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NATIONAL SCIENTIFIC CONFERENCE
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NOVEMBER • 19 • 2022

THE BOOK OF ABSTRACTS

National Scientific Conference

„e-Factory of Science”

VIII edition

The Book of Abstracts

November 19, 2022



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Promovendi Foundation Publishing

Address:

17/19/28 Kamińskiego st.

90-229 Lodz, Poland

KRS: 0000628361

The papers included in this Book of Abstracts have been published in accordance with the submitted texts. The authors of individual papers are responsible for the lawful use of the materials used.

e-mail: fundacja@promovendi.pl

www.promovendi.pl

ISBN: 978-83-963887-7-3

Open access



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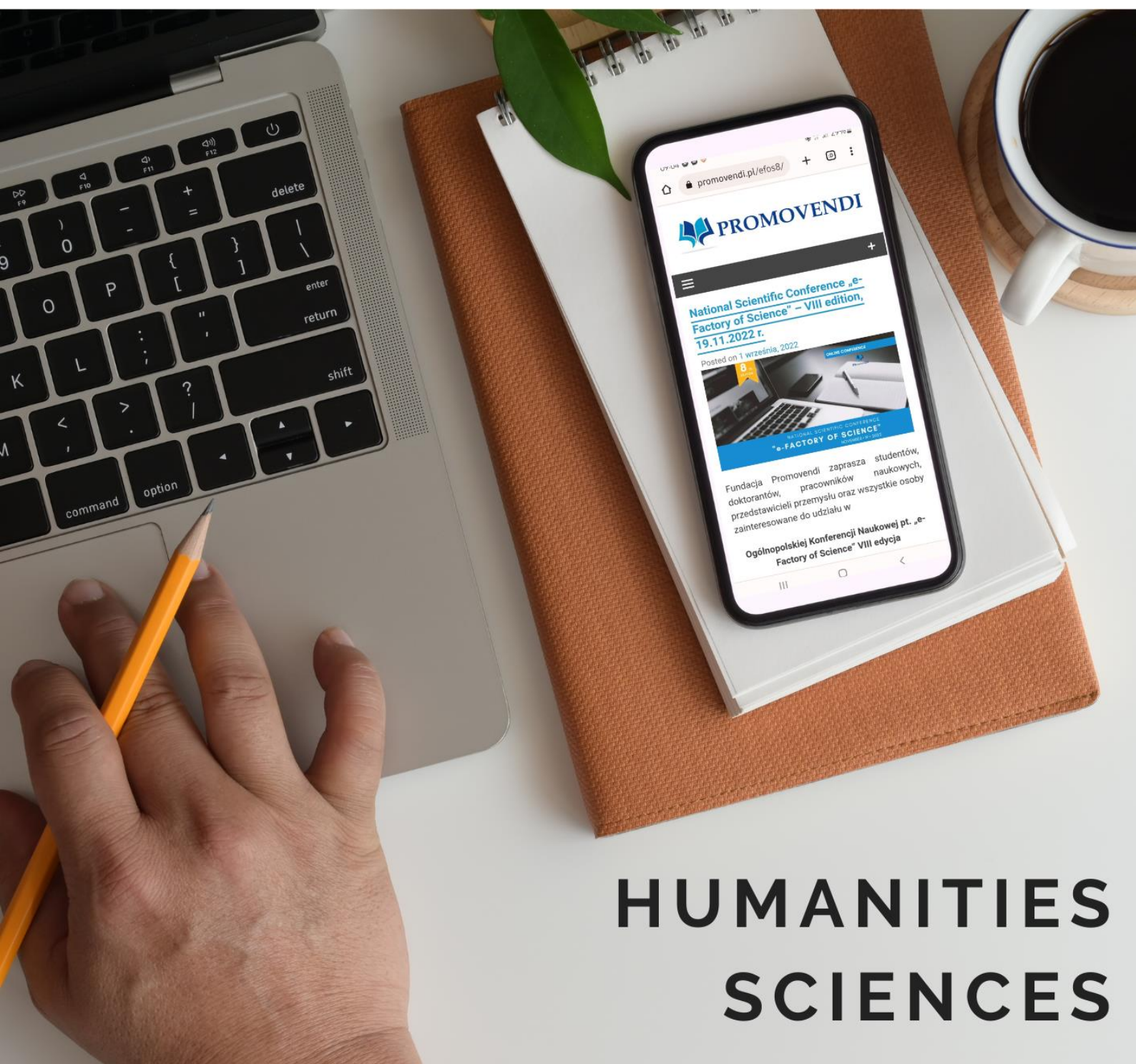
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ABSTRACTS OF PRESENTATIONS



HUMANITIES SCIENCES



LINGUISTIC AND VISUAL ANALYSIS OF ARTICLE TITLES ON THE "SUPER EXPRESS" PORTAL

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A few words about the author(s):

Bachelor of Journalism and Social Communication, researcher of media, media language, politics, remediation and multimodal messages.

Abstract:

The aim of the work is to show the variety and multiplicity of the titles of articles on the "Super Express" portal. This portal is informational and journalistic, so there are titles referring to many semantic and linguistic groups. 378 titles were analyzed in the study. In addition, a research survey was carried out, which allowed to determine the attractiveness of the title among the public. The research will make it possible to formulate answers and conclusions regarding the creation of titles, their diversity and how they touch the pragmatic aspect.

Keywords:

press, analysis, titles, controversy



A PROPOSAL OF INCLUDING FULL-FLEDGED VIDEO GAMES IN EEG BIOFEEDBACK THERAPY

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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:

EEG Biofeedback is a relatively new tool that may become useful in therapy of different kinds of disorders and symptoms related to body and brain. Neurological knowledge and advancing engineering thought, makes constant upgrades to such tools used in therapy. Those upgrades are supposed to make training more effective. In opposition to cognitive trainings that use video games, neurofeedback uses simple applications which enables patients to see their own psychophysical state. The aim of this presentation is to show alternatives for current ways of training patients' interactions with digital content in order to improve their experience and enlarge involvement in therapy. It will also present terms connected to cognitive training and video games.

Keywords:

cognitive training, neurofeedback, video games



THE IMPORTANCE OF MIRROR NEURON ACTIVITY IN EMPATHY

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A few words about the author(s):

I am a graduate of cognitive science. The topic of empathy and neurobiological foundation of this ability always fascinated me. In the future I wish to continue my studies and deepen my knowledge in the field of cognitive science.

Abstract:

The capacity to place oneself in another's position, commonly known as empathy, was one of the most difficult problems to solve in modern science. Because of that, a lot of theories concerning origins and causes of empathic behaviour were formed. The discovery which significantly contributed to defining empathy was the discovery of mirror neurons. Distinguishing this type of neurons, their functioning and areas of the brain, where the largest clusters of mirror neurons are present, enabled scientists to deepen the knowledge of empathic behaviour and empathy itself. This presentation will concentrate on empathy as well as issues related to mirror neurons such as their discovery, characteristic and functioning. It will also show the association between the activity of mirror neurons and the manifestation of empathy.

Keywords:

empathy, mirror neurons, empathic behaviour



THE CLERGY'S RIGHT TO HOLIDAYS

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Rev. Paweł Lewandowski, ICD, STL – Associate Professor in the Department of Public and Constitutional Church Law, acting Director of Wydawnictwo KUL, Judge of the Diocesan Tribunal in Tarnów.

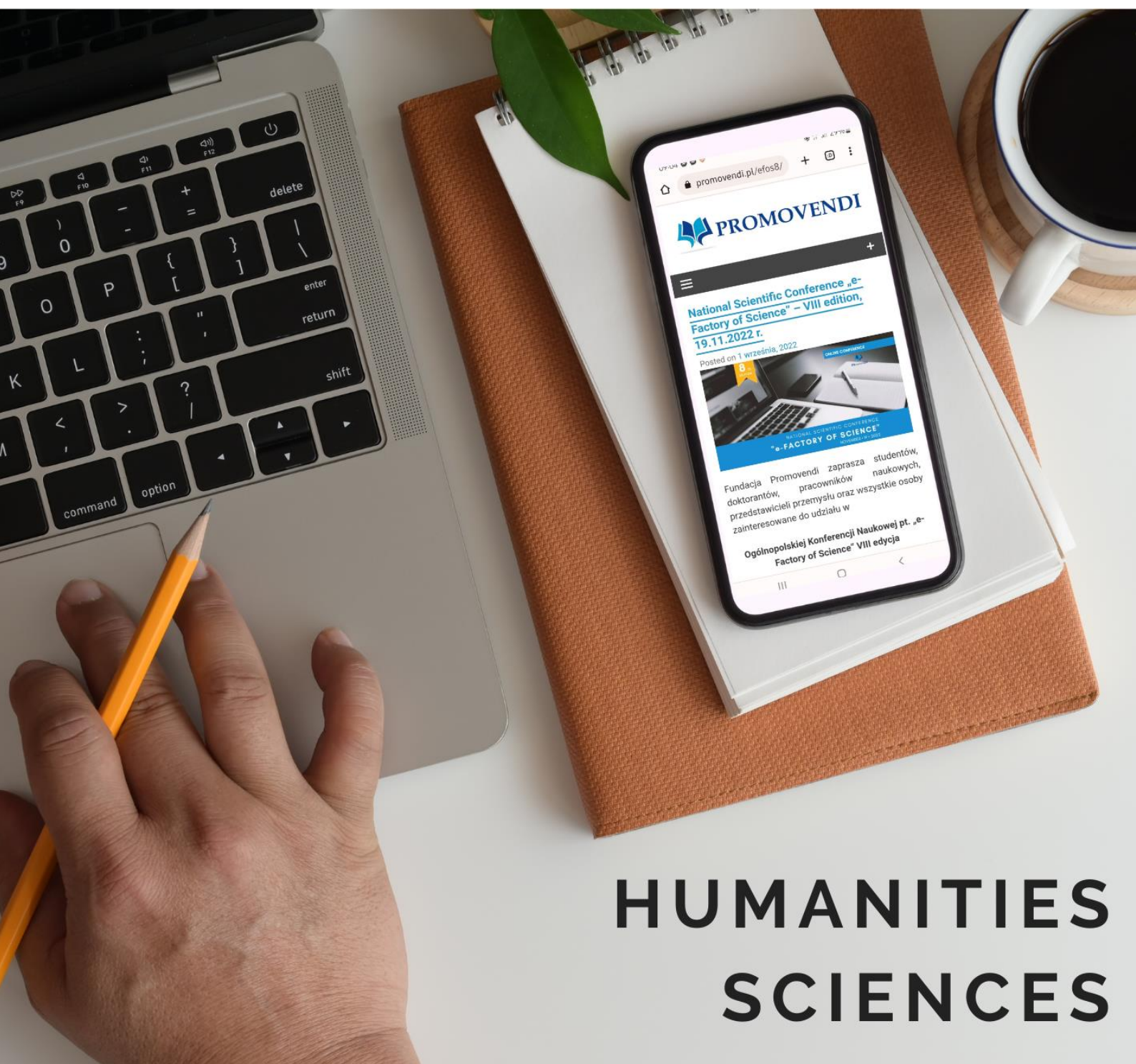
Abstract:

The Church's Magisterium, in numerous documents, draws attention to the value of leisure time and calls for the proper exercise of the right to rest. This right should be seen as one of the most important entitlements enjoyed by a person undertaking work. The need for adequate rest was recognised by popes who taught on social issues, including Leo XIII and John Paul II. The proposed issue is of significant importance for clergy and of a practical nature. With regard to universal legislation, an analysis will be made of can. 283 § 2 of the 1983 Code of Canon Law, in which the code legislator proclaims the right of the clergy to due and sufficient annual holidays, as defined by universal or particular law, as well as of can. 533 § 2 and 550 § 3 of the 1983 Code of Canon Law, which will lead to a systematisation and definition of the way in which the clergy's right in question is exercised. An indication of the reception of universal legislation in Polish particular legislation will show the detailed solutions adopted by individual diocesan bishops in the particular Churches entrusted to them.

Keywords:

canon law, clergy, holidays, diocesan bishop, can. 283 § 2

ABSTRACTS OF POSTERS



HUMANITIES SCIENCES



THE SUBJECTIVE INTENSITY OF PREMENSTRUAL DISORDERS SYMPTOMS AND PSYCHOTIC-LIKE EXPERIENCES

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A few words about the author(s):

Rachela Antosz-Rekucka, is a PhD candidate at the Doctoral School in Social Sciences, Jagiellonian University. She is interested in clinical and abnormal psychology, psychotherapy and marginalized groups.

Abstract:

Premenstrual disorders are characterized by the occurrence of severe affective and somatic symptoms that disturb the daily functioning in the last week of the luteal phase of the cycle. They still did not earn enough attention from the researchers, especially in psychology. Very little is known about the relationship between premenstrual and psychotic disorders. The aim if this study was to address this gap by examining the relationship between premenstrual disorders and psychotic-like experiences (PLEs, subclinical symptoms of psychosis that occur in healthy population). Depressive symptoms and trait anxiety were used as control variables. All study variables were assessed using self-report questionnaires, 108 people (102 females, 6 non-binary people; aged 18-25) participated in the study. Significant, positive (moderate to strong) correlations were found between premenstrual symptoms and various types of PLEs. Moreover, premenstrual symptoms were a non-redundant predictor of PLEs frequency when depressive symptoms and anxiety were controlled. This suggest premenstrual symptomatology may be an important factor impacting subclinical psychotic symptoms (and maybe also clinical ones). However, as the study was explorative in nature and used retrospective measure of premenstrual symptoms, more research is needed in the topic.

