We represent Department of Toxicology at Medical University of Lublin.

Abstract:

Macromycetes, nowadays and in the past, have been used in traditional Asian and European medicine as a source of valuable clinical and pharmacological active substances.

Currently, there is an increase in the interest of researchers in biologically active substances isolated from mushroom fruiting bodies, which directly translates into an upward trend in the number of publications on this subject. They are believed to be a source of bioactive substances of both high and low molecular weight, exhibiting a number of medicinal properties. There is evidence that macrofungi can be used as neuroprotective agents.

More and more research suggests that culinary and medicinal mushrooms may play an important role in preventing a number of neurological dysfunctions, which include Alzheimer's disease and age-related Parkinson's disease. Examples are *Herichium erinaceus*, *Ganoderma lucidum*, *Sarcodon* spp., *Antrodia camphorata*, *Pleurotus giganteus*, *Lignosus rhinocerotis*, *Grifola frondosa* and many others.

Keywords:

fungi, macromycetes, neuroprotective activity, neurodegenerative diseases



HADDAD SYNDROME - EPIDEMIOLOGY, DIAGNOSTICS, THERAPY, PROSPECTS FOR THE FUTURE

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Anna Antonik – medical student at the University of Rzeszów, member of Students Science Club "NEURON".

Abstract:

Congenital central hypoventilation syndrome (CCHS) is a rare disease characterized by an alveolar hypoventilation. The primary symptoms are the inability to control breathing that varies in severity (especially during sleep) and apnea leading to hypercapnia and/or hypoxia which is related to the weakening or lack of responsiveness of peripheral and central chemoreceptors. CCHS is a dominant genetic condition resulting from a pathogenic variant of the paired-like homeobox 2B (PHOX2B) gene located on chromosome 4. This disease belongs to neurocristopathy, i.e. disorders associated with abnormal migration, differentiation or death of neural crest cells [from which the autonomic nervous system (ANS) originates] during embryogenesis. This group of diseases also includes Hirschsprung's disease (HD) – a congenital malformation of the large intestine characterized by a lack of parasympathetic ganglion cells in the submucosal and intramucosal plexus and interneurons in the distal colon. When CCHS and HD occur simultaneously, Haddad syndrome is diagnosed. At this moment, there is no pharmacologic treatment, which can replace ventilatory support. Patients with CCHS require individual and adequate ventilation with support for normal activity and sleep, enabling them to lead a fulfilling life. The aim of the presentation is to present the most important information about Haddad syndrome, including epidemiology, diagnostic procedures and therapy, as well as prospects for the future.

Keywords:

congenital central hypoventilation syndrome, Haddad's syndrome, Ondine's curse, neurocristopathy, PHOX2B gene mutation



SHORT-CHAIN FATTY ACIDS(SCFAS) – COMMON SUBSTANCES WITH EXTRAORDINARY PROPERTIES

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A few words about the author(s):

We are fourth year medical students interested particularly in ways that commensal microbiota can help humans treat various diseases and maintain one's health.

Abstract:

Short-chain fatty acids (SCFAs) are the end products of anaerobic fermentation of dietary fiber by the gut microbiome. The most vital representatives of this group are acetate, propionate and butyrate. One of the reasons for the disrupted production of SCFAs are the differences in composition of the intestinal microbiota. The diversity of the microbiome is influenced by many factors. Dysbiosis of the intestinal flora yields the disruption of SCFA synthesis, which can lead to dysregulation of key processes in the gastrointestinal tract, as well as in the whole system. The aim of this study was to analyse the literature that addresses the mechanisms by which SCFAs affect the body. Materials and methods: a review of the available literature based on the PubMed database. Results: SCFAs are noted to have a significant effect in supporting the integrity of the intestinal wall by positively influencing both the cells which constitute it and the cell junctions. Therefore, the permeability of the blood-gut barrier for immunogenic agents is reduced. Studies indicate the ability of SCFAs to modulate inflammatory responses by regulating their pathways and downgrading the expression of pro-inflammatory cytokines. SCFAs also exhibit multidimensional anti-cancer potential. Conclusions: Scientific reports suggest that by taking care of the intestinal microbiome and the proper content of SCFAs in the gastrointestinal tract, we are able to significantly improve the health of our bodies.

Keywords:

SCFA, gut microbiota, inflammation



SELECTED METHODS OF DETERMINING THE LEVEL OF INDIVIDUAL COMPONENTS OF SPECIAL FITNESS IN TABLE TENNIS BY GOMES – LITERATURE REVIEW

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A few words about the author(s):

Lecturer at the Poznań University of Physical Education and College of Vocational Education in Wrocław, sports expert at the Institute of Sport and Education Development in Warsaw, coach of the Polish team of disabled people in table tennis.

Abstract:

Table tennis is a sport in which a high level is determined by many factors. Despite its advantages mobilizing physical activity at various levels of sports advancement, many tests evaluating special fitness have not been developed for this discipline, which would help to better assess the sports level of a competitor, especially at the initial stages of training. The most frequently used tests of special fitness in the world literature are those proposed by Gomes in (2000).

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 9 attempts to determine the accuracy of strokes in table tennis according to Gomes (Reaction speed - 2 attempts, Displacement speed - 3 attempts, Skill speed - 2 attempts, Manual quickness and ability - 2 attempts). 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:

table tennis, special fitness, stroke accuracy, literature review



THE ROLE OF THE ACTIN CYTOSKELETON AND EZRIN IN THE MIGRATION OF CERVICAL CANCER CELLS

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Employee of Department of Histology and Embryology CM UMK in Bydgoszcz.

Abstract:

In the case of cervical cancer, the 5-year survival rate is estimated at 92%, while in the case of regional and distant metastases, this parameter decreases to 58% and 17%, respectively. These statistics may be related to the invasiveness of this type of cancer, as well as resistance to routinely used methods of treatment, including cytostatics. The actin cytoskeleton is important in changing the shape of the cell and building the structures necessary for movement. In turn, ezrin plays a key role in regulating cell adhesion and polarization. Both structures are involved in the epithelial-mesenchymal transition (EMT).

Numerous studies indicate a correlation between the level of ezrin and the invasiveness of the cancer. Zacapala-Gómez et al. (2017) suggested that ezrin can be useful as prognostic marker in cervical cancer patients. The high level of ezrin is identified in invasive tumor. In turn, Kong et al. (2016) showed that the reduction of the protein level in HeLa, SiHa, CaSki and C33A resulted in morphological changes in cells, lower motor abilities and, consequently, reduced EMT.

