National Scientific Conference

SCIENCE AND YOUNG RESEARCHERS

VI edition

June 04, 2022

The Book of Abstracts

National Scientific Conference
„Science and Young Researchers”

VI edition

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June 04, 2022

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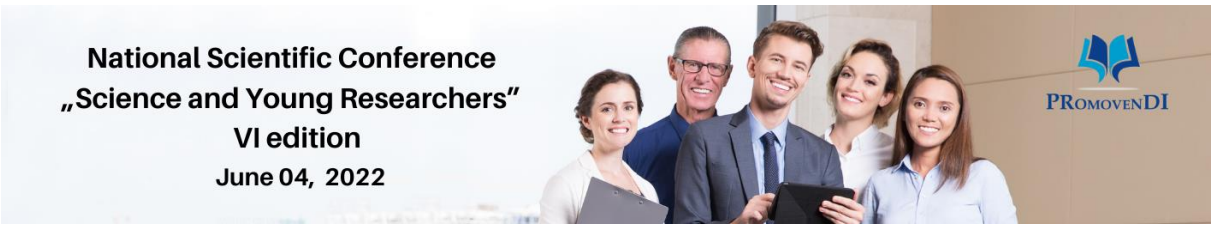

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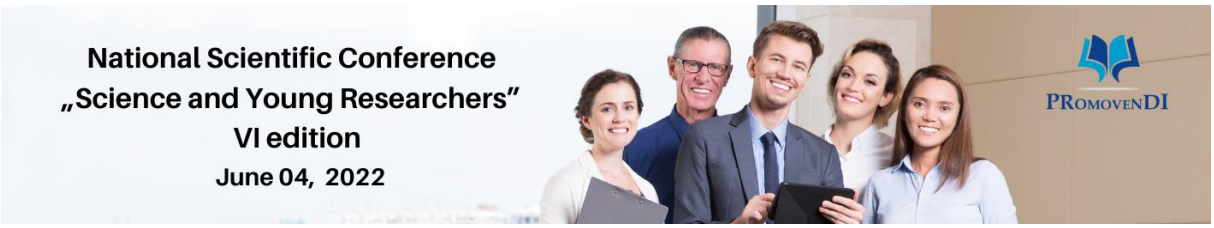

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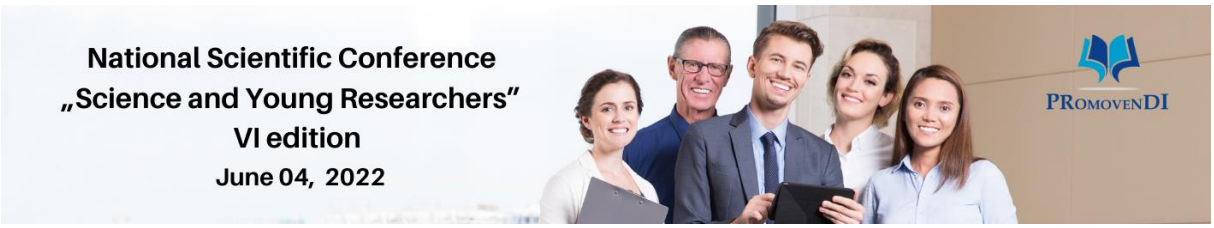

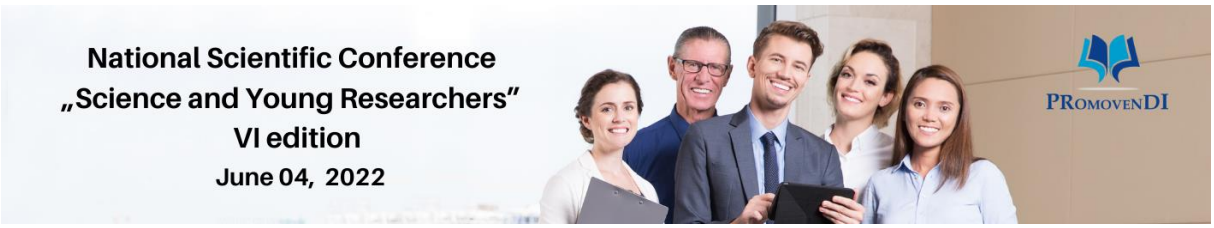

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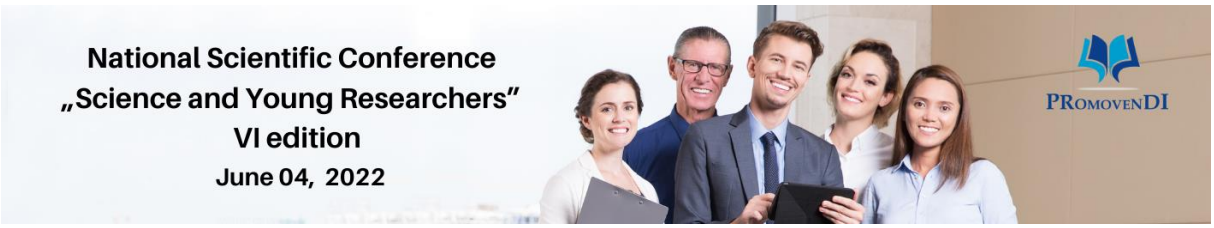

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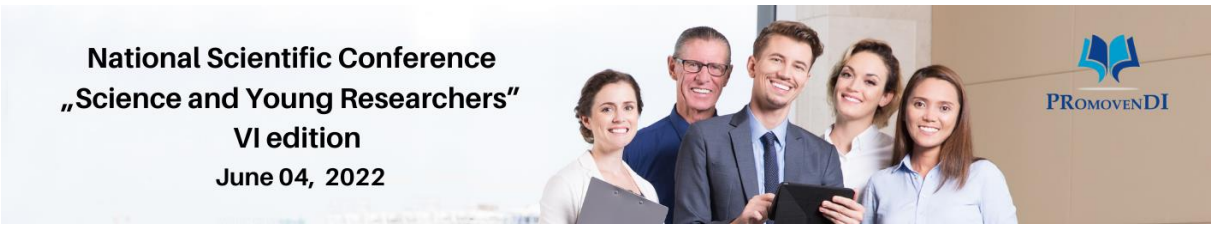

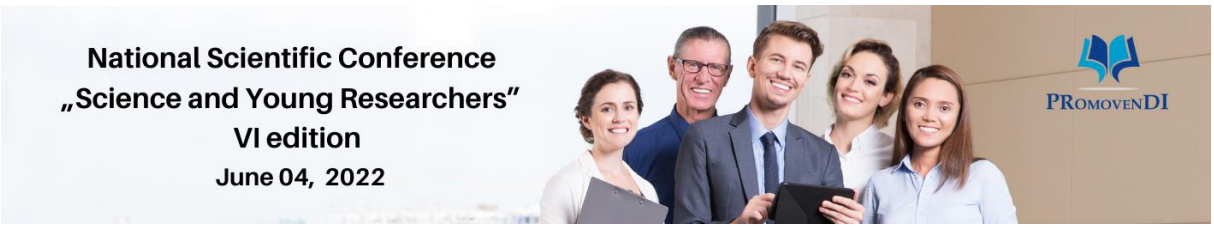

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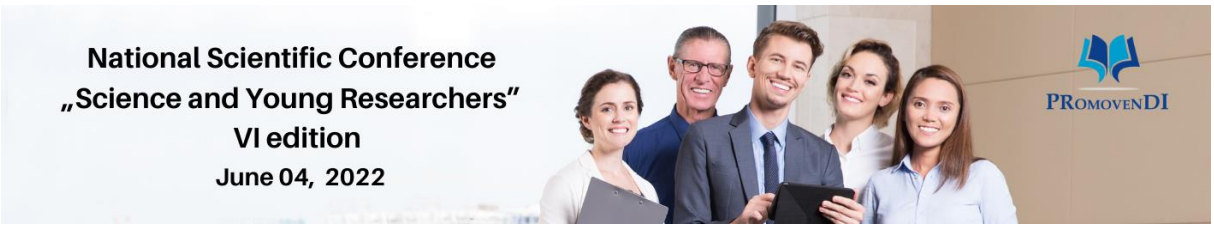

ANALYSIS OF CAREER PATHS CHOSEN BY GRADUATES

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A few words about the author(s):

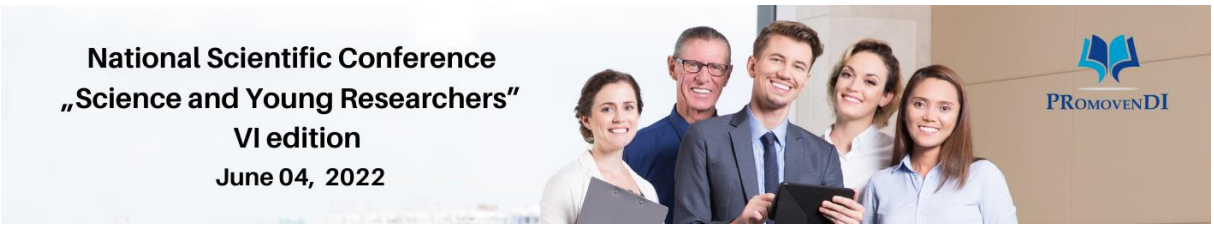
The author of the study is a student in the first year of her master's degree at the Poznan University of Economics and Business and a member of the "Qualitas" Student Science Club.

Abstract:

Today, it is increasingly claimed that a university degree does not guarantee a better or more profitable job. An anonymous survey was carried out to analyze the career paths chosen by university graduates. The information about studies completed by the respondents were collected and compared with their current job. The aim of the study is to determine to what extent the knowledge acquired by the respondents and their academic title helped them on their later professional path. Furthermore, the results helped to answer the question why some of the respondents decided to work differently from the subject of their studies.

Keywords:

career path, graduates, major of studies



APPLICATION OF COGNITIVE NEUROSCIENCE TECHNIQUES IN THE CONTEXT OF QUANTITATIVE AND QUALITATIVE METHODS

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A few words about the author(s):

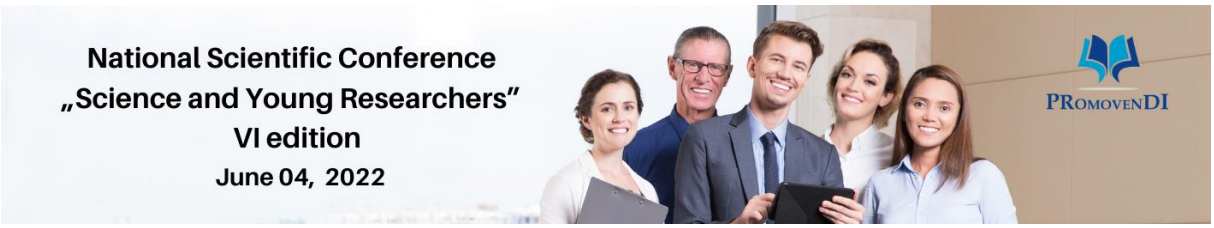
Graduate of computer science, teacher of vocational subjects, participant of several scientific conferences, activist for the science club "Initiative".

Abstract:

In order to study the area of interest, it is necessary to select the most appropriate research method. It is supported by optimally selected research techniques. For this purpose, appropriately constructed tools are used. The most frequently chosen methods are quantitative and qualitative methods. On the other hand, a technique that is nowadays an alternative to techniques in quantitative and qualitative research is cognitive neuroscience. Tools such as: Eyetracking, GSR (Galvanic Skin Response) and HR (Heart Rate), EEG (electroencephalography), fMRI (Functional Magnetic Resonance Imaging), and Facial Coding will be discussed. The used cognitive neuroscience tools allow for an in-depth study of areas in various areas of life.

Keywords:

neuroscience, research methods, EEG, Eyetracking, fMRI



PLANNING ARTISTIC ACTIVITIES WITH PRESCHOOL CHILDREN IN CONTACT WITH A LITERARY WORK

Natalia Jeżewska

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A few words about the author(s):

My name is Natalia Jeżewska. I am studying at the University of Silesia in Katowice. I am PhD student - Pedagogics. I am interested in intersubjective translation literary text in preschool education.

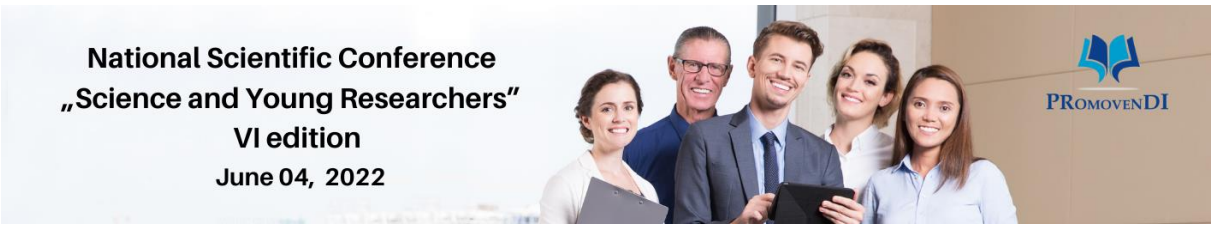
Abstract:

In education, we often encounter boredom and routine in teaching. It's worth it change teachers' horizons in dealing with Polish language education in kindergarten and grades 1-3. Teachers use words to interpret a literary text. Nevertheless however, children have a certain guiding modality: e.g. auditory, kinesthetic, visual, etc.

Therefore, the literary text should be interpreted taking into account all communication channels. Intersemiotic translation, which consists in recoding, seems to be a creative method literary text into the language of theater or art. So it is worth interacting with the text polysensorically what I would like to show in my speech.

Keywords:

literary text, art, theater, early school, children



SUPPORTING CHILDREN'S DEVELOPMENT IN THE PERIOD OF: EARLY, MIDDLE AND LATE CHILDHOOD?

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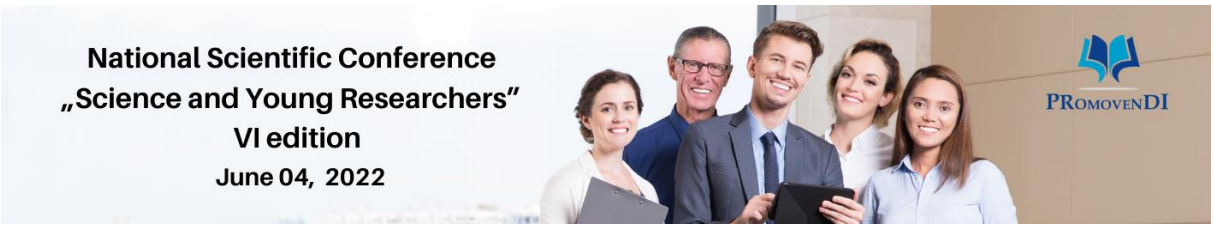
Kornelia Kordiak is a student of pedagogy at the University of Wrocław. She finished early school and pre-school education. Currently studying pedagogical therapy. She is interested in the history of teaching and the education of a young child.

Abstract:

This article is about a child and his childhood. I tried to include in it all the important periods of the child's development. At every stage of development, it is worth remembering to develop the child's independence, talk to him about his needs and possibilities, support in activities, activities, and not do them for them. It is also worth remembering that the child learns the most through play, so you should give him opportunities for it as much as possible. After all, it is an effective way of developing a child's own activity, allowing for the enrichment of children's experiences. Thanks to its social context, it becomes possible to understand and obey the rules, as well as adjust to the needs and partner opportunities. Let us talk to children about their feelings and experiences, because in this way we not only support the development of communication in them, but also build an emotional bond with them, which gives them a sense of security.

Keywords:

childhood, child, development, supporting



THE NAMES OF REALITIES IN TRANSLATION

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A few words about the author(s):

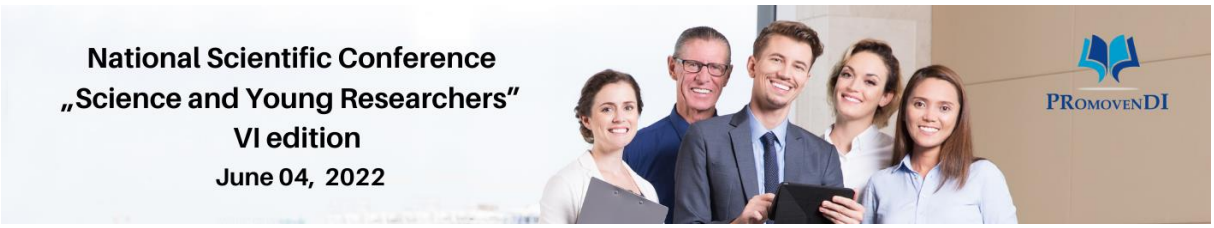
I am a student of Ethnolinguistics at Adam Mickiewicz University in Poznań. I am interested in translation.

Abstract:

The names of realities include the names of natural phenomena, names related to culture and names referring to social and political life. These names refer to the realities of the country depicted in a given text. They constitute a challenge for translators as they are difficult to convey to the target language audience, who might not be familiar with the culture of the source text. Therefore, many translation techniques have been created to handle this problem. The aim of this presentation is to present different types of names of realities, their functions and translation techniques along with various examples.

Keywords:

names of realities, translation, culture



FACTORS INFLUENCING CUSTOMER SATISFACTION IN THE ONLINE AND STATIONARY SHOPPING PROCESS ON THE EXAMPLE OF CLOTHES

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A few words about the author(s):

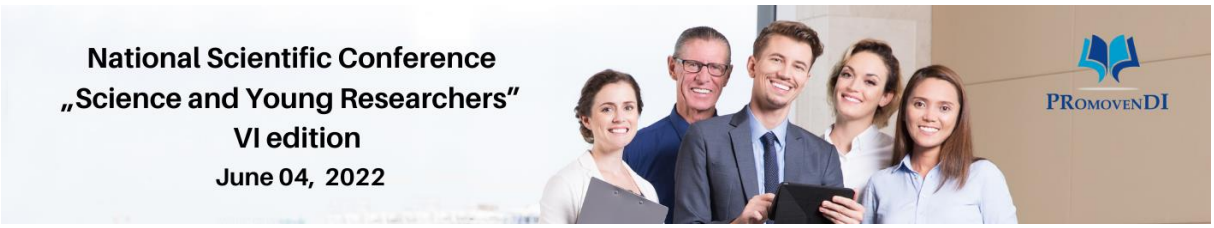
I am a third-year student of commodity science. I am active in the Qualitas research club, which is related to quality management. I am particularly interested in the quality of services.

Abstract:

The modern market provides a wide range of clothing. The report "E-commerce in Poland 2020" indicates that clothing is one of the most frequently purchased products by consumers. Growing competition causes manufacturers to take more and more advanced industry, technological and marketing activities to convince customers to buy their goods and increase their competitive advantage. The coronavirus pandemic has significantly impacted consumer purchasing behaviour according to the report "E-commerce in Poland 2021". It was the Internet and online shopping that became the first choice of customers in times of quarantine. The constantly developing e-commerce industry offering many applications and amenities has permanently entered the purchasing market. On the other hand, traditional stationary shopping still has its supporters. The aim of the research was to find out about the factors influencing customer satisfaction in the online and stationary clothes shopping process. The survey research was conducted in May 2022 using a survey questionnaire. It was created and made available on the internet platform. It consisted of closed questions, mostly multiple choice. 70 people took part in the survey, of which the largest group of respondents were women aged 21-29.

Keywords:

online shopping, stationary purchases, customer satisfaction



SHOPPING HABITS RELATED TO THE PURCHASE OF FACE CARE COSMETICS

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A few words about the author(s):

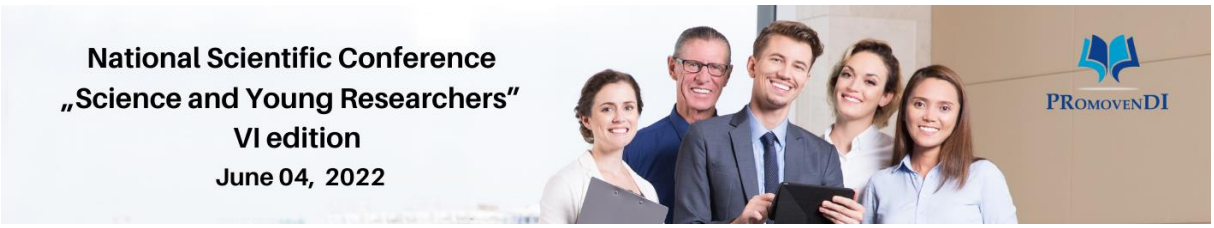
I am a 3rd year student of the 1st degree in the field of Commodity Science. I am a member of student research club - Qualitas. I take part in a various events and projects that allow me to broaden my knowledge.

Abstract:

Nowadays, people have access to a wide variety of facial care products. It is becoming more and more popular to take care of the complexion and appearance, and the variety of cosmetics allow to meet the needs of many customers. A survey was conducted in March 2022 to estimate the significance of this type of cosmetics in the lives of the respondents. The questionnaire was created and made available on an online platform. It consisted of closed questions, single and multiple-choice. 102 people took part in the study and the largest group were women aged 21-29. As the results shown, the vast majority always or almost always analyze the composition of face care cosmetics they buy. Only 6 respondents said they never did. It also turned out that consumers are faithful to the brands used and the vast majority declare that they rarely use new brands. The typical customer obtains information about cosmetics from the Internet, but makes purchases in brand-name cosmetics chain stores. The most attractive form of promotion turned out to be price reductions and special offers, for example 2 for the price of 1. The purchase most often occurs when the used products have ran out. The next most common answers were change of the season and the recommendation of friends. Most people declare that they spend PLN 31-50 a month on cosmetics of this type and most of the respondents declared that their financial situation was rather good.

Keywords:

skin care, facial care products, face care



RISK MANAGEMENT IN THE PRODUCTION PROCESS

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A few words about the author(s):

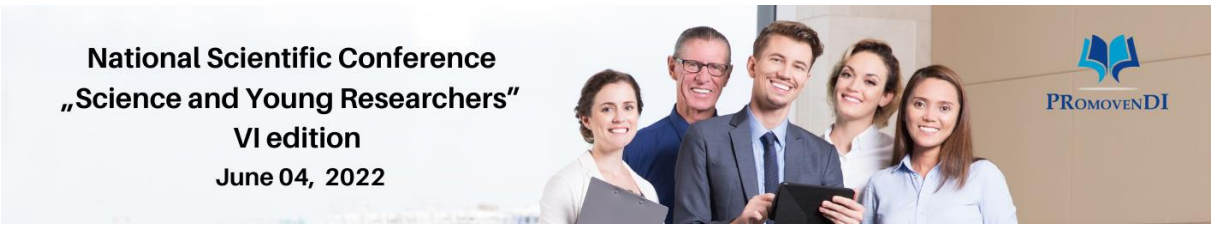
Paweł Owczarczyk has many years of manager experience in the private sector in the telecommunications industry. Since 2019 he is working delivering projects for the Polish Armed Forces and managing the production of military products.

Abstract:

Production process as one of the key elements of the production company. The whole discussed issues were embedded in the reality of companies of the armaments industry. This sector of the market is very specific and sensitive to situations resulting in dangerous or uncertain situation. The presentation covers all issues related to the definition of risk, management and the essence of the process in relation to the implementation of production tasks. The results of the research present the most frequent risk factors occurring in the production process of armaments companies. The aim of the presentation was to present issues related to risk management in the production process.

Keywords:

armaments, production, risk, process, management



CHOSEN ETHICAL DOUBTS CONNECTED WITH THE PROBLEM OF HUMAN ENHANCEMENT

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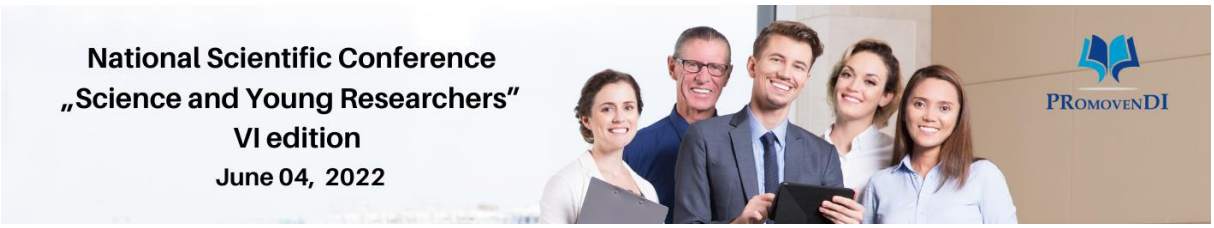
Student of 4th year of theology at University of Warmia and Mazury in Olsztyn, seminarian interested in moral theology and bioethics, member of students science club of ecumenist theologians.

Abstract:

Development of technology and medicine opened they way to human enhancement. This seems to be helpful and providing new opportunities. However, it is necessary to consider moral issues connected with human enhancement. The goal of the research was to look into chosen ethical doubts. Firstly, the issue of progress was examined. Progress is understood correctly only if it concerns the common good of mankind. Enhancing few people is, in fact, not giving the all people opportunity to develop themselves, but increasing social differences between them. Secondly, state of science is not developed enough to predict all the consequences of enhancement. It raises another problem – problem of responsibility. Negative effects can appear many years after the intervention. It is unacceptable to treat human as research test and to leave him alone with some negative effects. Problem of human enhancement is also connected with a lot of social consequences – social injustice, deepening the differences between states (rich and poor), liberty. Promoting human enhancement might be also destructive for a single person. It assumes fast effects without big effort instead of hard work and self-development to achieve some goals. There is also a risk to easily cross the moral boundaries and to restrict freedom of some people. The resaerch shows that human enhancement arises lots of moral doubts, which are justified and seem to be impossible to miss or overcome.

Keywords:

human enhancement, ethics, moral issues, progress, moral responsibility



ASSOCIATION OF SENSE OF ADULTHOOD WITH SELF-EFFICACY BELIEFS

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A few words about the author(s):

Doctoral student of psychology at the Catholic University of Lublin, psychotherapist of adolescents and adults.

Abstract:

The relationship of sense of adulthood with self-efficacy beliefs in the domains of occupational, knowledge acquisition, intimate relationship, worldview formation, interpersonal relationships (friendships), leisure activities, gender role taking, and virtual domain was examined. The Sense of Adulthood Scale and the Domain Self-Efficacy Belief Scale were used for the study. A total of 425 subjects participated in the study, ranging in age from 19 to 30 years, a period of emerging adulthood. Results indicate strong correlations between adulthood and self-efficacy beliefs in the domains of work, knowledge, interpersonal relationships, intimate relationship, and gender roles. In particular, self-confidence in these domains was found to be important because these domains are important in adulthood-adult roles involve tasks from these domains.

Keywords:

self-efficacy belief in domains, sense of adulthood

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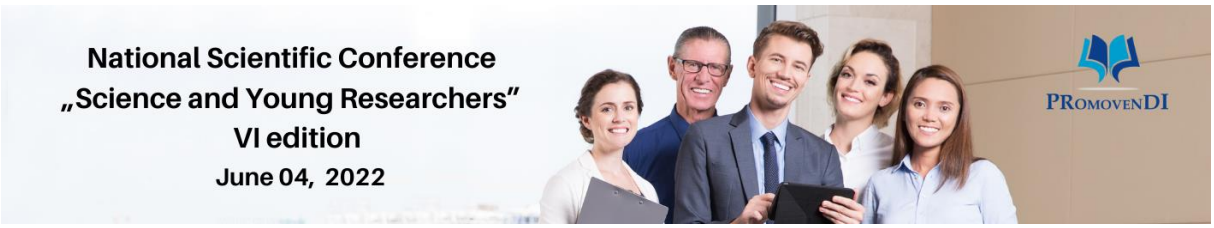
HUMANITIES SCIENCES



OUTCOMES OF EDUCATIONAL EFFORTS REGARDING THE INFORMAL CITIZENSHIP TRAINING OF SENIOR CITIZENS

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A few words about the author(s):

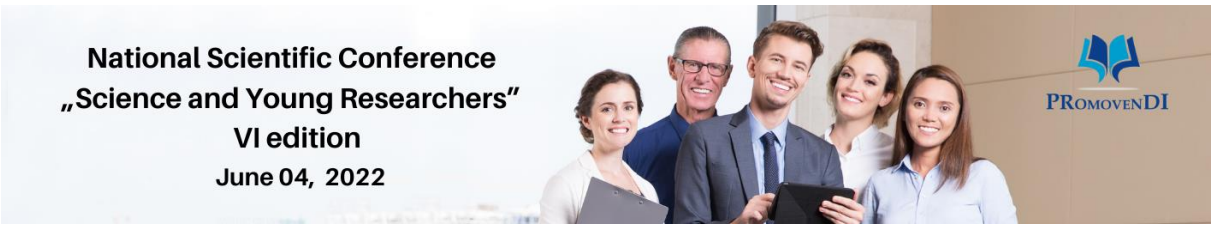
Katarzyna Hamant is a third-year Ph.D. student at the Doctoral School of Sociological Sciences at SWPS University in Warsaw. She researches in the field of informal civic education in the context of lifelong learning.

Abstract:

The attendance of senior citizens in programs that are organizedas part of informal citizenship training is an undervalued area ofeducation. Within these programs, participants experience manypositive changes regarding their social and citizenship skills. Thisstudy poses the question, 'What are the outcomes of this type oftraining of senior citizens, within the range of three categories oflearned skills: citizenship, cognitive, and interpersonal? 'The research project is based on a case study - the educationalprogram "UTW for the community" implemented by the Association of Creative Initiatives "Ę" as part of a project "Universities of the Third Century - Senior Citizens in Action" by the Polish-American Foundation 'Freedom'. A total of 48 participants (N=48) took part in this study, between the ages of 63 and 74 years. The researcher applied a retrospective assessment (ex-post). The results point to a significant statistical increase in the participants' skills regarding all of the three areas: citizenship, interpersonal, and cognitive.

Keywords:

informal citizenship training, senior citizens, civic competences



MOTIVATION TO LEARN STUDENTS

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A few words about the author(s):

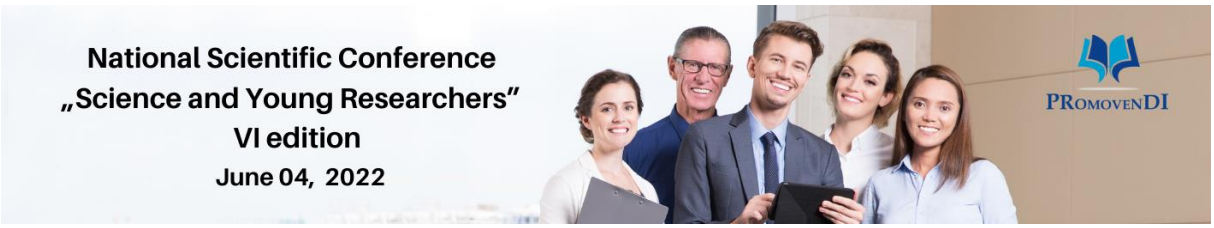
My name is Natalia Jeżewska. I study Pedagogy at the University of Silesia. I am a PhD student. He is interested in intersemiotic translation of a literary text.

Abstract:

The issue of motivation to study is a key concept of quality academic education at universities of various faculties. It is related to this issue also the identification of students with a future professional role. The most important motive for studying is the possibility of self-realization and development self, in line with the student's interests. The choice of studies also depends on his family situation, cultural environment and economic conditions. Own research concerned the motivation to study, its motives, and change or constant motivation over the different years of study. Students participated in the study humanities from various universities, modes, years, and ages.

Keywords:

motivation, students, study, research



GENERAL INTELLIGENCE AND EVALUATIVE CONDITIONING

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A few words about the author(s):

I am a psychology student. I am interested in photography and literature.

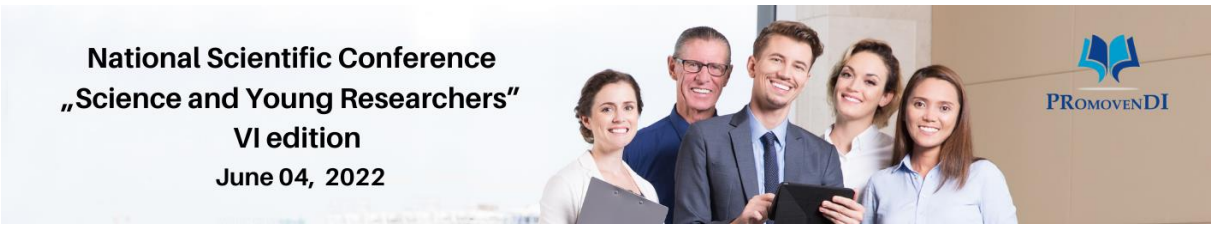
Abstract:

Evaluative conditioning is defined as a change in the assessment of a neutral object (CS-conditioned stimulus) due to its multiple exposure with another, affectively marked stimulus (US-unconditional stimulus). According to propositional approach EC effects are due to deliberate formation and truth evaluation of propositions. Dual-process theories are explaining EC in terms of propositions and associations, defined as formation of mental links between representations of stimuli. The phenomenon of inconsistent attitudes can be explained on the basis of these theoretical models. Dual-process theories state that implicit attitudes are due to associative mechanisms, while explicit evaluations are proposition-based. Propositional accounts explain inconsistency as an effect of ineffective integration of information.

If the second explanation is accurate, participants with higher general intelligence level, thus more efficient in interference and information integration, will develop more consistent attitudes.