Keywords:

premenstrual disorders, premenstrual syndrome, premenstrual dysphoric disorder, psychotic-like experiences, psychosis continuum hypothesis



APPLICATION OF COGNITIVE NETWORKS. LITERATURE RESEARCH

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A few words about the author(s):

The author is a lawyer and IT specialist by education. Currently, he is a doctoral student at the PhD School of UEW. Co-author of publications using the use of IT in law, including those in the field of legal knowledge management.

Abstract:

Correct identification of the causes and the effects that arose allow not only to improve the decision-making process, but also to introduce the necessary changes. Their application in various fields of science allows the discovery of new phenomena and facts. Their specificity may sometimes cause difficulties in their use. The conducted research using a systematic literature review is aimed at identifying not only the number of publications from the last decade, but also the areas in which they are used. The analysis will be carried out using the Systematic Literature Review, on the basis of which it will be possible to define not only related keywords, but also areas. The following publication databases will be reviewed: Scopus and Web of Science.

Keywords:

cognitive maps, Systematic Literature Review (SLR), research areas, cause and effect



THE ROLE OF USER EXPERIENCE IN VR AND AR TECHNOLOGIES – A LITERATURE REVIEW

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A few words about the author(s):

I am a PhD student in the discipline of management and quality studies at the Wroclaw University of Economics and Business. My interests are User Experience, User Interface design and creative problem solving methods such as Design Thinking.

Abstract:

Virtual Reality (VR) and Augmented Reality (AR) technologies are developing year by year and expanding the scope of their functioning. It can be said that both technologies are designed to create an amazing experience for humans. For this reason, when designing solutions using VR and AR, User Experience (UX) designers are also increasingly involved. For user experience creators, these are completely new areas, because there are no established design paradigms or best practices for them. The aim of this work is to indicate the role of User Experience in VR and AR technologies. In this article, a literature review is used as a research method. Four publication databases were selected for the study: Science Direct, Emerald, Wiley Online Library and Springer, while considering the year of publication, the range from 2018 to 2021 was selected.

Keywords:

User Experience (UX), Virtual Reality (VR), Augmented Reality (AR), ICT, literature review



THE WAYS OF SOCIALIZING HOMESCHOOLED STUDENTS

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A few words about the author(s):

Zuzanna Porębowicz is a student at Akademia Pedagogiki Specjalnej im. Marii Grzegorzewskiej. She is interested in alternative forms of education.

Abstract:

Homeschooling or home-based education is a way of learning, where a student doesn't attend school. It doesn't mean, however, that he or she is at home all the time. Homeschooling families are finding different ways to socialize their children, that are learning at home. The issue of socialization is a big one, when it comes to homeschooling. Some assume that children that are learning at home won't be able to socialize properly. How does it look from the perspective of homeschooling parents?

Keywords:

homeschooling, home based education, socialization



STUDENT SUPPORT GROUP AS A FORM OF PSYCHOLOGICAL HELP FOR STUDENTS

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A few words about the author(s):

I am a third-year student of psychology at the Andrzej Frycz Modrzewski University in Krakow. My scientific interests in general are mainly related to the issue of stress as well as coping with it.

Abstract:

As soon as the students begin their studies, they may be unprepared to face the additional stressors regarding social, academic, and financial burdens. In order to help students to overcome the difficulties of everyday life, a support group for psychology students was established at the A.Frycz Modrzewski Krakow University.

The purpose of this survey was to assess the general interest of AFMKU students in this initiative, as well as to obtain information on what kind of problems students have to face and what are their expectations from the student support group.

118 students were surveyed using an online questionnaire of the author's design. The tool included questions about basic data and core questions about the issues addressed at the support group, some of which related to the respondent's self-assessment of how they felt about such problems, others about basic knowledge and willingness to participate in the support group.

According to the students, the biggest problem is the negative stress they feel. Various types of interpersonal problems were also mentioned. A significant number of students indicated that they would like to learn relaxation techniques to reduce stress and increase mental toughness.

The preliminary results of the present study showed that stress is a major problem faced by AFMKU students. The introduction of workshops demonstrating different ways to deal with stress should be considered and the initiative of student support groups should be continued.

Keywords:

support group, students, psychological help, stress

ABSTRACTS OF PRESENTATIONS



MEDICAL SCIENCES



RHABDOMYOLYSIS – POSSIBLE LIFE-THREATENING COMPLICATION OF INFECTIOUS AND ONCOLOGICAL DISEASES – OWN EXPERIENCES AND LITERATURE REVIEW

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PhD student in Doctoral School of Medical University of Silesia in Katowice.

Abstract:

Rhabdomyolysis is a group of clinical and biochemical symptoms following the damage of the striated muscles. As a result of the damage of the myocytes, their intracellular components are released into the intercellular space and then into the blood. In most cases, rhabdomyolysis course is asymptomatic – except for the laboratory tests abnormalities.

In the case of severe muscle damage occurs the triad of symptoms: muscle aches, muscle weakness, dark color of the urine (pink to almost pink and black). It is believed that in most cases the coexistence of several predisposing factors occurs, such as infection, trauma/surgery, physical effort or medications. Injury, especially crash syndrome causes mechanical destruction of muscle cells and release their ingredients. The disease in children population is rare, only a few reports concern children.

Keywords:

rhabdomyolysis



COULD PROBIOTICS SUPPORT TREATMENT OF DIABETIC FOOT INFECTIONS?

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Our scientific interest is focused on the diabetic foot infections. We search for new alternatives to conventional treatment and try to understand the pathogenic nature of infection factors, to find new, customized treatment options.

Abstract:

Diabetic ulcers are still common complication of diabetes. It is estimated that 19–34% of people affected by diabetes will develop a foot ulcer in their lifetime. Every year over 1 million of patients lose at least a part of their lower limb due complications related to the diabetes. There are several risk factors related to ulceration process e.g. neuropathy, infections, peripheral artery disease, while complications related to the treatment of diabetic foot ulcers are often a result of increasing resistance of bacteria involved in the infection process to antibiotics. The aim of our studies was analysis of the influence of probiotic supplementation on the prevention and treatment of diabetic ulcers. To identify potentially eligible studies, databases of Pub Med/Medline, Scopus, Web of Science, Embase were searched. According to the literature multidirectional studies e.g. antibiotic therapy in combination with diet therapy seems to be more efficient than simple activity. As diabetic ulcer is often combined with dysbiosis of local microbiome that may lead to infection, application of probiotic may help in prevention of infection. Moreover, application of probiotic as support of bacteria eradication may decrease the problem of growing bacterial resistance to antibiotics. Probiotics might be good candidates to this type of therapy also due to their anti-inflammatory activity, promotion of wound healing, stimulation of immune system.

Keywords:

probiotic, diabetic foot, infection, ulcer



ANTIPSYCHOTIC DRUGS IN ANOREXIA NERVOSA

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Alicja Sierakowska – student scientific society at Institute of medical sciences. Adam Pawlak – doctor in medical sciences, psychologist, psychotherapist. Michał Braczkowski – doctor in biological sciences.

Abstract:

Anorexia nervosa (AN) is a mental illness included in the spectrum of eating disorders. It most often begins in young girls or women between the ages of 14 and 18, with an average incidence at age 15. Currently, there is a trend toward lowering the age at which the first symptoms occur. The disease is characterized by taking restrictive or destructive actions, leading to intentional weight loss. In addition, it is accompanied by a disturbed perception of one's body image. To date, treatment of AN has been based primarily on psychotherapy, with accompanying pharmacotherapy. Currently, fluoxetine is the only drug registered for the treatment of AN. There are reports suggesting a possible pathology within the dopaminergic metabolism, which suggests the validity of the thesis for the use of antipsychotic drugs. Moreover, the literature reports benefits of neuroleptic drugs. An example of which are studies indicating relatively higher weight gain after olanzapine use compared to placebo. Nevertheless, the aspect of antipsychotic use in AN requires further research.

Keywords:

anorexia nervosa, treatment, antipsychotic drugs, olanzapine



POLYELECTROLYTE MULTILAYERS IN BLOOD SUBSTITUTE PREPARATIONS

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A few words about the author(s):

NanoSanguis is an unique niche where the advanced science meets practical application experience and professional business.

Abstract:

The finding for an effective blood substitute would solve a problem of a chronic shortage of blood donors, avoid a risk of disease transmission and lower immunity, and effectively address religious concerns related to human blood transfusions. One of the main directions of these research are perfluorocarbon (PFC) emulsions which have the ability to dissolve and transport respiratory gases. These compounds are both hydrophobic and lipophobic, so they can enter the bloodstream only in an emulsified form. Production of stable PFC emulsion requires high concentrations of surfactants, however they in high concentrations show significant cytotoxicity, which is unacceptable when considering emulsions blood substitute applications. For this reason, the development of a new biocompatible coating covering the particle of the emulsion seems crucial for future exploration of the PFC carrier system potential. An interesting group of compounds used to create biocompatible coatings are polyelectrolytes (polymers whose repeating units bear an electrolyte group). NanoSanguis oxygen carrier has a structure of a core/shell particle in which the core is made of the PFC and the shell consists of surfactant covered with polyelectrolyte layers. The shell obtained by our chemistry team was made of materials approved for contacting with blood. A stabilizing polyelectrolyte emulsion with particle diameters below 6 μm (erythrocyte size is 6-9 μm) was acquired during the study.

Keywords:

red blood cell (RBC) substitute, perfluorocarbons (PFCs), polyelectrolytes



NOVEL HUMAN TOPOISOMERASE II INHIBITORS AS ANTICANCER AGENTS

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A few words about the author(s):

Barbara Kaproń graduated from Medical University of Lublin with Master's Degree in Pharmacy in 2013. In 2018 she obtained a PhD in pharmaceutical sciences. The areas of her research include drug development and anticancer activity of molecules.

Abstract:

Despite of remarkable progress in diagnostic techniques and improvement in methods of treatment, cancer diseases are still one of the leading causes of death. There is also no strong evidence that most new anticancer drugs improve or extend patients' life. Therefore, it seems essential to try to identify new drug candidates chemically different from currently used anticancer agents. The herein research aims at the comprehensive analysis of anticancer potential of new thiosemicarbazide-based human DNA topoisomerase II (topo II) inhibitors. The effect of the compounds on a panel of cancer cell lines was examined. Among the cell lines tested, lung cancer (A549) and melanoma (A375) cells were the most sensitive to compounds 1 ($IC_{50}=0.23\mu g/ml$), 2 ($IC_{50}=0.83\mu g/ml$) and 3 ($IC_{50}=0.25\mu g/ml$). The observed activity was even 90-fold higher than that of etoposide, with selectivity index values reaching 125. In-silico simulations showed that contact between 1-3 and human DNA topoisomerase II was maintained through aromatic moieties located at limiting edges of ligand molecules and intensive interactions of the thiosemicarbazide core with the DNA fragments present in the catalytic site of the enzyme.

The work was supported by the National Science Centre, Poland, under Preludium grant (UMO-2018/29/N/NZ7/01726).

Keywords:

thiosemicarbazide derivatives, human DNA topoisomerase II, anticancer drug design



TRYPEPTIDE GHK-CU IN PREVENTION OF OXIDATIVE STRESS – IMPLICATIONS FOR COGNITIVE HEALTH

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A few words about the author(s):

Edyta Kucharska, PhD: Adjunct Professor in the Department of Chemical Organic Technology and Polymeric Materials at West Pomeranian University of Technology in Szczecin. Research directions: synthesis and modification of compounds with medical and cosmetic applications.

Abstract:

Oxidative stress and disrupted copper homeostasis are considered leading causative factors in development of age-associated neurodegenerative conditions. Tripeptide glycyl-L-histidyl-L-lysine (GHK) was discovered in 1973, possesses antioxidant, anti-inflammatory, and wound healing properties. Moreover, GHK has high affinity for copper ions and easily forms a copper complex GHK-Cu. The aim of this paper is to bring attention to the tripeptide GHK-Cu for safe use in wound healing skin care.

Keywords:

tripeptide GHK, copper complex GHK-Cu, oxidative stress



THE OBESITY EPIDEMIC, LEADING TO TYPE TWO DIABETES - THE METABOLIC DISEASES OF THE 21ST CENTURY

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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:

In recent years, there has been a worrying trend of weight gain in humans. It is a global problem with long-term consequences. More and more obese people are developing insulin resistance, leading to type 2 diabetes. Increased body weight is also thought to be a cause of the development of other life-threatening chronic diseases. Obesity is a complex health, social and economic problem, despite the media portrayal of a slim figure and easy access to food and dietary supplements, the condition is affecting more and more people worldwide. The growing epidemic of obesity among children and adolescents should become a crucial focus of the struggle for doctors, as well as the medical community. For this reason, it is particularly important to emphasise the need to shape health-promoting behaviour from early childhood.