Taking into account the above reports, the protein may be an interesting target in the context of reducing the formation of secondary cervical cancer foci.

Keywords:

microfilaments, ezrin, EMT, cervical cancer



INFLAMMATORY BOWEL DISEASE IN THE CONTEXT OF STRESS

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A few words about the author(s):

Dominik Kędzierski – student of Psychology, in the course of Master's Studies. Participant of research projects. Milena Durasiewicz – Psychologist, Psychotherapist, psychodietician, author of many publications. The main area of research's the gastroenterology.

Abstract:

The consequences of stress have been noticed both in medicine and in psychology. The progression of psychosomatic diseases is the result of the impact of stress on the body. One disease entity that is exacerbated by stress is inflammatory bowel disease (IBD).

The aim of this presentation is to attempt a holistic look at selected aspects of stress in the context of its impact on the functioning of patients.

The first part of the work presents the phenomenon of stress according to various definitions, theories and approaches. Among the approaches, biological and psychological ones were distinguished. The last part of the presentation concerns a review of scientific studies showing the relationship between stress and the severity of symptoms of inflammatory bowel disease.

Research results indicate that stress affects both the mental and somatic well-being of patients. A clear progress was noted in the case of long-term stress affecting patients. Stress causes the activation of pro-inflammatory cytokines that exacerbate the symptoms of the disease.

The work is based on scientific articles, clinical trial reports, as well as a review of professional literature in relation to the evidence-based medicine trend.

Keywords:

stress, inflammatory bowel disease



AYAHUASCA TOURISM IN THE AMAZON REGION

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A few words about the author(s):

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

Abstract:

The aim of this presentation is to present the phenomenon of Ayahuasca tourism among Europeans travelling to the Amazon region and to introduce the reader to basic information about the little-known tradition of Ayahuasca consumption in our area, as well as the rituals and ceremonies that accompany it. The work presents introductory information on Ayahuasca and information on the decoction itself, i.e. the origin of the name, the ingredients, as well as the mode of action and history. It also discusses its treatment in the health dimension i.e. as an aid to the treatment of diseases of the body and spirit. It is also about the assumptions and objectives of the research. The results of a questionnaire survey of people for whom Ayahuasca was their main destination in the Amazon regions are analysed.

Keywords:

tourism, Ayahuasca, trips



TOURIST TRAFFIC IN PALACE AND CASTLE FACILITIES IN PODKARPACKIE VOIVODESHIP

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Abstract:

The study analyses tourism traffic in selected palace and castle facilities located in the Podkarpackie Voivodeship. The presentation provide information on these objects and the development of tourist traffic in the last decade: 2010-2019.

The aim of the study was to determine the structures and dynamics of tourist traffic at the studied facilities. Comparisons were also made with other similar tourist destinations in the country and off the country. A qualitative and quantitative method was used in the study. The research tool used is a content analysis and the data provided by the surveyed units. The data obtained were analysed and presented in the form of graphs.

As a result of the analysis of the data, it can be concluded that the castle sites included in the study generate quite a lot of tourist traffic during the year. However, a comparison with similar sites in the country shows still untapped potential.

Keywords:

castles, palaces, tourism, Podkarpacie



CERVICAL CANCER – AN INTERDISCIPLINARY PROBLEM

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A few words about the author(s):

We are a group of students from Medical University of Lublin. Gynaecology and obstetrics is our passion, so we would like to draw attention to the importance of prevention and the risks of not doing so.

Abstract:

Cervical cancer is detected in women most often after the age of 60. It is the fourth most commonly diagnosed malignant tumour in women. HPV infection is behind the development of most cases of cervical cancer. HPV strains 16 and 18 are the most oncogenic and are the most commonly detected in patients. Cancer develops gradually and has different stages, which is why prevention is so important. Earlier recognition of symptoms is a more favourable prognostic factor for patients. The main method of treatment is surgery, which in most cases is based on a total hysterectomy. A cytological examination every three years is recommended for prophylaxis, and earlier detection of cancer. Cervical cancer is a risk for many women, which is why screening and frequent visits to the gynaecologist are so important.

Keywords:

cervical cancer, prevention, treatment, hpv, symptoms



CONTEMPORARY PROCEDURE DIAGNOSTIC AND THERAPEUTIC PROCEDURES IN THE PITUITARY GLAND TUMOURS

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A few words about the author(s):

We are a group of students from Medical University of Lublin. Our scientific interests concern many aspects of medicine, particularly we are interested in fields such as epidemiology and endocrinology.

Abstract:

Pituitary tumours are often detected by chance during imaging examinations. They are tumours located inside the skull in the bony hollow, the Turkish saddle. They are characterised by a variety of origins, but most are hormonally active tumours. The most common is the prolactin tumour, which produces prolactin, elevated levels of which give peripheral symptoms. Large tumours, macroadenomas, compress the optic nerves and give mostly neurological symptoms. In small tumours, pharmacotherapy and radiotherapy are used in the treatment. Macroadenomas require surgical intervention. They are mostly removed by access through the wedge sinus. Due to their range of non-specific symptoms, pituitary tumours present both diagnostic and therapeutic challenges.

Keywords:

pituitary tumour, prolactinoma, treatment, surgery, radiotherapy



ANTI-CANCER POTENTIAL OF RETINOIDS – A REVIEW

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A few words about the author(s):

I have studied Pharmacy at Medical University of Lublin since 2019.

Abstract:

Retinoids are a class of chemical compounds that are structurally related to vitamin A. They are involved various functions in the human body including vision, reproduction, metabolism, growth, differentiation, hematopoiesis, immunological processes and etc. The retinoids as derivatives of vitamin A may also play a role in cell differentiation, proliferation and apoptosis of cancer cells. In vitro studies showed that exposure to retinoids results in the inhibition of growth cancer cells, by regulation of mitochondrial function, mikroRNA and gene signaling pathways. The positive effects of retinoids have been observed in a premalignant lesion of the oral mucosa and, oral, lungs, liver and colorectal, thyroid, prostate and breast cancer.

This review focused on new mechanisms of retinoids' anti-cancer effects and evaluation of their effectiveness in combination therapy with chemotherapeutic drugs.