Keywords:

evaluative conditioning, general intelligence, propositional approach, dual- process theory



HAND THERAPY IN SENSORY INTEGRATION

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A few words about the author(s):

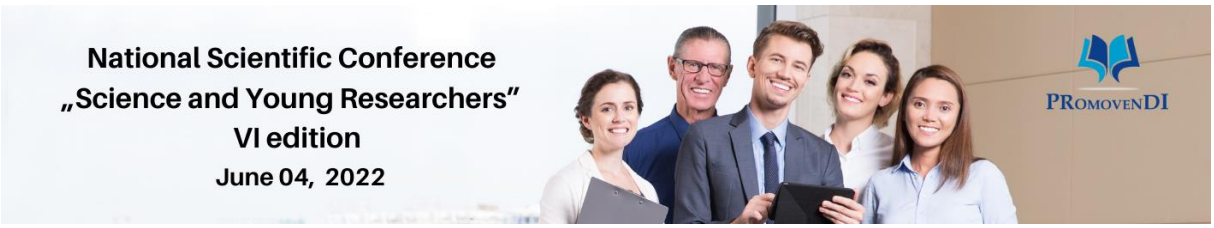
MA, PhD student of Pedagogy at the Catholic University of Lublin.

Abstract:

Hand therapy to a team of selected, coordinated actions and activities that made it possible to improve corrective actions for control - achievements - top. The aim of our hand, which is directed to the national address, but also to people who have their own countries, is, inter alia, Maybe she.

Keywords:

hand, therapy, SI



NEUROMARKETING'S APPLICATION IN THE RESEARCH OF CONSUMER BEHAVIOUR

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A few words about the author(s):

The author Adrianna Mateja graduated bachelor degree in computer science. Now she is a student of the last year of Management at the University in Szczecin. In the future she would like to pursue a PhD in cognitive neuroscience.

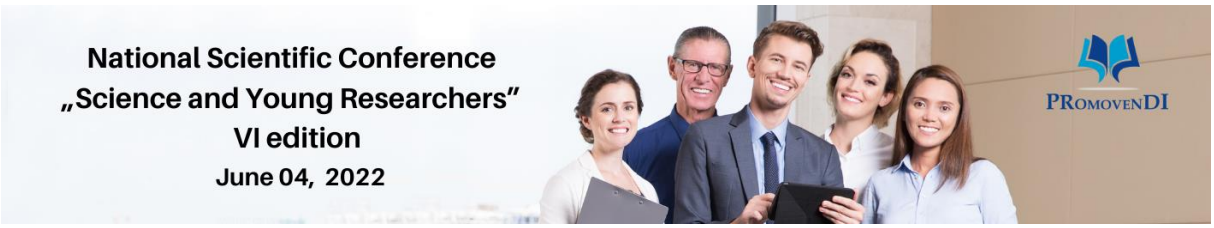
Abstract:

In recent years, researchers have tried to find out how customers make decisions and what is indicative of their choice behavior. Based on research in laboratories, they discovered that it is possible to study the brain and body responses of people to learn about the factors that influence specific choices and purchase decisions and reactions to specific advertising triggers.

Since American companies have offered neuromarketing research and consulting services, neuromarketing has quickly gained popularity and is used by many international corporations to study consumer behavior. Neuromarketing research is used by large corporations such as Yahoo, Hyundai, and Coca-Cola, as well as by many smaller businesses that want to learn more about their customers' decision-making process. The work has a theoretical character. Secondary sources of information were used, including examples of the application of the use of neuromarketing in the study of consumer behavior by various companies.

Keywords:

neuromarketing, consumer behaviour, neuroscience



WHAT IS THE PROCESS OF DIAGNOSING DYSLEXIA?

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A few words about the author(s):

I am a third-year student of special education.I am interested in the topic of dyslexia and more specifically its existence among adults.In the pursuit of knowledge about dyslexia I have completed a few courses related to it.

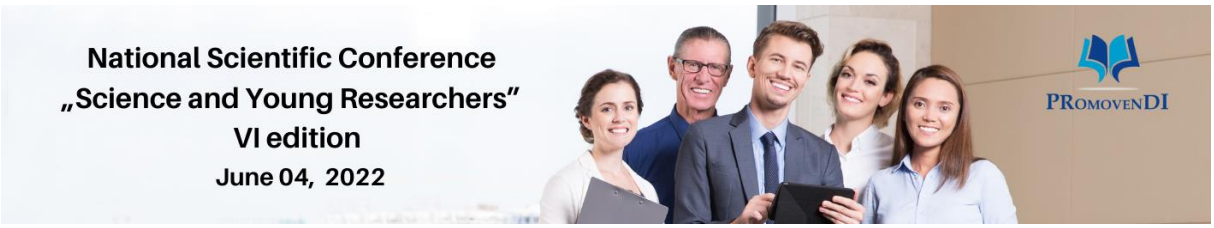
Abstract:

Dyslexia is becoming more and more frequent as each year the number of people with such diagnosis rises. But how do we know when to diagnose it? And how should we do it?

First, it is important to rule out other possibilities that could be causing symptoms similar to those of dyslexia, for example hearing or vision problems. (For a child to be considered as a group of at risk for dyslexia, they have to be within the intellectual norm.) Student must be within the intellectual norm, to be considered as a child with a risk of dyslexia. Then we should apply for an assessment at psychological and pedagogical counseling clinic where qualified professionals (special educational needs teacher and psychologist) will evaluate the student's difficulties.

Keywords:

dyslexia



THE INFLUENCE OF THE MASS MEDIA ON THE IMAGE OF THE MODERN FAMILY

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A few words about the author(s):

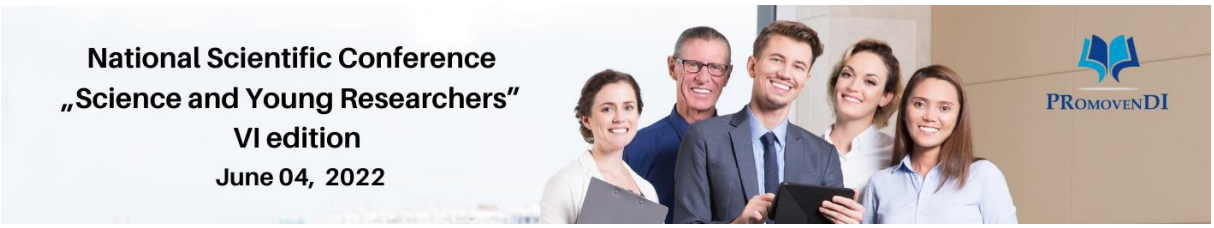
Works as a primary school teacher. I am a student of the doctoral school at the John Paul II Catholic University of Lublin. My area of scientific interest is family and integral education.

Abstract:

In recent years, the mass media play a special role in various spheres of human life and significantly change the standards of communication. Contemporary civilization has introduced a new style of family life, changing the consciousness of families and generations. Today, each of us has contact with the radio, the Internet and television, which are the main source of information, entertainment, and sometimes even replace direct contact with another human being. As a result of such processes, personal ties and relationships are weakened or even degraded. The easy availability and speed of new technologies means that the new form of contact is replacing the traditional one, which can be observed among the youngest generation in the first place.

Keywords:

mass media, family, influence, modern times, internet



ACHIEVING ADULTHOOD BY YOUNG PEOPLE - THE RESULTS OF LONGITUDINAL STUDIES

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A few words about the author(s):

PhD student at the Faculty of Psychology and Cognitive Science at the University of Adam Mickiewicz in Poznań. She is interested in the psychology of human development. She works as a systemic psychotherapist in a private practice.

Abstract:

Problems with determining the point at which a person reaches adulthood have made that adulthood more and more often considered in terms of the process (Arnett, 1997). It is postulated that crossing the threshold of adulthood should not be equated with specific life events and age, nor should it be assumed that suddenly and simultaneously a person achieves all the attributes of an adult and can be unequivocally qualified as such a person (Gurba, 2011). Adulthood should be treated as an effect of the process of entering adulthood.

In the presentation I will present the results of longitudinal studies (three measurements), which were carried out on young people in the initial phase of reaching adulthood (1st measurement - 19 years, 2nd measurement - 19.5 years, 3rd - 20 years). The aim of this research was to find an answer to the question of how young people enter adulthood in the psychological and social dimensions? Are there changes in the degree of fulfillment of adult social roles and tasks and the development of mental competences assigned to adults with the age of adolescents?

If so, what are they? The results showed that the changes were mainly of an upward nature. Only in the case of one of the analyzed attributes of adulthood (the feeling of being ready to have a group of friends) there was a decrease between the measurements. It should be noted that reaching adulthood was analyzed in accordance with the two-dimensional model of adulthood (Wysota and Bakiera, 2019).

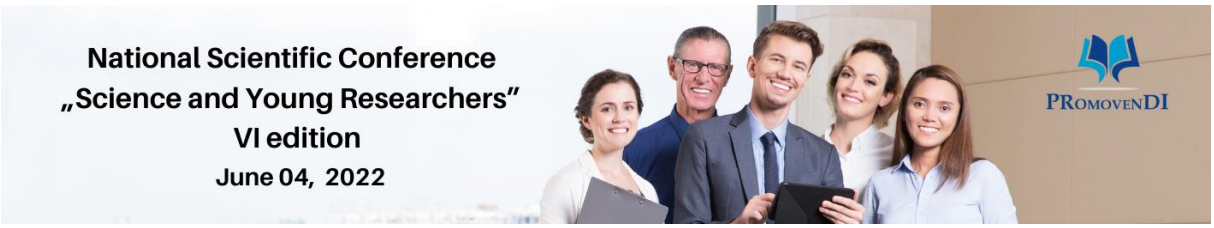
Keywords:

adulthood, social dimension of adulthood, psychological dimension of adulthood, entering adulthood

ABSTRACTS OF

PRESENTATIONS

TECHNICAL AND NATURAL SCIENCES



WHEY - VALUABLE BY-PRODUCT OF THE DAIRY INDUSTRY

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Students of the Faculty of Veterinary Medicine of the University of Life Sciences in Lublin, active in the newly established student research club in cooperation with representatives of BioLive Innovation

Abstract:

Whey is a by-product of the manufacture of dairy products. It contains valuable proteins (lactoferrin, beta-lactoglobulin, alpha-lactoglobulin). Dairymen must face a problem which is utilisation whey on account of acidic pH, high content of sugar.

Lactoferrin is biologically active. It is a glycoprotein that weighs 78 kDa with the ability to bond iron. This protein demonstrates antibacterial activity, supports development of animal cells and preventing intestinal infections.

One of the problems connected with whey usage is the fact that it contains significant amounts of sugars which hinder its processing. Solution in this case is dialysis.

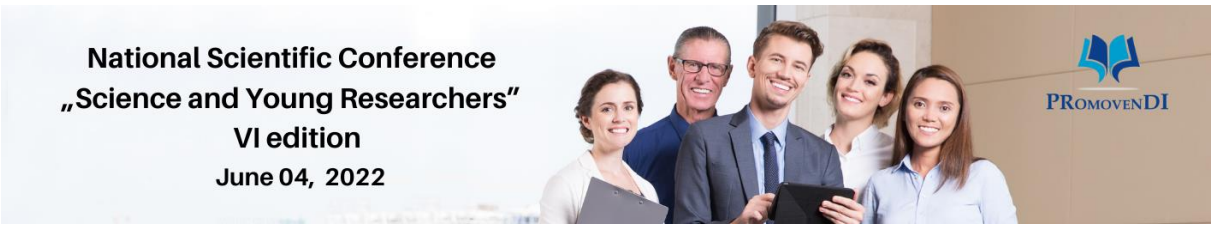
The study's purpose was to analyze the protein profile of whey by MALDI-TOF mass spectrometry and by bidirectional electrophoresis 2D, as well as to check the influence of dialysis on the extirpation of possible changes in it.

Material used for studies was sweet whey from a local dairy. The whey was dialyzed using dialysis tubes. The next step was to perform electrophoresis non-dialysis and dialysis trials. After that the proteins were prepared for identification with the MALDI-TOF technique. Additionally, for whey and its dialysate mass spectra were determined over a wide range of mass to load.

The results showed that dialysis does not have a significant effect on protein composition of whey. The assigned signals were visible on the obtained mass spectra proteins characteristic of whey both before and after dialysis.

Keywords:

whey, bioactive proteins, lactoferrin



MODIFICATION OF PHARMACOLOGICALLY ACTIVE SUBSTANCES THROUGH ATRP TECHNIQUES

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A few words about the author(s):

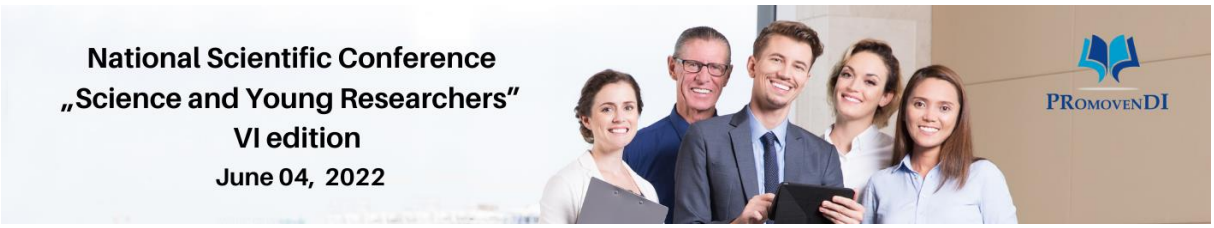
Martyna Korbecka is a second-cycle student in the field of biotechnology at Rzeszów University of Technology. She is involved in the research based on the application of atom transfer radical polymerization (ATRP) techniques.

Abstract:

The atom transfer radical polymerization (ATRP) techniques are the most frequently used methods for the synthesis of polymers because these concepts allow controlling the structure of the received polymers confirmed by narrow molecular weight distribution and precisely-defined molecular weight of the polymer grafts. It is also possible to synthesize well-defined branched architecture, i.e. star-shaped polymers and polymer brushes. A privileged concept in the synthesis of branched polymers by the ATRP approach is "grafting from", which consists of two main steps. Initially, substrates containing hydroxyl groups are modified by esterification with α-bromoisobutyryl bromide to incorporate functional ATRP initiation sites into their structures. And then the monomers are polymerized in a controlled manner from built-in initiation sites. It is an excellent way to modify biopolymers, vitamins, and drugs with ubiquitous hydroxyl groups in their structure. In this concept, pharmacologically active substances can be used as the core for modification with polymers, which may improve the properties of these substances or give completely new physicochemical properties. So far, the antibiotic rifampicin has been modified through ATRP techniques. Modifying rifampicin with ATRP techniques by adding polymer chains based on poly(acrylic acid) leads to the formation of branched systems in the form of micelles, which open or close depending on the pH of the environment.

Keywords:

ATRP techniques, „grafting from" concept, rifampicin



POSTNATAL DEVELOPMENT OF THE AXIAL SKELETON IN HOMING PIGEON (COLUMBA LIVIA DOMESTICA)

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A few words about the author(s):

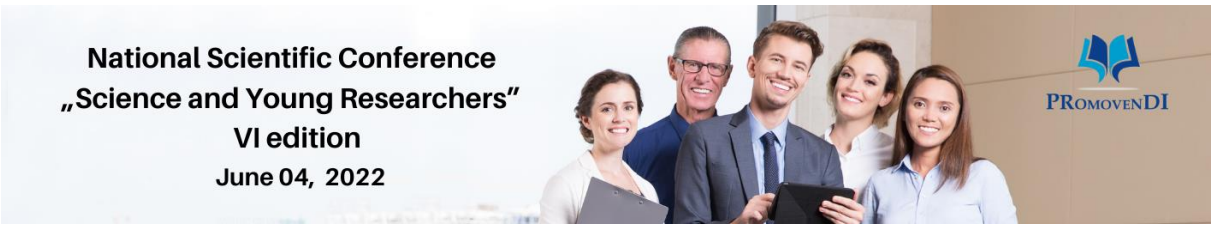
Presented here results are part of Piotr Kuziak's master thesis. Tomasz Skawiński and Bartosz Borczyk are lecturers at University of Wrocław. Their main research topics are herpetology and evolutionary biology.

Abstract:

The development of the avian axial skeleton exhibits different patterns of ossification. Many aspects of this processes remain unknown, however, recent studies clarify some of them. For example, it was discovered that in some species, the vertebral column starts ossification from a single locus located in the middle part of the thoracic vertebrae and spreads bidirectionally. On the other hand, the ossification sequence in the vertebral column can proceed anteroposteriorly. Such a pattern was until recently believed to be universal. Our aim was to investigate how the axial skeleton develops during the posthatching period in the homing pigeon (Columba livia domestica). The sample consisted of 37 specimens, ranging from a hatchling to a 35 days old specimen, collected in 24 h intervals. All of them are stored in the Department of Evolutionary Biology and Conservation of Vertebrates, University of Wrocław (IZK). To visualize skeletogenesis we used the double-staining procedure. We noticed the first ossifications in bodies of the cervical vertebrae C3-C5 at the time of hatching and anteroposterior direction of development in this region. In the thoracic series, a similar pattern was observed in arches (bodies ossified bidirectionally). In the lumbosacral and caudal regions, the vertebrae undergo a similar pattern (with slight deviations). Our results are not consistent with previous studies, but provide important new data on the development of the avian axial skeleton.

Keywords:

axial skeleton, skeletogenesis, ossification, vertebrae



STUDIES ON SORPTION OF PHOSPHATES ON CHITOSAN HYDROGEL MODIFIED WITH CERIUM (IV) IONS

Tomasz Mańdok (1)*, Łukasz Wujcicki (2), Wiktoria Reimann (3), Gabriel Kaczmarek (4), Marcin Pająk (5), Joanna Kluczka (6), Gabriela Dudek (7), Krzysztof Piotrowski (8)

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A few words about the author(s):

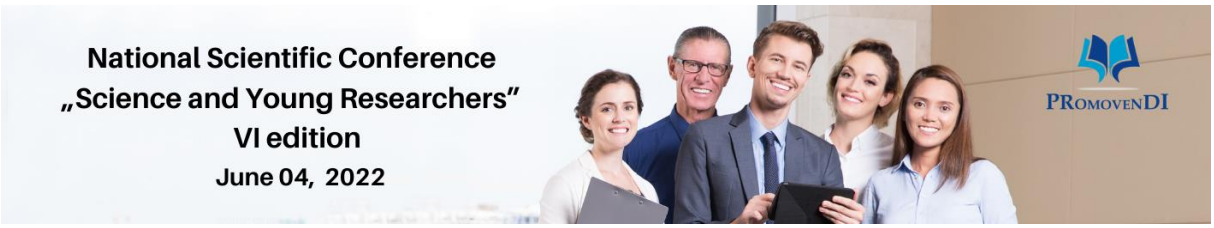
The authors of these results are members of a team working in the Laboratory of the Silesian University of Technology. J. Kluczka, G. Dudek and K. Piotrowski are academic stuff. The rest of the authors are students at the Faculty of Chemistry.

Abstract:

The process of eutrophication is an increasingly common phenomenon affecting water bodies. Ponds or lakes located in close proximity to fertilised agricultural fields are most at risk. The Baltic Sea is also exposed to eutrophication through riverine inflows carrying artificial fertilisers from fields located in the vicinity of rivers. One of the factors influencing the development of the eutrophication process is phosphorus, the main component of fertilisers, whose concentration exceeding 0.1 mg/L makes the water susceptible to this process. This paper presents a method for phosphorus removal based on its sorption onto chitin hydrogels with cerium (IV) ions in the form of cerium hydroxide $Ce(OH)_4$. The sorbent was described in terms of its sorption kinetics, Freundlich and Langmuir's isotherms were determined and its structure was analysed by scanning electron microscopy (SEM). In order to determine the concentration of phosphorus in the analysed model samples, the inductively coupled plasma optical emission spectrometry (ICP-OES) technique was used. The method presented in this paper allows to reduce the amount of phosphorus entering the environment in an efficient manner and line with green chemistry principles.

Keywords:

phosphorus, eutrophication, sorption removal, chitosan, cerium ions



DEVELOPMENT OF A FULLY BIODEGRADABLE COMPOSITE MATERIAL INTENDED FOR FOOD CONTACT

Kamil Niesporek (1), Oliwia Baszczeńska (1), Marcin Bociek (1), Mikołaj Masłowski (1), Klaudia Kopeć (2), Agnieszka J. Nowak (3)*, Marek Rojczyk (4)

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(2) Biomedical Engineering, Faculty of Biomedical Engineering, Silesian University of Technology, ul. Roosvelta 40, 41-800, Zabrze
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A few words about the author(s):

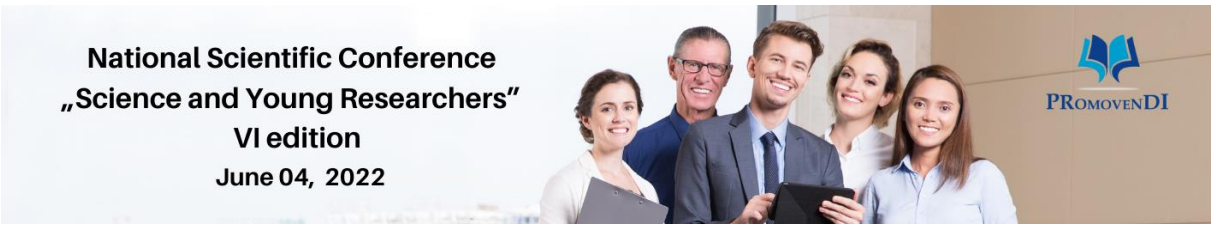
We are students of the Silesian University of Technology from the faculties Environmental Engineering and Biomedical Engineering. The article was created as part of the PBL (Project Based Learning) in which we participated.

Abstract:

As the world's population increases, so does the demand for disposable packaging. The research described in this paper aimed to develop a fully biodegradable composite material for contact with food and to test its properties. BIOPLAST GS 1289 was selected as the matrix material, while walnut and eggshells were used as fillers. Materials were selected on a multicriteria analysis. The sections describe the stages of composite manufacturing. Hardness, impact strength, static tensile tests, melt flow index, Young's modulus, and water absorption were carried out. It succeeded in creating a material that showed fully satisfactory parameters in each of the tested properties at different proportions of the constituent substances. In the longer term, it is planned to develop a composite with a target ratio of 70/30, with a predominance of filler, while maintaining the strength properties.

Keywords:

biodegradable composites, natural fillers, polymers



DIRECT METHODS FOR METAL SURFACE CLEANLINESS EVALUATION

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AGH University of Science and Technology

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A few words about the author(s):

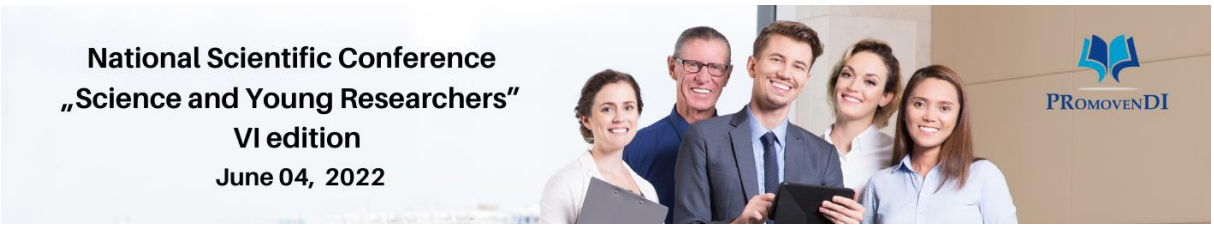
PhD student working in Automotive Industry, Quality field.

Abstract:

Increasing awareness of product quality, the tendency to miniaturization, and the need to use more and more sophisticated surface finishing techniques necessitate the care of improving the cleaning of parts, as well as monitoring their cleanliness. The available literature data clearly show that the reason for the poor quality of the coatings, poor adhesion, low corrosion resistance, etc., is insufficient cleaning of the surface before coating. These problems indicate the validity of paying attention to the issue of surface cleanliness. The article reviews the literature on direct methods of assessing the cleanliness of metal surfaces. The types of impurities, product cleanliness levels, and methods of measuring surface cleanliness are described.

Keywords:

surface cleanliness, contamination, cleanliness levels, direct methods



BIOMECHANICAL LOWER LIMB PROSTHEHIS

Michał Cichowicz*, Aleksandra Ogórska, Piotr Strobejko

Faculty of Mechanical Engineering and Mechatronics,
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A few words about the author(s):

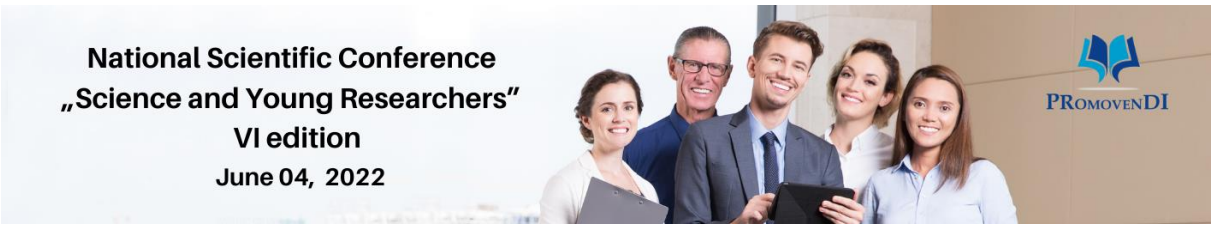
A group of students, which belongs to the Student's Science Club of Mechatronics by the Department of Production Management, which interest in biomechanics and human-robot interaction.

Abstract:

In the entire world, a lot of people suffer on many diseases, which could be caused by accidents, random situations and other factors. In these cases, the parts of human body are often injured or amputated. The results of amputations causes, that a human live comfort gets worse. To solve this kind of problem, the complex mechanical constructions called prostheses are used. Knowing that fact it is possible to substitute an amputated limb and make a disabled hu-man possible to be fit. However, most of constructions produced nowadays do not allow hu- man to feel like with the normal limb before an accident. In this paper, the novel concept of a biomechanical lower limb prosthesis will be presented. With the signals from muscles registered by electromyographic electrodes (EMG) it is possible to allow a disabled person to have better interaction with prosthesis and use it as a real limb. The machine will allow also to use the prosthesis in a passive mode in case of a low level of electric power. Furthermore, the construction will be dedicated to an individual patient because of the contact elements manufactured basing on the amputated stub. Additionally, the device will be equipped in a novel mechanism to compensate the vibrations during walking. The entire construction will be produced from an aluminum alloy and carbon fibers.

Keywords:

lower limb prosthesis, biomechanical prosthesis, mechanical construction



OBTAINING PROTEIN EXTRACTS FROM HEMP POMACE IN FEED INDUSTRY AND ITS ENZYMATIC HYDROLYSIS

Maciej Olesiewicz (1)*, Karina Skrzypoń (1), Wiktoria Czupryna (1), Aleksandra Popielarz (1), Michał Czelej (2)

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A few words about the author(s):

Students of the Faculty of Veterinary Medicine of the University of Life Sciences in Lublin, active in the newly established student research club in cooperation with representatives of BioLive Innovation

Abstract:

Industrial hemp known as fibrous hemp are spread worldwide and have accompanied humanity for thousands of years. They are counted to usable plants finding usage in many industrial branches including fiber and oil production. By-product of oil pressing is hemp pomace-
so-called hemp expeller. Although it's mainly a waste product, part of it is successfully used as feed additive for horses, in pigs or cattle.

The study's purpose was evaluation of bioactive peptides production from protein extract derived from hemp (Cannabis sativa L.) pomace.

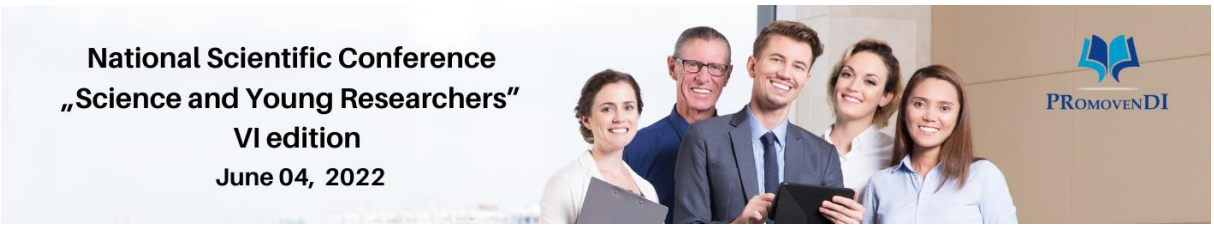
Material used for studies were grounded hemp expeller resultant of hemp seed processing. First step in performing the analysis was protein extraction from pomace. Extracted protein concentration was determined by biuret reaction in relation to the calibration curve for casein. Next part of studies was conducting a few enzymatic hydrolyses using different dilutions of plant origin enzymes- papain and bromelain. Hydrolysis effectiveness was determined by assigning hydrolysis degree for each reaction.

Obtained results indicate that both type of the enzyme and its addition (ratio „enzyme:substrate") as well as duration of reaction have influence on hydrolysis effectiveness.

Proteins extracted from hemp expeller in have significantly disintegrated lead to obtaining protein-peptide blends which might potentially be easier to assimilate as well as can characterize by bioactive properties.

Keywords:

hemp, expeller, protein extracts, bioactive peptides



ARTIFICIAL NEURAL NETWORKS IN THE ANALYSIS OF PILE DRILLING PARAMETERS

Filip Puch

Rzeszow University of Technology

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A few words about the author(s):

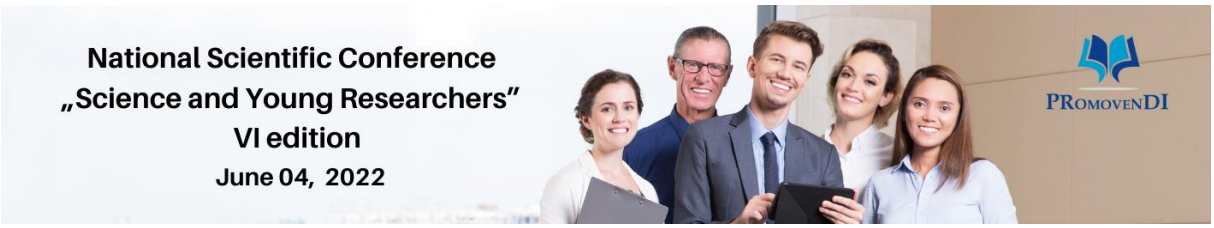
Pile works manager and PhD student at the Rzeszów University of Technology, interests in geotechnics and deep foundation.

Abstract:

In the speech, the autor presents the results of his research on the use of artificial neural networks for the analysis of pile drilling parameters. Describes the control and measurement systems of modern pile machines and technology of bored piles. Autor presents the process of creating a model of artificial neural networks capable of predicting soil parameters and the load-bearing capacity of piles on the basis of drilling parameters, which improves the safety of foundations. The created model of the artificial neural network allowed for the development of an innovative method of estimating the load capacity of piles. Finally, the author presents the practical application of the new method.

Keywords:

bored piles, artificial neural networks, geotechnics



PROTEIN FROM RAPESEED. PRODUCTION TECHNOLOGY AND SCALE-UP

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A few words about the author(s):

Experienced in scaling up of biotechnological processes, technological validation of bioreactors and other installations for food processing. Responsible for designing and developing equipment, laboratory experimentation unit, pilot plant facility.

Abstract:

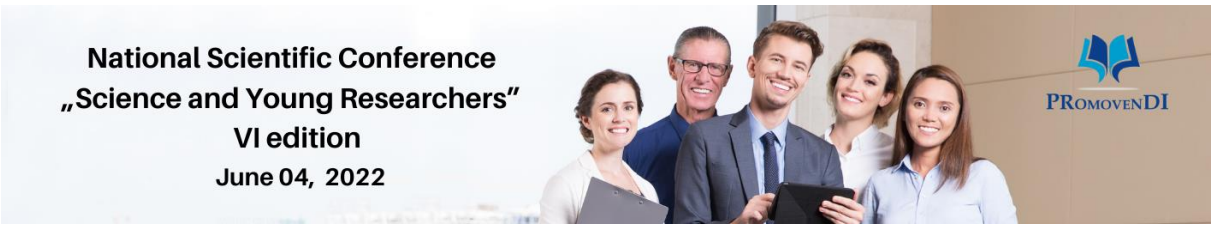
NapiFeryn BioTech developed and patented technology to obtain food-grade protein products from oilseeds such as rapeseed. Company's efforts to bring rapeseed protein to the market resonate well with current trends manifested in increased customer acceptance and growing demand for plant-based foodstuff. Technology platform of NapiFeryn offers a variety of advantages such as more ecological production process and usage of local resources. Moreover, this technology opens up new opportunities for rapeseed processors' business strategy.

This presentation focuses on the tasks performed by the technology transfer department in terms of technology transfer, scale up and optimization. This includes validation of existing production lines (from laboratory to pilot) and future industrial scale design including CAPEX and OPEX calculations for the first commercial facility. The final concept assumes that protein products will be generated in the biorefinery, where the core production of protein products is run together with auxiliary processes allowing for recovery and recirculation of water and solvents used in the production process.

Introduction of rapeseed-based protein production technology to the global oilseed processing industry presents great challenge for the daring investors, but it also offers high return on investment. NapiFeryn BioTech technology package is to be commercialized through licensing agreements.

Keywords:

rapeseed, plant protein, technology, scale-up, biorefinery concept



INFLUENCE OF MATERIAL ADDITIVES AND DRYING PROCESS ON MECHANICAL PROPERTIES OF ALGINATE HYDROGELS

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A few words about the author(s):

Maria Skrodzka is a master's student in Biomechanics and Magdalena Łabowska is a PhD candidate in Department of Mechanics, Materials and Biomedical Engineering at Wroclaw University of Science and Technology.