Keywords:

Type 2 diabetes, obesity, metabolic diseases, epidemic, treatment



WHAT DO CHRONICALLY ILL PEOPLE WITH MULTIMORBIDITY DISEASE NEED

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A few words about the author(s):

Izabela Paluch Filipaska PhD student of the second year of the doctoral school of the Medical University of Silesia. Alicja Paluch fourth-year student of medicine in the Medical University of Lublin.

Abstract:

INTRODUCTION: A chronic patient is an individual suffering from a long-term condition that does not resolve and, over time, progresses causing damage to health and reduced quality of life associated with treatment. Chronically ill patients are very often multi-disease burdened and face multiple health care problems.

MATERIALS AND METHODS: A total of 200 healthcare professionals were included in the study. We conducted a selfadministered questionnaire consisting of 30 questions, plus a metric analysed for conclusions.

CONCLUSIONS: Analysing the results, it can be concluded that 100% of the respondents come into contact with a chronically ill person in their work. 73% talk to and support such a person with an illness. 97.5% of the respondents believe that such a patient requires multi-specialist care. 91% say they try to treat the patient with understanding and empathy. 87% say that people with this condition expect interest, support, and readiness to help.

SUMMARY: Chronically ill people need love, understanding, support, and empathy, and in the last place, the patients indicated material assistance. Medical personnel is constantly burdened with work stress, which is difficult to cope with. Optimal interdisciplinary support should be provided for the well-being of the patient. In patients with a multi-disease burden, action strategies should be implemented to improve their quality of life and mental status.

Keywords:

multimorbidity, disease, patient, chroniquesdisease, medicine



DISEASES AND DEFECTS FOUND IN NEONATAL SCREENING

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A few words about the author(s):

Laboratory diagnostician.

Abstract:

Neonatal screening is recognized by the WHO as an important preventive measure. In Poland, pilot screening for phenylketonuria was started in 1965 at the Institute of Mother and Child. Currently, 29 congenital diseases are screened, including phenylketonuria, congenital hypothyroidism, cystic fibrosis, congenital adrenal hyperplasia, biotinidase deficiency, and 24 other congenital malformations of metabolism. During the year, such congenital diseases are detected in about 400 newborns. Research is being done for the entire population of newborns in seven laboratories coordinated by the Institute of Mother and Child. The Newborn Screening Program is funded by the Ministry of Health. In March 2021, the Screening Department began screening tests for spinal muscular atrophy (SMA).

Hearing impairment screening tests are conducted independently by the Wielka Orkiestra Świątecznej Pomocy Foundation.

Keywords:

phenylketonuria, congenital hypothyroidism, cystic fibrosis



UTERINE NECK CANCER

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A few words about the author(s):

Laboratory diagnostician.

Abstract:

Cervical cancer is the second most common cancer among women aged 15 to 44. Poland ranks second in European morbidity statistics. Annually in our country, almost 4,000 women are diagnosed with cervical cancer, unfortunately nearly half of them die. Women who have not undergone cytological examinations for many years are most often affected by the disease. Cytology offers a chance to detect cancer at an early stage of its development, while it is still fully cured. The main cause of cervical cancer is the human papillomavirus – HPV. Chronic HPV infection causes 99.7% of cervical cancer cases.

Keywords:

human papillomavirus – HPV, cytology, cancer



INNOVATIVE SYSTEM OF EQUIPMENT FOR STORAGE AND FULL RECORDING OF THE CIRCULATION OF THERMOLABILE DRUGS

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A few words about the author(s):

The team working for the Mawi company.

Abstract:

An innovative system of equipment for storage and full recording of the circulation of thermolabile drugs. It responds to the market demand of the medical industry. The current state of equipment in hospital departments does not provide the possibility of monitoring the conditions under which the circulation of drugs takes place. The lack of available solutions leads to situations where patients are given drugs that, due to improper storage conditions, may not have therapeutic effects, and in extreme situations may even harm patients. The problem is particularly significant in the case of oncology therapies. Its scope flows naturally from the problems currently reported to the Company when carrying out deliveries of refrigeration equipment to customers associated with the health service (hospitals, pharmacies). MAWI has prepared a project that solves the described problem and developed a system for storing and monitoring the circulation and storage conditions of drugs. The developed solution will close the “cold chain” of drug circulation.

Keywords:

cold chain, drug storage, temperature control



PRELIMINARY EVALUATION OF THE TOXICITY OF CEFEPIME PHOTODEGRADATION PRODUCTS USING THAMNOCEPHALUS PLATYURUS

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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:

High levels of drug consumption are linked to increasing environmental pollution from pharmaceutical substances. The presence of drugs in the aquatic environment can have a negative impact on aquatic organisms and contribute to the development of antibiotic resistance.

The object of this study was to analyze the potential ecotoxicity of a mixture of cefepime, a fourth-generation cephalosporin, and photodegradation products of parent compound after UV-Vis irradiation. For this purpose, a standard solution of the antibiotic was irradiated using a lamp simulating sunlight with controlled temperature (35°C). The samples were incubated up to 6 hours, while keeping an unirradiated sample for comparison. The irradiation parameters were selected based on conducted previous kinetics studies that indicate the stability cefepime under UV-Vis irradiation.

Conducting the Thamnotoxkit F test began with hatching test organisms from cysts attached to TOXKIT kits. Plates with Thamnocephalus platyurus cysts were incubated for 22-24 hours at 25°C. Test organisms and previously prepared cefepime solutions after irradiation as well as control samples were applied to a multiwell plate. After 24 hours incubation in the dark, the number of dead larvae was counted and the mortality rate of the crustaceans was calculated from it by determining the LC50. The analyses revealed higher toxicity of the mixture of photodegradation products and the parent antibiotic compared to the untreated solutions.

Keywords:

cefepime, antibiotic, water pollution

ABSTRACTS OF POSTERS



MEDICAL SCIENCES



NURSING CARE OF THE PATIENT AFTER STROKE

**Klaudia Jakubowska (1)*, Katarzyna Przednowek (2), Małgorzata Gorzel (1),
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A few words about the author(s):

The research findings are based on a case study research with a student from the Medical University of Lublin and lecturers from various professions, including: a nurse, a physiotherapist and a specialist in art therapy.

Abstract:

Strokes are one of the leading causes of disability and are the second leading cause of death. They affect men more often and the incidence increases with age. As many as 87% of strokes are ischaemic, whereas haemorrhagic strokes are less common but have a poorer prognosis. Early recognition of stroke symptoms and treatment has an impact on the patient's later condition and functioning in the community. The aim of this study was to determine the role of the nurse in the care of patients after stroke. The study used the individual case method and it was conducted on 23.11.2021 in the neurology clinic in Lublin. The subject of the study was a patient after a stroke. Data were obtained from a direct interview, observation of the patient during the interview, measurements of vital signs, as well as inspection of the medical records. A nursing interview questionnaire was also used, selected scales and a stroke knowledge questionnaire. The post-stroke patient required comprehensive assistance from the nurse in functioning with the effects of the disease. It was up to her to assess needs and the appropriate selection of the method of assistance. The actions taken by the nurse were not only to help with already existing problems, but should also prepare the patient and his family to function in the home environment.

Keywords:

stroke, stroke rehabilitation, nursing care, treatment



ART THERAPY IN THE FIGHT AGAINST "STUDENT BURNOUT"

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A few words about the author(s):

Study developed by lecturers at Vincent Pol University and the Centre for Research and Learning Innovation in Lublin in collaboration with students and teachers of VI High School – King Sigismund Augustus in Białystok.

Abstract:

Art therapy is a multidimensional therapeutic tool which, among other things, develops emotional intelligence. Thanks to art in a broad sense, young people recognise emotions, learn to understand them, express them and consequently regulate them. The aim of this work is to present the author's art therapy programme devoted to providing skills for dealing constructively with stressful situations and the ability to recognise the symptoms and effects of stress. The programme of activities entitled. "EMBRACE STRESS". Aim of the class: to identify one's own needs, analyse the sources of stress and recognise how to cope with it. The class is aimed at people of school age. Class time is 3 hours. The course of the workshop includes 7 sessions. Expected therapeutic effects: working through stressful situations, building self-esteem and adequate self-assessment, becoming aware of one's own abilities and predispositions. Expected educational effects: learning to help release emotional tensions, learning relaxation techniques, learning how to cope with stressful situations, learning to recognise symptoms and effects of stress. Anticipated developmental outcomes: coping constructively with stress, responding appropriately to stressful situations, using one's own abilities and predispositions, expressing one's feelings, emotions and needs.

Keywords:

art therapy, stress, self-esteem, therapeutic tools



EVALUATION OF THE EFFECTIVENESS OF KNEE JOINT MOBILIZATION IN PATIENTS WITH GONARTHROSIS

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A few words about the author(s):

The authors are lecturers at the Vincent Pol Academy in Lublin. The study was conducted with a patients suffering from knee osteoarthritis.

Abstract:

Gonarthrosis is an increasingly common problem of the aging population and undoubtedly poses a major diagnostic and therapeutic challenge. The knee is characterized by high mobility in flexion and significant stability in extension, which predisposes it to mechanical overload and injury. Other risk factors include overweight and abnormal alignment of the lower limb. The main objective of the study was to evaluate the effectiveness of mobilization of the knee joint in patients with gonarthrosis. The study included a group of 46 patients with X-ray-confirmed osteoarthritis. The first complaints of pain appeared on average 7 years before the start of therapy. All the subjects had attempted treatment by other means before mobilizing the knee joint. The most common were physical therapy treatments and kinesiotherapy. They also took painkillers. The first examination took place before the start of the physiotherapy, and another after 4 and 12 weeks. Therapy took place once a week for 45 minutes over a period of 5 weeks. During follow-up visits, knee joint function and subjective pain intensity were assessed. The study showed a reduction in pain and improvement in joint function. The score values obtained on the Lysholm questionnaire demonstrate of significant overall functional improvement in the subjects. The number of points obtained on the subjective VAS rating scale testifies to the patients' good evaluation of this treatment.

Keywords:

VAS scale, gonarthrosis, knee joint, kinesiotherapy



THE DIFFERENCES IN THE ELEMENTAL COMPOSITION OF POLISH IPA STYLE BEERS

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A few words about the author(s):

4th year medical students from department of Biochemistry and Medical Chemistry, Pomeranian Medical University in Szczecin.

Abstract:

INTRODUCTION: Beer consists of the ingredients such as water, malt, hops, and brewer's yeast. Poland ranks fifth in Europe in terms of the amount of consumed beer. In recent years the growing popularity of craft beers is observed. Craft beers are produced on the basis of an original and unique recipe, there are no artificial additives in them, but only natural, traditional ingredients. Traditional india pale ale (IPA) style beer is made with American hops with intense flavour and aroma. Hazy IPA beers are less purified, unfiltered and therefore richer in nutrients.

AIM: Determining the differences in the elemental composition of Polish IPA style beers.

METHODS: Beer samples were digested using a MARS digestion system. Elemental composition of samples was determined with the use of ICP-OES.

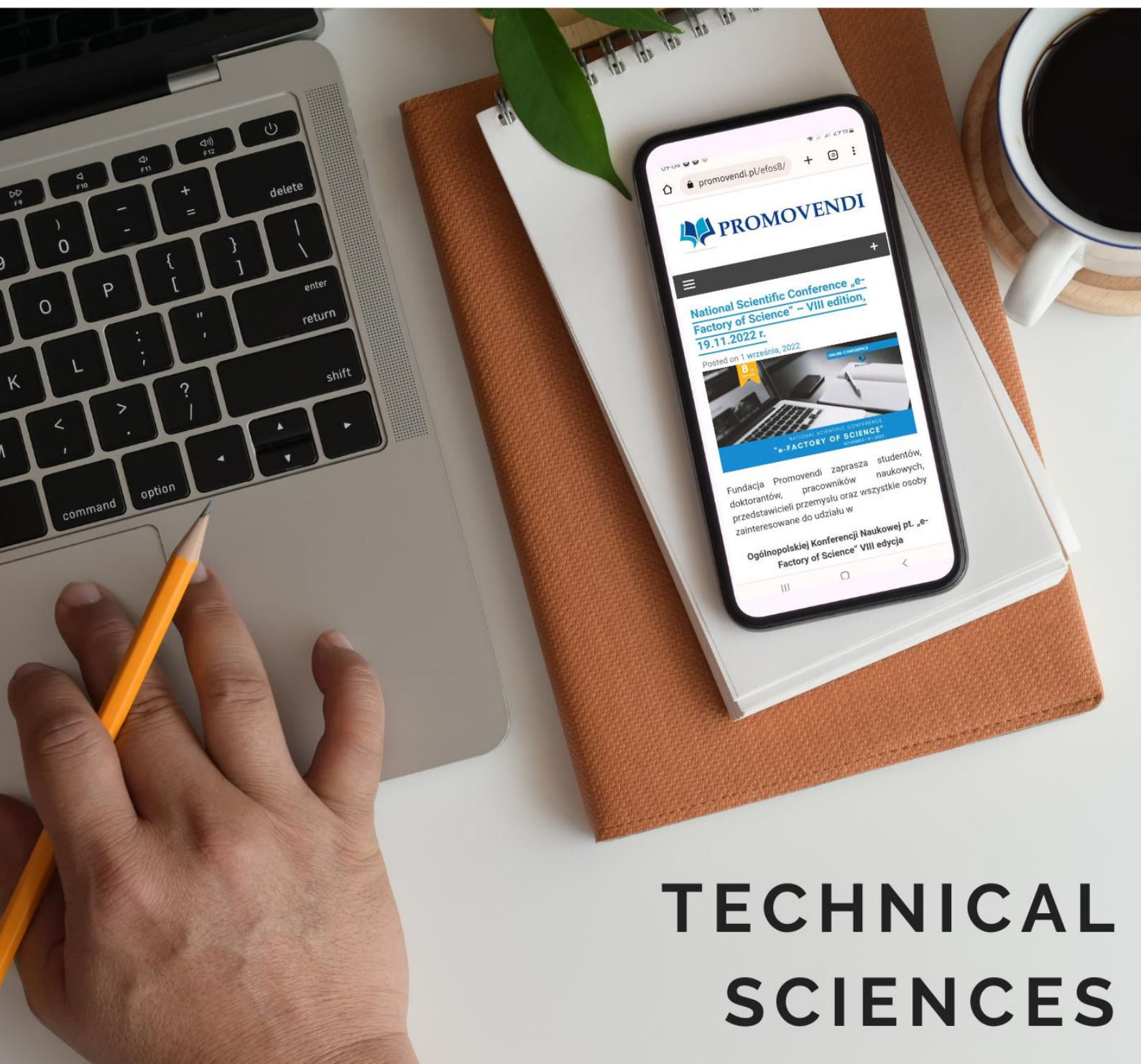
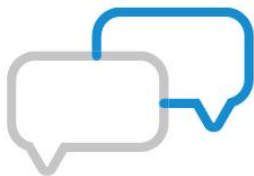
RESULTS: The highest levels of the Ca, Mg, K, Zn, Cu, Fe, Mn in were observed in NEIPA-style beers. The highest concentration of P was found in DIPA-style beer.