Keywords:

retinoids, vitamin A, cancer, in vitro



ANTIBIOTIC RESISTANCE AS A SERIOUS THREAT TO GLOBAL HEALTH

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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:

Antibiotic resistance occurs when microorganisms stop reacting to one or more antimicrobial agents. The World Health Organization (WHO) has identified bacterial resistance to antibiotics as a major global threat to health, development and food safety. According to the European Centre for Disease Prevention and Control, in the European Economic Area every year there are about 670,000 infections caused by antibiotic-resistant bacteria and about 33,000 people die from these infections. It is estimated that in 2050 about 10 million people will die worldwide from these infections.

Overuse and misuse are the main causes of growing antibiotic resistance, through which the effectiveness of antibiotics is compromised. Antibiotics released into the environment with the feces of both humans and animals are also a serious cause of antibiotic resistance development.

The consequence of increasing bacterial resistance to antibiotics is an increase in the duration of the therapy and even its failure. Declining drug efficacy often leads to the elimination of first-, second- and even third-choice antibiotics from therapy. It then becomes necessary to use less effective, more expensive antibiotics, often with stronger side effects, which can reduce the effectiveness of treatments such as organ transplants.

In the light of this information, it has become extremely important to monitor antibiotic use and take measures to prevent drug resistance.

Keywords:

antibiotic resistance, antibiotics

ABSTRACTS OF **POSTERS**



MEDICAL
SCIENCES



ANTICANCER THERAPY USING MIRNAS

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A few words about the author(s):

My name is Justyna Dziedzic. I am studying at Maria Curie-Sklodowska University in Lublin. I am a second-degree student of medical biotechnology. My curiosity is mainly focused on modern methods of treating cancer and genetic diseases.

Abstract:

Cancer diseases are conditions that have been known for many years. Despite this, cancer treatment is still a major challenge for specialists. Currently known treatments are invaluable in the fight against cancer, but their use causes many side effects and adverse reactions. The significant increase in the number of people suffering from cancer forces scientists to search for the most effective cancer treatments. One aspect worthy of attention is ribonucleic acid (RNA). RNA is divided into several types, one of which is miRNA. MicroRNAs (miRNAs) are short molecules that have regulatory functions. More specifically, they are responsible for post-transcriptional gene silencing. MiRNA molecules have become a focus of scientific interest as structures that can help specifically target cancer. Studies to date indicate that miRNAs will be able to be used in novel anti-cancer gene therapies. The use of miRNAs is promising, but requires further and more thorough research.

Keywords:

miRNA, anticancer therapy, cancers



APPLICATION OF NANOCARRIERS IN COMBATING MULTIDRUG RESISTANCE IN CANCERS

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A few words about the author(s):

I am a 4th year student of medical biotechnology at Maria Curie-Skłodowska University in Lublin. I am interested in the topic of drug resistance of cancer cells.

Abstract:

The occurrence of multidrug resistance (MDR) is a major problem in cancer therapy. The lack of sensitivity of tumour cells prevents effective elimination of tumours and micro-metastases. Increased doses of drugs are required to eradicate the tumour, which adversely affects the patient's body by destroying healthy cells. The solution to the problem is to deliver the therapeutic precisely to the tumour cells using appropriate transport systems. Nanotechnology – using of nanocarriers as means of transporting drugs to target cells bypassing healthy cells offers great hope in this field. In this way it will be possible to increase the concentration of drugs in tumours without toxic effects on healthy tissue. The use of nanoparticles coated with specific markers will allow selective delivery of active substances and combat the phenomenon of multidrug resistance. Nanocarriers used in anticancer therapies include dendrimers, liposomes, polymeric nanoparticles, polymeric micelles and nanotubes.

Keywords:

cancer therapy, multidrug resistance, nanotechnology, nanocarriers



HOW WESTERN DIET AND PLANT-BASED DIET MODIFICATES THE GUT MICROBIOTA?

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A few words about the author(s):

Dietitian student of second degree at the Jagiellonian University in Cracow. Interested in nutritional prevention of diseases. At this moment working on the topic of fecal microbiota transplantation and how diet affects the gut microbiota.

Abstract:

The gut microbiota defines a set of microorganisms such as bacteria, viruses, fungi, or parasites located in the intestines. Rising numbers of research includes affect of gut microbiota on health. Dysbiosis, which means a disruption in the proportion of microorganisms, may lead to many diseases, like diabetes type II, neurodegenerative disorders, or depression.

Among the most potent factors modifying the composition of the microbiota is diet. Changes in the microbiota are observed just after 24 hours.

The western diet consists of products containing high levels of fat and sugar, but low levels of fiber. Research shows that the western diet makes changes in the gut microbiota and increases inflammation. These changes may for example lead to metabolic diseases and obesity.

On the other hand, a plant-based diet positively affects the gut microbiota. This probably happens due to a higher level of fiber which nourishes bacteria and increases the level of short-chain fatty acids (SCFA). Research shows that a higher level of SCFA is associated with a reduction of inflammation.

Keywords:

western diet, plant-based diet, gut microbiota, nutrition, inflammation



MIDWIVES WORKING IN THE LABOR ROOM TOWARDS NON – PHARMACOLOGICAL METHODS OF LABOR PAIN RELIEF

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A few words about the author(s):

Patrycja Guzewicz - PhD student at Medical University of Białystok, midwife working in the labour ward.

Abstract:

Natural childbirth is a unique event in a woman's life. A very important role is played by the midwife, who is responsible for providing support to the woman in labor, taking care of the well-being of the fetus and the woman giving birth, as well as minimizing the pain of childbirth by using various techniques - pharmacological and non-pharmacological. In a study conducted on 135 Polish midwives working in the delivery room, the attitude towards non-pharmacological methods of labor pain relief, the frequency of their use, and the reasons for not using them were examined. The study used the questionnaire designed by the authors. The results indicate that among the non-pharmacological methods of labor pain relief, midwives most often use vertical positions (77%). Among the vertical positions, the knee-elbow position is the most popular (69.6%). Aromatherapy is used least frequently (24.5%). Almost all midwives confirmed that non-pharmacological methods of labor pain relief effectively reduce pain and positively influence the course of labor (85.2%). The majority of midwives as an obstacle to the use of non-pharmacological techniques of labor pain relief pointed to disagreement on the part of colleagues (67.4%), lack of support from the management (58.5%), lack of sufficient equipment (48.1%), lack of knowledge (45.2%). It is important to educate midwives and their leaders in this area.