Abstract:

Alginate hydrogels consist of three-dimensional polymer chains filled with water. A characteristic property of hydrogels is the ability to swell and retain a significant amount of water in their structure. Alginate hydrogels because of their biocompatibility are used in the biomedical industry as bioinks in additive technologies, drug carriers, and tissue engineering (Ahmed 2015).

Due to the high water content of hydrogels, they are exposed to water loss during storage or the manufacturing elements. Water loss through hydrogels can affect their mechanical properties. One of the current directions of research development on the limitation of water loss by hydrogels is the use of material additives of other polymers. The addition of other polymers can also modify other hydrogel properties to adapt them to specific applications.

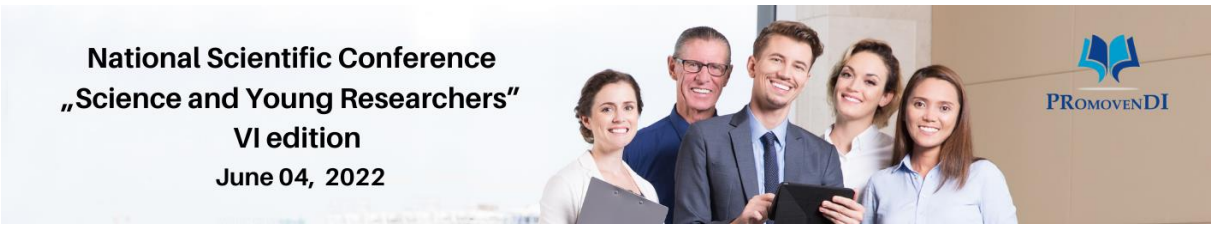
This study is aimed to determine how material additives affect the mechanical properties of alginate hydrogels. It was examined whether hydrogels return to their original mechanical properties after complete drying and rehydration.

The mechanical properties of hydrogels were determined in a uniaxial tensile test. Samples of pure alginate and samples of with gelatine added at different mass ratios were tested.

Studies have shown a significant effect of gelatine addition on some mechanical properties of hydrogels. Statistically significant differences in the properties of dried and rehydrated hydrogels were also shown.

Keywords:

hydrogel, drying process, mechanical testing



ASSESSMENT OF THE PROPERTIES OF THE $ALSI_{13}MG_1CUNI$ ALUMINUM ALLOY USED IN THE PRODUCTION OF CASTINGS FOR PISTONS TO COMBUSTION ENGINES

Michał Starczewski (1, 2)*, Anna J. Dolata (1)

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A few words about the author(s):

Michał Starczewski - for many years associated with the production of pistons for combustion engines at Złotecki Sp. z o.o. Piston Factory. Currently a PhD student at the Faculty of Materials Engineering, Silesian University of Technology.

Abstract:

The aim of the work is to compare the physicochemical properties of two deliveries of the $AlSi_{13}Mg_1CuNi$ aluminum alloy used for the production of piston casts intended for operation in a combustion engine. Two batch materials were selected for the tests, one of which revealed casting defects at the stage of machining the casting.

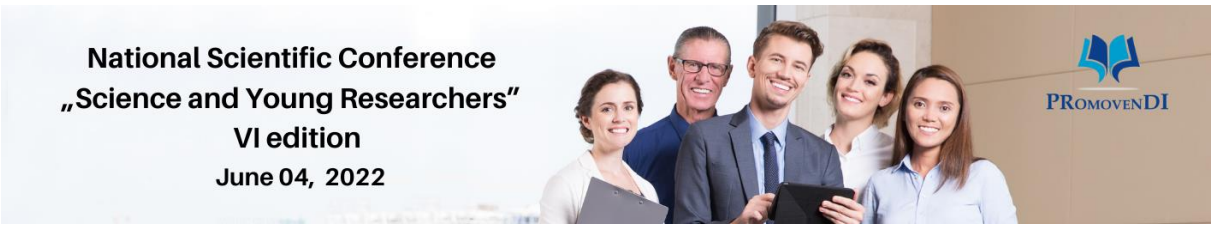
The scope of the tests carried out included: analysis of the chemical composition of heats, evaluation of the tensile strength of samples cast into MetalHelth molds, evaluation of technological properties based on the castability test, determination of the density index, analysis of coarse-grained inclusions (K-test). For each material, the test specimens were cast according to the subsequent stages of the production cycle, that is, after melting the charge, after the refining process and 5 hours after the completion of alloy refining.

Detailed analysis of the obtained test results allowed to identify additional significant requirements for the AlSi13Mg1CuNi silumin.

The end result is the development of guidelines that apply to determining the requirements for the raw material ordered for the production of piston castings.

Keywords:

aluminium alloy, piston cast, castability test, density index, coarse-grained inclusions



ROLE OF IBPA PROTEIN IN THE VIRULENCE OF PLANT PATHOGENIC BACTERIA DICKEYA SOLANI

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A research group led by prof. dr hab. Joanna Skórko-Glonek at the Department of General and Medical Biochemistry, Faculty of Biology, University of Gdańsk. The group specializes in phytopathogenic bacteria D. solani and pathogenic H. pylori.

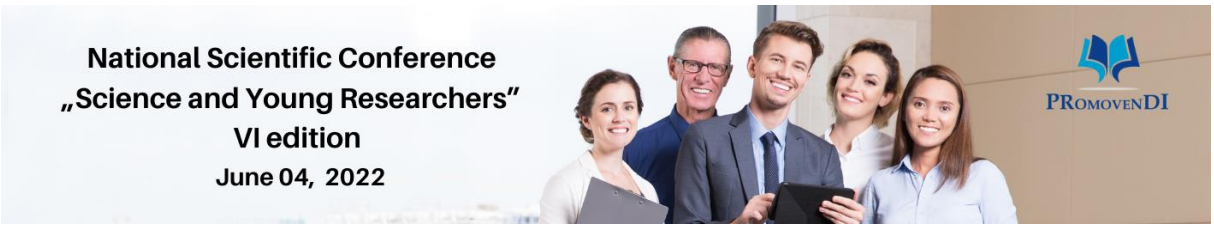
Abstract:

Bacteria from Dickeya genus are gram-negative plant pathogens clustered to Soft Rot Enetrobacteriaceae, causing diseases in economically important plants. The most dangerous species in this genus is D. solani, infecting potato plant. In general, virulence of phytopathogenic bacteria depends on factors like the activity of cell wall degrading enzymes and chemotaxis. Process of plant infection is associated with induction of stressful conditions to which bacteria are exposed. In numerous bacterial pathogens, the significant role in virulence is performed by the protein quality control system. This system is responsible for protein folding and/or degradation of irreversibly damaged proteins. Among the stress proteins, the most diverse group are the sHsps proteins (small heat shock proteins), which include the IbpA protein. IbpA protects the cell mainly against thermal and oxidative stress.

We decided to check the role of IbpA in D. solani virulence. D. solani ibpA::cm was subjected to following assays: activity of extracellular enzymes; siderophores synthesis/secretion, motility; and plant tissue maceration. The mutant strain showed reduced virulence in the chicory leaf model. The remaining tests showed no differences in relation to the wild-type strain, hence the mechanism of action of IbpA in the pathogenesis of D. solani remains unclear today.

Keywords:

virulence, phytopathology, IbpA, chaprone, D. solani, chicory, sHsps, PQCS



THE USE OF ESSENTIAL OILS IN PREVENTION OF LYME DIESEASE

Marta Alicja Kacprzak (1), Karolina Pitura (2)

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(2) Institute of Horticultural Production, Faculty of Horticulture and Landscape Architecture

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A few words about the author(s):

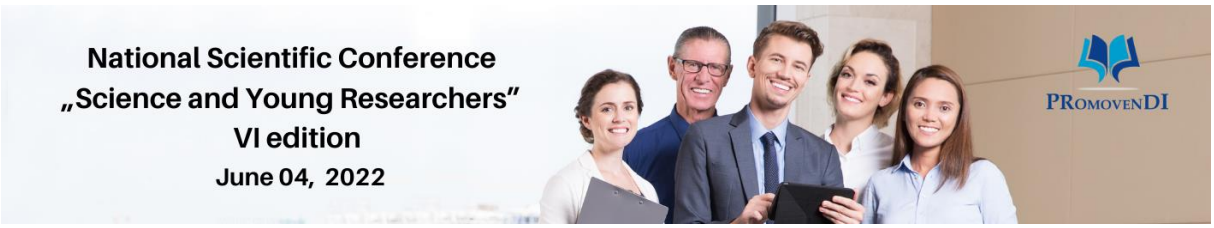
Marta Alicja Kacprzak is a student of Biocosmetology at University of Life Sciences in Lublin. As a Graduate of Herbalism and Plant Therapies at the University of Life Sciences and Naturopathy she is fascinated by medicinal plants and ethnobotany.

Abstract:

Lyme disease is an infectious disease caused by bacteria belonging to the spirochetes. It is transmitted between individuals by ticks of the genus Ixodes. The infection occurs when the tick bites and feeds. Borreliosis is a disease that attacks many systems of the human body causing many health problems. In Poland, the first case was reported in 1987. Since then, the incidence of the disease has increased. In 2017, the number of cases reached 21,516 patients. This paper compiles and describes effective essential oils helpful in early prevention of Lyme disease. The author's composition of oils that can serve as a natural repellent against ticks and the recommended method of its application are also presented.

Keywords:

Lyme disease, tick, essential oils, prevention,



BASIC COMPONENTS USED IN ELECTRONICS

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A few words about the author(s):

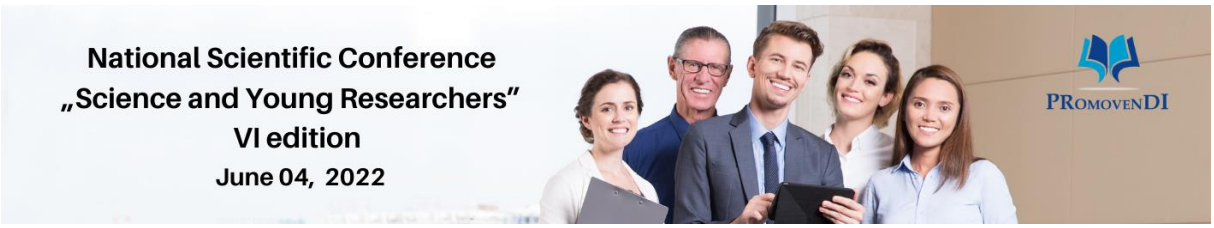
My name is Paweł Błaszczyk and I am the student of Łódź University of Technology. My hobbies are electronics and basketball. My field of study is automatics and robotics. I have been studying electronics for 4 years in my high school.

Abstract:

The presentation includes basic information about the most popular components, that are used in electronics nowadays. It was made mainly for beginners, that is why there are no complicated equations or charts. The main goal of this presentation is to increase peoples' interest in electronics.

Keywords:

electronics, electronic components



NATURAL SUBSTITUTES FOR SYNTHETIC SUBSTANCES USED IN COSMETICS

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A few words about the author(s):

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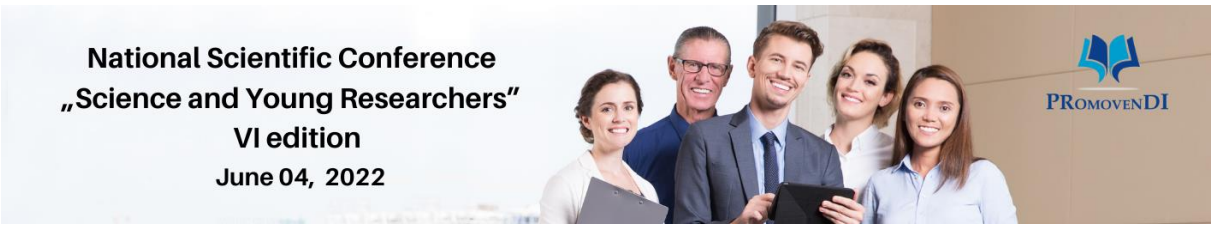
Abstract:

In today's world, more and more emphasis is being placed on environmental protection. Collective responsibility for the state of our environment also means a conscious choice of cosmetics, which we use every day. Natural, ecological, and "bio" cosmetics, based on raw materials coming from ecological farming, are becoming more and more popular. This is a result of the growing popularity of raw materials coming directly from nature, counted among the so-called "renewable sources". On the market today, you can find a lot of cosmetics that contain natural substitutes for synthetic substances. But do they work in the same way, and show the same physicochemical and care properties? Is the principle of their action is the same? Or is it just a marketing ploy? In this work, I would like to find answers to these questions. Interesting compounds, which are originally obtained synthetically or from animals, are: currently popular vitamin A, or retinol; naturally occurring in the skin hyaluronic acid and hydroquinone, valued for its skin brightening properties. Plants have been found in nature from which compounds have been isolated that exhibit similar effects to the substances listed above. They will be compared in terms of mechanism of action (if known), care properties and natural occurrence to well-known synthetic substitutes.

Keywords:

natural substances, synthetic substances, cosmetics



MIXED-USE ARCHITECTURE AS THE NEXT STAGE IN THE DEVELOPMENT OF MODERN CITIES

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"Young Urban Planning" Science Club, ul. Warszawska 24, 31-155 Kraków, Poland

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A few words about the author(s):

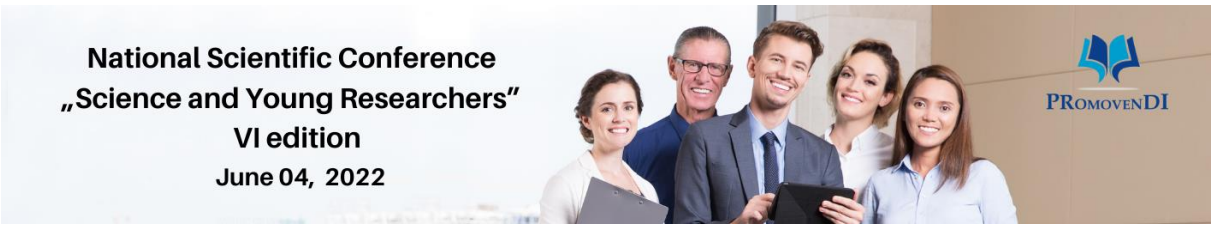
Master's degree student at the Faculty of Architecture of the Cracow University of Technology. Member of the "Young Urban Planning" Science Club.

Abstract:

The development of the city should maximize accessibility for users and be implemented in accordance with the idea of sustainable development. Each urban district has its own specificity. We can often see the division of urban areas in terms of their functions (for example: La Defense in Paris-the typical business area). In the era of suburbanization, an important aspect in designing new urban spaces is to mix the functions of individual sectors, rather than thematizing them, in order to balance the access of residents to as many services as possible.
Creating bedroom suburbs, business or party sectors causes cities to freeze fragmentarily at a given time of the day, instead of creating a coherent whole. Nowadays, the most important factors in choosing a place to live are amenities. That is why the idea of "mixed-use" was born. This means, among other things, providing an adequate number of amenities within accessibility to reduce car traffic, create community interactions and ensure the continued development of cities.

Keywords:

architecture, urban, mixed-use, city, development



THE INFLUENCE OF INERT GAS REFINING PROCESS DURATION ON THE PROPERTIES OF THE EN AC 44200 ALLOY

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A few words about the author(s):

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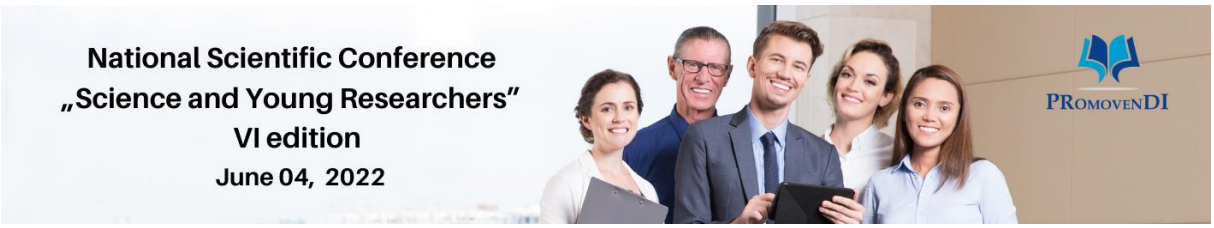
Abstract:

The ability to apply and improve the quality of aluminum alloys plays a particularly important role for the automotive and aviation industries, and thus, continuous learning of the possibilities offered by improving metal treatment processes in order to eliminate shortages and increase the field of application of used alloys is still relevant. This presentation focuses on the representation of the level of changes in the EN AC-44200 silumin, caused by the inert gas refining process after melting under industrial conditions, by applying different processing times. It presents the results of the hardness testing, as well as the tomographic and microscopic analysis of the samples obtained after the melting and refining process. These results provide insight into the importance of inert gas refining in the industry and the quality of changes, primarily in the level of metal gasification and its homogeneity through the analysis of the main alloying components. It also allows to qualify the upper time limit an alloy should be refined in order to obtain a satisfactory result in the case of similar alloys.

Keywords:

refining, alloys, aluminium



THE INFLUENCE OF THE PRESENCE OF METHANOL IN CELLULOSE PAPER ON ITS AGING PROCESS

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A few words about the author(s):

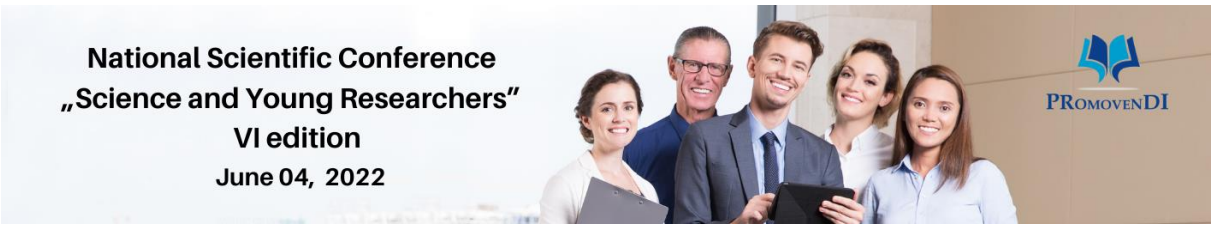
A graduate of the Poznan University of Technology. A lover of technical sciences. n particular, combining the fields of mechanics, electricity and computer science.

Abstract:

The thesis: The influence of the presence of methanol in cellulose paper on its aging process deals with the problem of aging cellulose insulation, which is an integral part of the transformer structure. So it is influencing on his work. The research focused in particular on pressboard paper and the influence of methanol content on its aging process, taking into account additional factors supporting aging, such as temperature. Therefore, examining the aging process of insulation and the deterioration of mechanical strength is an important factor. Which is worth investigating.

Keywords:

methanol, isolation, sample, transformer



MEMANTINE-POLYPYRROLE DRUG DELIVERY SYSTEM AS A CHANCE IN THE TREATMENT OF NEURODEGENERATIVE DISEASES ?

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A few words about the author(s):

Sara Krawczyk is a Ph.D. student of Materials Engineering at the University of Silesia. Her research-based on polypyrrole-drug delivery systems in the treatment of neurodegenerative diseases.

Abstract:

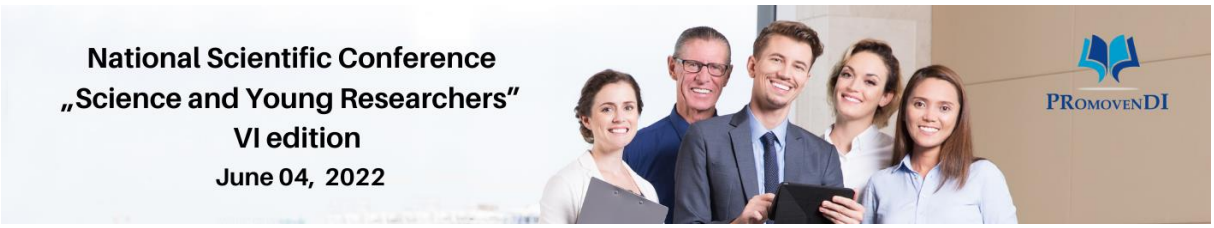
Neurodegenerative diseases such Alzheimer or Parkinson's disease cause damage to the neural system. Every year the percentage of people suffering from such diseases has increased. The only way of treatment are medical substances that only alleviate the symptoms like movement or memory problems. How to make the treatment more efficient?

In this research, pyrrole was synthesized with heparin and memantine, in the presence of sodium dodecyl sulfate on ITO substrate. The aim of the project was to synthesize the medical substance with a polymer matrix and characterize it using electrochemical, spectroscopy, and microscopy methods to perform a preliminary test that could be used to treat neurodegenerative diseases. Obtained layers were investigated by UV-Vis spectroscopy to confirm the presence of medical substances released into the physiological solution. Atomic Force Microscopy was used to define the roughness of obtained drug delivery system and registered changes caused by releasing. FTIR spectroscopy was used to confirm the medical substance's incorporation into the polymer matrix.

Results showed that it is possible to obtain a drug delivery system based on pyrrole, which stimulated-potentially can release memantine into the physiological environment. Such a system ensured the delivery of the therapeutic dose. This preliminary research showed that such a system delivered medical substances and potentially released them, which may be subjected to further biological tests

Keywords:

conducting polymers, polypyrrole, memantine, drug delivery systems



NATURE AS A DETERMINANT OF CONTEMPORARY DESIGN AND ITS IMPACT ON THE PEOPLE

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A few words about the author(s):

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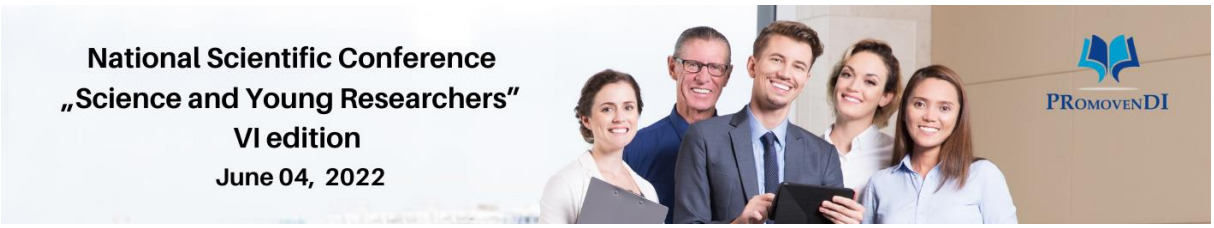
Abstract:

In contemporary architecture attention is focused on the introduction of green in modern design and construction trends. People spend more and more time in enclosed spaces that are separated from natural elements. The solution to this problem is the concept of biophilic design. Biophilic design seeks to satisfy our innate need to affiliate with nature in modern buildings and cities. Natural conditions for work, study and everyday life can be created through the entry of nature into the designed spaces. The achievement of this objective is subject to the fulfilment of certain conditions. First, because biophilia refers to changing human trends, biophilic design focuses on natural conditions that have a positive impact on our health, well-being and productivity. Another outstanding feature of the concept is the focus on the environment and not on a single natural phenomenon. The study concluded that plants increase creativity and productivity. Daylight has a strong influence on the psychology of the environment. In addition, it has been found to contribute to improving our well-being and health. Water and air flow also play an important role in biophilic design, as these aspects complement the natural atmosphere. In addition to the direct elements, there are also indirect possibilities in the sense of nature. It is about natural materials such as wood and earth, visual senses, sounds and smells that contribute to a multi-sensory, biophilic experience.

Keywords:

nature, biophilic design, contemporary design, architecture



ADVANTAGES AND LIMITATIONS OF HYBRID SUPERCAPACITORS UTILIZING SODIUM IODIDE IN AQUEOUS AND AQUEOUS-ORGANIC MEDIA

Aleksandra A. Mroziewicz*, Justyna Lubera, Natalia H. Wisińska, Magdalena Skunik-Nuckowska

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A few words about the author(s):

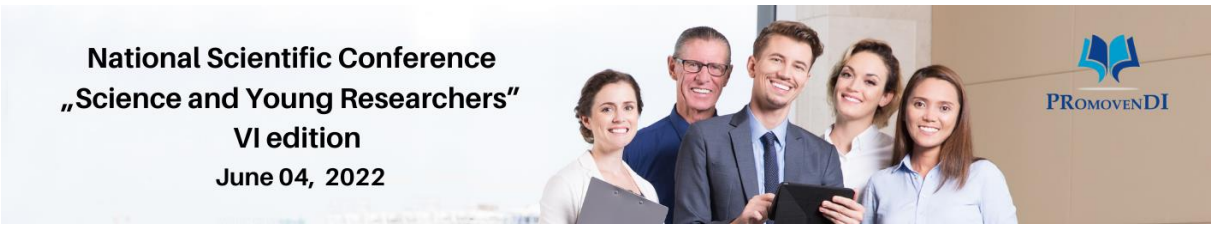
Aleksandra A. Mroziewicz is a master's student at the Faculty of Chemistry, the University of Warsaw as a part of dr M. Skunik-Nuckowska's research group. Her scientific interests are focused on hybrid supercapacitors utilizing redox electrolytes.

Abstract:

Supercapacitors are high-power devices playing a key role in energy storage technologies as complementary systems for batteries and renewable energy sources. However, their low energy density is a serious limitation. Among the strategies to overcome it, the most interesting is the construction of hybrid systems utilizing both battery and capacitor-like features. It has been found that charge might be stored by a redox-active electrolyte. One of the most fascinating redox couples, historically the first utilized in hybrid supercapacitors, is I-/I2. As demonstrated, the presence of iodides in the electrolyte solution significantly contributes to the total charge stored by the device. It has been also proved that oxidized forms of iodine such as I2 and I3- (that are charge carriers in a supercapacitor) could easily adsorb on carbon electrode surfaces which were believed to eliminate the self-discharge problems related to the redox-shuttle effect involving a physical transport of the charged carriers to the opposite electrode and their back reduction reaction. Herein it will be shown that the confinement of I2 and I3- in pores of electrode material does not prevent redox-shuttling. The driving forces leading to the self-discharge, the effect of other ions present in the solution, and the solution pH will be shown. Finally, some strategies, which could potentially decrease the self-discharge rate, but also those leading to broadening the voltage window, will be presented as well.

Keywords:

supercapacitor, sodium iodide, redox electrolyte, self-discharge, redox-shuttle effect



BASIC PROCEDURES IN VETERINARY SURGERY AND THEIR RISKS

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A few words about the author(s):

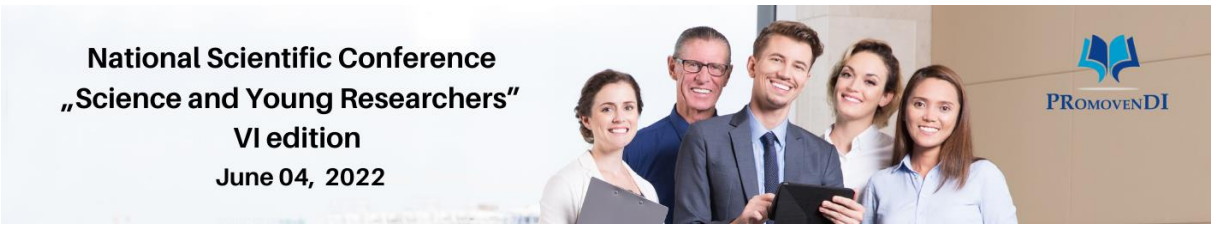
5th year student of veterinary medicine. Author of many reviews and research works in the field of animal nutrition and its impact on the clinical condition of patients.

Abstract:

Veterinary surgery has developed significantly over the past few decades. People are ready to go for more complicated surgery to save their pets' life and health. There are more and more specialists in the field of animal surgery in Poland. At a time when surgical procedures are a daily routine in every clinic, it must not be forgotten that even the simplest ones involve high risks. The presented review describes the basic surgical procedures and analyzes their possible risks.

Keywords:

veterinary, surgery



ATOPIC DERMATITIS - AN INCREASINGLY COMMON DERMATOLOGICAL PROBLEM IN DOGS.

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University of Warmia and Mazury in Olsztyn

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A few words about the author(s):

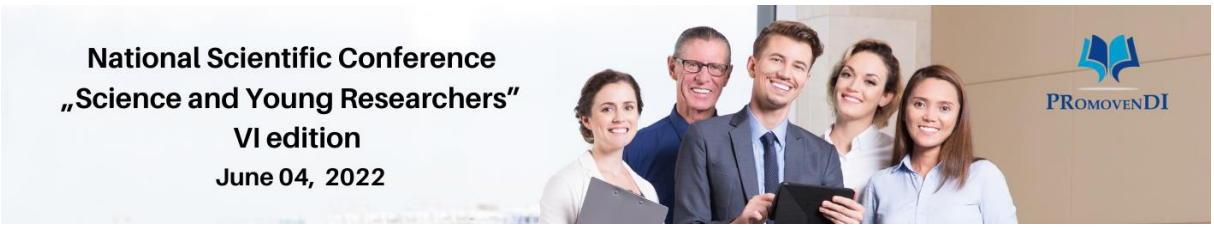
5th year student of veterinary medicine. Author of many reviews and research works in the field of animal nutrition and its impact on the clinical condition of patients.

Abstract:

Atopic dermatitis is an autoimmune disease that appears more and more frequently in veterinary clinics. Diagnostics as well as effective treatment are highly problematic. Both environmental and genetic factors contribute to its development. The presented work analyzes atopic dermatitis, focusing mainly on differential diagnosis and new methods of treatment of this disease.

Keywords:

atopic, dermatitis, dogs



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

Paweł Pater

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A few words about the author(s):

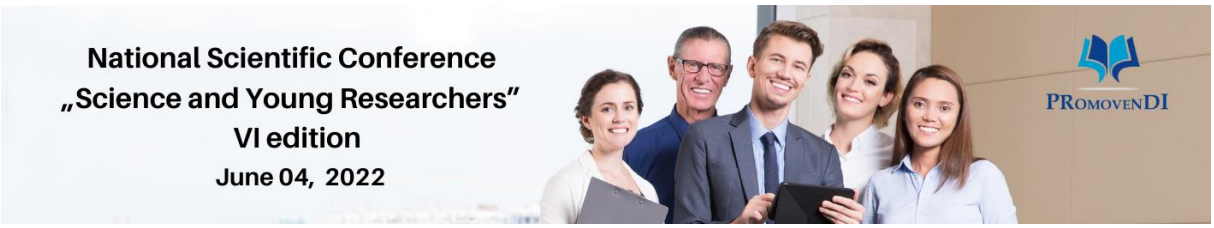
Paweł Pater MSc. Mechanical Engineering - Bydgoszcz University of Technology, specializing in machine and device design. Since 2012, the president of the company GOSTER Sp. z o.o. .Mechanical design engineer, inventor, owner of several patents.

Abstract:

The presentation is to shows 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, recykling, gearless exciter, exciter



CERAMIC-POLYMER COMPOSITE BIOMATERIALS AS A CARRIER FOR ACTIVE SUBSTANCE

Karina Piętak*, Dagmara Słota, Wioletta Florkiewicz, Agnieszka Sobczak-Kupiec

Department of Materials Science, Faculty of Materials Engineering and Physics, Cracow University of Technology, 37 Jana Pawła II Av., 31-864 Cracow, Poland

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A few words about the author(s):

Karina Piętak is a Ph.D. student in the Department of Materials Engineering, Cracow University of Technology. She conducts interdisciplinary research activities at the interface of materials engineering, chemical engineering, and nanotechnology.

Abstract:

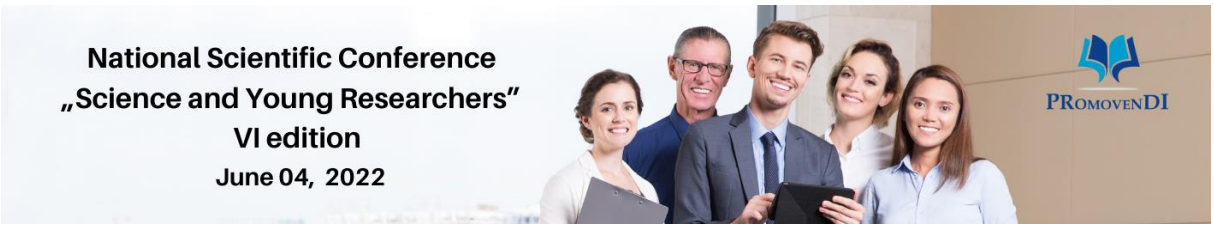
One of the most common diseases of civilization, associated with an increase in life expectancy, is osteoporosis. It is characterized by a decrease in bone density, as well as a reduction in cohesion with tissues, which can cause various fractures. To improve damaged tissues, biomaterials are an innovative solution. These materials are widely used in orthopedics, dentistry and regenerative medicine.

The aim of this study was to create a ceramic-polymer composite biomaterial to carry active substances. The polymer phase was polyvinylpyrrolidone and betaine, but the ceramic phase was hydroxyapatite. The obtained matrices were modified with the antibiotic clindamycin. The composite biomaterials prepared in this way were subjected to swelling tests in various liquids simulating the internal environment of the human body, and the kinetics of antibiotic release from the composite matrices were investigated.

Acknowledgements: The „Multifunctional biologically active composites for applications in bone regenerative medicine" project is carried out within the TEAM-NET programme of the Foundation for Polish Science financed by the European Union under the European Regional Development Fund. POIR.04.04.00-00-16D7/18.