CONCLUSIONS: Taking into account the recommended dietary allowance, studied beers can be considered an important source of potassium, phosphorus, magnesium and manganese, and the NEIPA-style beer is the richest source of those elements. However, beer is not only the source of nutrients but also carbohydrates and ethanol, therefore it should be consumed with caution.

Keywords:

Craft beer, india pale ale

ABSTRACTS OF PRESENTATIONS



TECHNICAL SCIENCES



SECURITY DESIGN OF CONTEMPORARY PUBLIC UTILITY FACILITIES

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A few words about the author(s):

Research and teaching assistant professor at the Faculty of Architecture of the Wrocław University of Science and Technology. Interests include issues such as design of public utility buildings, security design and identity in architecture.

Abstract:

Nowadays, a growing demand is observed in security design for safe architecture of buildings and public spaces. Terrorist attacks have a large impact on changes taking place in transportation, urban and architectural design of the cities. Due to their location and rank, capitals and metropolises are most at risk. As a result of terrorist activities, specifications and requirements related to preventing the effects of potential attacks are more restrictive. Generally available security methods allow for consistent implementation of the investment and the surrounding. A wide range of measures serve this purpose, such as a technology, integrated monitoring and anti-burglary alarm systems, access control devices, motion sensors, glass protection, building structure reinforcement, system protection, correctly shaped forms of newly designed objects, as well as zone protection design, as well as satellite surveillance. It should be noted that it is important to ensure appropriate safety solutions for public architecture, retaining aesthetic and functional values at the same time of designed forms, which shall be difficult to foreseeable by the potential threats.

Keywords:

security, design, architecture, hazard identification, zones of protection



COMPARISON OF THE INFLUENCE OF CATIONIC GUAR GUM ON STABILIZATION AND FLOCCULATION PROPERTIES OF THE AQUEOUS SUSPENSIONS OF GLAUCONITE AND MONTMORILLONITE

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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 study was to compare the influence of cationic guar gum (CGG) on stability of the aqueous suspensions of glauconite (GT) and montmorillonite (MMT). In the experimental part, measurements of stability of GT and MMT suspensions were performed in the presence of CGG. The adsorption amount of cationic polymer on surface of two negatively charged clay minerals was also investigated. In both cases the spectrophotometric method was used. The obtained data show that cationic guar gum can be used as an effective flocculant of the aqueous suspensions of glauconite and an effective stabilizer of the aqueous suspensions of montmorillonite. Based on the adsorption measurements, it can be concluded that the cationic polymer adsorbs very well on the surface of both negatively charged clay minerals. Electrostatic interactions are mainly responsible for the adsorption process. Therefore, the most likely flocculation mechanism for the CGG/GT system is bridging flocculation. As the polymer concentration increases, the adsorption amount increases, and aggregates of the colloidal particles linked by the polymer chains of high molecular weight are formed. These aggregates sediment quickly. In contrast, in the case of the CGG/MMT system, electrosteric stability is the most likely stabilization mechanism. As the concentration of the polymer increases, the adsorption amount of the polymer on the clay minerals surface also increases, which translates into the increase in stability.

Keywords:

stabilization, flocculation, cationic guar gum, glauconite, montmorillonite



PREDICTIVE MODELLING FOR REAL-TIME GAME CONTENT MODIFICATION

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A few words about the author(s):

DevOps Technical Lead of Vivid Games. Currently researching applications of distributed computing in Kubernetes clusters for building scalable Machine Learning solutions. Proponent of GitOps principles in Machine Learning.

Abstract:

Machine Learning has been a crucial part of development of new technologies in recent years. In mobile gaming, modelling user behaviour in order to influence the way they interact with the game has been regarded as one of the main ways, in which Machine Learning can improve the user experience and have a positive impact on generated revenue. On the other hand, the high dynamics of user populations in mobile games render the classical methods of delivering Machine Learning based predictions non-viable. Thanks to recent development in distributed computing using Kubernetes platform and the power of public cloud, new solutions can finally start to emerge. With the combination of Kubeflow, Kserve and Istio it is possible to develop a solution that does not only provide scalability, required by the ever-changing amount of users, but also disentangles the Machine Learning components from game logic, allowing for separation between Data Science teams and game developers.

Keywords:

Machine Learning, Kubernetes, mobile gaming, real-time predictions



ELECTRICALLY CONDUCTIVE COATINGS CONTAINING SODIUM LIGNOSULFONATE AND CARBON NANOTUBES AS POTENTIAL ORGANIC SENSORS

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A few words about the author(s):

Anna Martin is a PhD student of material engineering at Poznan University of Technology. Her research area is focused on carbon nanomaterials, especially on thin carbon films containing polymeric dispersants and surfactants.

Abstract:

Because of their conductive properties, carbon nanotubes (CNTs) are used in the production of thin-film electrical and electronic components. By using the techniques of printing, spraying, or coating CNT layers from aqueous suspensions, it is possible to obtain functional 2D structures. An interesting area of research is the suspension of CNT and biopolymers in water dispersion. Sodium lignosulfonate (SLS) is a derivative of lignin. Because of its strong dispersion properties in water, SLS is used for dispersing e.g. dyes, pesticides, and carbon nanomaterials.

The presentation includes the results of tests of electroconductive coatings containing CNT and SLS, made with the use of an automatic paint applicator. On the basis of the coating resistance, the stability of CNT/SLS suspensions was tested and the dependence of the coating resistance on the duration of ultrasonic homogenization was determined. Examination of the CNT/SLS composite in a system with controlled air humidity allowed the assessment of the hygroscopic properties of the coatings. The determination of the contact angle allowed us to determine the hydrophilic properties of the coatings for various concentrations of CNTs, and the water flood test allowed us to determine the wettability of the SLS/CNT composite. In the future, the results obtained may constitute a breakthrough in organic printed electronics.

The authors thank the Ministry of Education and Science (0512/SBAD/2220) for funding the research.

Keywords:

carbon nanotubes, sodium lignosulfonate, biopolymer, thin carbon layers, thin-film sensors



DETERMINATION THE ACTIVATION ENERGY AND DEACTIVATION ENERGY FOR ENZYMATIC REACTION

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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 17 publications in Web of Science. In the 2022 she obtained the Medal of the National Education Commission. She reviewed of 14 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 activation energy E_a and E_d can be determined 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. However, the determined values of E_a and E_d by application of the traditional method are burdened with an error in the range from 30% to 220% [1]. In this work, the mathematical model describing the change in the dimensionless activity of the enzyme a depending on the temperature T . The parameters E_d and T_{opt} were determined by a non-linear regression according to the Levenberg-Marquardt procedure in SigmaPlot 15.0. Knowing the value of the activation energy of the deactivation reaction E_d , the activation energy E_a is determined.

Knowledge of E_a , E_d and T_{opt} parameters for enzyme will allow design, modeling and optimization process of biotransformation with using this enzyme.

[1] Milek 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, activation energy, Levenberg-Marquardt



DETERMINATION THE ACTIVATION ENERGY AND DEACTIVATION ENERGY OF PHENOL DECOMPOSITION BY IMMOBILIZED HORSERADISH PEROXIDASE

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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 17 publications in Web of Science. In the 2022 she obtained the Medal of the National Education Commission. She reviewed of 14 manuscripts.

Abstract:

Phenolic compounds permanently pollute aquatic ecosystems mainly due to their harmful effects on organisms, even at very much low concentrations. The toxic water can induce some serious health problems in human beings, such as damage to the brain, central nervous system and the liver. So, removing toxic phenolic compounds is important environmental issue. The various methods were evolved in wastewater treatment, such as adsorption process, biochemical degradation, coagulation, membrane process and oxidative degradation.

The aim of the analysis were determined parameters of the optimum temperatures T_{opt} , the activation energies E_a , and the deactivation energies E_d for horseradish peroxidase immobilized on nanofibrous. The curve of horseradish peroxidase activity as a function of temperature was analyzed. Determining optimum temperatures T_{opt} was 324.38 ± 1.22 K, activation energies E_a was 41.14 ± 25.80 kJ/mol, and the deactivation energies E_d was 197.61 ± 52.38 kJ/mol for horseradish peroxidase immobilized on the poly(vinyl alcohol)-polyacrylamide (PVA-PAAm) nanofibrous.

The obtained results of E_a , E_d and T_{opt} parameters might find application in the design and modeling in phenol decomposition by horseradish peroxidase immobilized on nanobifrous.

Keywords:

immobilized horseradish peroxidase, deactivation energy, nanofibrous



VISCOELASTIC PROPERTIES OF EMULSIONS STABILIZED WITH THE ADDITION OF POLYETHYLENE OXIDE

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A few words about the author(s):

I am a graduate of chemical engineering and a PhD student in the field of chemical sciences at the Poznan University of Technology.

Abstract:

Emulsions are two-phase dispersion systems consisting of two liquids that do not mix with each other. The type of emulsion is determined by the type of dispersed and dispersing phases. The stability of the emulsion is often modified by adding a polymer which, depending on the conditions, may increase or decrease the stability of the system. The stabilization of multiphase systems by polymers is widely used in practice, for example in water and wastewater treatment processes, in mineral processing, in the production of paints and inks, in the paper, food, pharmaceutical industries, as well as in agriculture. Emulsions are fluids characterized by various rheological properties. Concentrated and highly flocculated emulsions additionally have the properties of viscoelastic fluids. The composition of the continuous phase also has a great influence on the properties of the emulsion. If added to the continuous phase high-molecular polymer with significant concentration, it will determine its properties.

The aim of this study was to obtain results on the stress relaxation during the shear flow of model emulsions with the addition of poly(ethylene oxide). The relaxation spectra were determined based on the fit of experimentally determined dependencies of the storage modulus and the loss modulus to the oscillation frequency of the generalized Maxwell model.

Keywords:

emulsion, viscoelastic properties, rheology



INFLUENCE OF THE QUALITY OF GRAPHENE MATERIALS ON THE ACHIEVED CURRENT PARAMETERS IN LIB CELLS

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A few words about the author(s):

I am a final year student of doctoral studies at the Lodz University of Technology, majoring in Materials Science. In my work, I focus on the functionalization of graphene in order to develop high-performance anodes for lithium-ion cells.

Abstract:

Commercially used lithium-ion batteries use graphite anodes, which due to their limited volumetric energy density and extended charging time have limited application possibilities.

Therefore, it was necessary to develop modern LiB anodes that would meet the requirements of the increasing energy demand. Graphene attracts special attention from scientists due to its unique structure and unique properties.

It is predicted that anode materials based on graphene are able to provide several times higher current parameters compared to commercially used graphene anodes.

However, a problem that limits the commercial use of graphene anode materials is the very low quality of the commonly used graphene. It turns out that carbon materials commercially sold as graphene, i.e. a single layer of carbon atoms, actually consist of a mixture of single and multi-layer graphene structures, sheets of graphene oxide and reduced graphene oxide, and graphite plates. Such material is commonly called nanographite, and its properties significantly differ from those obtained by undisturbed graphene structures.

In my work, I compare three different carbon materials purchased from commercial suppliers, create their characteristics and show the impact of the quality of the material used on the current parameters, including crystallite size, number of graphene layers, degree of oxidation and structure defects.

Keywords:

lithium-ion batteries, graphene, graphene-based anodes, graphene quality, battery performance



STRUCTURAL AND SPECTROSCOPIC PROPERTIES OF MULTICOMPONENT GERMANATE GLASSES CONTAINING TITANIUM DIOXIDE DOPED WITH RARE-EARTH IONS FOR PHOTONIC APPLICATIONS

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A few words about the author(s):

Expert in the field of glass science and technology, especially rare earth doped glasses for optical applications.