Keywords:

midwives, midwifery, pain-relief methods, childbirth

SNP LABELING WITH TAQMAN PROBES MORE ADVANTAGEOUS THAN SEQUENCE READING IN DIAGNOSTICS

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A few words about the author(s):

The authors are members of the R&D and NAAT development departments of growing companies in the biotechnology sector. The aim of their scientific activity is the development of diagnostics based on molecular biology, genotyping and genetic inference.

Abstract:

DNA sequencing and TaqMan genotyping are well-established position among approaches to variant determination for single nucleotide polymorphism (SNP). Out of 585 revised articles, only 3 comprehensively compared the above as SNP detection methods rather than application use. Most publications focus on one or a few SNPs in a single case or application, not in a broader perspective. Our unique approach presents their comparison in relation to diagnostic possibilities in various fields of application.

DNA sequencing and TaqMan genotyping we presented as two different approaches to get the result. Sequencing is like reading a book to find a typo. TaqMan probes, on the other hand, allow the addition of a label to a sequence consistent with an allele variant. Due to the specific hybridization of the probe also information about the flanking sequence remains recovered. Therefore, the interpretation of the result in diagnostics is much easier.

We conducted studies for 3 sectors that benefit from SNP genotyping - oncology, dietetics, and diseases. We compared TaqMan genotyping and DNA sequencing in terms of accuracy of SNP variant determination and flanking sequence consistency in both methods. The financial, time, and process complexity costs were also compared in order to determine the usability in the diagnostic sector. It has been shown that in the above fields of diagnostics, TaqMan genotyping should be considered as the method of choice as it is more advantageous.

Keywords:

SNP, TaqMan genotyping, DNA sequencing



THE DIAGNOSTIC SIGNIFICANCE OF THE QUALITY OF ISOLATED DNA IN GENOTYPING WITH TAQMAN PROBES

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A few words about the author(s):

The authors are members of the R&D and NAAT development departments of growing companies in the biotechnology sector. The aim of their scientific activity is the development of diagnostics based on molecular biology, genotyping and genetic inference.

Abstract:

The variety of applications of TaqMan genotyping is confirmed by a significant number of publications in various fields of science and technology, which are constantly being updated. The developing market of diagnostic applications deserves special attention in relation to this research work. Many types of samples are genotyped, from swabs that differentiate genetic predisposition or determine the source of infection, through forensic hair and blood samples to oncology Paraffin-Embedded Tumor Tissues documenting the progression of cancer.

The primary issue raised by diagnostic sources regarding SNP genotyping in general is the quality of DNA after isolation from problematic samples. Only a few publications have attempted to determine the quality of DNA necessary to obtain adequate amplification efficiency, which determines the correct allelic discrimination. For this reason, we decided to analyze the possibility of genotyping with TaqMan probes for isolates of typical samples of the diagnostic sector. To determine the quality of the samples, we generate a plasmid standard curve for the SNP of the GAPDH gene. Known length of the amplification target (168 nt) corresponds to most assays for SNPs genotyping. It is also the limit value of DNA fragmentation that can still be considered useful. We analyzed the quality of isolates from various origins of samples used in diagnostics (i.e. saliva, hair, blood, swab) and further confirmed the high potential of this genotyping technique.

Keywords:

SNP, TaqMan genotyping, DNA diversity

ABSTRACTS OF **PRESENTATIONS**



TECHNICAL AND NATURAL SCIENCES



EFFECT OF MULTIPLE HEAT TREATMENT OF POLYCAPROLACTONE (PCL) ON THE PROPERTIES OF FILAMENTS INTENDED FOR 3D PRINTING OF STRUCTURES FOR BIOMEDICAL APPLICATIONS

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A few words about the author(s):

Aleksandra Bednarek graduated Biomedical Engineering at Lodz University of Technology. She interested in using the 3D printing in tissue engineering. Apart from scientific interests she is an open water swimmer.

Abstract:

A heat treatment of polycaprolactone (PCL) may have a significant influence on the mechanical and biological properties of the filaments being used for 3D printing the structures intended for biomedical applications. The main purpose of this project was to verify the effect of multiple heat treatment on a polycaprolactone of three molecular weights of 25 kDa, 37 kDa and 50 kDa. Firstly, the filament was extruded twice. It allowed to reflect a real printing process conditions. The third extrusion was conducted to verify the possibility of polycaprolactone recovery and reuse. Samples taken from each filament have been examined as followed: measurement of filament diameter, thermal and surface analysis, tensile test and eucariotic cells viability test. Results showed that the cytotoxic effect are induced by the physiochemical changes of PCL being a result of temperature influence. With these results in mind, it was concluded that the 25 kDa and 37 kDa PCL filament could be reused for biomedical applications.

Keywords:

polycaprolactone (PCL), multiple heat treatment of filament, 3D printing, tissue engineering



MULTI-LAYER SELF-ORGANIZING MAP IN IDENTIFYING AND CATEGORIZING ERRORS PROBLEM FOR ROBOTIC PROCESS AUTOMATION SOFTWARE

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A few words about the author(s):

Doctor of technical sciences in the field of computer science. Participant of a scientific internship at Stanford University, conducting research in the area of soft computing, including neural networks, metaheuristics, fuzzy logic and flow graphs.

Abstract:

The Robotic Process Automation is the use of software bots to automate repetitive, routine tasks that can be performed by software instead of workers. However, sometimes the RPA bot encounters a situation it has not been programmed to handle and in such cases it stops. The reasons for this can be related to unidentified exceptions for automated business processes, limitations of the environment in which the bots are working, or problems with input data with a structure different than expected. Therefore, the creation of a model of a verifiable solution for detecting the causes of such unexpected events and errors and their prediction was the goal of the conducted research. As it turned out, it is possible to propose a solution model that uses multilayer self-organizing networks and the Random Forest method with quality assessment of results. The model uses a modified weighting factor in multilayer SOM networks, a modified method for adjusting the weights of neighboring neurons, and a modified learning method to find features that allow correct identification of errors and their causes. The created solution returns satisfactory results and is an interesting concept of the possibility of solving an important problem in the area of business process automation.

Keywords:

RPA, uncover knowledge, Multi-layer SOM



COMPARISON OF TWO METHODS TO DETERMINATE THE DEACTIVATION ENERGY OF ENZYMES

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A few words about the author(s):

Her scientific interests is the determination of enzyme deactivation parameters. She is authors of 18 publications in Web of Science. In the 2022 she obtained the Medal of the National Education Commission. She reviewed of 18 manuscripts.