Keywords:

biomaterials, polymers, hydroxyapatite, clindamycin



HYBRID GLASS DOPED WITH SUBSTITUTED AND UNSUBSTITUTED METAL PHTHALOCYANINE – EFFECT OF SOL-GEL CONDITION ON STABILITY OF LUMINOPHORES

Barbara Popanda (1)*, Jarosław Grolik(2), Marcin Środa(1)

(1) AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Department of Glass Technology and Amorphous Coatings, al. A. Mickiewicza 30, 30-059 Kraków, (2) Jagiellonian University, Faculty of Chemistry, Gronostajowa 2, 30-387 Kraków

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A few words about the author(s):

Barbara Popanda is a PhD student at AGH University of Science and Technology in Kraków. Jarosław Grolik is a specialist in the heterocyclic compounds synthesis. Marcin Środa is a specialist in the glass technology.

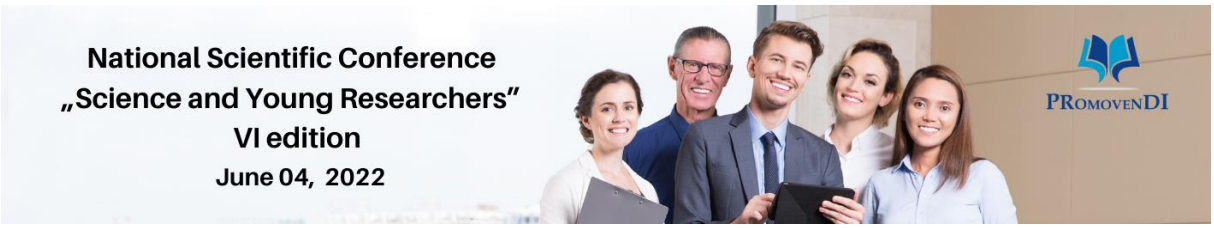
Abstract:

The aim of the work was to obtain a transparent hybrid material doped with two different zinc phthalocyanines using the sol-gel method for optoelectronic application. The matrix was based on inorganic-organic mixtures, made of modified alkoxysilanes with organic groups, not hydrolyzing under sol-gel conditions. Two types of gels were prepared. Unsubstituted zinc phthalocyanine or substituted alkoxy zinc phthalocyanine was incorporated, respectively. The stability of physical incorporated and chemical bonded phthalocyanines in the glassy matrix were compared.

Solvents and catalyst systems of different polarity were used for the experiments. The stability of phthalocyanines in the sol was investigated by absorption spectroscopy in the UV-ViS range. The study was conducted based on FT-IR, SEM, XRD and thermoluminescence (TL) methods for the obtained gels. The phthalocyanine in a system using isopropanol as a solvent and two-stage acid-base catalysis (HCl-NaOH) demonstrates the highest stability. We found that the phthalocyanine substituted by siloxane groups exhibits higher stability in the glass than unsubstituted zinc phthalocyanine incorporated into matrix by physical interactions.

Keywords:

phthalocyanine, hybrid glass, sol-gel technique, luminescence, optoelectronics



HEALTH COMPLICATIONS RESULTING FROM INPROPER CAGE CONDITIONS IN PARROTS

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A few words about the author(s):

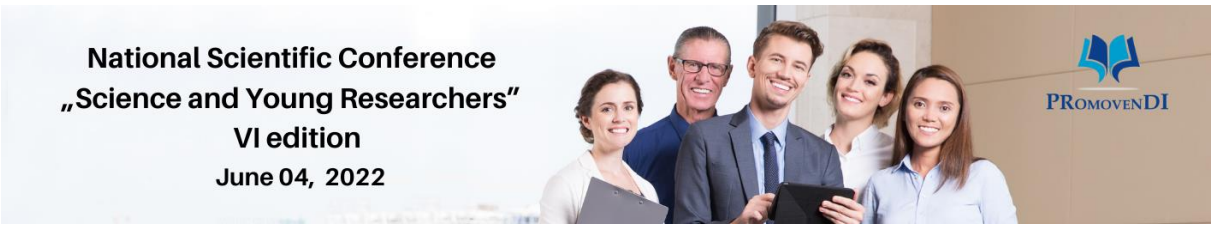
Third year veterinary student at Faculty of Veterinary Medicine. Volunteer in a clinic for exotic patients and at a rehabilitation center for protected birds. Falconer. The choice of topic was related to a personal interest in bird medicine.

Abstract:

Companion parrots are birds that falls within the order Psittaciformes. That includes: the Cacatuidae Family (Cockatiels and Cockatoos) and the Psittacidae Family (the Lory and Lorikeet, the Parrots and Parakeets). The health of caged parrots is highly owner-dependant as it is largely related to the diet and conditions of maintenance. Examination of patient's cage should include looking at its' size, shape and equipment. Bowls, perches, padding, toys, the material from which the cage is made and its location should be taken into consideration. Evaluation of the cage can give a preliminary picture of the patient's situation and the cause of his health problems. The presentation will introduce dangerous elements of cage equipment, affection of its' surrounding, possible health complications and a few examples from clinical practice. Possible threats include toxicosis, feather damage, immunosupression due to stress that can lead to opportunistic infections, behavioral disorders, leg injuries and predisposition to nasal infections. Birds presented as examples had problems with a) bacterial infection due to most likely hormonal changes, which appeared because of mirrors presence in cage and long time of bird regurgitation at its' own reflection; b) feather plucking. The presentation will work well as a pictorial presentation of possible threats to the owners of parrots and thus increase awareness.

Keywords:

parrot health, parrots, cage, avian medicine



METHODS OF REPAIRING DAMAGED FEATHERS ON BIRDS

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A few words about the author(s):

Third year veterinary student at Faculty of Veterinary Medicine. Volunteer in a clinic for exotic patients and at a rehabilitation center for protected birds. Falconer. The choice of topic was related to a personal interest in bird medicine.

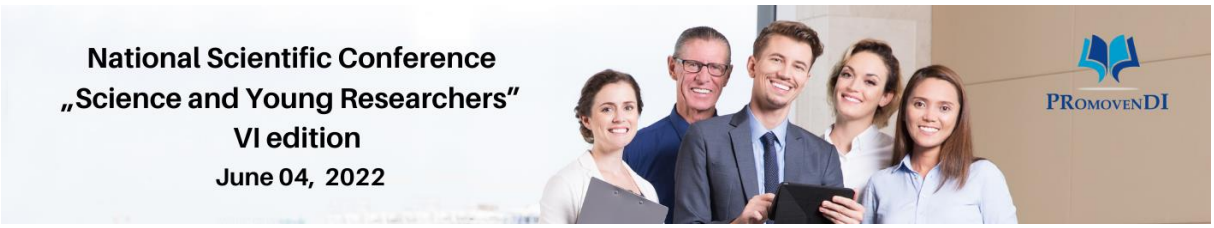
Abstract:

An intact feather structure is essential to maintain flight fluidity. While individual damage is not critical, it can promote damage to subsequent feathers. Damage to feathers can affect for example hunting performance. Hawks use rectrices to make agile maneuvers. With their damage, they lose their advantage in flight over their prey, becoming much weaker hunters. In the case of falcons, which reach a higher speed in the air, the gap in the feathers creates space for rapidly incoming air, which can favor their breaking. Progressive damage can affect the ability to fly. Birds with varying degrees of feather damage are sent to rehabilitation centers. Birds with undercut feathers, burnt ends, damaged during use, transport or with accident damage. The presentation will show ways to repair mechanical damage to feathers: from bends, changes in shape treated with water steam, through strengthening in the event of a partially break and imping in the event of a full break into two parts. In the absence of feathers of the same species, feathers of other species may be used in justified cases, if they allow to fulfill their physiological function, and therefore have similar measurements and shape.

The preparation of the patient for the procedure and the necessary materials as well as examples of application will be presented. Imping feathers allows to bypass the waiting time for moulting, so it affects the speed of the possibility of releasing some rehabilitated birds into the wild.

Keywords:

feathers, bird rehabilitation



INFLUENCE OF THE PARTICLE SIZE DISTRIBUTION OF ADSORBENTS ON THE ADSORPTION PROCESS OF SELECTED TEST SUBSTANCES IN LIQUID CHROMATOGRAPHY

Regina Przywara (1)*, Mateusz Przywara (2), Wojciech Zapała (2)

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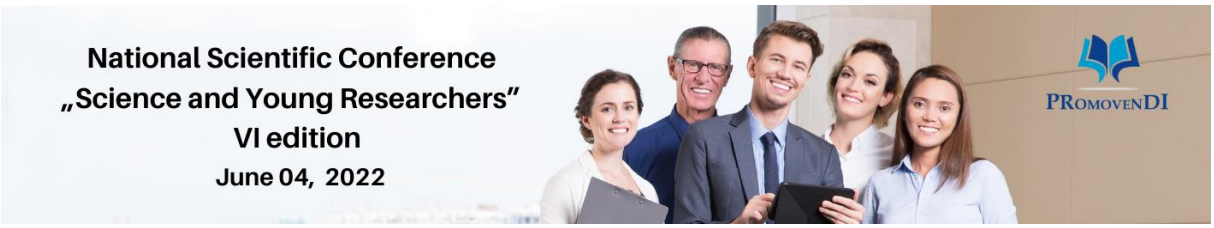
Graduate of the Faculty of Chemistry at Rzeszow University of Technology, faculties: Biotechnology and Chemical and process engineering. PhD student at the Doctoral School of Engineering Sciences at Rzeszow University of Technology.

Abstract:

The application of hydrophilic interaction chromatography (HILIC) is still receiving much attention in chromatographic practice based on polar stationary phases in combination with partially aqueous eluents containing acetonitrile or methanol. The list of polar stationary phases used in HILIC chromatography for various applications is very long and includes any polar silica-based stationary phase. The study used two types of stationary phases based on silica gel with different particle size distributions. The test substances were phenol and caffeine. Laboratory studies of the particle size distribution were conducted using the laser diffraction method. The adsorption capacity of an adsorbent is affected by its grain size. This phenomenon affects the chromatographic process and its performance. The mass transport resistance is affected not only by the particle size but also by the particle size distribution of the adsorbent. It can make a significant contribution to the overall adsorption process.

Keywords:

liquid chromatography, adsorbent, particle size distribution



TRIBOLOGICAL AND PHYSIOCHEMICAL PROPERTIES OF COMPOSITE COATINGS FOR BONE REGENERATION

Dagmara Słota (1)*, Wioletta Florkiewicz (1), Karina Piętak (1), Mateusz Dyląg (1, 2), Magdalena Głąb (1), Anna Drabczyk (1), Sonia Kudłacik–Kramarczyk (1), Agnieszka Tomala (1), Bożena Tyliszczak (1), Agnieszka Sobczak–Kupiec (1)

(1) Department of Materials Science, Faculty of Materials Engineering and Physics, Cracow University of Technology, 37 Jana Pawła II Av., 31-864 Krakow, Poland;

(2) ATMAT Sp. z o.o., Siwka 17, 31-588 Kraków, Poland

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A few words about the author(s):

Dagmara Słota is a PhD student at the Cracow University of Technology. In her research she concerns with bioactive composites and materials as carriers of active substances, which may find application in regenerative medicine of the skeletal system.

Abstract:

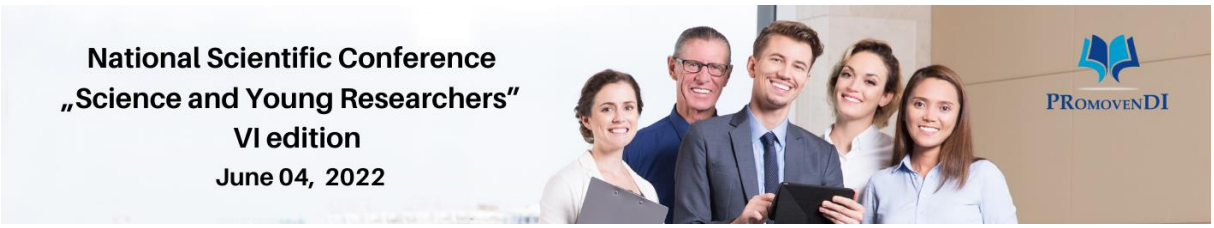
A "biomaterial" is a term used to describe a material that can be used to manufacture devices and components that have direct contact with tissues in the body. They are used to create implants as well as to cover the surfaces of devices that are implanted into living organisms. Nowadays, a key feature of medical devices, is their multifunctionality to ensure effective and long-lasting functionality. One solution that can provide this is coating of implants, thus creating specific layers of biomaterial. Implant coating is also one of the strategies used to increase biocompatibility as well as provide additional functions without changing the base material.

In the present study, innovative composite coatings for hard tissue regeneration based on polyvinylpyrrolidone (PVP) and polyethylene glycol (PEG) containing glutathione as well as collagen enriched with bioactive hydroxyapatite (HA) were developed. The materials were subjected to physicochemical and tribological analysis, as well as incubation studies to determine their properties and potential for use as a drug carrier.

The „Multifunctional biologically active composites for applications in bone regenerative medicine" project is carried out within the TEAM-NET programme of the Foundation for Polish Science financed by the European Union under the European Regional Development Fund. POIR.04.04.00-00-16D7/18.

Keywords:

hydroxyapatite, biomaterials, composites, coatings, bone regeneration



HOMOGENEOUS METALLOCENE CATALYSTS: INFLUENCE OF METALLOCENE STRUCTURE AND CATALYTIC SYSTEM ON POLYMERIZATION OF (FUNCTIONALIZED) OLEFINS

Wojciech Szot (1, 2)*, Mateusz Malus (2)

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(2) Department of Chemistry and Technology of Functional Materials, Chemical Faculty, Gdansk University of Technology, G. Narutowicza Str. 11/12, 80-233 Gdansk, Poland

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A few words about the author(s):

Students of the Gdańsk University of Technology fascinated by the chemistry of polymers and the practical side of the application and production of polymers. Full of enthusiasm to share our thoughts and insights.

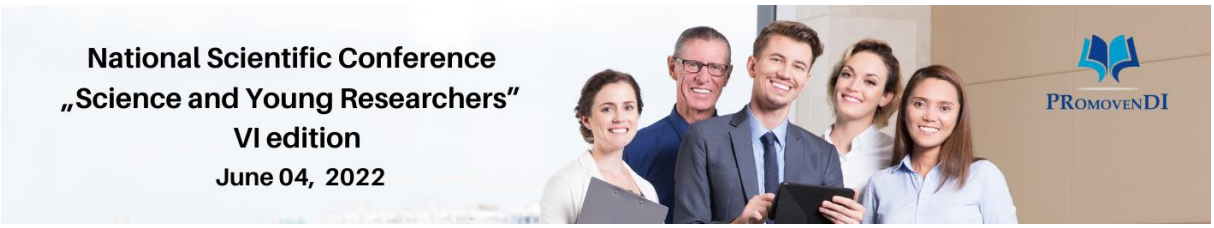
Abstract:

Polyolfin-based copolymers are typically made using either a homogeneous aspecific catalyst or a heterogeneous isospecific Ziegler-Natta catalyst based on vanadium or titanium, respectively. Nevertheless, olefin polymerization using homogeneous metallocene catalyst is also a great importance in the polymer industry, wherese single-site metallocenes have been used as catalysts for homopolymerization and copolymerization. Huge impact on steric control of metallocene catalysis has modification of the metallocene structure – type and amount of ligands and substituents or presence and numer of bridge between the ligands. Catalysts are usually poisoned with molecules that contain an oxygen atom in their structure by Lewis acid-base complexation, protonolysis, or both. Therefore, apart from the catalyst structure, the entire catalyst system - cocatalyst, scavenger and protecting groups - is of great importance.

All parameters described above have immense impact on activity of catalyst, what is corellated with yield of reaction but also with properties of produced polymer, e.g. molecular weight, molecular weight distribution, melting point, glass transition temperature and mechanical properties. This review covers research into the polymerization of (functionalized) olefins with homogeneous metallocene catalysts.

Keywords:

polymerization, polyolefins, metallocene catalyst, functionalized polyolefins



ANALYSIS OF THE IMPACT OF GREENERY AND WATER MANAGEMENT ON THE URBAN ORGANISM AND ITS USERS.

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A few words about the author(s):

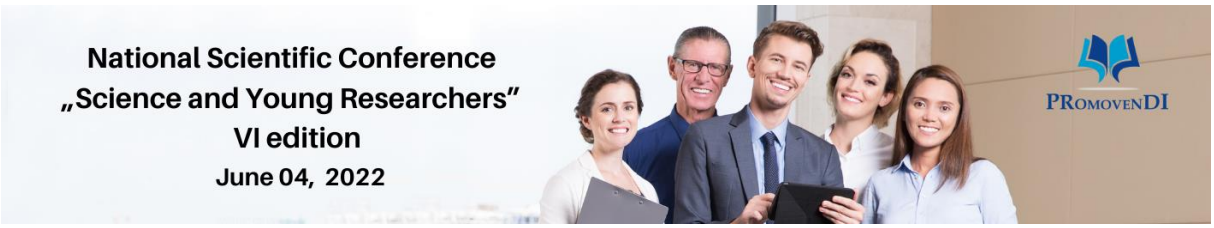
4th year student of the faculty of architecture of the cracow university of technology. Member of "young urban planning" science club.

Abstract:

Greenery in the city has many different functions and uses; among other things, it regulates water management, insulates and protects against wind, noise and other harmful factors. The diverse urban spatial landscape, rich in various green spaces, watercourses or water reservoirs also has a significant impact on the mental and social health of the inhabitants. Greenery also contributes to reducing the effect of the so-called "heat island", i.e. a specific urban microclimate with higher temperature and lower humidity. This is related to the use of hardened surfaces, impermeable to water, as well as the reduced factor of biologically active land, resulting from the high intensification of development. A wide range of green spaces is necessary for the proper functioning of the human body and to improve the climate situation, which is becoming more and more dramatic nowadays. Greenery provides people with health, enables them to develop social contacts and has an aesthetic function. The contemporary problem of the so-called "concreteosis" phenomenon can only be solved by planting and adequate water retention.

Keywords:

greenery, water, landscape, city, urban



THE EFFECT OF ALLOYING ADDITIVIES ON SELECTED MECHANICAL PROPERTIES AND CORROSION RESISTANCE OF MATERIALS SINTERED ON A ZIRCONIUM MATRIX

Radosław Wnuk*, Lucyna Jaworska, Michał Stępień, Adam Zwoliński

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A few words about the author(s):

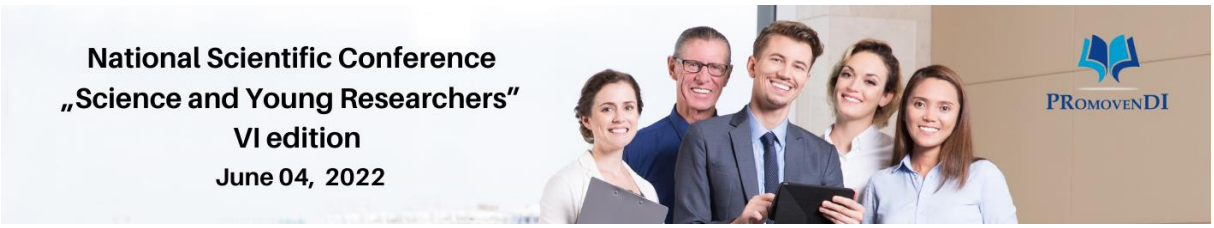
Radosław Wnuk is a graduate and doctoral student at the Faculty of Non-Ferrous Metals at AGH in Cracow in the field of material engineering.

Abstract:

Zirconium is a material used primarily in the nuclear, chemical and medical industries, including the production of bone implants. It is characterized by a high melting point (1860 °C), good resistance to corrosion caused by many acids and bases as well as sea water, low neutron absorption and high mechanical strength. High purity zirconium metal is expensive due to the need for hafnium separation. Elements used in the nuclear industry (e.g. pipes, rods) are obtained by melting, plastic working and heat treatment techniques. Machining is used to produce more complex shapes, but material losses are very high. An alternative may be powder metallurgy and the use of pressing and sintering techniques to produce products from zirconium and its alloys. Then the material losses may be small and the production process does not require high energy expenditure, and the density of the material obtained from powders is very close to the theoretical density of the material obtained by melting methods. The results of the tests of density, hardness and corrosion resistance of zirconium sinters with the addition of Cu, Nb, Mn and pure zirconium will be presented. Consolidation of the powders was carried out by pressing the electrically activated SPS. The sinters are characterized by residual porosity and therefore their corrosion resistance is lower than that of the materials obtained by the melting method. Sinters with 2.5% and 16% by weight of niobium have the best corrosion resistance.

Keywords:

powder metallurgy, SPS sintering, hardness, density, corrosion resistance



COMPARISON OF SAMPLE PREPARATION METHODS IN THE COURSE OF CHROMATOGRAPHIC ANALYSIS OF WATER POLLUTANTS

Jakub Woźniak*, Stanisław Popiel

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A few words about the author(s):

M. Eng. Jakub Woźniak, PhD student at the Doctoral School of the Military University of Technology, in the discipline of chemical sciences, in the field of exact and natural sciences. Works in analytical chemistry and instrumental analysis.

Abstract:

This work describes the process of comparing two methods of preparing water samples in the course of chromatographic analysis of chosen organic pollutants in drinking water, both bottled and tap water. The sample preparation processes were optimized using both techniques, partial validation has been carried out and the qualitative and quantitative analysis of selected compounds was performed.

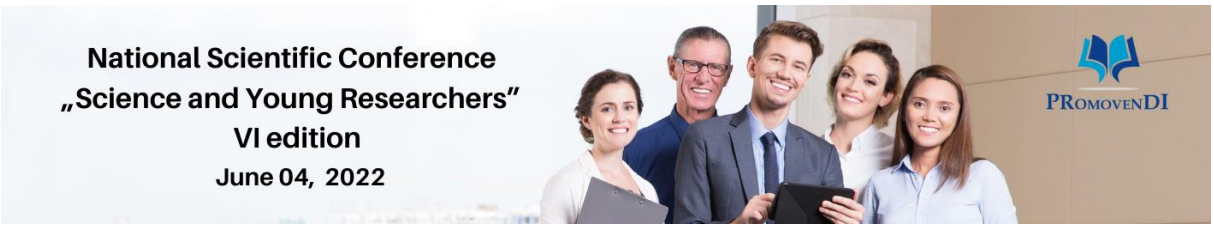
The information coming from the institutions monitoring the pollution of water: The Municipal Water and Sewerage Company, The Chief Sanitary Inspectorate and information from the Guidelines for the quality of drinking water by the World Health Organization were considered.

The most important information on the preparation of water samples is presented. The basic aspects of two chosen sample preparation techniques - solid phase extraction and solid phase microextraction are discussed.

The experimental part describes the methodology of selecting appropriate conditions for the chromatographic separation of the tested substances. The parameters for the preparation of water samples were optimized with the two mentioned techniques, calibration charts necessary for the quantitative analysis of selected pollutants were prepared, and selected drinking water samples were tested, both bottled - from several producers, and tap water, collected in several places in Warsaw.

Keywords:

drinking water, solid phase microextraction, solid phase extraction, polycyclic aromatic hydrocarbons, chloroorganic pesticides



CONCEPTION OF TUMOR LOCALIZATION USING MICROWAVE NOISE RADIATION

Konrad Wróbel

Military University of Technology, Kaliskiego 2, 00-908 Warsaw, Poland

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A few words about the author(s):

Author is a PhD student on Military University of Technology in Warsaw at Electronic Faculty. The aim of author interest is microwave technology in use to detect neoplastic lesions.

Abstract:

Detecting tumors and their locations is still challenging stage in cancer treatment. Nowadays most popular diagnosis methods use a portion of energy (X-rays, magnetic field, sonic wave etc.) to illuminate tissue and then the investigate how tissue transform that energy. These methods have a significant disadvantage - they are invasive. Any dose of energy that interacts with a tumor can increase cancer growing speed. To face with this problem noninvasive techniques appearing, but they are still not very common and lots of them didn't go beyond the research zone. One of this technique is based on natural microwave radiation of bodies which temperature is above absolute zero. Cancer tissue which temperature is higher than temperature of surrounding tissues (caused by presence of own blood circulation system and intensified metabolic processes) sends a portion of energy that can be detect at skin surface. The aim of presentation is to propose a conception of tumor localization method using microwave energy detected at skin surface on different frequencies.

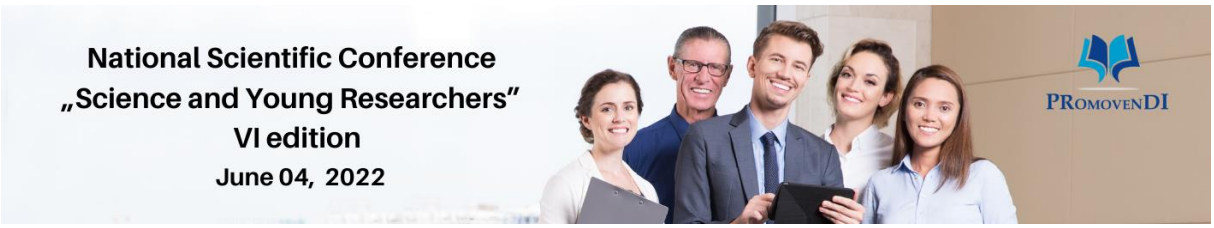
Keywords:

microwave noise radiation, tumor detection

ABSTRACTS OF

POSTERS

TECHNICAL AND NATURAL SCIENCES



PHOTOVOLTAICS – ANALYSIS OF THE APPLICATION, THE POSITIVE AND NEGATIVE EFFECTS OF THE USE OF PHOTOVOLTAIC MODULES AND PHOTOVOLTAIC FARMS BASED ON EXISTING SOLAR PLANTS AND POWER PLANTS IN EUROPE

Karolina Chrościńska

Białystok University of Technology, Faculty of Architecture

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A few words about the author(s):

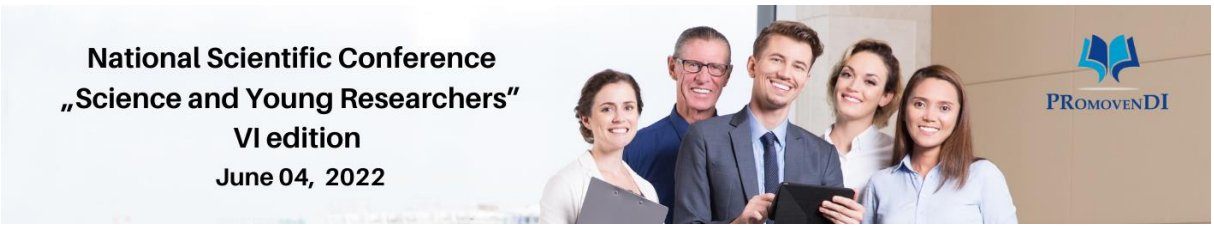
Hello. My name is Karolina Chrościńska. I am an architecture student at the Białystok University of Technology, Faculty Of Architecture. I am also interested in music and learning new languages.

Abstract:

The aim of the poster is to discuss the booming of solar power plants in Europe. The first photovoltaic farm was founded in 1994 near Toledo (Spain). Today, the basis for design is the use of ecological solutions to reduce the negative impact of human activities on the environment. One way to reduce the negative effects is to use the increasingly popular photovoltaic modules, from single-family homes to photovoltaic farms. The results of the analyses are intended to provide a broader insight into the issue of photovoltaic installations and to summarise the most important aspects for decision-making on future small and large investments in photovoltaics.

Keywords:

ecological solutions, photovoltaic installations



SUSTAINABILITY IN ARCHITECTURE. ACHIEVEMENTS OF GREEN BUILDING USING THE EXAMPLE OF THE ENVIRONMENTALLY FRIENDLY ESTATE OF BEDDINGTON ZERO ENERGY DEVELOPMENT NEAR LONDON

Michał Fiłonowicz

Bialystok Technical University, Faculty of Architecture

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A few words about the author(s):

My name is Michał Fiłonowicz. I am a student of architecture at the Bialystok University of Technology. I have been interested in architecture since I was young and it is the direction in which I develop.

Abstract:

The aim of this poster is to examine the impact of the application of pro-ecological solutions in architecture on the environment and the quality of building exploitation.

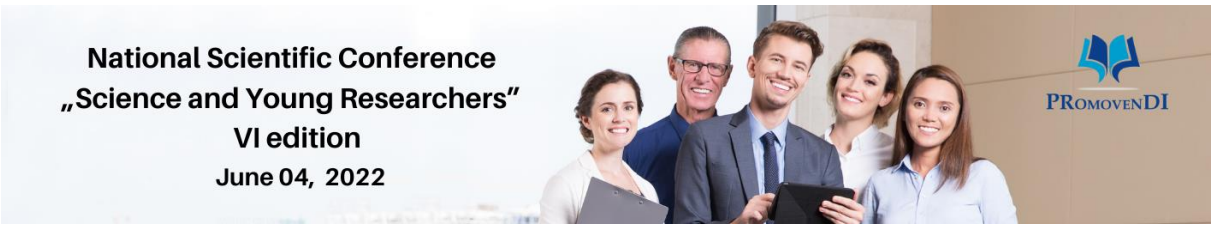
Due to the growing public awareness of the negative impact of human activity on the natural economy, solutions allowing for the reduction of human-environmental impact are being introduced in every field. One example of such actions is ecological construction, allowing for low consumption of natural resources of the earth with low emissions of undesirable substances produced during the use of buildings.

The Beddington Zero Energy Development (BedZed), near to London, is one of many examples of this type of construction. As this habitat has been in use for quite a long time, it is possible to examine the tactile impact of the technical solutions applied into operational results, which makes it possible to confirm or deny the appropriateness of their use. Additionally, the opinions of the inhabitants allow for verification of the quality of life, both in economic and psychological aspects, in this type of facilities.

Having analysed the available data, it is possible to determine which assumptions and technical solutions bring the expected results, and which do not fulfil a specific role or are rejected due to the high costs of the installation itself or its use. The study also explores the impact of eco architecture on its users.

Keywords:

architecture, construction, pro-ecological, earth



ACRYLAMIDE INDUCES OXIDATIVE DNA DAMAGE, CELL APOPTOSIS, AND CHANGES IN MORPHOLOGY IN CACO-2 CELLS

Agnieszka Maher (1)*, Adriana Nowak (1), Małgorzata Zakłos-Szyda (2), Dorota Żyżelewicz (3), Ilona Motyl (1)

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(3) Institute of Food Technology and Analysis, Faculty of Biotechnology and Food Sciences, Lodz University of Technology, Stefanowskiego 4/10, 90-924 Łódź Poland

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A few words about the author(s):

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

Abstract:

Acrylamide (AA) is known to be present not only in industry but also in daily diet due to the Maillard reaction. AA has been classified into Group 2A as a compound probable carcinogenic to humans.

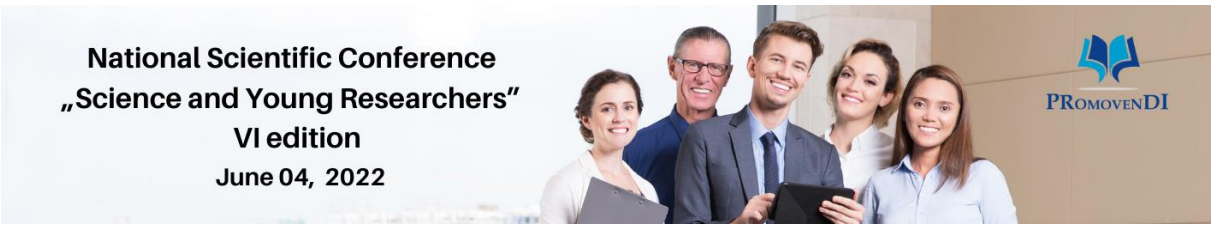
The aim of the following research was to measure oxidative DNA damage (measured with Endo III and Fpg enzymes); the degree of cell death (cell death detection ELISA PLUS); and to assess the morphological changes using microscopic methods (Giemsa/May–Grünwald, DAPI, AO/PI staining methods and scanning electron microscopy), induced by AA in the human colon adenocarcinoma Caco-2 cell line. The AA concentrations (0.2 – 12.5 mM) were chosen based on previous cytotoxicity testing.

The results revealed an increase in oxidative DNA damage in Caco-2 cells treated with 3.2 – 12.5 mM of AA at 12% - 25% for Endo III, and 20% - 55% for Fpg. Apoptosis was detected after the cells' incubation with 3.2 – 12.5 mM of AA and the enrichment factors were 30% - 40%. However, the results show that AA at the studied concentration was not potent to induce necrosis of Caco-2 cells. It was detected that Caco-2 cells treated with AA caused chromatin condensation, cell shrinkage, increased vacuolization, membrane and cytoplasm blebbing, early and late apoptosis, as well as membrane ruffles.

It has been proven that AA induces oxidative DNA damage which was correlated with apoptosis induction and changes in morphology in Caco-2 cells.