Abstract:

Among the variety of inorganic glass host, barium gallo-germanate (BGG) glasses doped with rare-earth ions are becoming more interesting and attractive class of materials for optical fibers operated at infrared range. These glass systems present quite relatively low phonon energy, good thermal stability, and weak absorption coefficient of hydroxyl groups, giving important contribution to the emission characteristics and excellent spectroscopic properties from the applications point of view. The short-range order structure and optical properties of barium gallo-germanate glasses strongly depends on the relative ratios of network-former atoms in chemical composition. As experimentally verified, TiO_2 depending on its concentration plays a dual role in the glass structure and has the positive effect on luminescence properties of rare-earth ions. Until now, emission properties of rare earth ions in inorganic glasses with a high content of TiO_2 have not been yet studied, to the best of our knowledge. This presentation concerning on the synthesis, structural and luminescence properties of multicomponent titanate-germanate glasses singly doped with rare-eath ions. Firstly, X-ray diffraction analysis confirmed fully amorphous nature of the received samples. Near-infrared luminescence spectra corresponding to the main laser transitions of trivalent rare-earth ions were measured. The presented results also give contribution to the glass science and technology.

Keywords:

inorganic glasses, titanium dioxide, rare-earth ions, luminescence properties



METHOD OF OBTAINING BEADS WITH A HIGH CONTENT OF CALCIUM ALGINATE

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A few words about the author(s):

Sylvia Kwiatkowska-Marks in 2004, she obtained a PhD degree in technical sciences at the Faculty of Chemical Technology and Engineering of the Szczecin University of Technology. Since 1997 he has been a researcher and teacher.

Abstract:

The disadvantage of beads with a low alginate content is their low sorption capacity (calculated on the volume of beads). Therefore, the use of such a biosorbent on an industrial scale entails the need to build large-volume reactors and use a large amount of biosorbent beads. The use of beads with a higher alginate content in the biosorbent would significantly reduce the volume of the reactors. Unfortunately, the production of such beads is hindered by the high viscosity of the aqueous alginate solutions. The methods known so far allowed to obtain gels with a concentration of up to 6.5% by mass. A method has been developed that allows to obtain beads with a content of over 20% alginate mass. It involves the use of a suspension of sodium alginate particles. It has been called the high concentration method.

Keywords:

alginate beads, high concentration method, beads with a higher alginate content



SORPTION OF CU(II) ON BEADS WITH DIFFERENT ALGINATE CONTENT – COMPARISON OF LANGMUIR AND FREUNDLICH ISOTHERMS

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Sylvia Kwiatkowska-Marks in 2004, she obtained a PhD degree in technical sciences at the Faculty of Chemical Technology and Engineering of the Szczecin University of Technology. Since 1997 he has been a researcher and teacher.

Abstract:

Beads with various alginate content (2.7%, 5% and 6.4%) were produced from SIGMA-Aldrich's low-viscosity alginate. Cu (II) ions were sorbed on the beads. This sorption proceeds according to the ion exchange mechanism, therefore the Langmuir and Freundlich isotherm equations are most often used to description the experimental results. It has been investigated which of them describes the experimental data more efficiently. Regardless of the alginate content in the biosorbent, the Langmuir isotherms describe the experimental data much better than the Freundlich isotherms, which in all cases showed a significant deviation from the experimental data. The best copper ion sorbent were beads with the lowest alginate content: 2.7 wt.%, because they were characterized by the highest affinity and the highest sorption capacity.

Keywords:

sorption of Cu(II), alginate beads, Langmuir isotherm, Freundlich isotherm



BROWNIAN MOTION

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A few words about the author(s):

Student of mathematics at the University of Silesia in Katowice. Scientific fields of interest: functional equation, differential equation, mathematical analysis.

Abstract:

Brownian motion is the random motion of particles suspended in a medium (a liquid or a gas). Possibly the most noticeable manifestation of this phenomenon is the motion particles in a beam of sunlight or when brewing tea. Large dust particles move because of myriads of impacts by the molecules that comprise the surrounding medium. In making a mathematical model of this situation, we should regard the impacts as occurring randomly.

We formulate a model in which Brownian motion is regarded as being caused by an assemblage of particles that move randomly on a line, taking steps of equal length with equal probability of moving right and left. Expression is obtained for the probability $w(m, N)$ that such a particle has moved m steps to the right after taking a total of N steps. We describe this model in two ways- using classical probability and difference equations.

Bibliography:

C.C, Lin, L.A. Segel, Mathematics Applied to Deterministic Problems in the Natural Sciences

Keywords:

Brownian motion, difference equations, probability



CARBIMAZOLE AS THE PRODRUG THYROID HORMONE INHIBITOR

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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:

Inhibiting the overproduction of thyroid hormones of various origins is the main task of carbimazole in the human body. It is a pro-drug compound whose active form, thiamazole, begins its therapeutic action upon precise delivery to the intended organ. This makes it possible to eliminate numerous side interactions, potentially threatening numerous tissue and cellular systems.

The studies carried out concern the synthesis and reactivity of carbimazole to explore the chemistry of this compound, addressing the problem of its efficient synthesis, reactivity with iodine molecules and the effect of metabolic transformations on changing process conditions, as well as chemically programmable hydrolysis to the active form called thiamazole. All studies have been confirmed by a series of chromatographic and spectroscopic analyses to reliably determine the resulting organic structures, as well as to draw theoretical conclusions in terms of predicted absorption from the gastrointestinal tract, free radical scavenging capacity and the effect of molecular structure on hydrophobicity.

The research aims to better understand the chemistry of carbimazole in order to utilise its therapeutic abilities to a greater extent, but also be a starting point for further development activities in the context of its modified derivatives.

Keywords:

carbimazole, prodrugs, hyperthyroidism, iodine, programmable hydrolysis



BREAK ROOMS FOR EMPLOYEES EXPOSED TO NOISE AT WORKSTATIONS. RESEARCH AND SOUNDSCAPE MODIFICATIONS

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A few words about the author(s):

Employee of the the Department of Acoustics, Electronics and IT Solutions, Central Mining Institute. Does research in Acoustics, Acoustic Engineering and Public Health.

Abstract:

The research was conducted as a part of the OMSOUNDS project "Developing of a soundscape method for shaping the acoustic environment in break rooms for employees working in noise."

The acoustic climate affects the health, performance and productivity of employees. The existing regulations and standards divide the sounds into harmful (due to their sound pressure level) and safety for the human body. They do not divide sounds into pleasant and unpleasant ones.

The aim of the project is to develop a method of designing the soundscape environment in break rooms, during breaks at work, for employees who work at workstations with noise.

The project involved objective and subjective measurements of sound at workstations and in break rooms. The results of the research showed, that the soundscape in the break rooms is not always favorable and may have a negative impact on the well-being of employees.

In connection with the obtained test results, it was found that there is a need to improve the soundscape for more friendly for workers.

As a part of the project implementation, a prototype acoustic adaptation of the break room was made and presented.

Keywords:

noise at workplace, break rooms, soundscape, soundscape evaluation



TESTING RESULTS OF VARIOUS MATERIALS ON A SCREEN WITH A GEARLESS EXCITER

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A few words about the author(s):

Paweł Pater MSc. Mechanical Engineering – Bydgoszcz University of Technology, specializing in machine and device design. Since 2012, the president of the design and production company GOSTER Sp. z o.o. . Inventor, owner of several patents.

Abstract:

The presentation is to show the results of the research under the NCBR Smart Growth Operational Program project carried out to develop a screen model using a new concept of vibrator construction. The research focused on increasing service life of bearings by improving lubrication and optimizing heat dissipation. The concept of the screen driven by the new vibrator was developed and the optimal working parameters based on experiments were selected, on which the optimization of the screening method for various types of waste was carried out, taking into account difficult-to-screen waste, focusing on the measurements of effectiveness, efficiency, acceleration and blocking of the screening media. Based on the research, an innovative screen was developed, with a machine settings table for specific screened materials. Four patent applications were submitted (two patents granted, two applications pending).

Keywords:

screen, exciter, recycling screen



HUNGARIAN METHOD AS ONE OF THE OPTIMIZATION METHODS

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A few words about the author(s):

Student of the Krakow University of Technology in the field of Automation and Robotics.

Abstract:

In today's industry 4.0, process optimization is an important factor. One of the effective methods used to separate, among others, work among employees / machines is the Hungarian method. Its use is applicable to both minimizing and maximizing the optimization problem.

Keywords:

processing, industry 4.0, hungarian method, optimalization



HOW DOES ISOPROPYL ALCOHOL WORK ON DRY YEAST?

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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. I run research according to the principles of response surface methodology (RSM).

Abstract:

The aim of this study was to conduct the permeabilization process of *Saccharomyces cerevisiae* dry yeast cells with isopropyl alcohol under the various conditions. The carried out tests were to indicate concentration of the alcohol solution, temperature and duration of the process in order to achieve the highest possible efficiency of the permeabilization process. Based on the absorbance measurements there were determined the values of the rate constant of the hydrogen peroxide decomposition by intracellular catalase. These results were, in turn, the basis for the creation the graphs of the response surface, leading to determine values of the parameters for the most effective permeabilization. The optimum operating conditions were observed at 50% concentration of isopropyl alcohol and temperature of 15°C. Studies have shown that the processing time is a parameter of a little impact on the efficiency of the process. It is worth noting the use of too high concentrations of the alcohol in the permeabilization process causes a decrease in the value of the decomposition of the hydrogen peroxide reaction rate constant.

Keywords:

permeabilization, RSM, catalase, yeast



PREDICTION OF THE INCREASING OF CELL MEMBRANES PERMEABILIZATION

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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. I run research according to the principles of response surface methodology (RSM).

Abstract:

In technological processes, there is often a need to impose certain process conditions, often different from optimal conditions. The aim of this study was to predict the effectiveness of baker's yeast cells permeabilization process for the planned process temperature values. The process of increasing the permeability of cell membranes was carried out with the use of three alcohols. There were applied mathematical models determining the dependence of catalase activity on the parameters of the permeabilization process. The performed calculations showed that for all cases was met the condition of the maximum existence (i.e. the value of the determinant above zero and the value of second-order derivatives below zero). Then, the maximum activities of AT for the established temperatures T were calculated by substituting the determined values of S and t into the mathematical models. The results of the calculations are presented on three-dimensional graphs for the common temperature range from 7°C to 18°C . The conducted analysis proves that the ethanol permeabilization process is very sensitive to temperature changes. Estimated maximum activities of AT form a wide range of values, in which the lowest (1000 U/g) is five times smaller than optimum activity A_{opt} . For comparison, permeabilization with 2-propanol at 23°C causes the lowest $AT = 3130 \text{ U/g}$, which is only two times lower than A_{opt} .

Keywords:

permeabilization, catalase, RSM, yeast



VALVE REGULATED LEAD ACID BATTERIES WITH ABSORBENT GLASS MAT SEPARATOR PRODUCTION OVERVIEW

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Institute of Chemistry and Technological Electrochemistry, Poznan, Poland*

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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:

Valve regulated lead acid batteries with absorbent glass mat separator are nowadays one of the most popular batteries used in cars with start – stop application. They distinguish oneself with high cranking current while at the same time they are able to achieve better results in terms of cycling performance in comparison to standard flooded batteries or enhanced flooded batteries. Submitted work summarizes the production processes used in production of valve regulated lead acid batteries with absorbent glass mat separator, describing processes like oxide production, grid production, pasting, curing, assembly and formation.

Keywords:

lead – acid battery, absorbent glass-mat



FACTS AND MYTHS ABOUT AIRCRAFT CONSTRUCTIONS

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A few words about the author(s):

The authors of the presentation are engineers and active students on Aviation and Aeronautics at Rzeszów University of Technology. Daily, they are trained to achieve the Airline Transport Pilot's Licence in academic Aviation Training Centre.

Abstract:

Nowadays there are thousands of flights conducted daily, carrying millions of passengers to a whole variety of destinations. Planes are either taking off or landing every few seconds. Each of us has at least once seen an airplane. Yet not many of us have wondered how it works. This presentation aims at covering one of the most vital and most popular topics regarding airplane's construction and operating. It includes facts and myths busting based on authors' knowledge and experience collected during aviation education and everyday life.

First part of the presentation, which discusses the facts, starts with the outer parts of the airplane. Later on it moves to inner parts of the construction. It provides the answers for questions such as: „Why does the airplane fly?” and „How is it possible to breathe on the cruising level?”.

Second part will be based mostly on the authors' experience used to bust the most popular myths spread amongst passengers. The presentation strives to prove e.g. lack of phone influence on onboard systems, as well as explain currently used method of navigation – traditional map is long gone.

Keywords:

aircraft, construction, wings, engines, myths



THE USE OF ARTIFICIAL INTELLIGENCE IN IMAGE ANALYSIS

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A few words about the author(s):

A student of the Krakow University of Technology in the field of Automation and Robotics, interested in the topic of artificial intelligence.