Abstract:

Enzymes are characterized, among others by the optimum temperature. When its exceeded, there is thermal denaturation of enzyme and a rapid decrease in enzyme activity.

The value of the deactivation energy E_d can be determined inter alia, from the curves of the dependence of the logarithm of the reaction rate ($\ln v$) on the reciprocal of temperature ($1/T$), the so-called Arrhenius dependence. The Arrhenius method was comparison with a new method for determining the valus of the optimum temperature T_{opt} , the activation energy E_d and also the deactivation energy E_d . The comparison the values E_d obtained from two methods was shown, that the determined value of E_d by application of the traditional method are burdened with an error in the range from 150% to 220% [1]. The mathematical model describing the change in the dimensionless activity of the enzyme a depending on the temperature T . The value of parameter E_d was determined by a non-linear regression according to the Levenberg-Marquardt procedure in SigmaPlot 15.0.

The knowledge of the deactivation energy E_d for enyme will allow design and modelling the enzymatic reaction.

[1] Miłek J., The activation energies and optimum temperatures of olive oil hydrolysis by lipase porcine pancreas. *Ecological Chemistry and Engineering S* 2021, 28(3), 389-398. DOI: 10.2478/eces-2021-0026

Keywords:

deactivation energy of enzyme, equation Arrhenius, method of Levenberg-Marquardt



OPTIMIZATION OF THE VERIFICATION PROCESS OF SAFETY-CRITICAL SYSTEMS IN AVIATION

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A few words about the author(s):

The authors have been involved in the field of critical systems verification for several years. They use their experience to optimize verification processes and provide tools to support related activities.

Abstract:

Safety-critical systems are those whose failure could result in loss of life, significant property damage, or environmental damage. In recent years, a growing share of this type of solutions has been observed among the modern technologies introduced to the market, ranging from unmanned aerial vehicles, through autonomous vehicles, to modern energetics. Due to the importance of safety-critical systems, the method of their development is strictly defined and must meet the standards accepted by appropriate authorities (like DO-178C or ED-12B for civil aviation). Data collected over the years indicate that the process of verification of such solutions, due to its complexity, can generate up to 60% of overall production costs, which naturally slows down the pace of their introduction to the market.

A team of specialists from the Łukasiewicz Research Network – Institute of Aviation and General Electric Company Polska Sp. z o.o., based on experience from projects of this type in Aviation, has developed a method and a supporting tool, the purpose of which is to: shorten the time and reduce the costs of verification processes, unify and transfer specific solutions between projects and make it independent of the physical location of the tested system or its components. In this presentation we will share the problems we've initially encountered and solution we came up with as a result.

Keywords:

safety-critical, verification, avionics, DO-178, DO-330



LATTICE DYNAMICS IN GAN NANOWIRES STRAINED BY WIDE BANDGAP OXIDE-SHELL

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A few words about the author(s):

Radosław Szymon is a PhD student at the Doctoral School of Wrocław University of Science and Technology. He investigates fundamental properties of semiconductor structures applied to optoelectronics by means of experimental methods.

Abstract:

Gallium nitride (GaN) – based light emitting diodes as the ecological and efficient source of light have brought about a revolution in lighting systems. Nowadays, the improvement of their growth techniques opens up new possibilities including core-shell nanowire (NW) structures overcoming limits of heteroepitaxy, protecting the core against degradation, providing to increase of efficiency and quality of fabricated nano-devices.

In my work, the strain in NW's core induced by wide bandgap oxide shell of Al_2O_3 and HfO_2 were studied experimentally by means of Raman spectroscopy. The measurements were performed with 532 nm excitation wavelength, without polarisation detection, at room temperature to appoint the phonon modes frequency. The observation of GaN E_2^{high} mode shift confirmed presence of strain, and its value was calculated. The dependence between the shell thickness (5, 10 and 20 nm) and strain were noticed and its origin has been discussed.

Strain-induced bandgap engineering is a highly useful tool for adjusting luminescence of studied materials for future application. In fact, the possibility of strain introduction in core-shell NWs was confirmed what opens the floodgates to photoluminescence measurements.

Keywords:

core-shell nanowires, GaN, wide bandgap oxides, Raman spectroscopy



RESISTANCE OF STAPHYLOCOCCUS SPECIES TO QUATERNARY AMMONIUM COMPOUND

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A few words about the author(s):

Zuzanna Byczkowska-Rostkowska – student of Microbiology. A lead author of this work. Magdalena Muszak – M.Sc of Microbiology. Joanna Gajewska – M.Sc of Food Technology and Human Nutrition. Currently, Ph.D Researcher.

Abstract:

Improper using of biocides and their dilution results in agent concentration gradients, exposing microorganisms to disinfectants in a wide spectrum of concentrations. Subinhibitory disinfectant concentrations result in the development of antimicrobial resistance, co-resistance and cross-resistance to other biocides, including antibiotics.

The aim of this study was to determine the sensitivity level of *Staphylococcus* sp. to quaternary ammonium salts, exemplified by benzalkonium chloride (BC). Additionally, the presence of the genes, which encode the efflux pumps involved in the removal of BC outside the cell, was analyzed using multiplex PCR method.

The study included 29 strains of *Staphylococcus* isolated from food of animal origin, belonging to the *S. aureus*, *S. epidermidis*, *S. haemolyticus* and *S. saprophyticus* species.

The results showed, that exposure to sub-inhibitory concentrations of benzalkonium chloride may result in an increase in the initial MIC values. Among 65.5% resistant isolates at least a twofold increase MIC value was observed. Moreover, among tested strains was found the presence of the *qacA/B* (3.4%) and *qacC* (58.6%) genes.

The results showed, that inappropriate using disinfectant and lack of their control can affect weaken the susceptibility of microorganisms.

Keywords:

Staphylococcus sp., disinfectants, benzalkonium chloride



TRANSCRIPTOME CHANGES IN LISTERIA MONOCYTOGENES DURING SOUS VIDE PROCESSING

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A few words about the author(s):

Monika Michalak – third year biotechnology student at the University of Warmia and Mazury in Olsztyn.