Keywords:

acrylamide, oxidative DNA damage, apoptosis, scanning electron microscope



MINERAL WOOL FROM DEMOLITION SITE AS A SUBSTRATE FOR PAVEMENT SLABS PRODUCTION

Marta Olszewska*, Zuzanna Cetner-Strzałkowska

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A few words about the author(s):

MSc M.Olszewska – graduate of Chemical and Process Engineering, WUT. Production engineer. MSc Z.Cetner-Strzałkowska – graduate of Civil Engineering, Military University of Technology. Manager of Tendering and Production Preparation Department at TREE

Abstract:

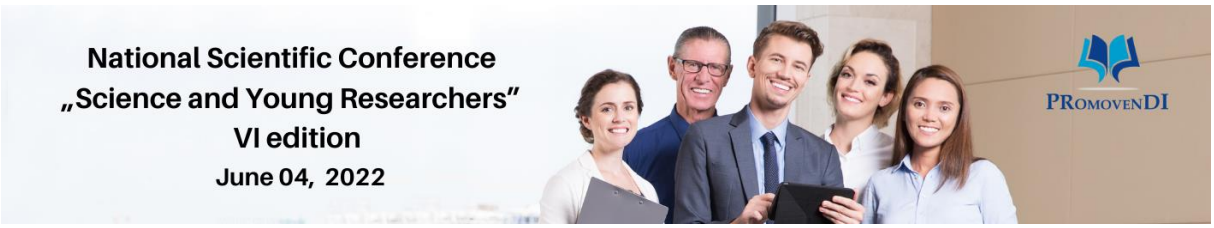
As part of the 'Wool2Loop' project, co-financed by the EU funds, the TREE company conducts research on the possibility of using mineral wool as a substrate for the production of pavement slabs.

The aim of this project is to minimize the influence of mineral wool on landfills. As it takes large spaces, it is crucial to develop methods of recycling. Alkali activation is a promising method as mineral wool contains large amounts of amorphous SiO_2 (mineral wool used in the research contains up to 56% of this oxide).

In the project there are tested possibilities of production of different construction components like: facade panels, 3D printing ink, dry concrete. TREE's task is to implement production pilot line for pavement slabs. During the project, a press container was tested to reduce the volume of wool for transport and the carbon footprint. 2 tonnes of primary shredded mineral wool from demolition sites were milled in a concrete mixer filled with stones (as a result 80% of particles' size were below 63 um). Next, the wool, slag, sand and chemical activator is mixed in a planetary agitator to be finally pressed in a vibropress. University of Oulu (Finland), that cooperates with TREE, has proved that obtained geopolymer material is resistant up to 150 cycles in freez-thaw tests. Although TREE is still conducting work on optimisation of the recipe at pilot-scale (due to costs of substrates and production), the resistance tests' results in a laboratory scale are promising.

Keywords:

mineral wool, alkali activation, slabs



DIRECTIONS OF USING WASTE FROM POTATOES PROCESSING.

Karolina Pakuła (1)*, Nikola Dłużniewska (1), Sylwia Sady (2)

(1)Student Scientific Association NEXUS, Department of Natural Science and Quality Assurance, Institute of Quality Science, Poznan University of Economics and Business, Poznan 61-875, Poland, (2) Department of Natural Science and Quality Assurance, Institute of Quality Science, Poznan University of Economics and Business, Poznan 61-875, Poland

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A few words about the author(s):

Karolina Pakuła and Nikola Dłużniewska are students of quality and product development at the University of Economics. Sylwia Sady Sady works at the Department of Natural Science and Quality Assurance, Poznan University of Economics and Business.

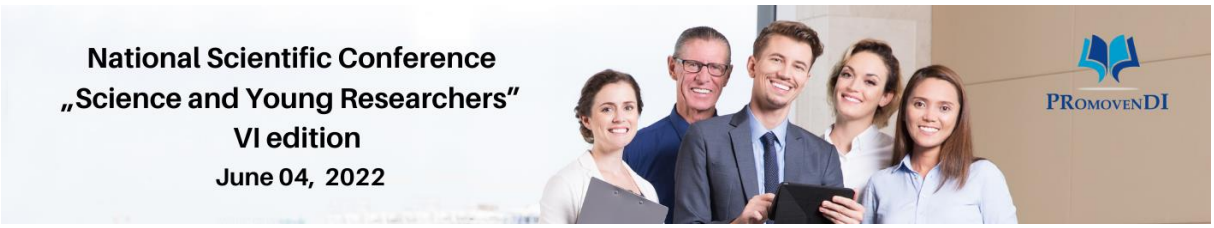
Abstract:

Potato is the fourth most common staple food after rice, wheat, and maize, with a worldwide annual output of over 368 million tons. The processing of potatoes generates large amounts of post-production waste. On the one hand, processing waste contains valuable, nutritional ingredients, which can be a raw material for processing, on the other hand, it is unstable and susceptible to the development of microorganisms, which requires immediate processing and creates organizational difficulties. Potatoes waste play a significant role in human health as a source of key nutrients, including starch, protein, minerals, vitamins, and phytochemicals. Various phytochemicals, including phenolic compounds, are associated with multiple health-promoting effects, especially with the reduction of the risk of chronic diseases. Potato waste is rich in phenolic compounds, which shown potent antioxidant, anticancer, anti-inflammatory, and antiproliferative activ-ities in vitro and in vivo.

The aim of the study was to analyze the possibilities of using potatoes processing waste. To achieve the goal, on the basis of literature studies, potatoes processing waste was characterized as a source of substances with health-promoting properties for the production of functional food and their current directions of management were discussed.

Keywords:

potatoes, waste reduction, waste valorization, waste quality, antioxidant properties



POLYMER MICELLES AS DRUG DELIVERY SYSTEMS IN TARGETED THERAPY

Kinga Plasa

Silesian University of Technology

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A few words about the author(s):

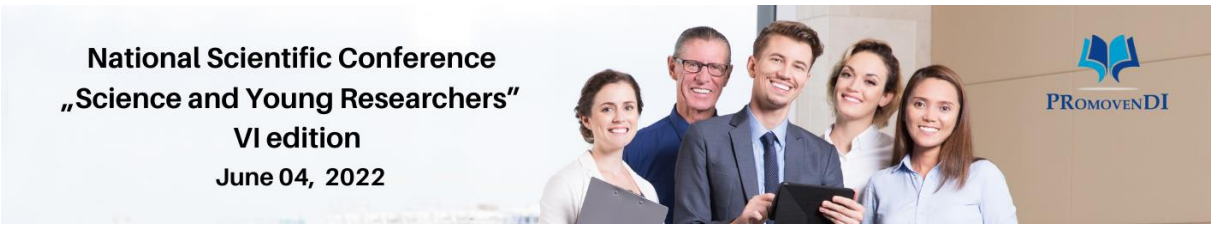
Kinga Plasa received her B.Sc. from Silesian University of Technology in 2022. Currently, she is continuing her studies in chemistry, specializing in pharmaceutical and cosmetic chemistry. She is interested in bioorganic chemistry.

Abstract:

This is a review on the use polymer micelles as drug delivery systems in targeted therapy. The delivery system actions by introducing the drug into the organism and then releasing the active ingredients at a specific place and time. The delivery of conventional drugs such as tablets or capsules by different routes of administration is associated with many difficulties as they are characterized by poor bioavailability and fluctuations in the level of drug concentration in the blood. Therefore, in order to eliminate these problems are designed drug delivery systems based on, for example polymer micelles.

Keywords:

polymer micelles, drug delivery system, targeted drug delivery



HYDROXYLATION OF 2-PHENYLETHANOL USING FUNGI AS WHOLE-CELL BIOCATALYSTS

Agnieszka Raczyńska*, Małgorzata Brzezińska-Rodak

Department of Biochemistry, Molecular Biology and Biotechnology, Faculty of Chemistry, Wrocław University of Science and Technology, Wybrzeże Stanisława Wyspiańskiego 27, 50-370 Wrocław,

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A few words about the author(s):

Agnieszka Raczyńska, MSc, Eng.

PhD student at the Wrocław University of Science and Technology. Graduated from the MSc degree with specialization Molecular Biotechnology and Biocatalysis. Research area related to whole-cell fungal biotransformations.

Abstract:

Chemical compounds such as tyrosol and hydroxytyrosol can be formed by the hydroxylation of 2-phenylethanol [1, 2]. These derivatives perform interesting properties like antibacterial, anti-inflammatory, anticancer and antioxidant activity. Such features are the reason for their use in various industries especially in medicine, pharmacy and cosmetology. Extraction from natural sources and chemical synthesis are widely used for obtaining these compounds [3]. Biotransformation conduct by whole-cell biocatalysts can be an attractive alternative to these methods. The use of fungi with defined oxidoreductive activity (eg. Cuninghamella sp., Beauveria sp.) can lead to the desired hydroxyl derivatives of 2-phenylethanol.

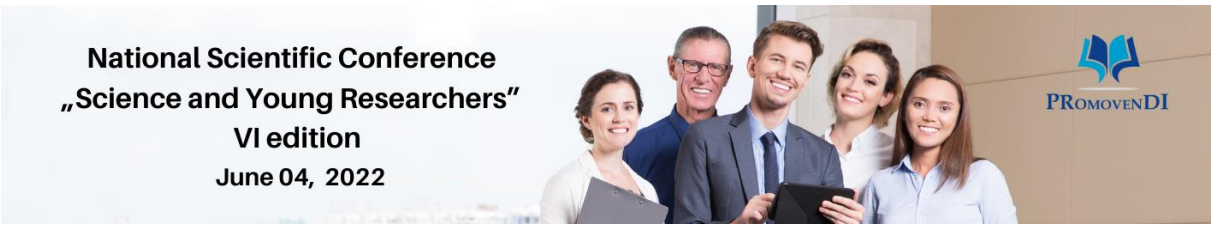
1. Szmigiel-Merena, B.; Brzezińska-Rodak, M.; Klimek-Ochab, M.; Majewska, P.; Żymańczyk-Duda, E. Half-Preparative Scale Synthesis of (S)-1-Phenylethane-1,2-Diol as a Result of 2-Phenylethanol Hydroxylation with Aspergillus Niger (IAFB 2301) Assistance. Symmetry (Basel) 2020, 12, doi:10.3390/SYM12060989.

2. Głąb, A.; Szmigiel-Merena, B.; Brzezińska-Rodak, M.; Żymańczyk-Duda, E. Biotransformation of 1- and 2-Phenylethanol to Products of High Value via Redox Reactions. Biotechnologia 2016, 97, doi:10.5114/bta.2016.62358.

3. Żymańczyk-Duda, E.; Szmigiel-Merena, B.; Brzezińska-Rodak, M.; Klimek-Ochab, M. Natural Antioxidants–Properties and Possible Applications. Journal of Applied Biotechnology & Bioengineering 2018, 5, doi:10.15406/jabb.2018.05.00146.

Keywords:

biotransformation, whole-cell biocatalyst, fungi, antioxidants, polyphenols



A SIMPLE MODEL OF PSEUDO-LIVING COPOLYMERIZATION OF TWO MONOMERS WITH A MULTIFUNCTIONAL CORE

Filip Rękas*, Jaromir Lechowicz

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A few words about the author(s):

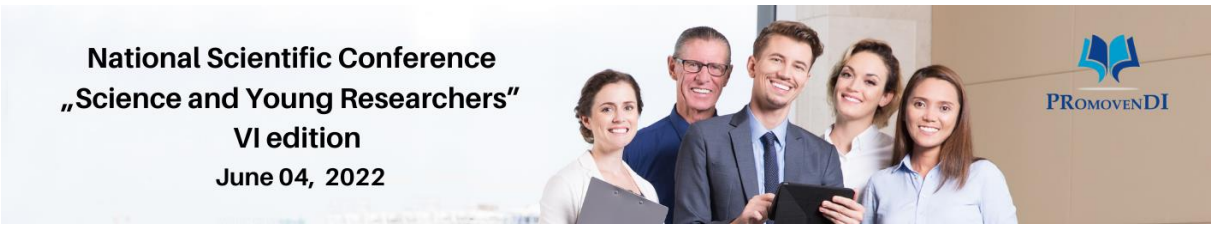
Filip Rękas is a student at Rzeszów University of Technology.

Abstract:

A simple model of copolymerization initiated by multifunctional species has been investigated. Functional groups of initiator molecules react with monomer molecules to create activate centers. They can attach next comonomer molecules and form new actives centers. The rates of reactions between active centers and comonomers affect the final form of macromolecules. With the use of the Monte Carlo simulations a gradient structure of macromolecules of the system was determined.

Keywords:

chain polymerization, model of copolymerization, branched copolymer



ANTIOXIDANT PROPERTIES OF PROTEIN EXTRACTS FROM HEMP POMACE AND THEIR HYDROLYSATES

Karina Skrzypoń (1)*, Wiktoria Czupryna (1), Maciej Olesiewicz (1), Aleksandra Popielarz (1), Katarzyna Garbacz (2)

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Students of the Faculty of Veterinary Medicine of the University of Life Sciences in Lublin, active in the newly established student research club in cooperation with representatives of BioLive Innovation

Abstract:

Nowadays industrial hemp (Cannabis sativa L.) has gained considerable popularity among plants grown in Poland. Because of wide application they are used in many fields. The processing of hemp is associated with formation of a large amount of off-products, including press cake used in feeds.

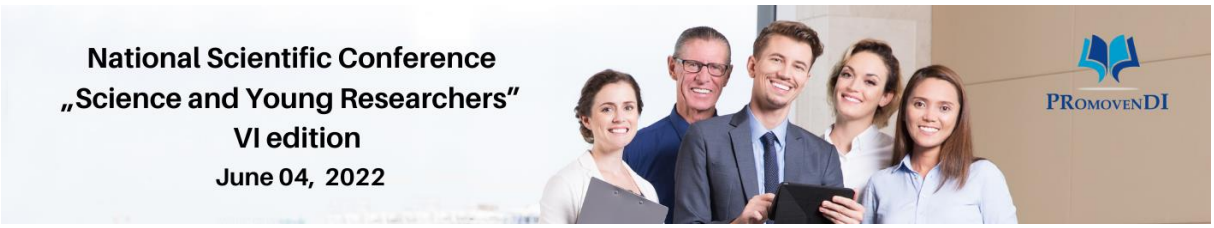
The material used in research was grounded hemp press cake. Protein extraction was conducted in water for one hour. Extract was centrifuged, obtained supernatant was divided into three parts. One of the parts was used for enzymatic hydrolysis by papain, the other two were dried or freeze-dried.

Antioxidant activity of prepared materials were determined by two analytical methods- DPPH and ABTS assays. In each method decrease in absorbance was observed when the radical was reduced by obtained samples.Absorbance measurements were made using spectrophotometer Marcel s300,semi-micro cuvettes. Based on obtained absorbance values for different dilution samples percentages of radical inhibition were established

Studies carried using two mentioned above methods proved that protein extract obtained from hemp press cake and its hydrolysates exhibited antioxidant activities. Results show that industrial hemp press cake can be used as a plant-based protein source with satisfactory properties.

Keywords:

expeller, hemp, protein extracts, antioxidant properties



MONOMERS FOR DENTAL APPLICATIONS

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A few words about the author(s):

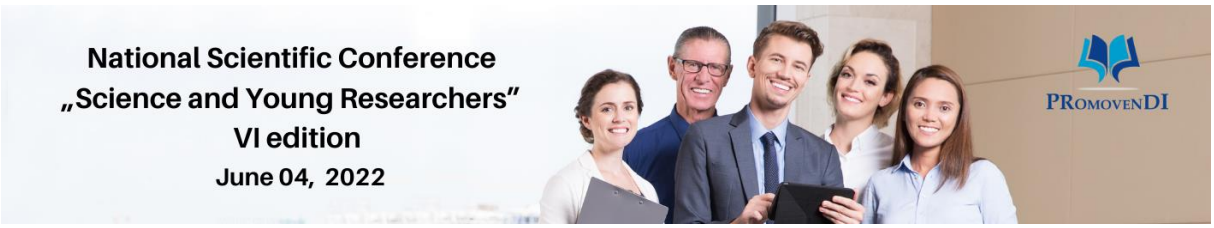
Julia Szreder received her B.Sc. in chemistry from Silesian University of Technology in 2022 and is currently studying for her master's degree at the Silesian University of Technology, specializing in pharmaceutical and cosmetic chemistry.

Abstract:

This is literature review on restorative materials and monomers used in dentistry with particular emphasis on anitbacterial compounds. The subject and purpose of this project is related to restorative materials with antibacterial properties, which is one of the newest trends in modern dentistry. The fillings are supplemented with materials that release antibacterial agents that work in the oral cavity, such as fluorine compounds, antibacterial monomers. Dental restorative materials constitute a diverse group. Currently, the most commonly used materials are polymeric materials. Due to their ability to adhere to the tooth structure, methacrylate resins are commonly used substances. The curing reactions of composite materials based on resins involve radical polymerization, where the methacrylic double bonds are broken, and then the monomer molecules combine into larger and stiffer cross-linked polymers. Bisphenol A-glycidyl methacrylate (Bis-GMA) and urethane methacrylate (UDMA) are the main methacrylate monomers used in the production of dental composite materials.

Keywords:

monomers, polymerization, methacrylates, dental restorative materials



POLISH CONSUMERS' PERCEPTION OF ELECTRIC CARS

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D. Świdurski is currently conducting research on consumers' perception of electric cars.

S. Sady conducts researches in the field of valorization of food processing byproducts.

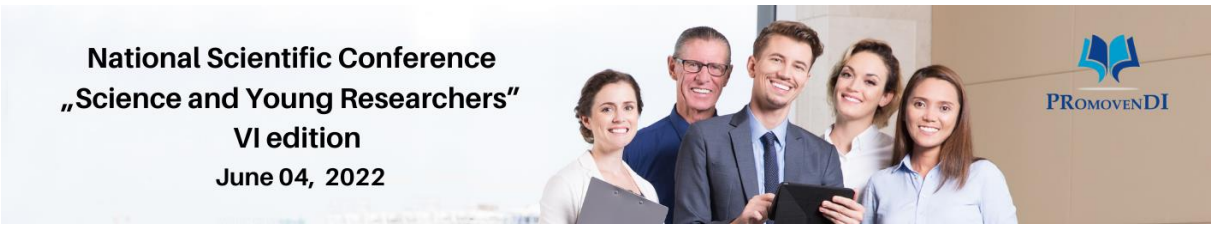
B. Pachołek's research and teaching interests focus on consumer behavior.

Abstract:

Electromobility is currently the leading trend in global automotive industry. In recent years, in Poland, same as in many countries in the world, a rapid increase in the number of electric cars is observed, as well as development of open-access charging infrastructure for the electric cars. Electric cars are claimed to be an ecological alternative for fossil fuel powered cars. According to data from The Polish Alternative Fuels Association (PSPA), the number of electric cars in Poland in the year 2019 was 4,9 thousand, in 2020 - 9,7 thousand, in 2021 - 17,7 thousand, while in 2022 this number reached 40,3 thousand. The PSPA estimates that the number of electric cars in Poland will reach about 290 thousand in the year 2025. This proves that Polish people increasingly purchase electric cars, which may successfully substitute fossil fuel powered cars. The aim of the study was to analyze consumers' perception of electric cars. The study was conducted with a technique of indirect interviews, using a survey questionnaire. The group of respondents consisted of passenger car owners and users. Received results show that respondents' perception of electric cars is varied.

Keywords:

electromobility, electric cars, battery electric vehicle, BEV, consumers



ZETA POTENTIAL

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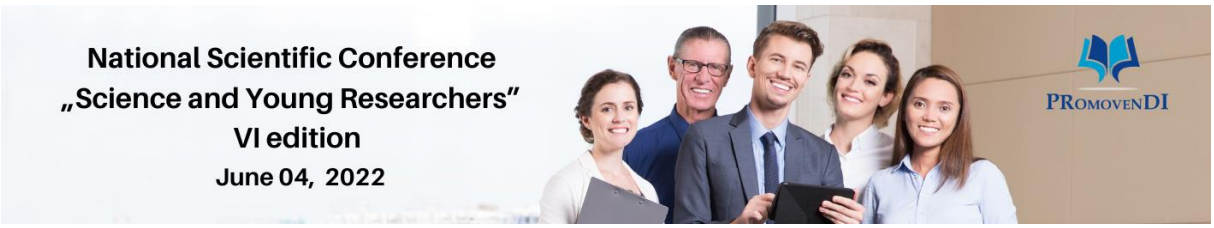
Master's student at the chemistry department of Maria Curie Skłodowska University in Lublin.

Abstract:

This poster focuses on describing methods for determining the electrokinetic potential (electrophoresis, electroosmosis, streaming potential, sedimentation potential). It also explains what a double electrical layer is. The limits of operation of electrokinetic techniques in relation to particle density and volume fractions of solids are also presented.

Keywords:

Zeta, potential, double electrical layer



ANTIMICROBIAL POTENTIAL OF SILVER NANOPARTICLES SYNTHESIZED BY "GREEN CHEMISTRY"

Anna Wasilewska*, Urszula Klekotka, Beata Kalska-Szostko

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A few words about the author(s):

Anna Wasilewska is interested in silver nanoparticles. Urszula Klekotka - is an assistant at the Faculty of Chemistry. Beata Kalska-Szostko is the Head of the BioNanoTechno Synthesis and Analysis Center, where she conducts structural research.

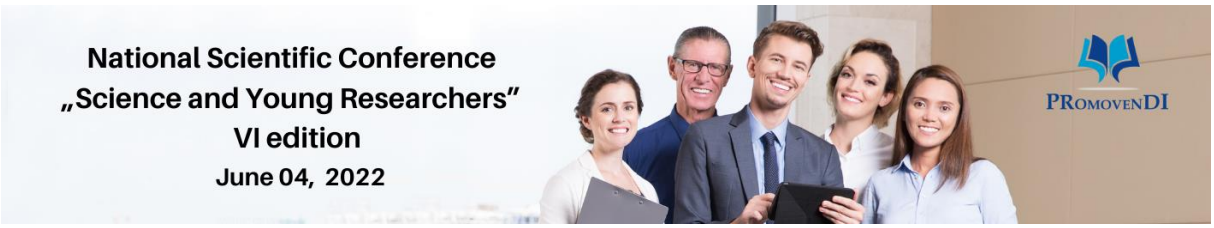
Abstract:

The antimicrobial properties of individual nanoparticles were assessed against selected pathogens (fungi and bacteria). The physicochemical characterization of silver nanoparticles was carried out using: transmission electron microscopy, X-ray diffraction and UV-Vis spectroscopy. The obtained results allowed to draw the following conclusions: (i) in extracts, the pH varies from 2.1 to 6.2; (ii) particles ranging in size from 9 ± 2 nm to 30 ± 2 nm were obtained; (iii) the nanoparticles exhibit different antimicrobial activity. The obtained nanoparticles synthesized by means of "green chemistry" showed a stronger antibacterial potential against gram-positive bacteria compared to gram-negative bacteria. It was established that the form (size and shape) of nanoparticles strongly depends on the extracts used and the amount of inorganic core precursor. The crystal structure of the nanoparticle core depends not only on the type of extract, but also on the pH value. Our research shows that plant extracts provide silver nanoparticles with specific antibacterial properties, and the most effective antimicrobial effect was potato extract.

Ag nanoparticles, which are effective antimicrobial agents, have a very high application potential and are a key element in the development of new processes for the synthesis of medicinal substances.

Keywords:

green chemistry, nanoparticles silver, extract, antimicrobal



MEASUREMENT OF ASCORBIC ACID CONTENT IN IRON BIOFORTIFIED SOY SEEDLINGS, WITH CONSIDERATION OF DIFFERENT STORAGE CONDITIONS

Karolina Wleklik*, Jagna Chmielowska-Bąk

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A few words about the author(s):

Karolina Wleklik is a student of biology at the Adam Mickiewicz University. Jagna Chmielowska-Bąk (PhD) is currently an assistant professor at the Department of Plant Ecophysiology (AMU).

Abstract:

According to the WHO, nearly 2 billion people worldwide suffer from anemia, in most cases - iron defficiency anemia (IDA). Children and women in reproductive age are in the highest risk group. In addition the highest incidence is recorded in Africa and South Asia (WHO, 2022). One of the possible solution for this problem are biofortified crops. Biofortification is a successful method of crops enrichment with various of nutrients.

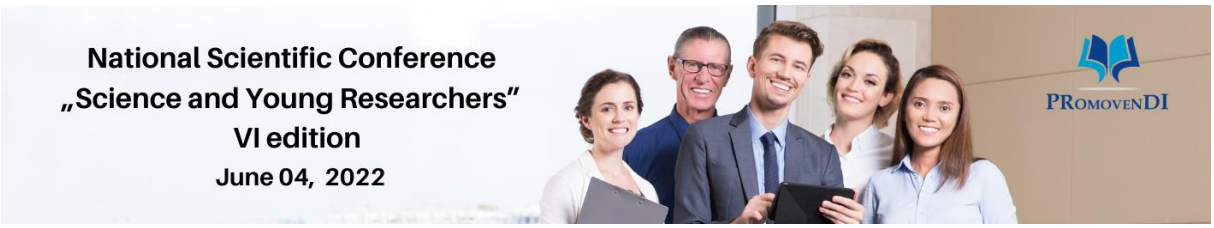
In earlier work we have shown that imbibition of soybean seeds in iron (II) chloride solution resulted in significant Fe enrichment of germinated seedlings. The aim of present work was to investigate if enrichment in Fe affects the level of ascorbic acid in soybean seedlings. Ascorbic acid is well known for its antioxidant properties and the ability to increase bioavailability of non-heme iron from plant-based food. Vitamin C levels were measured in Fe pre-treated soybean seedlings after 24, 48 and 72 h of germination periods. Moreover level of ascorbic acid was examined after an additional 72 h of storage in various conditions - room temperature, 4°C, -20°C, with and without access of light.

The results show slight decrease in vitamin C content in Fe-enriched soybean seedlings after 24, 48 and 72 h of germination. On the other hand different storage conditions had no effect on the level of ascorbic acid.

The study was financed in frame of the Initiative of Excellence – Research University Study@Research program (project nr 009/34/ID-UB/0009).

Keywords:

biofortification, iron deficiency, anemia, ascorbic acid



POLYURETHANE-RUBBER COMPOSITES

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Gdańsk University of Technology

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A few words about the author(s):

We are young and dynamic team which tries to break out of patterns and carry out models in scientific researches in a creative way.

Abstract:

Currently, material recycling products of car tires are used as filling in the construction of tunnels, layers of road surface substrates, sports surfaces, as well as for the production of car mats, wipers, cattle mats or as asphalt modifiers. However, these applications still do not guarantee sufficient demand for processed rubber waste. Therefore, a lot of research is currently being carried out on the search for potential applications for rubber fines, including in the plastics industry. The production of composite materials seems to be the most promising direction of research due to the multitude of potential applications of polymer-rubber products. Until now, it was used as a filling agent in composites based on polyurethanes, polyolefins or rubber. Properly modified had a rubber, with a structure ensuring sufficiently strong interactions at the interface of the matrix-filler phases, could be successfully used for the production of foamed polyurethane rubber composites. Polyurethane foams are a very wide group of materials that can be divided into rigid and flexible foams in the simplest way. In this work, rubber was used as a filler in flexible polyurethane foams and the physico-mechanical and thermal properties of polyurethane-rubber composites were examined.

Keywords:

composites, foams, recycling, rubber

ABSTRACTS OF

PRESENTATIONS

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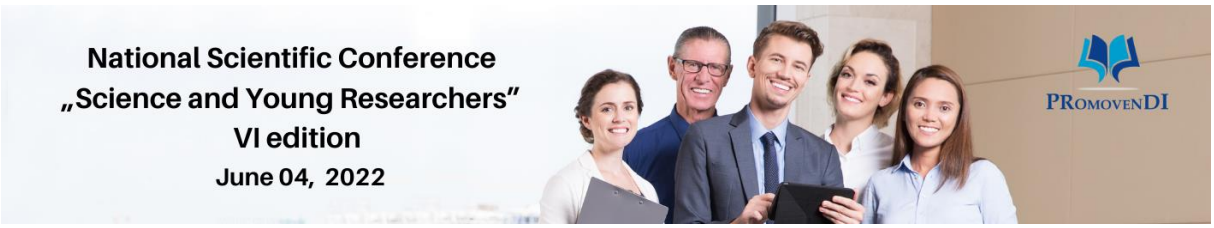

ESKETAMINE AS A NEW PROMISING DRUG FOR MANAGING TREATMENT-RESISTANT DEPRESSION

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I am a medical student at Nicolaus Copernicus University in Toruń, Collegium Medicum in Bydgoszcz.

Abstract:

Depression is a significant problem of public health that affects approximately 5% of the adult population. It is the third most common cause of disability worldwide after lower back pain and headache.

This disorder is characterized by anhedonia, low mood and fatigue that last a minimum of two weeks. There is a wide range of other negative symptoms such as lack of concentration, low self-esteem, insomnia and suicidal ideation. It can be a life-threatening disease, because of the increased risk of suicidal attempts among those affected.

Even though there are many therapeutic options available some patients struggle to find a treatment that works for them. Such cases are called treatment-resistant depression (TRD). They are characterized by two failed attempts at appropriate pharmacological intervention.

It is estimated that about one-third of those suffering from depression are going to have TRD.

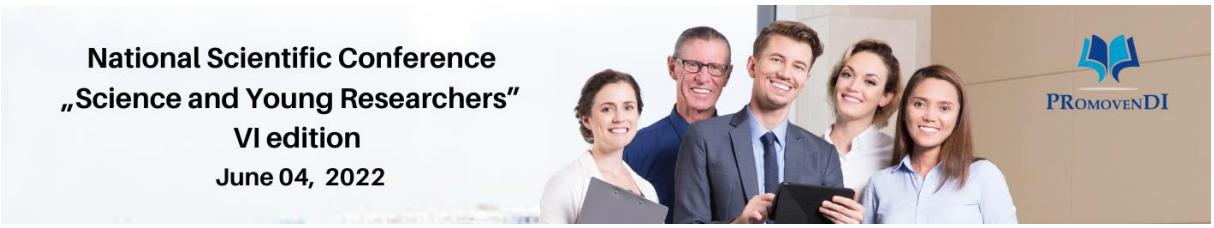
There is an emerging treatment on the market which is based on the application of esketamine, (which is an enantiomer of ketamine) with very promising results. Esketamine has been known in medicine as an anesthetizing agent. Ketamine has also been used as a recreational drug since the 1980s.

It is believed to work by blocking the NMDA receptors in the brain which in term affects the glutamatergic neurotransmission which is thought to play an important role in the pathophysiology of depression.

The objective of this work is to review the latest scientific research on this topic.

Keywords:

depression, TRD, esketamine



NEW AND EMERGING DRUGS USED IN TREATING MIGRAINES BY TARGETING CALCITONIN GENE RELATED PEPTIDES

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I am a medical student at Nicolaus Copernicus University in Toruń, Collegium Medicum in Bydgoszcz.

Abstract:

Migraines are a primary headache disorder that affects up to 14.70% of the population worldwide. Women are two times more susceptible to the disease than men. It is one of the leading causes of disability and carries a big burden on the quality of life for those affected.

The onset of an attack is usually characterized by a gradual unilateral pulsating head pain lasting from 4 to 72 hours. Other possible symptoms entail photophobia, sensitivity to smell or sounds, nausea and vomiting. In some patients, it can be preceded by an aura phase which involves sensory disturbances.

The exact pathomechanism of the disease is still not fully known. Elevated levels of calcitonin gene related peptides (CGRPs) during a migraine attack have been found to be involved in generating the feeling of pain.

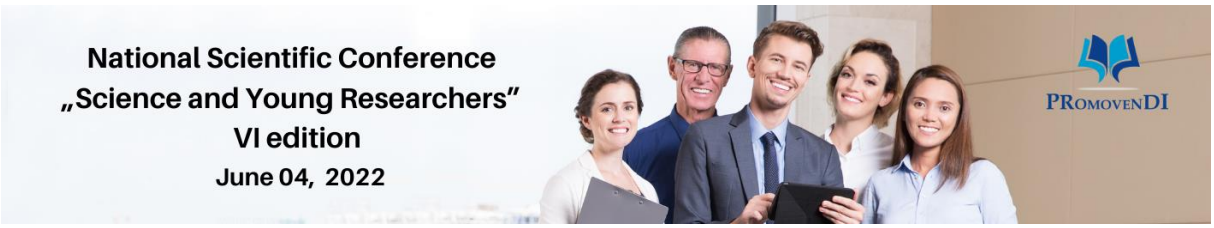
Considering this finding they have been the target of research in finding new therapeutics for treating the acute phase of attack as well as a preventive treatment.

Current new methods of pharmacotherapy involve monoclonal antibodies targeting the CGRPs as a preventive measure. There is a promising novel group of drugs that can be used orally in the acute phase of migraine called gepants that will soon be available in the EU. They can offer relief to patients that did not respond well to previous methods of treatment such as triptans and cause fewer side effects.

The aim of this work is to review the latest scientific research on this topic.

Keywords:

migraine, CGRP, gepants



EFFECTS OF HYDROTHERAPY TREATMENTS ON BIOELECTRICAL RECORDING OF THE BICEPS BRACHII MUSCLE

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A few words about the author(s):

Damian Poręba is a 5th year student of physiotherapy.

Damian Lizoń is a 5th year student of physiotherapy.

PhD Piotr Czech is a physiotherapist and academic lecturer.