Abstract:

For many years, we have seen an increase in the amount of data that requires analysis. One of the popular information carriers are photos, which with the current parameters of photographic cameras are characterized by high resolution, thanks to which it is possible to see many details. Large photos, e.g. 4096 x 2160, significantly affect the execution time of the algorithms that operate on them and the amount of memory needed for their storage. The presented algorithm of convolutional neural networks allows to reduce the size of the image, while maintaining its details, allowing the process of object recognition to be carried out.

Keywords:

Machine Learning, Deep Learning, Image Analysis



ARE RENEWABLE ENERGY USED IN CIVIL AVIATION?

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A few words about the author(s):

I am engineer and active student on master studies on Aviation and Aeronautics at Rzeszow University of Technology. Daily, I am trained to achieve the Airline Transport Pilot's Licence in academic Aviation Training Centre.

Abstract:

Alternative Energy sources is nowadays a very popular and important topic, which influences many of everyday life elements. Usually, this term brings to minds solar-panels mounted on the rooftops, or windfarms build on fields. While looking on an airplane it's difficult at the first side to imagine the way of using such a solution in it's operations. Connecting these two engineering fields may seem to be a tough venture. Yet the presentation includes examples of alternative energy sources used in aviation. It covers the issue of oil and gas used in aviation industry, as well as possible creation of fully electric airplane. Moreover, the presentation also discusses the concept of eco-airport, which may be the beginning of a new era in airports construction and modernization.

Keywords:

alternative, energy, aviation, fuel, airport

ABSTRACTS OF POSTERS



TECHNICAL SCIENCES



NANOPARTICLES IN FOOD INDUSTRY

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A few words about the author(s):

Mgr Magda Bielicka – A PhD student at the University of Białystok in the field of chemical sciences. Dr hab. Beata Kalska-Szostko – Assistant professor at the Faculty of Chemistry University of Białystok. Interests related to magnetic nanomaterials.

Abstract:

Nowadays is hard to find an area of human activity where nanotechnology is not present. Modern nanomaterials become very advanced and are used in many fields of science and production, e.g. electronics, automotive, construction, medicine, pharmacy, environmental protection as well as food industry [1]. Continuous development of a new nanosized products brings innovative applications and attractive solutions, especially in the food industry. Thanks to this food becomes safer, healthier and has better quality. Various nanomaterials are used as sensors for the detection and determination of: bacteria, viruses and pesticides presence in order to maintain food safe for consumption. Nanoparticles are commonly also applied in pasteurization and nanocapsulation in food science and agriculture [2].

The most commonly used nanomaterials in the food and environment related fields are: gold, silver, silicon, and magnetic nanoparticles [3].

This presentation will be a brief overview of the use of the most frequent nanoparticles in food related nanotechnology.

[1] S.H. Nile, V. Baskar, D. Selvaraj. et al. Nano-Micro Lett. 12 (2020)

[2] B.S. Sekhon. Nanotechnolo. Sci. Appl. 3 (2010) 1.

[3] B.S. Inbaraj, B.H. Chen. J. Food Drug Anal. 24 (2016) 1.

Keywords:

nanoparticle, nanomaterials, chemistry, food industry



SEAWATER DESALINATION USING PERVAPORATION METHOD

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Third-year PhD student at the Interdisciplinary Doctoral School of the Lodz University of Technology in the field of Chemical Engineering. The research area is the desalination, pervaporation method and membrane technology.

Abstract:

According to WHO data, about 900 million people do not have access to fresh water. Climate changes and the lack of water result in the search for new solutions to obtain it.

Pervaporation is a low-pressure membrane technique most often used in the separation of azeotropic mixtures. In pervaporation, there is a separation model called the dissolution-diffusion model. It consists in dissolving individual components of the mixture, changing the phase of the permeating component, and preferential transfer of the components of the mixture to the other side of the membrane. The permeate is obtained in the form of vapor, which is then frozen using an inert gas.

The desalination process using the pervaporation method was carried out on the equipment of Sulzer Chemtech, and the membranes used in the process are DeltaMem membranes dedicated to dehydration of alcohols. They are based on PVA in the active layer. The pervaporation process was carried out at four different flow rates and four temperatures. After completing the process, the permeate flux was determined as the amount of permeate obtained per time unit and the membrane area. Selectivity is a measure of the degree of desalination.

According to the results, selectivity of more than 99% was obtained, which makes the water ultrapure. The process capacity is in the range of 1.5-2 kg / m²h. These results show that the pervaporation process can be competitive with reverse osmosis in terms of the quality of the water obtained.

Keywords:

desalination, pervaporation, membrane technology, climate change, chemical engineering



BIOCOMPATIBLE POLYMER SYSTEMS WITH POTENTIAL APPLICATION AS THIRD GENERATION DRESSING MATERIALS

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A few words about the author(s):

Authors performed studies as part of the SMART-MAT Functional Materials Science Club. The research subject of the Science Club deals with the interdisciplinary field related to the biomaterials and nanotechnology.

Abstract:

Hydrogels are defined as at least two-component systems wherein one component is a hydrophilic polymer and the second one is water. The key feature of these materials is that they are able to reversibly absorb various aqueous solutions. Moreover, using adequate polymer materials during the hydrogels' synthesis it is possible to obtain hydrogels showing high biocompatibility due to which they find application e.g. as dressing materials acting as one of the most modern drug delivery systems. As part of the research, a row of syntheses was performed to develop such carriers containing additionally Aloe vera juice. The materials were obtained via the UV-induced photopolymerization process using appropriate photoinitiator and crosslinking agent. Such prepared hydrogels were subsequently subjected to the biological and physicochemical characteristics. Based on the performed experiments it was demonstrated that developed materials showed an ability to reversibly absorb aqueous solutions. It was also proved that their mechanical properties are similar to the properties of commercial dressings, and that the addition of Aloe vera juice resulted in the preparation of hydrogels stimulating the proliferation of L929 murine fibroblasts. Obtained results suggest that developed materials showed great application potential as third generation dressings.

Keywords:

hydrogel materials, controlled drug delivery, photopolymerization, third generation dressings, Aloe vera



HUMAN ACTIVITY INSIDE A BUILDING. CAN IT BE USED TO POWER IOT DEVICES?

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A few words about the author(s):

Rafał Owczarczak – Head of Development at KMB Grupa sp. z o.o. sp. k. PhD student of the Doctoral School of the Wrocław University of Science and Technology.

Abstract:

Batteryless powering of wireless IoT devices is important for expanding their application areas and extending their unattended operation. Among the limited number of sources of available waste energy inside buildings, harvesting mechanical energy appears to be an attractive solution. Waste mechanical energy generated from human activity inside buildings is characterized by widespread availability and relatively easy conversion to electricity. The poster presented here describes a method of harvesting mechanical energy using energy harvesters installed on a door closer and door handle rotation axis. The mechanical energy harvesting methods presented provide enough energy to power wireless indoor temperature and humidity sensors.

Keywords:

energy harvesting, wireless, sensor network, door, smart buildings



SYNTHESIS OF 3-MERCAPTOPROPYL O-GLYCOSIDES AND THEIR APPLICATION FOR IMPROVING THE BIOAVAILABILITY AND SELECTIVITY OF COMPOUNDS EXHIBITING ANTITUMOR ACTIVITY

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A few words about the author(s):

Julia Szreder is master's student at the Silesian University of Technology in Department of Organic Chemistry, Bioorganic Chemistry and Biotechnology at the faculty of chemistry as a part of Gabriela Pastuch-Gawolek research group.

Abstract:

Cancer's diseases are one of the greatest challenges of modern medicine. Anticancer therapies introduced so far are not effective enough. This is due to the low selectivity profile of approved chemotherapeutics, the use of which leads to numerous undesirable side effects. Cancer cells have a different energy metabolism, characterized by a high rate of glycolysis process, known as the Warburg effect. For this reason cancer cells have an increased demand for glucose. The way to improve the selectivity of a biologically active compound to cancer cells can be its conjugation with a sugar molecule, which should facilitate its transport through GLUT transporters which overexpression is seen in some types of cancer. Another solution may be the use of polymeric carriers that enable the controlled release of a biologically active compounds in the tumor environment. Such carriers can be polymers with attached sugar moieties, so called glycopolymers.

In our work we focused on the synthesis of 3-mercaptopropyl-O-glycosides, derivatives of monosaccharides and disaccharides. The presence of a thiol group in the aliphatic aglycone will allow for the substitution of bromine in the polymer support with an appropriate sugar derivative. A drug can be attached to the carrier thus formed. The obtained 3-mercaptopropyl-O-glycosides can also be used for the glycoconjugation of biologically active compounds such as uridine or 8-hydroxyquinoline derivatives.

Keywords:

glycosides, glycoconjugation, glycopolymers, antitumor activity, polymeric carries



WOOD PLASTIC COMPOSITES IN IN THE 21ST CENTURY

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A few words about the author(s):

A young and dynamic team of polymer enthusiasts, which have no secret of them.

Abstract:

In the current energy crisis, wood waste is even more incinerated to produce heat. However, the more preferred waste management method leads to material recycling. Research has therefore been undertaken to change the nature of the use of wood waste.

The aim of the work was to develop new types of composites that would be used in building materials. The project focused on obtaining 4 polymeric wood systems using 40%, 50%, 60% and 70% of the weight of wood chips. The production process was based on a two-stage method with compression formation and no additional catalysts were used.

The first step is to mix polyurethane with wood chips in a mechanical mixer. In the second, the wood chips saturated with polyurethane were placed in the mold cavity and pressed at high temperatures and pressures.

In order to determine the changes in strength, a composite study was carried out on bending, toughness and hardness. Water absorption tests were also carried out due to the use of natural raw material.

The addition of 60% by weight of wood chips has improved the strength of composite materials bending, toughness and hardness of materials. The values obtained are comparable to those currently available for sale with wood-like materials, thus constituting a competitive material for the wood-like materials currently used in the market.

Keywords:

polymer, polyurethane, composites, absorption, wood



USING A PLC CONTROLLER TO CONTROL AN OSCILLATING PLANT

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A few words about the author(s):

I am a PhD student at the Cracow University of Technology from discipline Automatic Control, Electronics and Electrical Engineering. In my research I deal with the automation of industrial processes through the use of PID controllers.

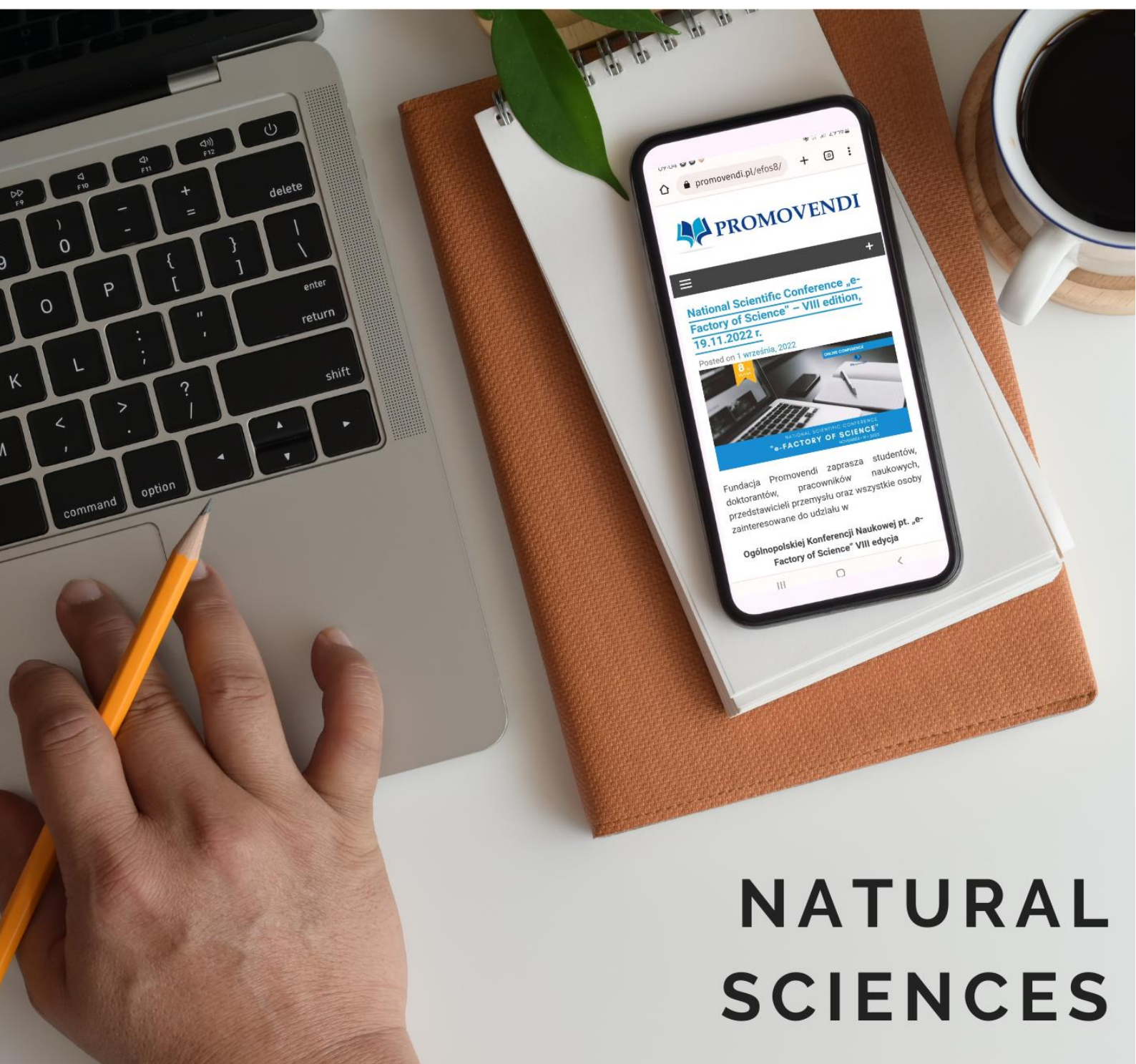
Abstract:

Control loops using PID algorithms are widespread and used in industry. A large part of machines, especially those controlling complex processes, are poorly tuned. This translates into poor quality of regulation as well as high consumption of energy used during production. The poster shows a position created for scientific research with the use of an oscillating plant. The method of object control and the applied PID control with the use of a PLC controller are explained. The possibility of visualizing the stand by means of a computer-simulated HMI panel was also presented.