Abstract:

Sous-vide is a method of food preparation that provides precise cooking temperature by sealing food in an airtight container and using thermal immersion circulator units for preparation. The method is considered safe due to the high temperature (60-80 °C) and long time of cooking (>2 hours). However, in the case of fish and seafood, it is recommended to process it at a temperature of up to 60 °C and for a time not exceeding 30 minutes, due to negative sensory changes. These cooking parameters during sous-vide processing may cause foodborne diseases in case the food is contaminated with pathogens such as *Listeria monocytogenes*. In this study transcriptome changes of virulence and antibiotic resistance of *L. monocytogenes* were investigated. For this purpose, *L. monocytogenes* strains from the collection of Department of Industrial and Food Microbiology of the University of Warmia and Mazury in Olsztyn were used. Strains were isolated from salmon (*Salmo salar*) and had phenotypic resistance to selected antibiotics. After sous-vide preparation real-time PCR was performed using *LIPI-1* genes and *drfA*, *fosX*, *lin*, *mpr*, *tetA1*, *tetA2*, *tetA3*, *tetC*, *sul* genes. The results showed underexpression in the case of 3 virulence genes. Only for tetracycline genes overexpression was observed. Although sous-vide processing does not increase the expression of virulence genes, it may contribute to an increase in resistance of strains to tetracycline, which poses a significant threat for consumers.

Keywords:

listeria monocytogenes, virulence, transcriptome, sous-vide



TRIPARTITE PRODRUGS AS AN EXAMPLE OF MULTIDIRECTIONAL, PROGRAMMABLE THERAPY

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A few words about the author(s):

Second year 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:

Since the 18th century, the development of civilisation and technological progress has been increasing rapidly, with the number and scale of diseases of a civilisational nature.

Therapeutics with a prodrug approach, which is based on the introduction a derivative of an active substance that undergoes biotransformation in the target organ, are proving to be the answer to this problem. Triple-drug pro-drugs are an innovative group of therapeutics that incorporate several potential therapeutic substances. It is a state-of-the-art division that implies a versatile and multidirectional use of the structural components. They can undertake blocking, poisoning, cell growth-stimulating and intercellular transport-accelerating activities. Most of them find their use in interactions with DNA molecules, making it possible to counteract the development of cancers of various origins.

Despite such an innovative idea, these compounds require long-term work in the context of clinical trials and the precise definition of how they react with biological material and possible indirect interactions. Thanks to the characteristics that influence efficient overcoming of cell-tissue barriers, they could become the therapeutic agents of the future, with the potential to solve many problems of the modern world.

Keywords:

tripartite prodrugs, programmable therapy, cDDP, piwampycilin, anticancer therapies



GREEN ANODES FOR SAFE AND HIGH-ENERGY NEW GENERATION OF LI-ION BATTERIES

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Ph.D. Eng., Monika Osińska-Broniarz currently, works as a Chief specialist in Łukasiewicz Research Network – Institute of Non-Ferrous Metals, in Research Group of New Technologies for Materials.

Abstract:

Lithium-ion batteries are the most preferred energy storage devices today for many high-performance applications. Recently, concerns about global warming, climate change and political instability and war in Ukraine have increased the need and requirements for Li-ion used in electric vehicles, and thus more advanced technologies and materials are urgently needed. Among the anode materials under development, silicon (Si) has been considered the most promising anode candidate for the next generation Li-ion to replace the widely used graphite. The obtained result allows to optimize the friendly composition environment, a green Si-based negative electrode for high-energy, long-life electrochemical cells of the next generation. Green, biodegradable binders in water-soluble form with high elastic properties were used as binders for active anode materials. The use of these compounds made it possible to eliminate toxic organic solvents from the technology of electrode production, as well as to increase the cyclical processes of charging and discharging testing cells.

The research was carried out as part of statutory work of Łukasiewicz-IMN in 2022.

Keywords:

Li-ion, anode, Si, green binders, water soluble binders



DETERMINATION OF MICROBIAL SURVIVAL DURING CEVICHE PREPARATION

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A few words about the author(s):

Mateusz Prusak – student majoring of gastronomy and culinary arts. He pursues his research as part of his work in the "Kocuria" student research group at the Department of Industrial and Food Microbiology.

Abstract:

Consuming ceviche carries similar risks to consuming other raw fish and seafood without heat treatment. Short-term exposure to lower pH can be ineffective against commensal and pathogenic bacteria. The aim of the study was analysis of the survival of microorganisms (*L. monocytogenes*, *L. innocua*, *H. alvei*, *E. faecalis*) after ceviche preparation and determination of the bactericidal properties of the various components of the dish. A ceviche was prepared by combining fish medium, cilantro, onions, habanero peppers, and fresh lime juice then all was homogenized and filtered. Additionally, each ingredient was prepared separately with fish medium only. The ceviche and its ingredients were combined with previously centrifuged fresh bacterial cultures and incubated at 4 °C for 30 min. To assess survival, cytometric analysis were performed. The highest reduction in bacteria occurred when all ceviche components were used, but for all bacteria it did not exceed 10%. The use of habanero peppers and cilantro alone did not reduce the number of bacteria. The most sensitive to the use of onions alone was the species *H. alvei*, in which a decrease to 98.59% of viable cells. The most effective ingredient in reducing the viability of microorganisms was lime juice, that cause <3% reduction of *L. innocua* and *E. faecalis*. The lowest reduction was characterized by strains of *L. monocytogenes* and *L. innocua*. This shows that traditional ceviche preparation is not an effective processing method.

Keywords:

ceviche, survival rate, flow cytometry



IMPACT OF NANOSTRUCTURAL NIOBIUM (V) OXIDES ON ELECTROCHEMICAL BEHAVIOUR OF COMPOSITE CARBON-SULFUR CATHODE FOR LI-S CELLS

**Magdalena Przybylczak (1, 2)*, Mariusz Walkowiak (2), Monika Osińska-Broniarz (2),
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Magdalena Przybylczak graduated from the Faculty of Chemical Technology of the Poznan University of Technology in 2013. In 2021, she began an implementation doctorate at the Doctoral School of the Poznań University of Technology.