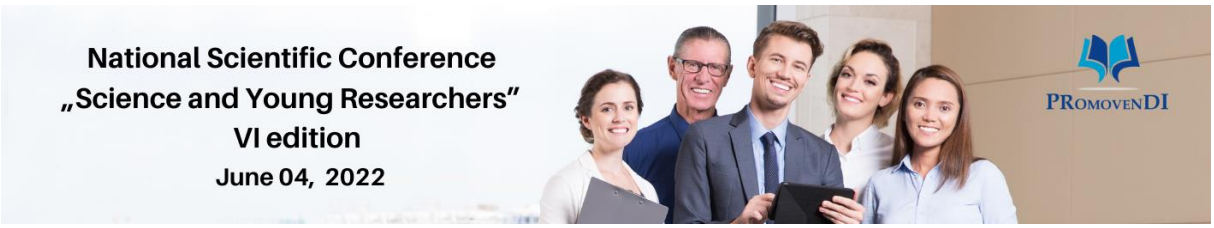
PhD Barbara Szpotowicz-Czech is a physiotherapist and academic lecturer

Abstract:

Water treatments are often used in rehabilitation. These procedures affect many levels of organisms. The aim of this study was to investigate the effect of a single whirlpool and alternating heat bath procedure on EMG signal of the biceps brachii muscle. The study involved 36 students, who were randomly divided into 3 groups: a treatment with a whirlpool bath and a variable-heat bath, and a control group without treatment with a 5 min interval between measurements. sEMG measurements were performed before and after the treatment using the SENIAM protocol, EMG recordings were collected during 15 sec of isometric work of the biceps muscle of the arm in the 90º flexion position at the elbow joint. In random order, the test was performed with a l kg weight and in the variant without external load. Both measurements were performed in standing position with four points of contact with the wall. Mean values and peak amplitudes obtained from the middle 5 sec of EMG recording were subjected to statistical analysis. After application of the vortex bath, the mean values and peak EMG amplitudes statistically significantly decreased in the no-load variant ($p<0.05$). On the other hand, application of 1 kg load prevented observation of these changes. Treatment with altemating heat bath in both variants did not affect the changes in EMG recordings. sEMG seems to be a very good tool for assessing the effect of physiotherapy treatments however it may require detailed planned study procedures.

Keywords:

surface electromyography, hydrotherapy, physiotherapy



USE OF SMALL-MOLECULE PERK INHIBITORS IN PRIMARY OPEN-ANGLE GLAUCOMA TREATMENT

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Department of Clinical Chemistry and Biochemistry, Medical University of Lodz, 90-419 Lodz, Poland

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A few words about the author(s):

The authors of the study conduct in vitro and in vivo research in the Department of Clinical Chemistry and Biochemistry at Medical University of Lodz in the field of neurodegenerative and neoplastic diseases.

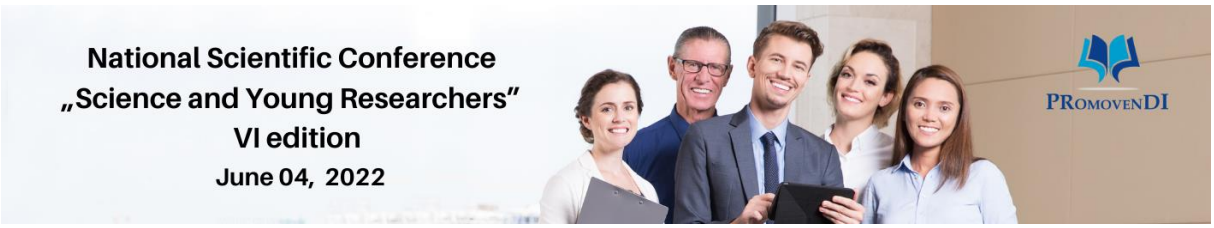
Abstract:

Glaucoma is commonly known as a chronic eye disease characterized by a progressive neurodegeneration of the optic nerve and rapid loss of retinal ganglion cells. Despite many studies, an etiology of primary open-angle glaucoma (POAG) still remains poorly understood, whereas there are several lines of evidence that its pathogenesis may be strictly correlated with the endoplasmic reticulum stress conditions and subsequent activation of the protein kinase RNA-like endoplasmic reticulum kinase (PERK)-mediated Unfolded Protein Response (UPR) signaling pathway. The main aim of the study was to evaluate the effectiveness of the selected PERK inhibitor in cellular model of POAG using primary human trabecular meshwork (HTM) cells. To evaluate the level of the ER stress marker proteins Western blot and TaqMan gene expression assay were used. The cytotoxicity was measured by LDH, whereas analysis of apoptosis and cell cycle progression was performed by flow cytometry. The results obtained have demonstrated that investigated PERK inhibitor triggered a significant decrease of ER stress marker proteins within HTM cells with induced ER stress conditions. Moreover, tested compound effectively increased viability, reduced apoptosis and restored normal cell cycle distribution of HTM cells with induced ER stress conditions. Thus, PERK inhibitors may provide an innovative, ground-breaking treatment strategy against POAG.

This research was funded by grant OPUS no. 2016/21/B/NZ5/01411.

Keywords:

PERK, UPR, ER stress, glaucoma, PERK inhibitors



GLUTAMATE RECEPTOR LIGANDS AS NEW TARGETS IN PHARMACOTHERAPY OF DEPRESSIVE DISORDERS

Sylwia Samojedny (1)*, Patrycja Pańczyszyn-Trzewik (2), Magdalena Sowa-Kućma (2)

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(2) Department of Human Physiology, Medical College of Rzeszow University, Institute of Medical Science

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A few words about the author(s):

Sylwia Samojedny is a student of medicine at University of Rzeszów, a member of the Physiology Student Research Club "Neuron".

Abstract:

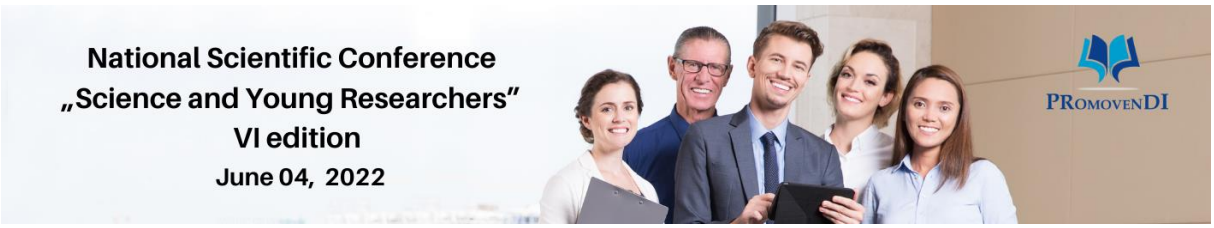
Depressive disorders are characterized by low mood, attention and concentration disturbances, or anhedonia and affect approximately 280 million people worldwide. Importantly, there is a strong link between depression and suicide. The etiology of depression is not fully understood, but underlying psychosocial, environmental and genetic factors are believed to be associated with neurotransmission dysfunction in the central nervous system (CNS). The current pharmacotherapy of depression mainly focuses on monoaminergic compounds, which are often insufficient.

A breakthrough in the search for new antidepressants was the discovery that an subanesthetic dose of ketamine [a non-competitive antagonist of N-methyl-D-aspartate receptor (NMDAR)] causes rapid antidepressant effect in patients with treatment-resistant depression. This finding strengthened the hypothesis that dysfunction of the glutamate system could be a key factor in the development of depression and gave hope for finding more effective drugs among glutamate receptors (especially NMDAR and α-amino-3-hydroxy-5-methyl-4-isoxazole propionic acid receptor - AMPAR) ligands. The purpose of this study is to provide an overview of recent preclinical and clinical studies supporting the efficacy of prototype rapid-acting glutamatergic antidepressants.

Acknowlegements: This work was created as part of the implementation of the project UMO-2016/21/B /NZ7/01623 financed by the National Science Center.

Keywords:

depressive disorder, glutamate, ketamine



CHANGES IN NITRIC OXIDE LEVELS AS A RESPONSE TO A STRESSFUL SITUATION IN YOUNG ADULTS

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A few words about the author(s):

Alicja Sierakowska- student scientific society at institute of medical sciences,

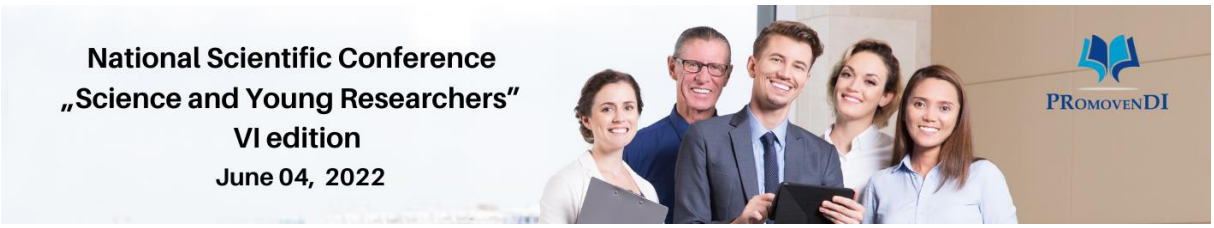
Michał Braczkowski- doctor in biological sciences, assistant in Department of Human Physiology University of Opole.

Abstract:

Nitric oxide is an endogenous with high biological activity. Depending on the concentration at which it occurs, nitric oxide is involved in both the physiological and pathophysiological processes, and its activity is directly proportional to this concentration. The aim of the study was to compare the concentrations of nitric oxide in the exhaled air, which is an indicator of the ongoing inflammatory process under various conditions with different health status of the participants of research project. The research group consisted of young adults - 2nd year students of the Faculty of Medicine at the University of Opole. The research group included 96 people aged between 20 and 30. The tests were carried out with the use of the Medisoft FeNO + apparatus. The entire research project included two measurements of the nitric oxide concentration in the exhaled air, 60 days apart. In 65% of respondents, a decrease in nitric oxide concentration was observed during the second measurement, which correlated with a potentially lower stress situation. In addition to somatic diseases, the cause of the above results may also be emotional problems. Among young people, stress, depression and anxiety disorders are also responsible for the chronic inflammatory process, which in the future may contribute to an increased risk of developing the most common diseases in the population.

Keywords:

nitric oxide, inflammatory process, stress situation, depression, anxiety disorders



SPRAIN OF THE ANKLE JOINT IN ATHLETES.

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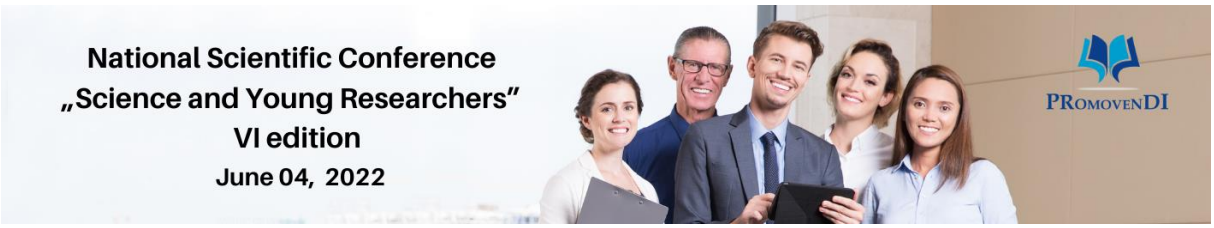
Fourth-year student of medicine at Collegium Medicum in Bydgoszcz.

Abstract:

Ankle sprain is one of the most common orthopedic ailments among athletes. In the case of acute ankle damage, conservative methods are used as treatment, such as immobilization in a plaster cast or in an orthosis. Many patients suffer from chronic ankle instability after a previous ankle sprain. Since this trauma is different for each patient, there is no single best, unified treatment for this condition. There is, however, scientific evidence of the effectiveness of individual methods that benefit most patients with these conditions. Among them, the most effective are the stabilization of the joint with an orthosis and exercise therapy, which, in combination with other methods such as rest, ice, elevation, lead to a more effective and faster recovery of the patient.

Keywords:

ankle sprain, treatment, recovery, athletes



THE IMPACT OF AIR POLLUTION ON PATIENTS WITH ASTHMA

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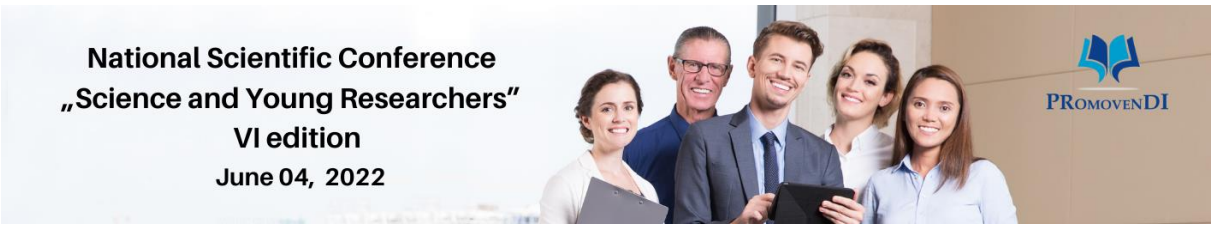
Abstract:

Asthma is a multiform disease associated with chronic inflammation of the airways. Characteristic symptoms include wheezing, shortness of breath, and cough of varying severity. Due to the etiology, we can distinguish allergic and non-allergic asthma. Exacerbations triggered by a variety of factors, such as allergens, respiratory infections, and air pollution, may occur during the disease.

This paper aims to present and describe the influence of air pollutants on the occurrence and course of asthma, based on the available state of knowledge. For this purpose, a review of the scientific literature has been performed, resulting in the following conclusions: exposure to air pollutants may trigger asthma symptoms, exacerbations, and hospitalizations. The severity of these symptoms depends on the dose of pollution and the duration of exposure. Tobacco smoking is associated with significant deterioration of asthma control and reduced lung function. It seems important to minimize exposure to air pollutants to reduce asthma exacerbations and adverse effects on respiratory diseases.

Keywords:

air pollution, asthma



IMEGLIMIN - A NOVEL THERAPEUTIC AGENT FOR TYPE 2 DIABETES

Aleksandra Ziółkowska

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Abstract:

Diabetes is a serious global health problem. According to WHO between 2000 and 2016, there was a 5% increase in premature mortality from this disease.

Type 2 diabetes is the most common type of diabetes in the world. This type of diabetes is the result of impaired insulin secretion and insulin resistance.

This paper is a review. It aims to characterize and present the mechanism of action and treatment effects of a novel therapeutic agent for type 2 diabetes – imeglimin.

Imeglimin is the first drug of the glimin group.

This drug works by affecting insulin sensitivity, gluconeogenesis, mitochondrial function, and pancreatic function. It also has antioxidant effects.

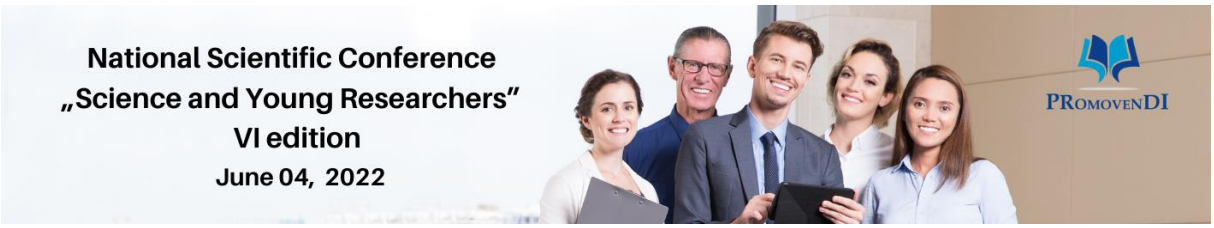
The peak effect of imeglimin is reached after 16 weeks of treatment.

Imeglimin was firstly approved for use in Japan, in June 2021

As the problem of type 2 diabetes becomes more severe, it is important to develop more effective therapies that target the pathophysiology of the disease. Increasing the effectiveness of treatment with new drugs may improve patients' quality of life and protect against diabetes complications more effectively.

Keywords:

diabetes type 2, imeglimin



THE ROLE OF ZINC IN THE TREATMENT OF MIGRAINE.

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A few words about the author(s):

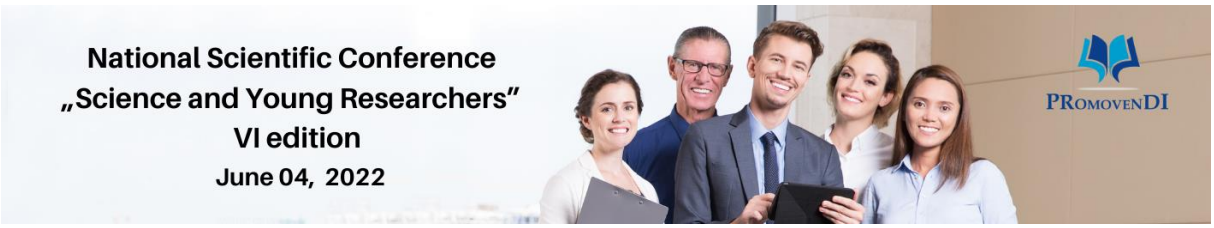
Agata Bawolska is a medical student at Collegium Medicum Nicolaus Copernicus University in Bydgoszcz. In the area of her interest is medical science. In particular, the effect of minerals in the treatment of neurological diseases.

Abstract:

Migraine is one of the most common headache disorders globally. Patient with this disease suffers from recurrent attacks of debilitating headaches, nausea, vomiting and photophobia. Migraine-related attacks are usually throbbing and annoying. The main cause of this disease is unknown. Some observational studies have revealed that vascular and neuroinflammatory mechanism can cause migraine headaches. Patients suffering from this disease usually use analgesic drugs to reduce pain. However, these medicaments have a few side effects, that is why alternative treatments are being sought. Zinc is an essential trace element with proven anti-inflammatory and antioxidant properties. Severe deficiency of this microelement can lead to serious consequences including neurological disorders. In some studies, low level of zinc have been observed in migraine patients. Recent reports have shown a link between deficiency of this mineral and migraine headaches. This review will discuss the potential of zinc as therapeutic agent in migraine. Current studies have shown that supplementation of this essential element has promising effects on the course of the disease. It has a significant outcome in reducing the frequency, duration, severity of migraine attacks and their impact on quality life. However, further constructive studies with a longer follow-up, different dosages and a larger group of respondents are required.

Keywords:

zinc, migraine, headache



ADVANCES IN TARGETING INFLAMMATION IN ATHEROSCLEROSIS

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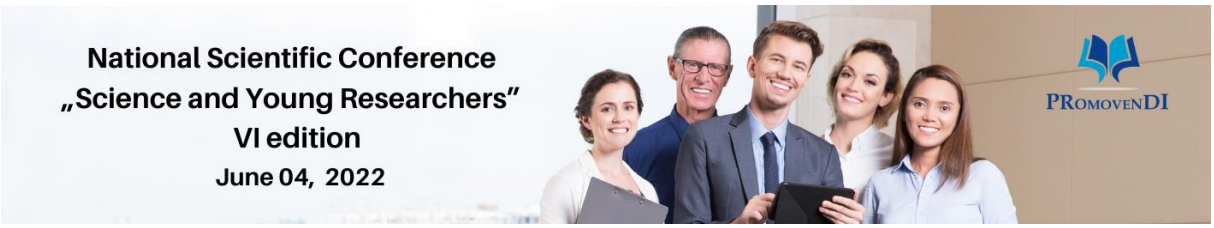
Abstract:

Anti-inflammatory therapy is a new trend in cardiovascular medicine. It has been shown that chronic inflammation is the main process that initiates and causes the progression of atherosclerosis, which can lead to many conditions such as coronary artery disease. It can be mediated by compounds such as cytokines, chemokines and adhesion molecules. Reducing risk factors like hypertension, hyperlipidemia, smoking, etc. and standard treatment have contributed to significant reduction in cardiovascular mortality over the past three decades. Unfortunately, it is not enough to block the development and progression of atherosclerotic plaque in the intima of large and medium-sized arteries. Results from basic and clinical trials have shown that an anti-inflamatory strategy may be a key part of optimal treatment for this global health problem. The aim of this presentation is to summarize the recent advances in therapeutic targeting of inflammation in atherosclerosis, consider attractive possibilities for modifying this process and list novel risk factors, and the most promising markers of vascular inflammation.

Keywords:

inflammation, atherosclerosis, anti-inflammatory therapy



PROSTATE NEUROENDOCRINE CANCER AS A RESULT OF HORMONAL TREATMENT OF PROSTATE ADENOCARCINOMA.

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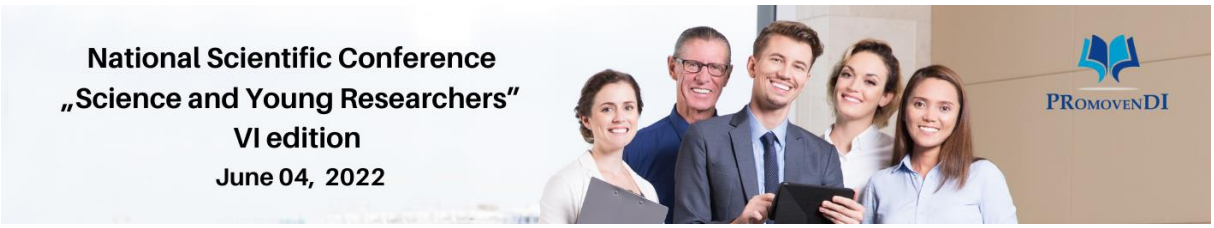
Abstract:

Prostate cancer is the most commonly diagnosed malignant neoplasm in men. Its variant is neuroendocrine prostate cancer (NEPC), which may arise de novo or as a mechanism of resistance to treatment with hormone therapy and / or chemotherapy for prostate adenocarcinoma. NEPC is a highly aggressive cancer, with a high degree of proliferation and resistant to the applied therapies. It accounts for about 2% of all diagnosed prostate cancers, and as only small cell carcinoma it is very rare (<1% of cases). The metastasis process in this neoplasm takes place in the visceral organs, e.g. the lung or the liver, which distinguishes it from adenocarcinoma, which metastasizes mainly in the skeletal system. The diagnosis of NEPC is quite difficult due to the limitations of biopsy performed, the heterogeneous nature of the tumor, the lack of uniform guidelines based on histology and biochemical markers, and the often misclassification as high-grade prostate adenocarcinoma. Therefore, it is necessary to find a "golden mean" in the detection of NEPC along with improved clinical-pathological or molecular classifications and new targeted therapies.

Keywords:

neuroendocrine tumors, neuroendocrine prostate cancer, prostate cancer



CLASSIFICATION OF LUNG NEUROENDOCRINE TUMORS - STAGE, TYPE AND GRADES. UP-TO-DATE KNOWLEDGE

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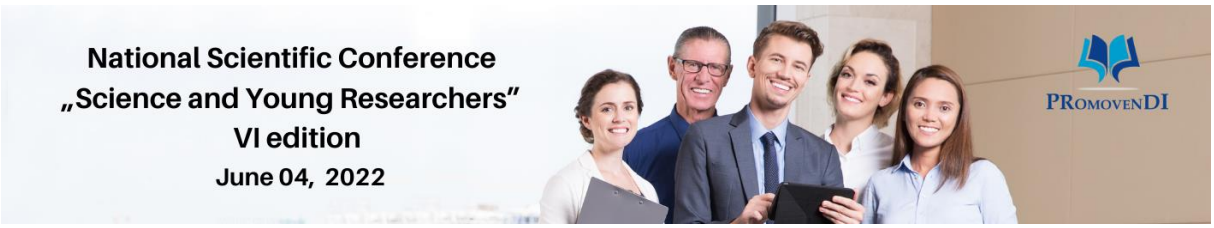
Abstract:

Lung neuroendocrine tumors are a heterogeneous group of neoplasms which include slow progression and long-term lesions, as well as very aggressive tumors with a high mortality rate. According to the World Health Organization, lung neuroendocrine tumors include: typical carcinoid (TC), atypical carcinoid (AC), multicellular neuroendocrine carcinoma (LCNEC) and small cell lung cancer (SCLC). Neuroendocrine neoplasms constitute approx. 20% of primary lung tumors, including SCLC approx. 15%, carcinoids approx. 2% (typical carcinoid predominance) and LCNEC approx. 3%. Lung NET classification is a complicated process based on the analysis of cytological and histological features. The origin of thoracic tumors plays a special role in the correct classification of metastatic tumors in order to find the best treatment options, given that lung and thymic NETs differ in tumor picture, endocrine symptoms, and basic risk factors and changes at the molecular level. The incidence of lung tumors is increasing, but there is still a problem with early diagnosis and implementation of treatment, therefore further exploration of knowledge about the diagnosis and classification of lung tumors affects the prognosis of patients with neuroendocrine tumors.

Keywords:

carcinoid, neuroendocrine tumors, lung neuroendocrine tumors



THE GUT MICROBIOME IN NEURODEGENERATIVE DISORDERS

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A few words about the author(s):

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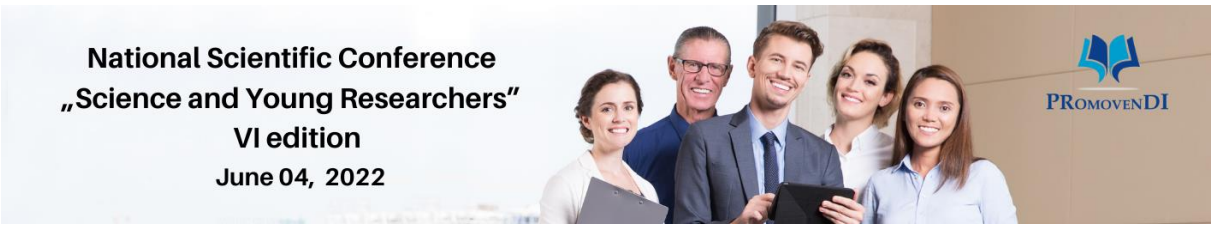
Abstract:

Neurodegenerative disorders affect millions of people around the world. The etiology of many of them is still not fully understood and currently neurodegenerative disorders are incurable. The available treatments only manage the symptoms or slow down the progression of the disease only. Recent studies show that the gut microbiome plays important roles in human's health, including the central nervous system condition. The interaction between the host brain and its gut bacteria is a complex relationship, called gut microbiome-brain axis.

The main purpose of the presentation is to present how microbiome can affect on the pathogenesis and course of disease like Sclerosis Multiplex, Parkinson's disease, Alzheimer's disease, Amyotrophic Lateral Sclerosis or Huntington's disease, and to show the potential of microbiota-targeted therapies.

Keywords:

microbiome, neurodegenerative disease, gut microbiome-brain axis



WILMS TUMOR IN A 7-YEAR-OLD PATIENT- CASE REPORT

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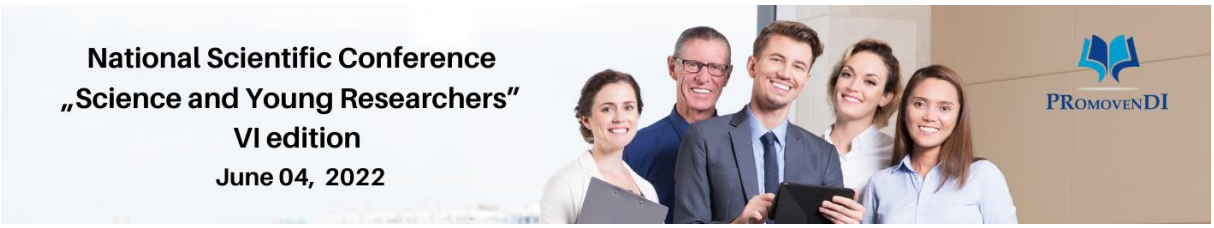
We are students at Medical College of Rzeszów University. Currently, we are studying in the 5th year of faculty of Medicine. We try to take our chances in various fields of medicine to extend our knowledge and gain as much experience as possible.

Abstract:

We present a case of 7-year-old boy admitted to our Clinic with stomachache and abdominal asymmetry. In Emergency Room ultrasonography was performed, which showed hypoechogenic structure which dimensions were 119x98x114 mm in left kidney. An abdominal CT scan demonstrated a huge heterogeneous low- density mass which volume was 445 ml, arising from the left kidney. Chest radiograph ruled out pulmonary metastasis. In additional laboratory findings there were elevated C-reactive protein and D-dimers. There was para-aortic lymphadenopathy. Diagnosis of nephroblastoma was made and patient was classified to preoperative chemotherapy. After a month control CT presented 91% reduction of the tumor comparing to the initial volume. Decision of left nephrectomy was made and then histopathology revealed blastemal type of WT. Patient underwent postoperative chemotherapy, was under control of the Clinic and reported for ultrasound follow-up. The patient had two tumor recurrences that were treated with chemotherapy, resection and radiotherapy. Currently, patient had control ultrasonography which demonstrated new heterogenous mass in renal bed after nephrectomy, which dimensions are 33x29x38 mm. Long-term survival for patients with nephroblastoma has steadily improved over the last several decades, and now exceeds 85%. Imaging plays an essential role in the initial diagnosis, staging and surveillance of WT.

Keywords:

Wilms tumor, kidney, nephroblastoma



CURRENT PTSD TREATMENT AND ITS DIFFICULTIES DURING THE COVID-19 PANDEMIC. EFFECTS OF ONLINE EMDR

Aleksandra Ciurzyńska

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A few words about the author(s):

5th year medical student

Abstract:

After more than 10 years of research, the Veterans Affairs and the Department of Defense have updated the treatment strategies for PTSD. This is especially important because of the increasing chance of symptom aggravation in psychiatric patients following COVID-19 outbreak.

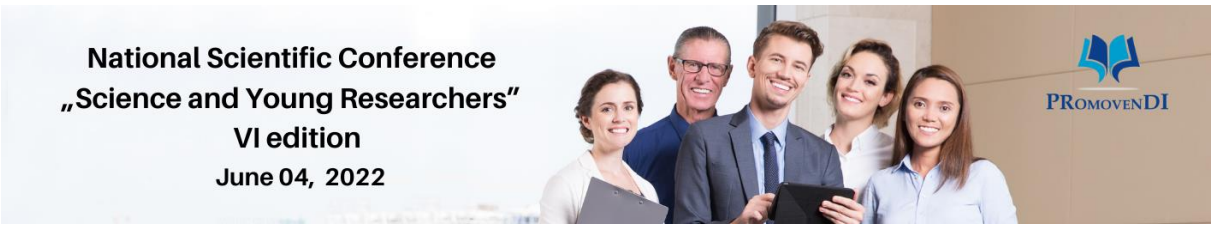
The purpose of this paper is to review the most recent treatments for PTSD and to see what impact online therapy has on the treatment itself. The gold standard of treatment is the use of trauma-focused therapies, such as Cognitive Processing Therapy, Prolonged Exposure Therapy, Eye Movement Desensitization and Restructuring. The use of medications can be helpful in controlling symptoms but benzodiazepines or other sedative hypnotic medications, which can cause dissociative and intrusive symptoms, should be avoided.

Moreover, individual therapy turned out to be more beneficial than group therapy. Research suggests that video chat therapy can be as effective as individual therapy. Use of manuals in order to guide and structure the therapy results in greater symptom loss compared to therapy without manualized approach. In monotherapy fluoxetine, venlafaxine, or paroxetine work best.

Over the past two decades, there has been conducted extensive research on ptsd treatment, updating the methods that are most effective and procedures which have not had sufficient documented effects. However, research is still highly needed in this area to gain more information to help those suffering from PTSD.

Keywords:

PTSD treatment, EMDR online, COVID-19 pandemic



SHAPING THE NUTRITION HABITS AMONG SCHOOL PUPILS

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A few words about the author(s):

Anna Dul is a graduate student in nursing. Her main passion is paediatrics. During undergraduate studies in her scientific works she repeatedly described the health behavior of school youth and preschoolers.

Abstract:

Health behaviors can change throughout a human being's whole life. Nevertheless, they are primarily shaped during childhood and adolescence in the process of socialization for a child is under the influence of patterns and information passed by parents, peers, the school and religion, social groups, or mass media.

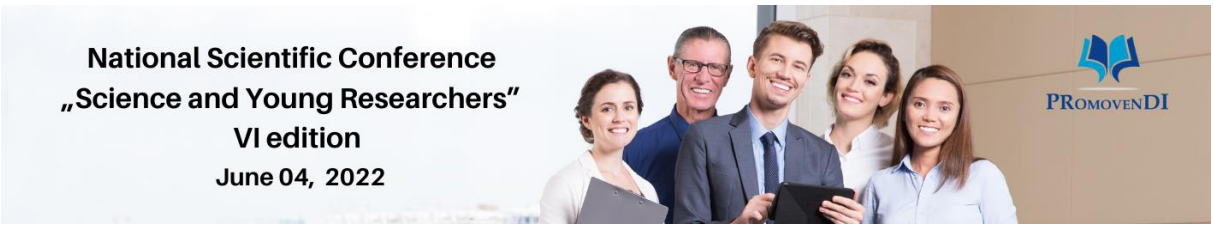
The aim of this paper is to show young people's knowledge about the health behaviors that are connected to shaping the health-conscious nutrition habits in school pupils.

According to the majority of respondents (64%), a good nutrition habit is having 4-5 meals a day at regular intervals. Furthermore, according to the respondents, a regular consumption of fruit and vegetables as well as starting a day with breakfast are also proper nutrition habits (47% and 48% respectively).

The research results prove a continuingly low level of knowledge about health among children and adolescents. Young people do not often see the correlation between nutrition, physical activity, mental hygiene and their health condition. Childhood and adolescence time is the time of education influence and shaping of proper nutrition behaviors and habits, which can be a future warranty of health.

Keywords:

health behaviors, nutrition habits, primary school pupils



LYME DISEASE: WHAT'S NEW?