Keywords:

PLC driver, PID controller, oscillating plant

ABSTRACTS OF PRESENTATIONS



NATURAL SCIENCES



DEVELOPMENT OF INNOVATIVE AGENTS SUPPORTING THE CULTIVATION AND PROTECTION OF PLANTS WHILE IMPROVING THEIR HEALTH AND SOIL QUALITY BY CARRYING OUT INDUSTRIAL RESEARCH AND EXPERIMENTAL DEVELOPMENT WORKS

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Research and Development Director in International manufacturing and trading company "EKODARPOL", also PhD student on University of Life Sciences, in Department of Agricultural Chemistry and Environmental Biogeochemistry.

Abstract:

The implementation of research and development projects by business entities, scientific units and agricultural holdings is an activity that effectively influences the development of the entire agricultural sector. The implementation of the Project entitled "Development of innovative agents supporting the cultivation and protection of plants while improving their health and soil quality by carrying out industrial research and experimental development works" enabled to increase innovation and develop the units involved in its implementation. The project has resulted in internationally innovative products that make it possible to increase the profitability of agricultural holdings by improving the quality of soil, better nutrition of plants and reducing losses caused by diseases and pests on crops of considerable economic importance. The implementation of the project was possible thanks to the European Union co-financing of industrial research and experimental development works that were necessary to develop innovative products covered by international patent protection and a comprehensive technology for their application. Well-thought plan and schedule of planned tasks are crucial for the described and any other R&D project. Therefore, in order to comprehensively disseminate the results of the implemented project, extensive information is provided in the presentation in the scope of: tasks performed, milestones achieved, research and experiment findings, and results achieved.

RESEARCH AND DEVELOPMENT PROJECT CARRIED OUT AS PART OF THE SCIENTIFIC AND INDUSTRIAL CONSORTIUM BY PPH EKODARPOL, THE POZNAŃ UNIVERSITY OF LIFE SCIENCES AND THE INSTITUTE OF PLANT PROTECTION IN POZNAŃ.

Keywords:

project, research, implementation, plant protection, fertilization



DIROFILARIA REPENS AND BABESIA CANIS: HAEMATOLOGICAL PARAMETERS AND IMMUNE RESPONSE PROFILE IN DOGS WITH SINGLE INFECTION AND CO-INFECTED WITH PARASITES

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A few words about the author(s):

I am a first year student at the Doctoral School of Science and Life Sciences at the University of Warsaw. I am interested in parasitology and tick-borne diseases are one of my main topics of interest.

Abstract:

Co-infection of *Dirofilaria repens* and *Babesia canis* are rarely reported in the literature and there is very limited knowledge of their impact on canine health. Central Poland is endemic for both which poses a risk of co-infection of these parasites in dogs.

To evaluate the impact of co-infection of *B. canis* and *D. repens* on canine health, four groups of dogs were examined: healthy dogs, dogs infected with *B. canis*, dogs infected with *D. repens* and dogs co-infected. Blood parameters indicative of anemia, kidney and liver damage were statistically analyzed. Additionally, expression levels of immune response genes were determined and compared to assess the type of immune response in single- and co-infections. Dogs infected with the *B. canis* suffered from anemia, kidney and liver insufficiency. In contrast, dogs with co-infection with *D. repens* and *B. canis* showed milder alternation in blood biochemical parameters associated with liver and kidney dysfunction compared to dogs infected only with *B. canis*.

The expression of genes associated with cellular (Th1) and humoral (Th2) immune response was determined. In dogs infected with *D. repens*, expression of all tested factors except INF- γ was observed. In 'Babesia 1' dogs the highest expression of GATA3 and IL-10 was detected, while in 'Babesia 2' - INF- γ , IL-10 and SOCS3. The expression of IL-13 was predominant in dogs infected with *D. repens*, and the expression of STAT6 and IL-10 in dogs with co-infection.

Keywords:

Babesia canis, blood parameters, *Dirofilaria repens*, immune response



HIKING IN THE BIESZCZADY NATIONAL PARK IN THE OPINION OF TOURISTS

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

Abstract:

One of the most popular forms of qualified tourism is hiking, which can be divided into mountain and lowland hiking. This type of activity can be practiced by any person, regardless of age, gender, origin or level of wealth. Thanks to the proper organization of tourist traffic and infrastructure in protected areas, tourists have the opportunity to practice various forms of tourism m.in.: in all national parks in Poland. The aim of the research was to get to know the opinions of tourists on hiking and tourist development of the Bieszczady National Park. The work used the diagnostic survey method, while the research tool was an original survey questionnaire. They concerned the study group, the frequency of visiting the park, the motives of tourists, the most frequently chosen places and the assessment of tourist development. The respondents assess the tourist development of the park well and show satisfaction with the organization of tourism in the BdPN.

Keywords:

qualified tourism, hiking, Bieszczady National Park



MICROBIOLOGICAL QUALITY ASSESSMENT OF DRY FOODS FOR DOGS DIVIDED INTO GRAIN AND GRAIN-FREE FOODS

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A few words about the author(s):

Katarzyna Kazimierska is a PhD student passionate about the nutrition of dogs and cats. Wioletta Biel is a research and university professor, involved in animal nutrition for many years. Her achievements include over 100 papers and scientific reports.

Abstract:

The importance of estimating the microbiological quality of dog food is crucial in providing healthy and safe foods. The aims of this study were comparing the nutritional value of dog foods divided into grain and grain-free foods and evaluating their microbiological safety. The contrast grain-free foods/grain foods confirmed a higher average of crude protein, ether extract, crude ash, crude fiber and energy for grain-free foods. In turn, grain foods showed a higher average of carbohydrates. The total aerobic microbial count in the analyzed dry dog foods ranged from $2.7 \times 10(2)$ to above $3.0 \times 10(7)$ cfu/g. In five (14%) dog foods the presence of staphylococci was detected; however, coagulase positive *Staphylococcus* was not found. Mold presence was reported in seven dog foods (19%) where the occurrence was more common in grain foods (6 of 7 positive results were in grain foods). In none of the analyzed foods Enterobacteriaceae were found, including coliforms, *Escherichia coli* and *Salmonella* spp. Bacteria of the genus *Listeria* and *Clostridium* as well as yeasts were also not detected. In conclusion, the evaluated dog foods had varied microbiological quality. The results indicate the need for quality control in the feed production process. Dog caregivers should handle all nutritional products with care, bearing in mind the potential risk to human and animal health, and manufacturers should take steps to reduce the possibility of contamination of products with pathogenic bacteria.

Keywords:

bacteria, molds, safety, pet food, comparison analysis



THE EFFECT OF SLEEP DEPRIVATION ON BRAIN PLASTICITY

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A few words about the author(s):

I am studying biology at Jagiellonian University.

Abstract:

Neuroplasticity is the brain's capacity to change, develop and adapt in response to aging, injury, developmental forces, and learning. Sleep is one of the basic physiological activities which helps animals keep their body healthy. Regular and healthy sleep is important for brain plasticity. In this presentation, I will show how sleep deprivation affects the brain.

During the presentation, I will present research on the decreased number of synaptic connections in the brain due to lack of sleep. The large body of data shows that sleep is important for the mechanism of synaptic plasticity which is connected with long-term potentiation. Sleep deprivation can slow down this mechanism which causes memory problems. Additionally, I will focus on studies that show the problems in functioning in some areas of the brain e.g. hippocampus due to lack of sleep.

In summary, in my presentation, I will present research on sleep deprivation and how lack of sleep can affect animals' brains.

Keywords:

brain, plasticity, sleep, sleep deprivation



TEMPORAL VARIATION IN NEPHOLOGICAL CONDITIONS IN THE CENTRAL PART OF MADAGASCAR. AN EXAMPLE OF ANTANANARIVO

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A student of geography at the University of Warsaw. Her main research interests focus on human impact on the natural environment and on its activities contributing to the protection of animal species particularly threatened with extinction.

Abstract:

The aim of the lecture is to present the temporal variation of nephological conditions in the central part of Madagascar, situated in the intertropical zone and characterized by significant spatial variation in climate. The results of the analysis of the size and type composition of cloud cover on a 20-year time scale (2001-2020), both daily and yearly, will be presented, based on data obtained from one meteorological station Antananarivo-Ivato, located near Antananarivo. According to the Köppen climate classification, it is located in the temperate climate zone with dry winter (Cwb).

On the basis of the conducted study, it was found that in the daily course of the day, the highest cloudiness in summer occurs in the afternoon hours, which is associated with strong convection movements, and the lowest - during the night hours, while in the winter period the maximum is observed in the morning hours, while the minimum - in the afternoon. In winter, the overall degree of cloud cover is less, which means less rainfall. This is also due to the climatic zone in which Antananarivo is located. Cloud type composition in Madagascar varies depending on the time of day and night. In the night hours, the largest share of Sc clouds, which are layered clouds, is marked. Convection (Cu) clouds dominate during the day.

Keywords:

cloudiness, types of clouds, Madagascar, Antananarivo-Ivato



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

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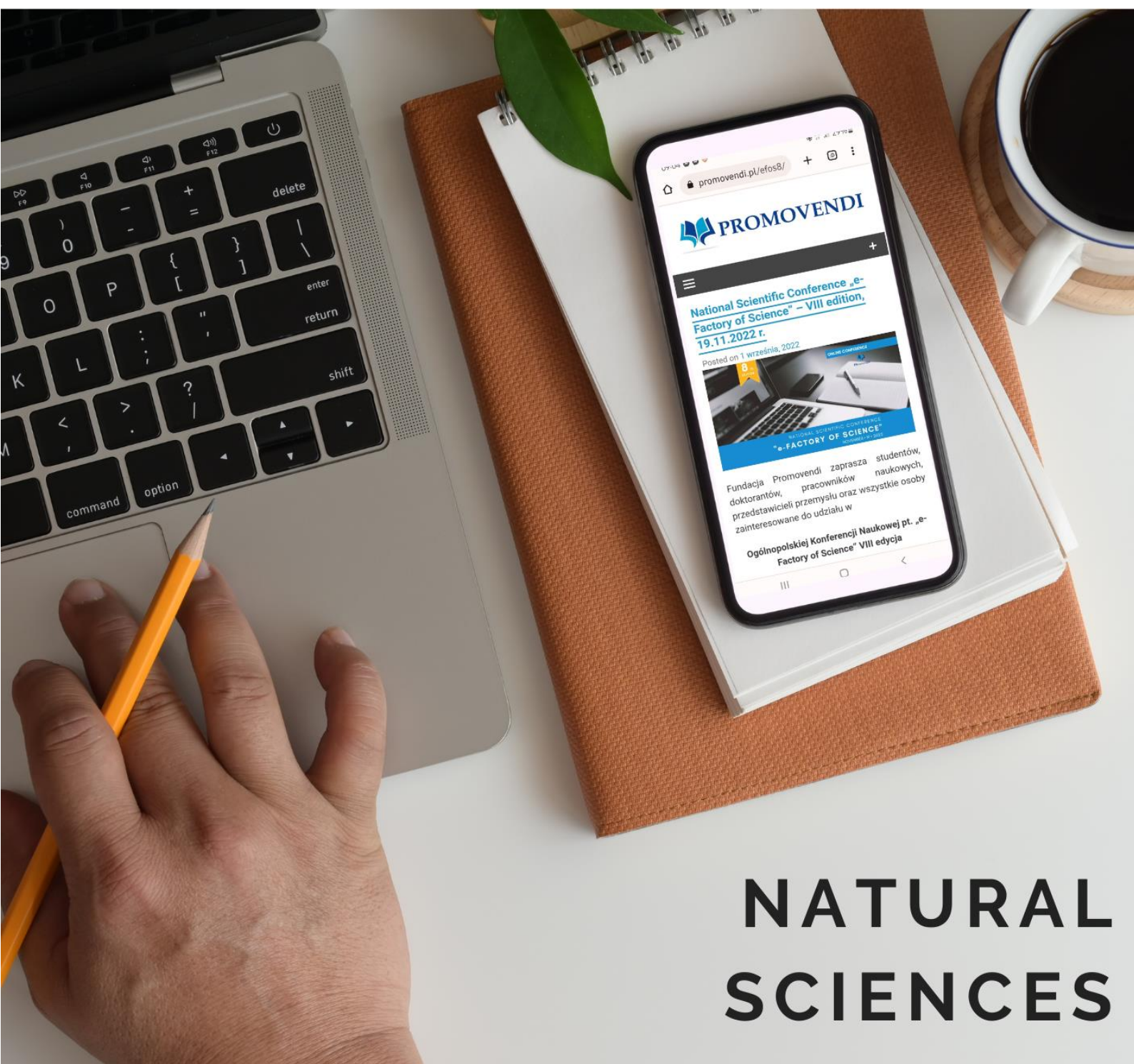
Abstract:

According to WHO data, as many as 96% of destinations worldwide could not provide tourism services due to pandemic-related restrictions in April 2020. The article deals with changes in tourist movement during the COVID-19 pandemic on the example of Zolochiv Castle, according to residents of Lviv region. At the time of writing this article, significant differences in tourist movement were observed, which the authors present and describe in detail. In addition, the authors take on to confirm or correct the hypothesis of tourist development in the city of Zolochiv and specify the factors limiting tourist movement during the COVID-19 pandemic. 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, Lviv region

ABSTRACTS OF POSTERS



NATURAL SCIENCES



THE INTENSITY OF LAND USE ON THE EXAMPLE OF COMMUNES OF THE CZESTOCHOWA AGGLOMERATION

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A few words about the author(s):

Paulina Kandzia Bachelor of Science, University of Silesia in Katowice, Faculty of Natural Sciences.