Abstract:

Lithium-sulfur (Li-S) batteries are regarded as one of the most promising candidates for next-generation high-energy density power sources. This is mainly due to exceptionally high theoretical electrochemical capacity of sulfur in organic electrolytes. Unfortunately, mechanisms of complex conversion-type electrode reactions of sulfur still need more in depth understanding, especially when it comes to detrimental phenomena associated with intermediate lithium polysulfide diffusion out of the electrode. To alleviate the aforementioned parasitic effect, adding finely dispersed transition metal particles to a carbon-sulfur composite has proved particularly effective. In this work, niobium (V) oxide has been synthesized in the form of nanometric deposits on carbon particles. The synthesized materials have been characterized in terms of structure and morphology. The oxide-decorated carbon has been combined with sulfur and CMC binder by means of simple physical mixing. Electrode materials obtained this way have been tested electrochemically with metallic lithium counter electrode and conventional organic electrolyte. Niobium (V) oxides in the form of finely dispersed nanoparticles can be regarded as promising cathode additives for Li-S batteries.

This work was financed in the framework of the Implementation Doctorate Program of the Ministry of Education and Science of Poland and was realized in the years 2021-2025 under contract No DWD/5/0241/2021 01.02.2022).

Keywords:

lithium-sulfur, battery, energy storage, lithium-ion



STATISTICAL EVALUATION OF MATHEMATICAL MODELS USED IN THE PERMEABILIZATION PROCESS OF BAKER'S YEAST CELLS

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A few words about the author(s):

Academic teacher and researcher for 13 years in the field of chemical and bioprocess engineering. My scientific activity is related to permeabilization process of baker's yeast cells.

Abstract:

Baker's yeast, apart from its traditional use in the food industry, can be used to carry out biotransformations. Due to the presence of large amounts of intracellular enzymes produced by them, they are used as biocatalysts. Their effectiveness can be increased many times by permeabilization. It is a process of increasing the permeability of cell walls and cell membranes to in order to make easier the access of reagents to the intracellular enzyme. This process allows the diffusion of reaction reagents while preserving the enzymatic activity of the cell. In the presented work was carried out a statistical evaluation of mathematical models used in the permeabilization of baker's yeast cells. For each of the models were designated R^2 coefficients of determination, there was performed analysis of variances and Fisher's test of significance, and there were developed scatterplots of predicted values relative to observed ones.

Keywords:

permeabilization, yeast cell, response surface methodology



OVERVIEW OF LEAD GRID PRODUCTION TECHNOLOGIES FOR LEAD ACID BATTERIES

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A few words about the author(s):

Senior Process Engineer on Europe in Exide Technologies. In lead - acid battery industry since 2017. Student of Doctoral School of Poznan University of Technology since 2021.

Abstract:

Lead acid battery industry exists more than 100 years. During this period, countless number of battery designs were introduced. Nonetheless all of them require lead grid as a current collector. This work focuses on main production technologies of lead grid, used as current collector in lead acid batteries. Main four production types of lead grid are: punching, expanded – metal, continuous casting and gravity casting. Technologies used for lead strip production which is necessary for punching technologies and expanded – metal technologies will be also included.

Keywords:

lead-acid battery, lead grid, lead strip



HOW CEVICHE PREPARATION CAN AFFECT VIRULENCE POTENTIAL OF LISTERIA MONOCYTOGENES

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A few words about the author(s):

Zuzanna Wasilewska – a bachelor student of gastronomy. She carries out her research as part of her work in the Kocuria student research group at the Department of Industrial and Food Microbiology.

Abstract:

Consumption of ceviche poses various risks regarding water contamination and raw material quality due to limited processing time. One of risks is *Listeria monocytogenes*, which is often isolated from fish. Aim of the study was to determine how ceviche preparation affects the virulence of *L. monocytogenes* strains in a in vivo model using *Galleria melonella* larvae. For this purpose a ceviche was prepared by combination of fish with cilantro, red onion, habanero peppers, and marinated for 30 minutes with lime juice with the *L. monnocyto*genes strains. Than strains were centrifuged and resuspend in saline and injected in *G. mellonella* larvae using a Hamilton syringe. After injection, larvae were incubated at 37°C. Larvae were considered dead if they did not move when touched. The results showed that only one strain was more virulent after the ceviche preparation, in which the death of each infected larva was recorded after 48 hours. A significant decrease in larvae's mortality was observed among the rest of the strains, up to 60% of the larvae infected with other strains were alive after 168 h. Although the stress induced by ceviche preparation may reduce the virulence potential of *L. monocytogenes* strains, in individual cases it can cause a significant increase, therefore, it can be concluded that response is a strain characteristic. The obtained results indicate importance of the quality of the products used to prepare this dish to avoid potential listeriosis infection.

Keywords:

ceviche, *Listeria Monocytogenes*, *Galleria Mellonella*, virulence

ABSTRACTS OF **POSTERS**



TECHNICAL AND
NATURAL SCIENCES



INFLUENCE OF THE ADDITION OF DIFFERENT ORGANIC MATERIALS ON SOIL WETTABILITY

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A few words about the author(s):

The authors work in Department of Physical Chemistry of Porous Materials of IA PAN, where research is focused on: surface physical chemistry of agricultural materials, wettability of solid phase of soil and soil degradation processes.

Abstract:

Wettability describes the level of wetting when solid and liquid phases interact with each other. Depending on the material's physicochemical properties, a drop of liquid could spread or retain its sphericity. If water is used as a testing liquid, the wettability of a material refers to its hydrophilic or hydrophobic nature.

Wettability affects many physical, chemical, and biological processes, determining the agricultural usefulness of soils. The degree of soil wetting is important in infiltration, evaporation, erosion, preferential flow, humification, and nutrient transport processes. The soil wettability variation is frequently explained by the type of plant cover, clay minerals, microflora secretions, and the presence of organic matter. The organic matter quality and quantity and its spatial distribution as a solid particles or thin film at mineral surfaces are considered to affect moisture conservation properties in unsaturated soils. Our studies aim to present the effect of different organic materials, such as acidic peat, biochar, and humic acids, on the wettability of silty soil. Wettability was estimated goniometrically, measuring the contact angle by the sessile drop method.

This research was funded in part by National Science Centre, Poland within grant number 2021/43/D/ST10/01656.

This research was funded in part by National Science Centre, Poland within grant number 2018/29/B/ST10/01592.