Robert Gattner

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A few words about the author(s):

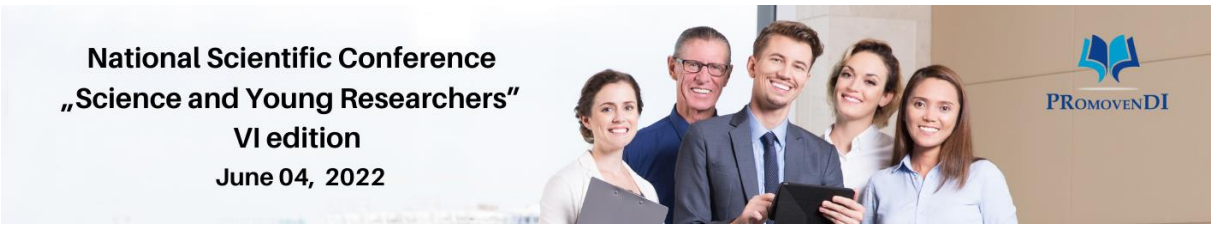
A student in the Faculty of Medcine at Ludwik Rydygier Collegium Medicum in Bydgoszcz.

Abstract:

Lyme disease is the most common vector-borne illness spread by ticks and an increasingly significant public health problem in the Northern Hemisphere, which is more prevalent than many people realise. The disease is caused by several Borrelia species and can become difficult to treat or cause permanent damage. This presentation reviews the diagnosis, prevention and treatment of Lyme disease, with focus on the recent Lyme disease vaccine candidate.

Keywords:

Lyme disease, vaccine, Borrelia, tick



THE CONNECTION BETWEEN DAIRY PRODUCTS CONSUMPTION AND OSTEOPOROSIS

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A few words about the author(s):

Gabriela Maria Gawlik is a first-year student of dietetics at Medical University of Lublin; a member of the Nutrition Studies Research Group.

Abstract:

The daily consumption of dairy products is believed to have a beneficial effect on building strong bones and teeth in a young age as well as to prevent osteoporosis later on.

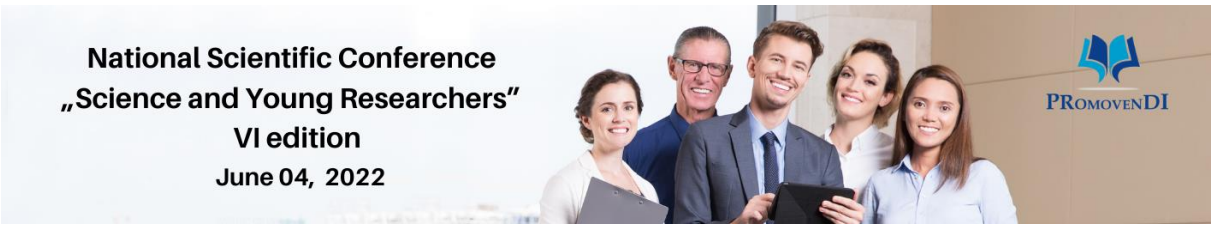
Dairy products are one of the most calcium-rich foods. In order to boost the overall consumption of calcium, the dairy industry clearly encourages people to drink cow's milk and eat dairy products since childhood.

Although some researchers confirm that the greater the consumption of dairy products, the lower the risk of osteoporosis and bone fractures, others claim that there is no association between dairy intake and an increased risk of osteoporosis. Finally, and quite surprisingly, the least popularized studies show that the consumption of dairy products not only decreases bone health but may also contribute to the development of osteoporosis.

In my presentation I would like to focus on the last group of studies which favour plant-based sources of calcium over animal ones. On the basis of the aforementioned studies I will explain the difference between the absorption of calcium from dairy products and calcium-rich plants.

Keywords:

osteoporosis, dairy, calcium, plant-based diet



LONG COVID AND ITS SPECTRUM OF SYMPTOMS BASED ON THE CASE REPORT AND SHORT LITERATURE-REVIEW

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A few words about the author(s):

Medical student of the 5th year with interests in the field of paediatrics, nutrition and sicence. The Head of the SRC Pediatric Allergology and Gastroenterology. An enthusiast of a healthy lifestyle and interior design.

Abstract:

INTRODUCTION: Long COVID is a term used to describe persistent symptoms after COVID-19 infection which cannot be explained by an alternative diagnosis.

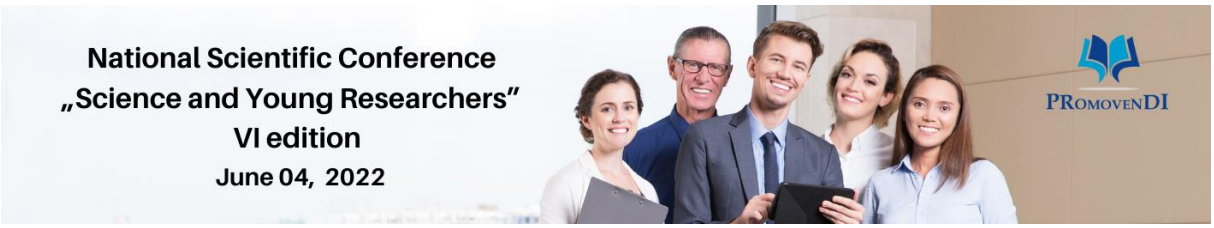
CASE REPORT: A 15-year-old boy was referred to the hospital due to coagulation disorders. In december 2020 the patient suffered from COVID-19 infection.Since then,the patient experienced weakness,fatigue,exercise intolerance,dyspnoea and pain in the chest. On the admission no abnormalities were found.Laboratory tests revealed elevated levels of D-dimers.Angio-CT showed fibrous changes at the base of the lungs.Spirometry showed increased airway resistance.The molecular testing revealed heterozygous genetic mutation in the Factor V Leiden,the diagnosis of congenital thrombophilia was established. However, previously presented clinical symptoms did not correspond with the laboratory and imaging diagnostic outcomes-the symptoms were considered as LongCOVID, which is a diagnosis of exclusion.

DISCUSSION: To date,the most frequent symptoms in adults are: fatigue, dyspnea, arthralgia, cough and thoracic pain(which can appear in different time after the COVID-19 infection) while taste and smell loss,dizziness,muscle weakness,chest pain and respiratory problems were described as the most common in children.

CONCLUSIONS: Presented case is an example of long COVID presence and its effect on everyday life of the patient.It is crucial to be aware of Long Covid various clinical features and address what implications it can have on patients.

Keywords:

long COVID, Post- COVID-Syndrome, Post- Acute Sequelae of SARS- CoV- 2



VIRUS INDUCED CANCER DEVELOPMENT

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A few words about the author(s):

A graduate of laboratory diagnostics, a member of the student research club in immunology, a candidate for the doctoral school.

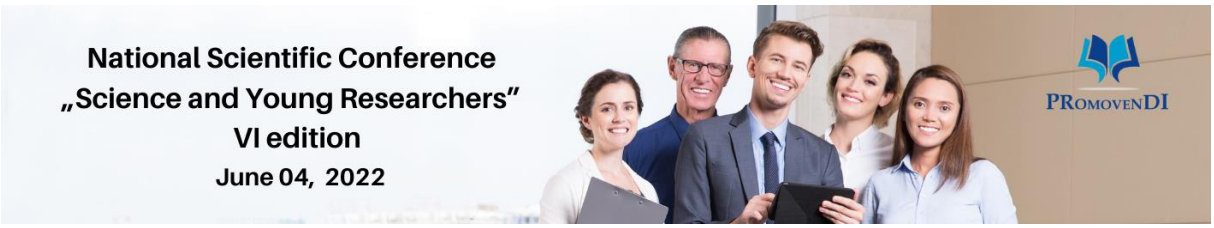
Abstract:

Viral infections are commonly linked to human oncogenesis, because of its direct or indirect influence on inflammatory mechanisms, growth of cells and apoptosis. Approximately 15-20% of human cancers worldwide are caused by viruses. Seven viruses that are most often associated with cancer development are: hepatitis B virus (HBV), hepatitis C virus (HCV), human papillomavirus (HPV), human T-cell lymphotropic virus (HTLV-1), Epstein-Barr virus (EBV), Kaposi's sarcoma herpesvirus (HHV8), and Merkel cell polyomavirus (MCV). These acellular microorganisms must be considered as the second most important risk factor for cancer development (exceeded by tobacco use only) and are particularly important when it comes to cervical and liver cancer. For this reason, oncogenic viruses have served as significant experimental models to identify and investigate cellular networks on a molecular level.

These have led to the discovery of certain oncogenes and tumour suppressors that are crucial for the regulation of immunological processes. Close study of viruses and human cancer has given some hope regarding new possible strategies for the prevention of carcinogenesis. Understanding the unique inflammatory mechanisms induced by human oncogenic viruses may help in the future to develop targeted cancer therapies – more effective and more tolerable by the patients.

Keywords:

human oncogenic viruses, cancer development, oncogenesis



BILATERAL OVARIAN BURKITT'S LYMPHOMA IN A 11-YEAR-OLD PATIENT- CASE REPORT

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A few words about the author(s):

We are students at Medical College of Rzeszów University. Currently, we are studying in the 5th year of faculty of Medicine. We try to take our chances in various fields of medicine to extend our knowledge and gain as much experience as possible.

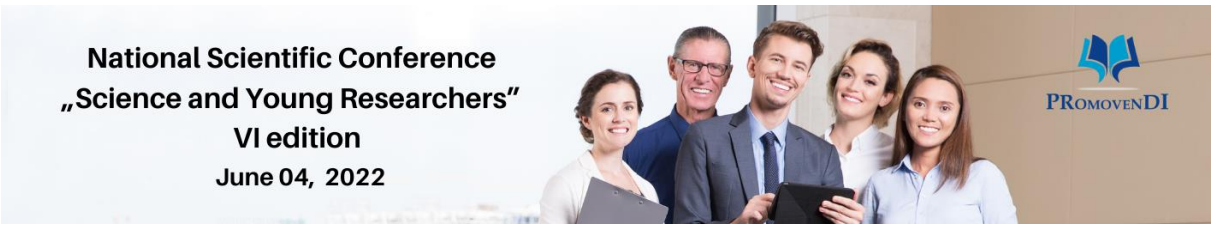
Abstract:

We present a case of 11-year-old female who was referred to our hospital due to acute stomach pain and progressive weakness. In laboratory tests confirmed low hemoglobin value (8,9 g/dl). Imaging studies showed perforated right ovarian tumor with massive intra-abdominal hemorrhage. The kid was qualified to an urgent surgery. Intraoperatively, there were confirmed bilateral ovarian tumors, perforation and hemorrhage of the right ovarian one. After a telephone consultation with Oncology Clinic in Warsaw, there was made a decision of total right ovary resection and simultaneously of not excising the left ovary with its tumor. In additional laboratory findings were as follows: elevated lactate dehydrogenase level and CA-125, CA 19–9, CA 15–3, human chorionic gonadotrophin and alpha-fetoprotein were within normal limits. The patient underwent bone marrow aspirate evaluation which showed the presence of 50% poorly differentiated cells. Based on above findings a diagnosis of Burkitt's lymphoma was made. The patient, in stable condition, was transferred to the Department of Pediatric Oncohematology for further treatment.

The ovary is the most frequent site of nonHodgkin's lymphoma in the gynecologic tract accounting for about 1% of all ovarian neoplasms. Surgical treatment is not the treatment of choice in patients with ovarian lymphoma, however it plays an important role in the diagnostic process.

Keywords:

ovary, Burkitt lymphoma, hemorrhage



WINDS OF CHANGE -MODERN TREATMENT OF CROHN'S DISEASE

Oliwia Makowska

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A few words about the author(s):

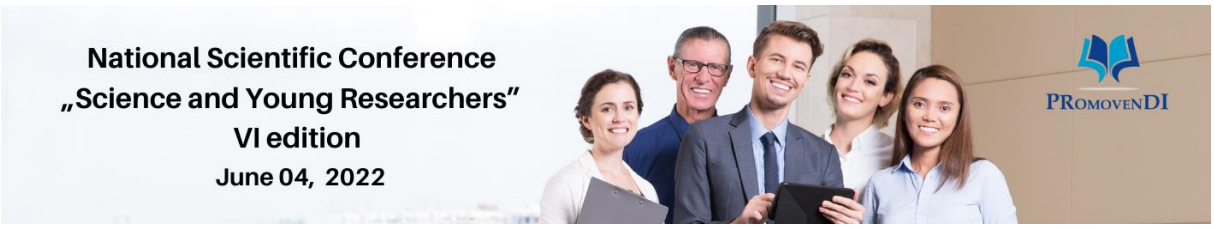
A 5th year medical student, with field of interest being internal medicine, but exploring both clinical and academic fields of medicine.A member of the SRC Paediatric Allergology and Gastroenterology and SRC Paediatrics and Paediatric Haematooncology

Abstract:

Crohn's disease (CD), one of the two main components of Inflammatory Bowel Disease (IBD), is a chronic disease affecting gastrointestinal tract, presenting with abdominal pain, diarrhoea, bowel obstruction, blood or mucus in the stool. The cause of IBD is multifactorial and includes genetic predisposition, mucosal barrier dysfunction, dysregulated gastrointestinal microbiota and immune responses as well as environmental factors. Typically the treatment focuses on controlling symptoms instead of elimination of the cause and consists of aminosalicylates, corticosteroids, immunomodulators and surgical intervation if necessary. The actual trend in treatment is not only to minimise symptoms and cope with complications but to eliminate local inflammation in order to reduce damage and restore the mucosa. Mucosal healing might be achived by novel therapeutic approaches like cell therapy or apheresis therapy which main mechanism is to isolate and absorb specific leukocytes resulting in decreasing inflammation. Association between mucosal inflammation and loss of residing bacteria has been proved thus usage of antibiotics, probiotics, and fecal microbiota transplantation might potentially play detrimental role in the treatment of CD. Another interesting direction in research concerns innate lymphoid cells responsible for maintenance of intestinal homeostasis, whose disturbances participate in IBD pathogenesis. A more profound cognition of ILC might deliver new methods of IBD treatment.

Keywords:

Crohn’s disease, inflammatory bowel disease



MODIFICATION OF CHEMOTHERAPEUTIC AGENTS WITH NATURAL EXTRACTS - NEW PERSPECTIVES IN CANCER TREATMENT, IN VITRO RESEARCH

Karolina Matulewicz*, Anna Bajek

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A few words about the author(s):

Graduate of medical biotechnology, PhD student of Interdisciplinary PhD studies at the medical faculty of Collegium Medicum in Bydgoszcz. In doctoral thesis, she focuses on the search for new methods of treating cancers of the genitourinary system.

Abstract:

Introduction: Bladder cancer is one of the most common cancer, therefore the currently used methods of treatment are constantly improving. In recent years, cytostatics have been increasingly combined with natural extracts, which may improve the therapeutic capacity.

Aim: The aim of the study was to compare the cytotoxicity of levofloxacin and ciprofloxacin in combination with the Norway spruce extract (Picea abies (L.) H. Karst)

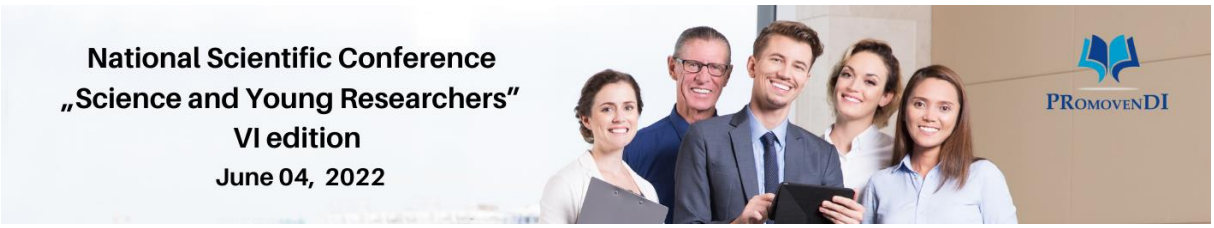
Material and methods: In vitro studies were performed on the T24 cell line. Solutions of levofloxacin and ciprofloxacin at concentrations of 10-1000 µM were tested. Cell morphology was performed using an inverted optics microscope (Nikon, Japan). Cell viability was assessed by the MTT assay (Abcam, UK). Apoptosis was identified on the basis of caspase-3 / -7 activity (Invitrogen by Thermo Fisher Scientific, USA).

Results: The results show a decrease in viability of cells treated with both compounds over time, in direct proportion to the increasing concentration. Based on the MTT test, higher cytotoxicity of levofloxacin and ciprofloxacin with the addition of 5% spruce extract is noticeable. Both compounds cause death by apoptosis, especially at the highest concentrations.

Conclusions: The results show that natural extracts can enhance the cytotoxic effect of drugs.

Keywords:

bladder cancer, natural extracts, ciprofloxacin, levofloxacin



METHODS OF TREATING AORTIC DISSECTION

Marina Milona

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A few words about the author(s):

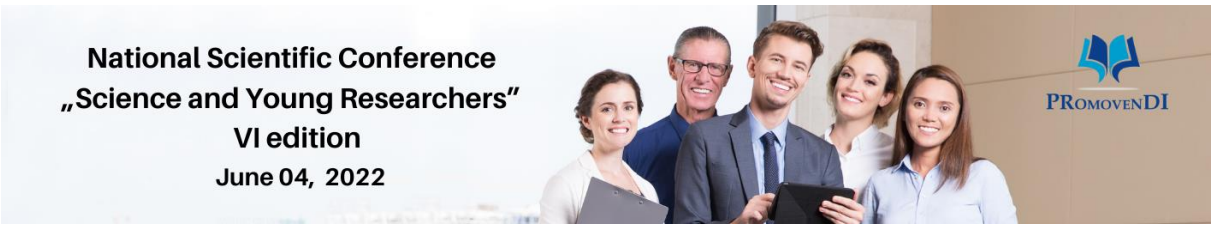
I am a student of the 5th year of medicine at the pomeranian medical university, where I am a member of the cardiosurgical research society and I attend microsurgery classes. In my spare time, I like go to the gym and go for long walks with my dog.

Abstract:

Aortic dissection is the most common catastrophic event to affect the aorta and is a life-threatening aortic condition, with an estimated annual incidence of 3 cases per 100,000. Aortic dissections are divided into two groups, depending on which part of the aorta is affected.
The most common group is type A involving a tear in the part of the aorta where it exits the heart (ascending aorta). A tear may also extend into the abdomen. The other type is Type B which only involves a tear in the lower aorta. The tear, as in type A, may also extend to the abdomen. Some factors may raise the risk of aortic dissection, such as sex, age, cocaine use, pregnancy, arteriosclerosis, hypertension, aortic aneurysm, and bicuspid aortic valve. Some genetic diseases can also increase the risk of having aorta dissection such as Turner syndrome or Marfan syndrome. The methods of treatment for aortic dissection include: anti-impulse therapy, aimed at minimizing the changes in pressure that the aortic wall, surgical treatment such as David Procedure, replacement of aortic arch and Frozen Elephant Trunk Procedure.

Keywords:

aortic dissection, aorta, dissection,



MIDOSTAURIN. THE FIRST TARGETED THERAPY TO IMPROVE TREATMENT RESULTS OF ACUTE MYELOID LEUKEMIA WITH FLT3 MUTATION

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A few words about the author(s):

I am student of 5th year Medicine at Collegium Medicum in Bydgoszcz.

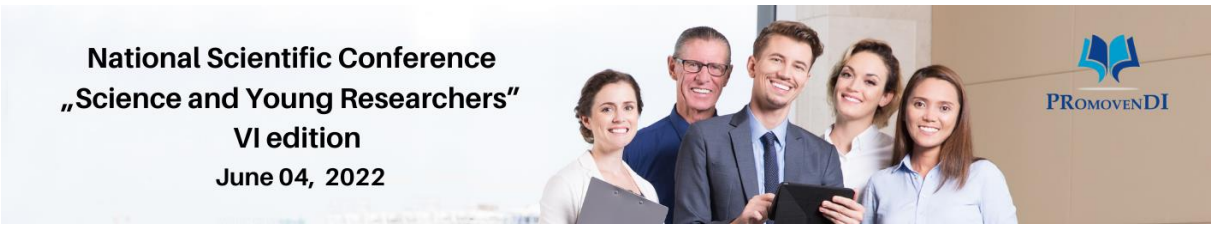
Abstract:

Acute myeloid leukemia (AML) accounts for approximately eighty percent of all cases of acute leukemia among adults. Each year in Poland, one diagnoses seven hundred. The disease mainly affects more senior people - the average age of patients is sixty-seven years. FLT3 gene mutations are the most common genetic disorders in AML, found in approximately thirty percent of patients - especially with normal karyotype.

Midostaurin is a multi-targeted kinase inhibitor that inhibits FLT3 signaling. That is the first targeted therapy to present improved outcomes, and it represents a game-changer. The clinical study demonstrates significant improvements in overall and event-free survival when once added midostaurin to standard chemotherapy in patients with newly diagnosed FLT3-mutated AML. Midostaurin combined with intensive chemotherapy is currently the standard treatment in this group of patients.

Keywords:

midostaurin, acute myeloid leukemia, FLT3 inhibitor



OLD DRUG, NEW DATA: IS ACETAMINOPHEN STILL SAFE FOR PATIENTS WITH HYPERTENSION?

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A few words about the author(s):

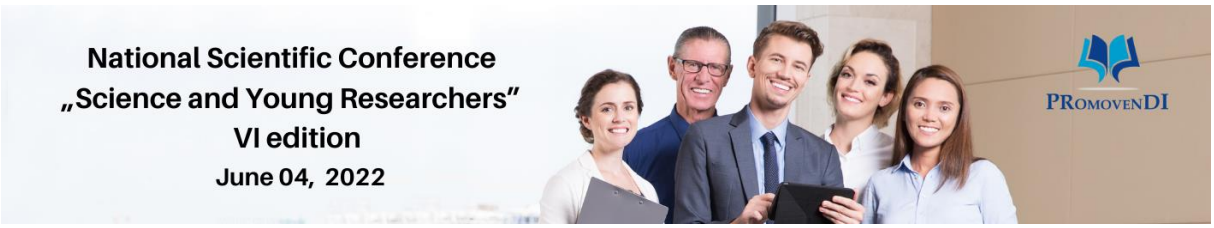
Aleksandra Nowacka is student of medicine at Collegium Medicum in Bydgoszcz. Her areas of interest include pain management and art, especially impressionist painting.

Abstract:

Acetaminophen is the most commonly used analgesic worldwide. In patients with increased cardiovascular risk, acetaminophen is preffered as a safe alternative to NSAIDs, which are known to increase BP. However, this concept is now being questioned. Almost 40 years ago, acetaminophen was first shown to increase systolic BP by ~4 mm Hg vs placebo in patients with hypertension. Since then, many studies have been conducted, but their results are inconsistent. Moreover, some of them had severe limitations (small groups, no blinding, combining acetaminophen with other products, populations with or without pain) and their interpretation is challenging. Recently, MacIntyre et al. in PATH-BP trial proved that regular daily intake of 4 g of acetaminophen increases systolic BP in individuals with hypertension by ~5 mm Hg compared with placebo. However, a short, only 2-weeks lasting trial makes unequivocal judgement impossible. It also remains unclear if this effect persists with chronic treatment. From the other hand, a 5 mm Hg SBP increase elevates cardiovascular risk significantly: stroke mortality by ~15%, CHD mortality by ~9%, overall mortality by ~7%. A study with longer follow-up is much needed. In conclusion, recent studies call into question the safety of regular acetaminophen use, and suggest caution when prescribing it for those with hypertension or at risk of ischemic heart disease or stroke.

Keywords:

acetaminophen, hypertension, blood pressure, adverse effects, cardiovascular risk



ALLERGIC DISEASES IN THE LIGHT OF SELECTED HYPOTHESES

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A few words about the author(s):

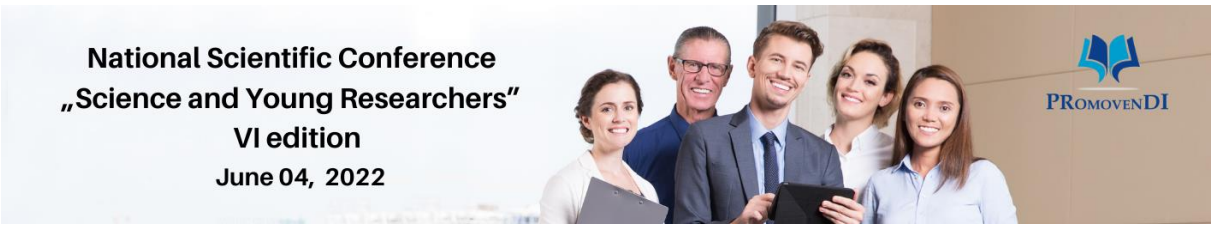
First-year students of full-time master's studies in nursing at the State Carpathian University in Krosno. Members of the Student Association of Honorary Blood Donors and Potential Bone Marrow Donors.

Abstract:

"The Western lifestyle", which is very popular, has many consequences, including a significant increase in the incidence of allergic diseases. The aim of this study was to review the literature and describe the factors that influence the occurrence of allergic diseases and how they contribute to the development of these diseases. The work is based on the analysis of selected literature on allergic diseases, paying attention to the premises of the hygienic hypothesis, the early exposure hypothesis and a survey examining the knowledge of society about allergic diseases. Examples of allergic diseases were described and the influence of factors such as lifestyle, diet and other diseases was analyzed. Natural methods of treatment, treatment with hemp oil and interference with the human bacterial flora are also described. These treatments are very promising but require more research. Allergic diseases are a very important public health problem and still represent a huge field for new research, the development of new therapeutic methods and the improvement of existing ones.

Keywords:

allergic diseases, immune system, hygiene hypothesis



THE RELATIONSHIP BETWEEN RESPIRATORY MUSCLES ECHOGENICITY AND SPEED TEST SCORES IN ADOLESCENT SOCCER PLAYERS.

Małgorzata Pałac (1, 2)*, Natalia Grygierczyk (2)

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A few words about the author(s):

physiotherapist, doctoral school student

Abstract:

AIM: The aim of this study was to assess the relationship between echogenicity of respiratory muscles and speed in adolescent soccer players.

METHODS: 23 male athletes aged 17 years old were examined. Ultrasound imaging was performed to assess echogenicity of the respiratory muscles. In order to asses speed, the athletes had to run 30 meters in linear line. Speed time was collected at 5th, 10th and 30th meters by the photocells system.

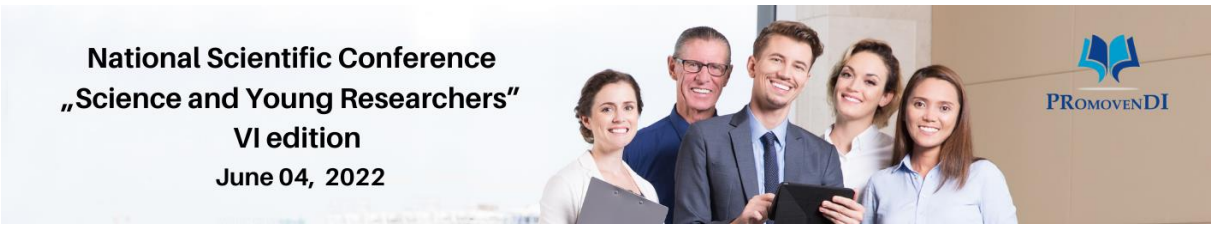
RESULTS: A significant moderate (R=-0.51) negative correlation was obtained between echogenicity of diaphragm ratio in transverse probe position and speed value at 30 m. In longitudinal probe position a significant moderate (R=0.51) positive correlation was obtained between intercostal muscles echogenicity at expiration and speed value at 30m. No more significant relationships were achieved.

DISCUSION: This preliminary results have shown that higher echogenicity value of the diaphragm ratio corresponded with lower speed at 30 m. Additionally, higher echogenicity value of the intercostal muscle echogenicity at the end of tidal expiration corresponded with better speed results at 30 m.

CONCLUSION: This study results have shown that echogenicity measurement of the respiratory muscles by ultrasound imaging may be at least partially related with speed performance in adolescent soccer players. Further studies are needed.

Keywords:

respiratory muscles, echogenicity, speed, soccer players



HOW TO COPE WITH STRESS?

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A few words about the author(s):

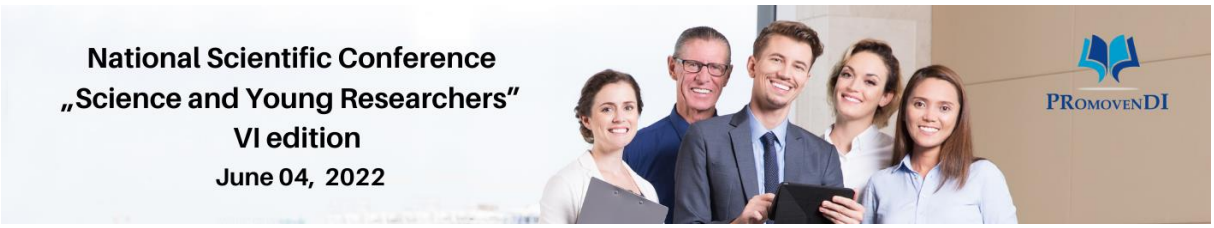
Anna Paśnikowska is a medical student, who is very interested in the psychology of the human brain.

Abstract:

Stress is a physiological response from your body to a stressor. It is a coping mechanism that your body creates to boost your metabolism to defend itself. To regulate stress, we have to study how this mechanism develops and how to recognize it. Every day we have to manage a lot of stressful and hard situations, hence we must learn to avoid unnecessary stress, accept not to control everything, and try to say "no" sometimes. We must remember that humans are not creatures guided by logic, but by emotions. Therefore, in order to take control over our feelings, relations, and comfort, in the first place we have to start working on our self-awareness and needs.

Keywords:

stress, self-awareness, emotions, acceptance, science



ANALYSIS OF THE IMPLEMENTATION OF THE PILOT PROGRAM "PREVENTION 40 PLUS" IN POLAND

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A few words about the author(s):

The author is a student of the Public Health at the Jagiellonian University Medical College in Cracow.

Abstract:

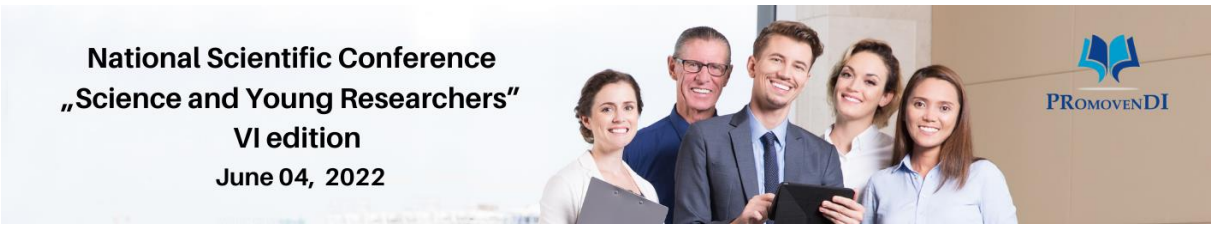
In response to the increasing prevalence of civilization diseases and the negative impact of the pandemic on the pro-health behavior of Poles, the Ministry of Health has created health program named "Prevention 40 PLUS". Criteria for participation in the program is the age of 40 and answering the survey questions. After completing the questionnaire by phone or via the website patient.gov.pl, the patient receives a referral for a diagnostic test package customized to individual needs.

The aim of the study was to examine the opinions on the "Prevention 40 PLUS" program among recipients. The study was conducted using an online self-constructed survey among 62 Poles over 40 years old. The survey showed that almost 40% of respondents had never heard of the program. Among people who knew about the program only 39% took part in it. The reasons why the patients did not participate in the program included the lack of time, lack of motivation and encouragement from the primary care physician and an ill-matched package of tests to the needs. Responders also pointed out that the program was not adapted to people over 60 years old.

In relation to the obtained results, the authors of the program should better tailor the diagnostic tests to individual needs. In addition, patients should be informed by health care workers about the possibility of participating in the program, as well as about the possibility of completing the questionnaire by phone.

Keywords:

health policy program, "Prevention 40 PLUS", prevention, diagnostic test program



SPINAL SACRAL SCHWANNOMA IN 15-YEAR-OLD PATIENT - CASE REPORT

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(2) Radiology and Diagnostic Imaging Department, St.Queen Jadwiga's Clinical Regional Hospital No. 2 in Rzeszów, ul. Lwowska 60, 35-301 Rzeszów,

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A few words about the author(s):

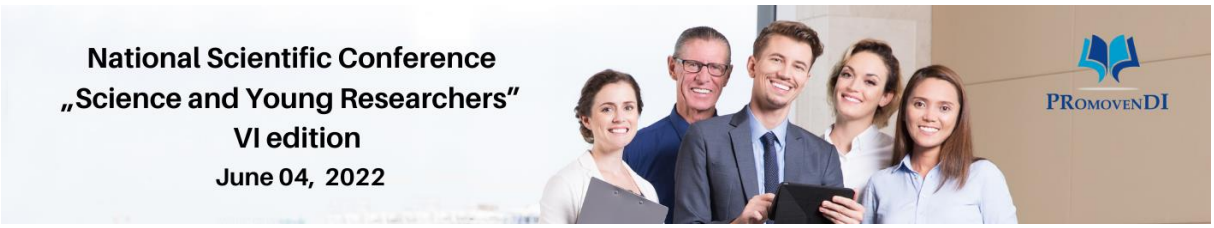
We are students at Medical College of Rzeszów University. Currently, we are studying in the 5th year of faculty of Medicine. We try to take our chances in various fields of medicine to extend our knowledge and gain as much experience as possible.