Abstract:

The study constitutes a general synthesis of the latest data on the intensity of land use of the settlement complex of communes included in the Czystochowa agglomeration. The research is based on the analysis of selected factors which, according to the author of the study, significantly affect the cases and changes in spatial development. The available sources, the latest statistical data and cartographic materials were reviewed - data from the field of spatial development, as well as demography and economy were used. On the basis of the collected data, a kind of scale was created with the help of which the aim of determining the intensity of land use in the analyzed area was achieved. Selected data concerning, inter alia, building density, land cover or population density were presented mainly by means of cartographic and statistical images. The information presented in the work indicates a kind of disproportions in the distribution of the analyzed factors in space, and thus - the heterogeneity of the space itself, of which they are components. The study on the examined example of the communes of the Czystochowa agglomeration proves the unequal intensity of land use.

Keywords:

land use, spatial development, Czystochowa agglomeration



EXPRESION OF GENES ENCODING CHITINASES IN MEDICAGO TRUNCATULA AFTER INOCULATION WITH RHIZOBACTERIA

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A few words about the author(s):

Adrianna Krzemińska, Msc Eng of horticulture, student of genetic and experimental biology. Anna Kisiel, PhD Eng, microbiologist, bioinformatist. My interest is soil microbiology and plant biotechnology. Co-founder of Somigro Ltd and BIODATA.

Abstract:

Chitinases are proteins responsible for the hydrolysis of the β -1,4-glycosidic bonds of chitin. These proteins also participate in the signal pathway being the response of the plant organism to environmental conditions. The synthesis of chitinases can be constitutively expressed, abiotic and biotic factors influence their induction.

Bacteria existing in the rhizosphere interact with plants, which can stimulate their growth by facilitating the absorption of mineral compounds, modulating the level of plant hormones, inducing systemic immunity against the pathogens, which results in the activation of proteins, among other chitinases.

The aim of the study was to test that rhizobacteria would be able to induce the expression of genes code chitinases in *Medicago truncatula*.

In the *M. truncatula* genome we found as many as 42 genes responsible for coding chitinase, for comparison in another model organism *Arabidopsis* only 26 genes were described. Sequences encoding chitinases belonging to 4 classes (CHITI, II, IV, V) were tests. Plants showed a higher expression of the six MtCHIT genes studied in the roots as compared to the leaves, which may indicate their participation in the response of these plants to interactions with the soil environment, including the rhizosphere microbiome. In the course of the research, it turned out that it was the inoculation of *Pseudomonas brassicacearum* and symbiotic *Sinorhizobium meliloti* that most increased the expression of the studied genes.

Keywords:

rhizobacteria, chitinase, gene expression, plant response



FACTORS INFLUENCING THE KINETICS OF THE BOD PROCESS

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A few words about the author(s):

Maciej Kołodziejczak – Student at Uniwersytet Szczeciński, chairman of SKN „LUNAPARK”, interested in organic chemistry, bioinformatics and machine learning. Miller Tymoteusz, PhD, data scientist.

Abstract:

Analysis of biochemical oxygen demand (BOD) of Słoneczne lake has taken place from January 2018 to December 2020. Additionally, chosen water quality indices were analyzed. To determine influence of factors on shaping the kinetics of BOD process a multivariate regression analysis was carried out. Results has shown that the most significant factors which had impact on BOD kinematics, especially on the degree of difficulty of biodegradation of pollutants (K_i), exponential growth rate of microorganisms (K_w) and final carbon BOD (L_0) were: COD-Mn, COD-Cr, N-NO₂, DO, TP, Cl⁻, SRP, TH, Ca²⁺, SO₄²⁺, HCO₃⁻, Mntot, Fetot, occurrence of convection, the sum of precipitation in the month of water sampling for testing, the sum of precipitation before water sampling for testing, the air temperature at 7:00am in the day of water sampling for testing, the average wind speed in the day before water sampling for testing, the average wind speed 2 days before water sampling for testing, cloud cover two days prior to sampling, periods of winter and summer.

Keywords:

hydrochemistry, regression analysis, biochemical oxygen demand



AN EXAMPLE OF DISCRIMINANT ANALYSIS IN HYDROCHEMICAL RESEARCH

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A few words about the author(s):

Students of the University of Szczecin in the field of genetics and experimental biology, science enthusiasts.

Abstract:

Water reservoirs, both natural and artificial, fulfill a number of functions in urban agglomerations. Often, green or walking areas are located near from it, hence the recreational function. In addition, water reservoirs also serve as retention reservoirs or wastewater treatment plants. Due to the increasing level of environmental pollution, water quality tests are necessary, especially for people and animals safety. In the period from January 2018 to December 2020, research was carried out on the water quality of Słoneczne Lake in Szczecin. In particular, the study focused on indicators such as temperature, COD-Cr, pH, TP, SRP and the concentrations of Mn, Ca^{2+} , Fe, HCO_3^- and Eh. In order to determine which indicators were actually the most important, a discriminant analysis was carried out. It showed that the indicators that had the biggest impact on the variability of water quality were temperature, pH, COD-Cr, TP and SRP. The reasons for such a state of water quality were most likely municipal sewage inflows, the transfer of organic compounds from bottom sediments, or illegal sewage discharge. To counteract such a situation, there are many solutions, such as regular and detailed surveys of the river flowing into the lake in order to identify pollution discharge sites, or increase monitoring of the most frequented places near the reservoir.

Keywords:

water quality, anthropopression, discriminant analysis



ISOLATION AND SCREENING OF WILD TYPE BACTERIA FOR ABILITY TO HYALURONIC ACID (HA) BIOSYNTHESIS

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A few words about the author(s):

All authors are biotechnologists by education. They have been associated with industry for years, where they are looking for new, interesting solutions for business in the field of biotechnology, biofuels and circular bioeconomy.

Abstract:

Hyaluronic acid (is a linear heteropolysaccharide belonging to the group of glycosaminoglycans. It occurs naturally in all tissues and body fluids of vertebrates, and its highest concentrations are found in the myocardium and endocardial valves, umbilical cord, vitreous body of the eye, periarticular fluid and oral mucosa. Moreover, it is part of bacterial cell wall envelopes, for example *Streptococcus pyogenes*, *Aerobacter aerogenes* and *Pasteurella*. Hyaluronic acid of bacterial origin has an identical composition to hyaluronic acid from higher organisms. Hyaluronic acid is widely used in cosmetology, pharmacy, veterinary and medicine, including in ophthalmology, dermatology, radiotherapy, rheumatology, gynecology and surgery. In ophthalmology, hyaluronic acid is used, among others in cataract surgery, cornea, glaucoma, posterior segment of the eye, strabismus and trauma. In dermatology, it is used, inter alia, in the treatment of burns and scars, as a matrix for autologous skin transplants, as drugs supporting the treatment of ulcers or replacing subcutaneous tissue defects. The aim of this study was isolation of wild type microorganisms capable of the biosynthesis of hyaluronic acid.

Keywords:

hyaluronic acid, wild type bacteria, isolation



ENGAGEMENT OF CERTAIN INTRACELLULAR RECEPTORS IN THE RESPONSE TO THE SILVER NANOPARTICLES-INDUCED STRESS IN NEUROBLASTOMA CELLS IN VITRO

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A few words about the author(s):

Paulina Matuszewska – the member of the Students' Science Group HELISA, interesting in cell biology and xenobiotics mechanism of action. Bartosz Skóra and Konrad Szychowski – the supervisors of Students' Science Group HELISA, experts in cell culture.

Abstract:

Silver nanoparticles (AgNPs) are structures with a size, ranging 1-100 nm. Recent studies have proved that AgNPs also show strong pro-oxidative properties in mammalian cells, including cancer ones, based on the production of large amounts of reactive oxygen species (ROS), direct degradation of the DNA structure and oxidation of lipids, building the cell membrane. It has also been shown that AgNPs with small size, (ranging from 1 to 10 nm) are able to cross the blood-brain barrier. However, the involvement of selected cell receptors in the response of nervous system cells to the presence of AgNPs has not been tested so far. Therefore, the aim of the study was to determine the influence of small-diameter AgNPs on the metabolism of neuroblastoma cells.

The obtained results showed that AgNPs have the ability to induce toxicity in neuroblastoma cells at microgram concentrations. Co-treatment the cells with antagonists of selected nuclear receptors reduced the toxic effect. The expression level of selected genes encoding the nuclear receptors, cytochrome and proliferation markers changed significantly after 6-hour treatment of cells with AgNPs.

The above results show that certain nuclear receptors are involved in the response of neuroblastoma cells to the presence of small-diameter AgNPs in their cytoplasm. Additionally, the involvement of cytochrome P450 isoforms in the toxic effect of these nanostructures in the tested cells was proven.

Keywords:

silver nanoparticles, toxicity, anticancer treatment



PRESCRIPTIVE ANALYTICS IN ENVIRONMENTAL SCIENCES

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Abstract:

It is widely recognized that machine learning (ML) techniques have the potential to revolutionize how we identify and respond to environmental issues. For example, ML can be used to automatically detect patterns of human activity that are damaging to the environment, such as illegal logging or illegal discharge of sewage into water bodies. However, simply applying ML methods is not enough to solve environmental problems. We must also be able to interpret and act on the results of these methods. This is where prescriptive analytics comes in. Prescriptive analytics is a branch of AI that deals with making decisions based on data. It can be used to develop recommendations for actions that should be taken in order to achieve a desired goal. In the context of environmental protection, prescriptive analytics could be used to recommend policies or interventions that would help reduce human pressure on the environment. Machine learning and prescriptive analytics are powerful tools that can help us protect the environment. However, it is important to remember that they are only part of the solution; without an in-depth understanding of the results generated by these methods, we will not be able to fully utilize their potential.

Keywords:

Machine Learning, environment protection, prescriptive analytics



MOLECULAR IDENTIFICATION OF BACTERIAL STRAINS ISOLATED FROM THE MEDICAGO RHIZOSPHERE

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Kisiel, PhD Eng, microbiologist, biotechnologist, bioinformatist. Co-founder of Somigro Ltd and Polish Society of Bioinformatics and Data Science BIODATA. Miller, PhD, data scientist. Co-founder of BIODATA.

Abstract:

Expanding knowledge about the natural environment is one of the elements of basic science. Thanks to modern computational methods and the use of modern IT tools, getting to know the details of ecosystems has become much easier. As an example of such research, the determination of which bacteria interact with *Medicago sativa* in the rhizosphere in selected arable fields of the West Pomeranian Voivodeship can be cited.

The first point of the research was the multistage bacterial multiplication. Subsequently, the identification was performed with the use of molecular methods based on sequencing of a fragment of the 16S rRNA gene and additionally, for *Pseudomonas* bacteria, the *rpoD* and *gyrB* genes. The obtained nucleotide sequences were translated into amino acid sequences and aligned to each other using the Mega 10.0 program. The analysis of the phylogenetic tree created on the basis of these sequences revealed five taxonomic groups. Based on the sequence of the 16S rRNA gene, bacteria isolated from the *Medicago sativa* rhizosphere (and warts- TO WYWAL) were assigned to 5 families: Pseudomonadaceae (3 strains of the genera *Pseudomonas*), Xantomonadaceae (2 strains of the genera *Stenotrophomonas*), Enterobacteriaceae (3 strains belonging to the genera *Citroboutacter*, *Leclercia*, *Raa*), Rhizobiaceae (1 strain of the genera *Sinorhizobium*) and the most abundant Bacillaceae (7 strains of the genera *Bacillus*, *Lysinibacillus* and *Paenibacillus*).

Keywords:

bioinformatics, rhizosphere bacteria, molecular biology



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książek artykułów oraz monografii naukowych
z nadanym numerem ISBN

ISBN: 978-83-963887-7-3



ISBN 978-83-963887-7-3



9 788396 388773