Keywords:

soil wettability, organic materials, peat, biochar, humic acids



HYDROGEL DRESSING MATERIALS – PROPERTIES AND APPLICATIONS

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Abstract:

Hydrogel materials are currently the most advanced group of dressings. They are defined as at least two-component materials consisting of a polymer network and water. Hydrogel synthesis involves the formation of cross-links between polymer chains resulting in a three-dimensional structure whose spaces are filled with water. This process takes place in a UV field and is called photopolymerization. Hydrogel materials fulfil many of the characteristics of an ideal medical dressing, i.e., maintaining a moist environment around the wound, permeability to oxygen and, unusually for modern drug delivery systems, ensuring controlled release of the active substance. Thanks to their structure, hydrogels can absorb aqueous solutions in a reversible manner, a highly desirable feature from the point of view of absorbing potential wound exudate and releasing the active substance. The hydrogel matrix can be extensively enriched with substances such as Aloe vera. Aloe vera juice has soothing properties and therefore increases the therapeutic effect of the hydrogel dressing. It also contributes to changing the morphology of the surface making it smoother. Hydrogel materials enriched with Aloe vera have application potential in the treatment of many skin conditions, e.g., diabetic foot, as well as supporting the treatment of burn wounds.

Keywords:

hydrogel, Aloe vera, diabetic foot



THE ROLE OF CHITINASE IN PLANT GROWTH AND DEVELOPMENT AND THEIR INTERACTION WITH THE ENVIRONMENT

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A few words about the author(s):

Adrianna Krzemińska, Msc Eng, student of genetic and experimental biology. Interest: biotechnology and plant genetics. Anna Kisiel, PhD Eng, microbiologist, biotechnologist. On a daily basis, she deals with soil microbiology and plant biotechnology.

Abstract:

Chitinases are enzyme proteins belonging to the group of glycosidic hydrolases (GH), present in the organisms of plants, animals, bacteria and fungi. They are responsible for the hydrolysis of the insoluble polymer – β -N-acetylhexosaminidase - chitin. Chitin is one of the most abundant polymers in nature. It is found in the cell walls of plants and fungi and in the exoskeletons of arthropods. In its structure, chitin is similar to cellulose.

Currently, many studies focus on accurately describing the role of plant chitinases in their growth and development and interaction with the environment. Understanding these mechanisms is of key importance in fully understanding the processes of plant growth and development, which will allow for full optimization of their cultivation.

The aim of the work was to describe the mechanisms of action of plant chitinases and to collect information the of interactions that contribute to their participation in plant growth and development, as well as the interaction of plants with the environment.

Keywords:

chitinase, growth and development, chitin, microbial interactions, cell signaling



INFLUENCE OF ACRYLAMIDE ON THE GROWTH OF LACTIC ACID BACTERIA AND YEASTS

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A few words about the author(s):

This respective poster has been completed while the first author was the Doctoral Candidate in the Interdisciplinary Doctoral School at the Lodz University of Technology, Poland.

Abstract:

Acrylamide (AA) is present in industry but also foodstuffs. AA was classified into Group 2A as a compound probable carcinogenic to humans.

The aim of the following research was to measure the influence of AA (5, 10 and 50 g/ml) on the growth of lactic acid bacteria and yeasts. The cells were activated, planted in each well of a 96-well plate and incubated in liquid MRS/YPG media at 30/37 °C (depending on strain) with specific concentration of AA for 24 hours. The controls were bacterial cultures without AA. After incubation, absorbance was measured at 550 nm with a reference filter of 620 nm, using a microplate reader.

The experiment revealed that AA influences on the growth of lactic acid bacteria and yeasts. AA is able to stimulate the growth of *Lactiplantibacillus plantarum* (5-50 µg/ml), *Lactocaseibacillus rhamnosus* (5-50 µg/ml), and strain 51 (5 µg/ml). In the case of yeasts, AA (50 µg/ml) induced the visible increase in *Saccharomyces cerevisiae* growth. However, AA also showed the decrease in the growth of the following lactic acid bacteria strains (*Pediococcus acidilactici*, *Latilactobacillus curvatus*, *Lactobacillus delbrueckii*, and strain 52), and yeasts (*Pichia fermentans*, *Hanseniaspora uvarum*). For certain lactic acid bacteria strains, AA can increase (*Lactiplantibacillus plantarum*) or decrease (*Lactobacillus delbrueckii*) growth in dose-dependent manner.

It has been confirmed that the influence of AA on the growth of lactic acid bacteria is strain-related.

Keywords:

acrylamide, lactic acid bacteria, yeasts, growth



ON DIVISIBILITY OF DEDEKIND NUMBERS BY 2 AND 3

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A few words about the author(s):

Bartłomiej Pawelski – PhD student at University of Gdansk. His research interests include solving combinatorial problems. He is currently focusing on counting monotone Boolean functions.

Abstract:

Dedekind numbers are the famous sequence of integers. They are known only up to eight inclusive. Research on the divisibility of Dedekind numbers, in particular the ninth, which is not yet known, will make it easier to verify the correctness of the result after its first calculation. The author focuses on the divisibility of the ninth Dedekind number by 2 and by 3.

Keywords:

monotone boolean functions, dedekind numbers, combinatorics, divisibility, inclusion relation



SELECTED ASTERACEAE VEGETABLES AS ANTIPLATELET AGENTS IN IN VITRO STUDIES

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Abstract:

Hemostasis is a process responsible for keeping the proper blood flow and preventing bleeding in case of damage of blood vessel. Blood platelets are the smallest elements in whole cardiovascular system. They play a key role in the prime hemostasis, but are also important part of second hemostasis. However, the dysfunction and unnecessary activation of blood platelets can lead to disorder of hemostasis and in the long term to development of cardiovascular diseases.

Asteraceae family is one of the biggest plant family. The best know species include chicory, lettuce, dandelion, and sunchoke. Asteraceae family have been used in everyday diet for ages, because they're good source of various nutrients and vitamins. Additionally, aster vegetables have various biological activity, such as antioxidant, anti-inflammatory, anti-diabetic activity. Asteraceae family are rich in phenolic acids, flavonoids and sesquiterpene lactone.

The aim of this project was to analyzed the effect of selected aster vegetables on blood platelets. Study included preparations from chicory, green lettuce, red lettuce and sunchoke. Analysis of anti-platelet effect of vegetable preparations was based on the level of adhesion of blood platelet to collagen and fibrinogen. The obtained results demonstrated anti-platelet activity of selected preparations from Asteraceae family, which suggest that this vegetables potentially can be used in prevention and maybe treatment of cardiovascular diseases.

Keywords:

Asteraceae family, blood platelets, hemostasis



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