Abstract:

We present a case of 15-year-old Eastern European female suffering from intensification of lower left limb pain, which radiate from knee to feet and knee to hip, that lasts over latest 1,5 year. Currently, the pain is intensificated and moreover the patient complaints about general weakness, reduced apetite, increased sweating and episode of severe stomachache. In Emergency Room was performed Ultrasonography, which showed solid mass in lower abdomen. Magnetic Resonance findings confirmed presence of tumor mass which dimensions were 53x82x51mm (LLxAPxCC) from neural foramen S1/S2. It revealed iso-intensity to hypointensity imaging on T1-weighted sequence and hyperintensity imaging on T2 weighted. Laboratory evaluation didn't demonstrate any abnormalities. There was a suspision of Schwannoma diagnosis which was confirmed in histopathology examination. There was made a decision of performing tumor not total resection. MR was performed two months after surgery and revealed 42% reduction of the tumor comparing to the initial volume. Sacral spinal schwannomas are very rare and constitute only 1-5% of all schwannomas. Local recurrence and malignant transformation of schwannoma are very rare. MRI is the gold standard in investigation that helps to estimate the extension of tumor and decide about the approach for surgery. The main aim of the treatment is the radical surgery, but in special cases the goal is modificated due to patient's clinical condition.

Keywords:

sacral, spinal, schwannoma, tumor, resection



TOXICITY EVALUATION OF CEFUROXIME AXETIL SOLUTIONS USING MICROBIOTESTS

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Department of Inorganic and Analytical Chemistry, Faculty of Pharmacy, Medical College, Jagiellonian University, 9 Medyczna St, 30-688 Kraków, Poland

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A few words about the author(s):

I am student of PhD school at the Jagiellonian University. Currently I am evaluating the toxicity of some antibiotics to the living organism. The other authors also focus on the subject of antibiotics and their impact on the environment.

Abstract:

According to the European Centre for Disease Prevention and Control, the occurrence of pharmaceutical substances in the environment is becoming a growing problem.

In 2020 Poland was on the 6th place in terms of the second generation of cephalosporins consumption, which includes cefuroxime axetil which is classified as a pro-drug. After oral administration it is metabolized by esterases to the active form i.e. cefuroxime, which causes the disruption of murein synthesis and leads to bacteriolysis during cell division.

The object of this study was to analyze the toxicity of the mixture of cefuroxime axetil degradation products, subjected to irradiation with radiation simulating sunlight, against the parent compound. For this purpose, the Daphtoxikit F (Daphnia magna) test was performed, by which the toxicity of the solutions after 24 and 48 h of incubation was determined.

The Thamnotoxkit F (Thamnocephalus platuyrus) test was also used, which allows assessing the mortality of crustaceans by determining the LC50 within 24 h. As a result of the experiments, the toxicity of the mixture of degradation products and the parent antibiotic was found to be higher relative to the untreated solutions. In addition, the toxicity was also shown to be affected by the exposure time; solutions after 5 h of exposure showed higher toxicity. It indicates, that solutions after irradiation have a potential to cause adverse effects on the aquatic environment.

Keywords:

cephalosporins, photodegradation, mictotoxkit

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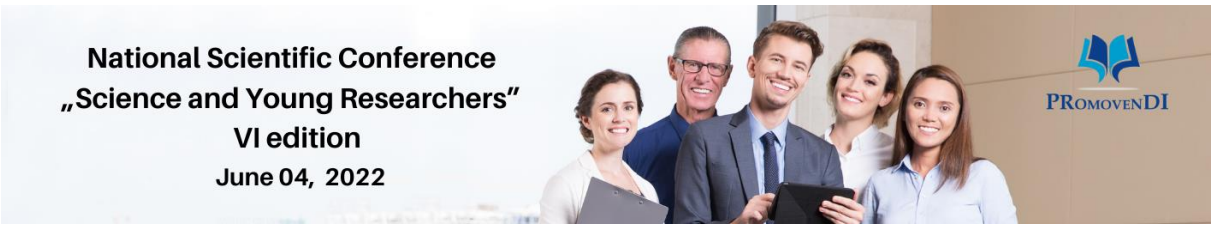

HEAVY METALS IN SELECTED POLISH CRAFT BEERS

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Department of Biochemistry of the Pomeranian Medical University

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A few words about the author(s):

Article written by members of the research club at the Department of Biochemistry of the Pomeranian Medical University.

Abstract:

Introduction: Craft beers are made of the highest quality products, free of artificial preservatives, often made according to an original recipe. The water, hops, and malt used in the process are the sources of many nutritional compounds. Of the 92 naturally occuring elements, approximately 30 metals and metalloids are potentially toxic to humans. Heavy metals are present in the food can cause acute and chronic poisoning, consequently leading to the development of many diseases.

Aim: The study aimed to examine the heavy metals of polish craft beers.

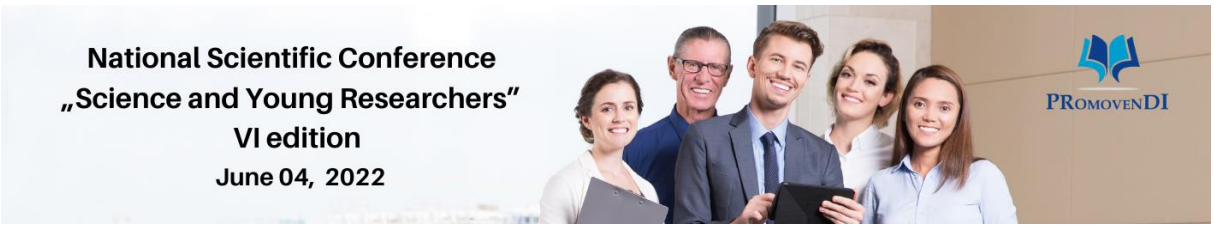
Methods: Beer samples were frozen immediately after collection. Samples were digested using a microwave digestion system. The level of chromium, nickel, cadmium, and lead of beers was evaluated using ICP-OES.

Results: The highest concentration of Cr, Pb, and Ni was found in NEIPA style beer (0.014 mg/l, 0.029 mg/l, and 0.067 mg/l, respectively). The highest mean concentration of Pb was characteristic for IPA style (0.0117 mg/l), Ni for DIPA (0.046 mg/l), and mean Cr was equal for DIPA and NEIPA style beers (0.008 mg/l). Cadmium levels in all of the beers were below the limit of detection. The concentration of Pb correlates negatively with alcohol and extract content. There was no correlation between the hoprate and the level of analyzed elements.

Conclusions: Heavy metals are present in craft beers such as lead, nickel, and chromium. In the case of NEIPA beers, one bottle might exceed the maximum daily dietary intake of lead (0.0125 mg/l).

Keywords:

heavy metals, lead, nickel, chromium, craft beers



SMALL-MOLECULE PERK INHIBITORS IN PRIMARY OPEN-ANGLE GLAUCOMA TREATMENT

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A few words about the author(s):

The authors of the study conduct in vitro and in vivo research in the Department of Clinical Chemistry and Biochemistry at Medical University of Lodz in the field of neurodegenerative and neoplastic diseases.

Abstract:

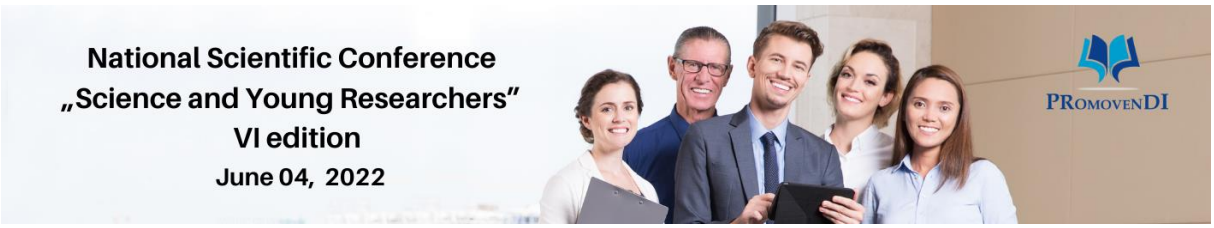
It has been shown that Endoplasmic-Reticulum (ER) stress and protein-kinase RNA-like endoplasmic reticulum kinase (PERK)-mediated Unfolded Protein Response (UPR) pathway are crucial in the primary open-angle glaucoma (POAG) progression. Hence, the present study aimed to evaluate the cytotoxicity of the small-molecule PERK inhibitor, that could be used in POAG treatment.The cellular toxicity of the investigated compound was measured in the primary human trabecular meshwork (HTM) cell line by the XTT assay and cell survival assay with Giemsa staining. Analysis of apoptosis was performed by caspase-3 assay.

After treatment of the HTM with induced ER stress conditions, with the 25 μM PERK inhibitor, XTT assay and cell survival assay with Giemsa staining determined a significant increase in HTM cells viability as compared to ER stress inducer-thapsigargin (Th) only treated cells at all incubation times. Following 24 h incubation of HTM cells with Th and tested compound at 25 μM, the caspase-3 activity was significantly decreased as compared to Th-treated HTM cells. PERK inhibitor effectively increased viability, proliferation, restored normal morphology and reduced apoptosis of HTM cells with induced ER stress conditions. Thereby, PERK inhibitors may provide an innovative treatment strategy against POAG.

This research was funded by grant OPUS no. 2016/21/B/NZ5/01411.

Keywords:

glaucoma, PERK; ER stress; unfolded protein response; PERK inhibitor



THE USE OF THE TLC METHOD FOR THE DETERMINATION OF THE FIFTH GENERATION CEPHALOSPORIN - CEFTOBIPROLE IN BIOLOGICAL MATERIAL

Żaneta Binert-Kusztal*, Joanna Żandarek, Małgorzata Starek, Monika Dąbrowska

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A few words about the author(s):

I am an employee of the Department of Inorganic and Analytical Chemistry, Faculty of Pharmacy, where I deal with the broadly understood analysis of cephalosporin drugs, with particular emphasis on the new 5th generation antibiotics.

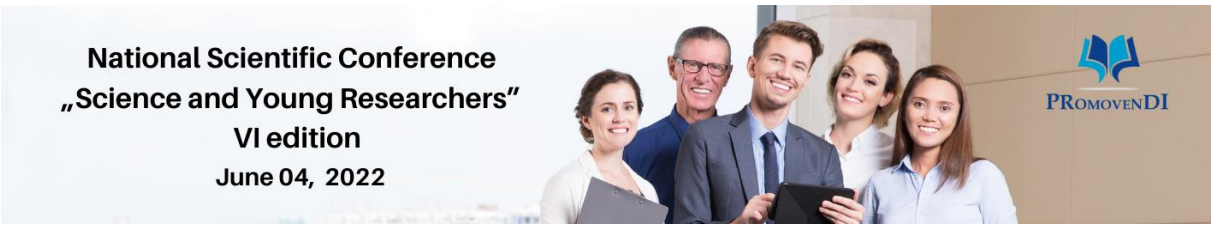
Abstract:

Ceftobiprole is a fifth-generation cephalosporin bactericidal β-lactam antibiotic with a wide range of antibacterial activity, including MRSA and resistant enterococci. It is not active after oral administration, so it is used as a prodrug, ceftobiprole medocaril sodium, by intravenous infusions. In addition, it is low bound to plasma proteins and minimally metabolized, which limits the possibility of interactions. It is mainly excreted unchanged in the urine. The drug exhibits linear and time-independent pharmacokinetics after both single and multiple doses. The half-life is approximately 3 hours, achieving steady state on the first day of dosing. Ceftobiprole works by attaching to penicillin-binding proteins, which interfere with cell wall synthesis, inhibiting cell growth.

In the presented work, TLC-densitometric method for the determination of ceftobiprole in biological material has been developed. When optimizing the conditions of the procedure, HPTLC Cellulose and TLC F254 plates were used as stationary phases. Densitometric detection was performed in the UV-Vis range. The procedure was validated according to ICH in order to ensure the highest reliability of the obtained results. Based on the results, it can be successfully assumed that the developed analytical method is accurate, which is confirmed by the recovery percentages, meeting the acceptance criterion of 95-105%, and can be used for the determination of ceftobiprole in biological material.

Keywords:

ceftobiprole, biological materials, TLC-densitometry



CRAFT BEERS AS A SOURCE OF MINERALS

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Department of Biochemistry of the Pomeranian Medical University

**kjanawka@interia.pl*

A few words about the author(s):

We are members of a student research club and students of the medical faculty.

Abstract:

Introduction: Beer is one of the most popular drinks in the world. It consists of the essential ingredients, i.e. water, malt, hops, and brewer's yeast. Poland ranks fifth in Europe in terms of the amount of consumed beer. A statistical Pole drinks around 98l of beer a year. In recent years, a new trend has been observed in Poland - the growing popularity of craft beers. 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. Consequently, such a product is less purified and therefore richer in nutrients.

Aim: Determining the mineral composition of selected polish craft beers.

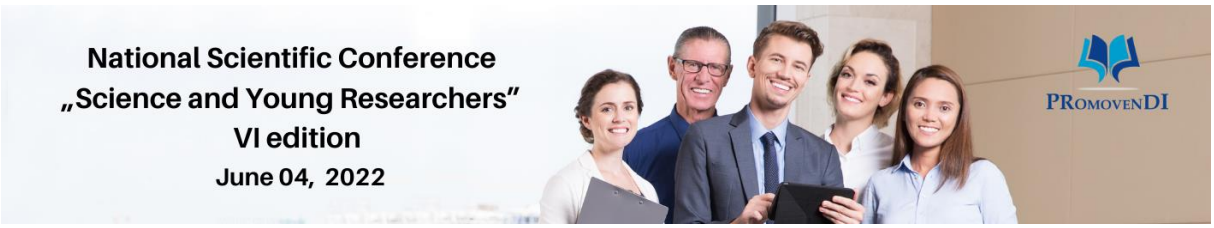
Methods: 20 beer samples were digested using a microwave digestion system. The mineral composition (Ca, Mg, P, K, Zn, Cu, Fe, Mn) of the beers was assessed with ICP-OES.

Results: The mean concentrations of Ca, Mg, P, K, Zn, Cu, Fe, Mn in analyzed beer samples were: 53,14, 159,72, 564,89, 1234,50, 0,17, 0,10, 0,181 i 0,718 mg/l, respectively. The highest level of the analyzed elements (except P) were observed in NEIPA-style beers. The highest concentration of P was found in DIPA-style beer.

Conclusions: Considering the recommended dietary allowance, craft beer can be considered an important source of potassium, phosphorus, magnesium and manganese. However, further studies of the bioavailability of the analyzed elements in beer should be conducted.

Keywords:

beer, minerals, Ca, Mg



ASSESSMENT OF THE SURFACE TOPOGRAPHY OF LITHIUM DISILICATE CERAMICS AFTER BRUSHING WITH AFM, SEM AND FT-IR

Katarzyna Kaczmarek (1)*, Bartlomiej Konieczny (2), Przemyslaw Siarkiewicz (3), Andrzej Leniart (1), Barbara Lapinska (2), Monika Lukomska-Szymanska (2), Slawomira Skrzypek (1)

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A few words about the author(s):

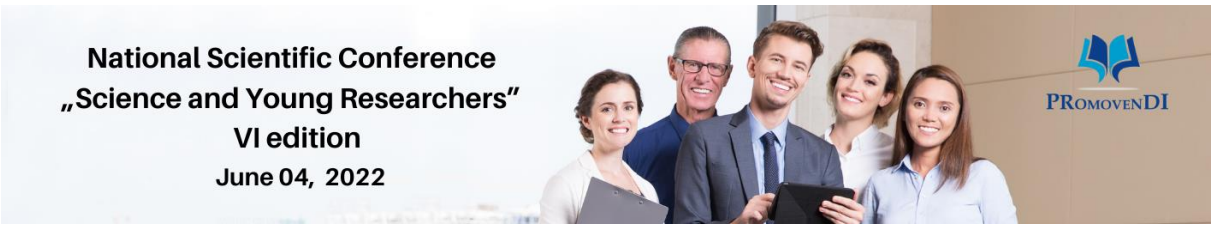
I am PhD student at InterChemMed. My research interests are focused on materials science, including examining the surface properties of ceramic dental materials and polymers using microscopic and spectroscopic techniques such as SEM, AFM or FT-IR.

Abstract:

A frequently used prosthetic material is lithium disilicate ceramics, characterized by biocompatibility and high aesthetics. It is an all-ceramic system used to perform such restorations as: inlays, onlays, veneers, anterior crowns and three-unit bridges [1]. Toothpastes are an integral part of daily oral care. The composition of toothpaste has a decisive effect on the tooth surface. The most abrasive and polishing ingredients in the composition of pastes, much less foaming or flavoring. The effect of toothpaste abrasives on dentin is determined by the Relative Dentin Abrasion (RDA). A high RDA value may have a destructive effect on dentin and enamel [2]. The aim of the study is to assess the effect of brushing on the surface of lithium disilicate ceramics covered with various glazes. The study of the ceramic surface was evaluated before and after 10, 50 and 100 brushing cycles of Elmex Sensitive (RDA=70) and Colgate Whitening (RDA=140). Each brushing cycle lasted 2 min. with a pressure of 2N. A scanning electron microscope (SEM), an atomic force microscope (AFM) and attenuated total reflection Fourier-transform infrared spectroscopy (ATR-FT-IR) were used to assess the surface morphology and topography. The surface roughness coefficients i.e. Rq, Ra and SAD were determined from the obtained data.
[1] F. Zarone, et al., BMC oral health, 2019, 19(1), 134.
[2] G. Johannsen, et al., Acta odontologica Scandinavica, 2013,71(3-4), 508–17.

Keywords:

lithium disilicate, ceramics, brushing, AFM, SEM



ASSESSMENT OF VITAL LUNG CAPACITY LEVELS IN SWIMMERS

Izabela Kaczorowska (1)*, Łukasz Tota (2), Tomasz Pałka (2), Marek Bawelski (2)

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MSc in Physical Education at the Academy of Physical Education in Krakow and a graduate in Forensic Biology at the Jagiellonian University.

Abstract:

Introduction.Swimming as a form of physical activity positively influences the efficiency of the human body.

Aim of the study. The aim of the study was to assessment of the vital capacity of the lungs in swimmers.

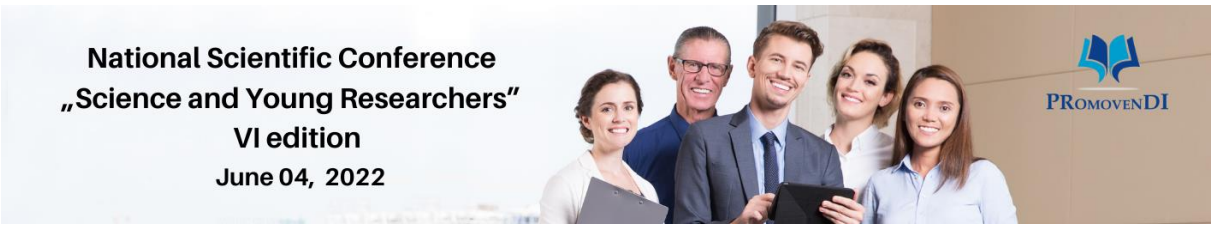
Material and methods. The study involved 14 swimming swimmers with an average training experience of 11±0.39 years (age 21±0.94 years). The control group consisted of 14 second-year students of physical education in the uniformed services of the Academy of Physical Education in Kraków,untrained,aged 20±2.26 years. The study included measurements of baseline somatic indicators and selected spirometric tests, in which vital capacity of the lungs, one-second forced expiratory volume and maximal voluntary ventilation.

Results: Lung vital capacity (VC) was 5.17±0.69 l in students and 6.85±0.90 l in swimmers. One-second forced expiratory volume (FEV1) in students was 3.21±0.6 l, and in swimmers - 5.25±0.67 l. Maximal voluntary ventilation (MVV) in uniformed services students was 163.91±40.86 l/min,while in swimmers - 180.61±36.12 l/min.

Conclusions: The results of the study showed that swimmers trained in swimming demonstrated higher respiratory fitness than students of physical education in the uniformed services.
The group of swimmers studied had high levels of vital capacity of the lungs (VC) and maximum voluntary ventilation (MMV). Swimming training significantly improves spirometric indicators in people who regularly engage in the above-mentioned physical activity.

Keywords:

physical activity, spirometry, vital lung capacity



THE IMPORTANCE OF THE B12 VITAMIN IN ADDICTION

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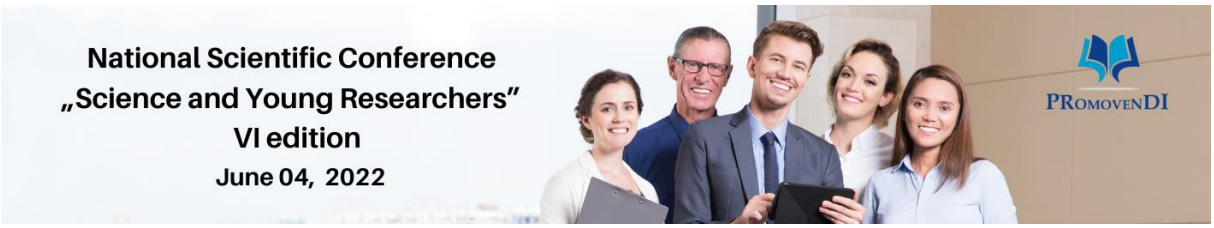
Students of the Faculty of Medicine, members of the scientific club at the Department of Biochemistry at the Pomeranian Medical University in Szczecin.

Abstract:

Chronic drug use leads to the development of addiction, as well as to inflammatory and neurodegenerative changes, which are believed to increase the risk of psychosis, cognitive impairment and Parkinson's disease in drug addicts. Vitamin B12, on the other hand, has anti-inflammatory and neuroprotective properties.

Keywords:

vitamin B12, addiction, anti-inflammatory, neuroprotective



PROPERTIES AND USE OF ALGAE IN COSMETICS

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A few words about the author(s):

Julia Kutek is a third-year student of biocosmetology at University of Life Sciences in Lublin.

Abstract:

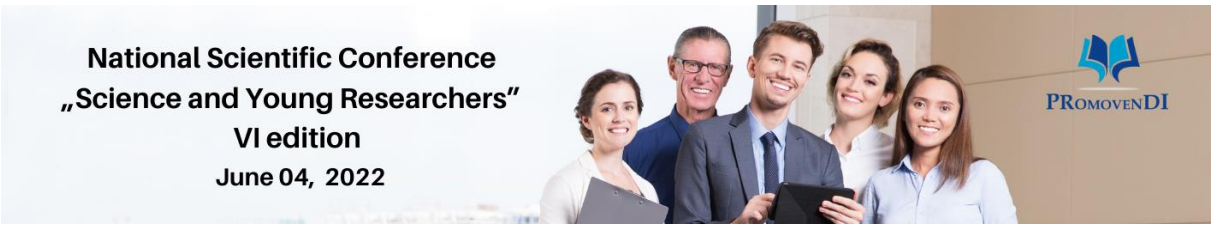
Algae are aquatic plants found in seas, oceans, lakes, rivers and even aquariums. Algae are an invaluable source of protein, fats and carbohydrates. In addition, they contain: iodine, iron, manganese, copper, bromine, potassium, phosphorus, chlorine, fluorine, sulphur, selenium, nickel and vitamins of groups B, A, C and E. Two types of algae are the most popular in cosmetics: marine and freshwater algae.

The most important representatives of freshwater algae are Spirulina and Chlorella, which are rich in amino acids, minerals and vitamins. The most commonly used types of marine algae are brown, green and red ones, which are rich in alginic acid or agar.

Algae used in cosmetic preparations are very versatile. They meet the needs of every type of skin, regardless of its age or ailments. They perfectly protect the skin against premature ageing and harmful external factors. Algae-based cosmetics provide the skin with nutrients and speed up regeneration processes.

Keywords:

algae, skin, cosmetics



TESTICULAR CANCER - THE MOST COMMON CANCER DIAGNOSIS AMONG YOUNG MEN

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A few words about the author(s):

Natalia Łysiak is a medical student with scientific interests focused on pathomorphology and surgery.

Abstract:

The peak incidence of testicular cancer (TC) occurs in men aged 15-34. In this group it is a most common cancer diagnosis.

95% of testicular neoplasia derives from germ cells, gonadal stromal tumors and lymphomas are rare. Germ cell tumors (GCTs) are mostly malignant and are characterized by the presence of an additional short arms of the twelfth chromosome. GCTs are divided into two groups: seminomas and nonseminomas (based on pathogenesis, histology, and clinical presentation). Some of the risk factors of GCTs include: rase (with a highest rate among Native American and white males), cryptorchidism, family history and others. The most common symptom of TC is a painless scrotal mass, some may present with swelling, gynecomastia and pain in the testis or abdomen.

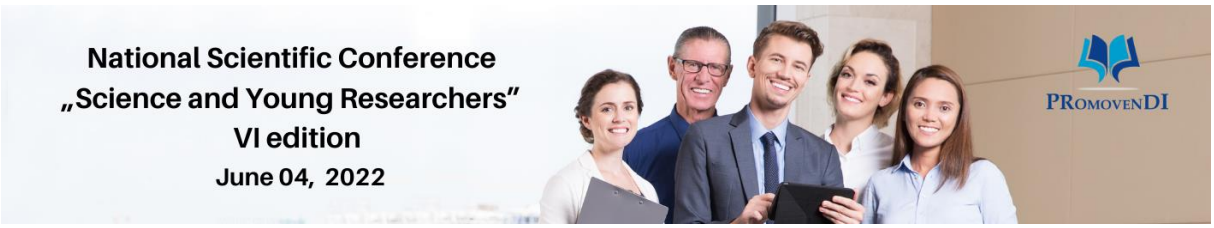
The diagnosis of TC is based on an ultrasonography (high sensitivity and specificity) and assessment of the levels of tumor markers (hCG, AFP), a biopsy should not be performed.

Therapy includes radical inguinal orchiectomy and radio- or chemotherapy. The 5-year survival rate is 97%.

In conclusion, due to the effectiveness of the therapy and high efficiency of diagnostic procedures, there is no need to create large-scale screening programs.

Keywords:

testicular cancer, germ cell tumor, seminoma, nonseminoma



EVALUATION OF PULMONARY FUNCTION IN PATIENT AFTER SEVERE COVID-19 INFECTION – A CASE REPORT

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Research team from the Unit of Rehabilitation in Internal Diseases, Jagiellonian University Medical College.

Abstract:

Aim of the study: The purpose of this study was to evaluate the persistent symptoms and pulmonary function in patient after severe COVID-19.

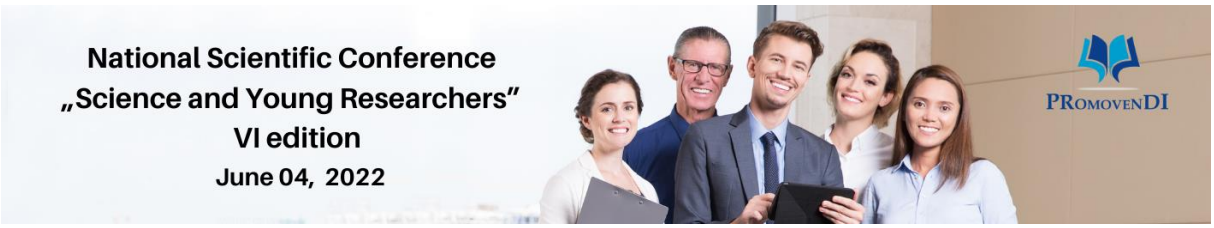
Case presentation: This case study describes the characteristics of a fully-vaccinated 59-year-old male with no chronic pulmonary diseases diagnosed before and medical history of severe acute COVID-19 infection 25 weeks before the assessment. The patient was admitted to the emergency department due to symptoms related to SARS-CoV-2 infection on November 26, 2021. Due to deteriorating respiratory and general condition, he was transferred to the intensive care unit, and was intubated and mechanicaly ventilated for 13 days. Patient underwent 5 weeks of inpatient pulmonary rehabilitation and 2 weeks of outpatient rehabilitation due to neurological complications (lower extremities polyneuropathy).

Results: Twenty-five weeks after SARS-CoV-2 infection, the patient reported persistent exertional dyspnea, joint pain, myalgia, and memory loss. Lung function test results showed a reduction in forced vital capacity (FVC) and in forced expiratory volume in one second (FEV1) with 63,2% and 63,8% of predicted value, respectively.

Conclusion: The results from case study indicated that the patients after severe COVID-19 infection may have impaired lung function and long-lasting persistent symptoms. Further research on a larger sample is warranted.

Keywords:

respiratory function test, spirometry, COVID-19



PROPERTIES OF SELECTED ACTIVE SUBSTANCES OF PLANT ORIGIN FOUND IN COSMETICS

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A few words about the author(s):

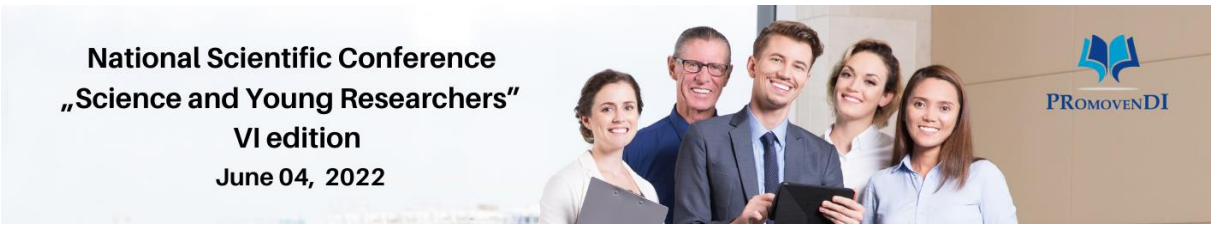
Chemistry student with a specialization of Pharmaceutical and cosmetics chemistry.

Abstract:

Plants have been used in hygiene and beautifying the body for centuries and to this day natural cosmetics are continuously increasing in popularity. Active ingredients of plant origin are used in different types of cosmetics (skin and hair care, decorative cosmetics and cosmeceuticals) and are separated from the raw material in the form of either pure compounds or extracts. Plant ingredients have a wide range of applications, having moisturizing, protecting, soothing, anti-aging, antioxidating and medical properties. Fragrant components, ingredients that improve the stability of other substances in the product or compounds of base formulations are also used. Plant compounds also have a high potential in protection of the skin from sun exposure, since many studies have shown their ability to absorb UV radiation and neutralize reactive oxygen species from both exogenous and endogenous sources.

Keywords:

phytocosmetology, active plant ingredients, plant extracts, antioxidants, photoprotection



THE ROLE OF HHV-1-INDUCED NEUROINFLAMMATION IN THE DEVELOPMENT OF NEURODEGENERATIVE PROCESSES

Magdalena Patrycy*, Małgorzata Krzyżowska

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Magdalena Patrycy – Master of University of Warsaw. Employee of WIHE. Małgorzata Krzyżowska – Post-doctoral degree in medical fields. Associate professor in Military Institute of Hygiene and Epidemiology in Warsaw. Manager of NCN research projects.

Abstract:

Introduction
Dementia diseases (such as Alzheimer's disease) are a growing problem of aging populations in Europe and worldwide. The AD pathogen hypothesis states that pathogens act as triggers, interacting with genetic factors to initiate neurodegenerative processes in the brain. Herpes simplex virus (HSV-1), which mainly causes infections of the mouth, throat, face, and eyes, enters the brain during immune system suppression and establishes a latency state there, particularly later in life. Investigating the role of microglia activity and the ways of their regulation/inhibition is perfectly in line with the search for new diagnostic (inflammatory markers) as well as therapeutic tools.

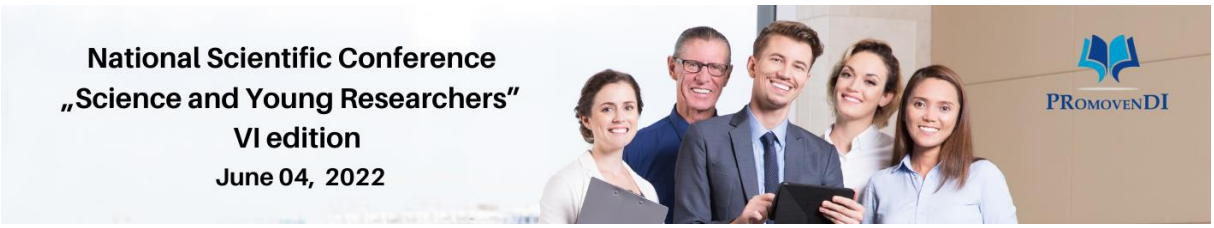
Materials and methods
The project uses two models: (i) an in vitro model of neuroglial cultures and (ii) a mouse model of HSV-1 infection with a highly virulent strain causing encephalitis in humans. The presence of neurodegenerative processes is tested both during primary infection (up to 8 days) and in latently infected mice.

Results and conclusions
The results showed microglia and infiltrating inflammatory monocytes are the source of inflammation in HSV-1-infected neural tissue. After disappearance of the foci of infection, inflammation persists in the latency phase and it positively correlates with beta-amyloid protein deposition.

Funded by 2020/37/B/NZ6/03284.

Keywords:

neuroinflammation, HSV-1, neurodegeneration, nervous system



OBESTATIN INCREASES HEALING OF LINGUAL ULCERS IN ANIMAL MODEL

Agnieszka Ewa Stempniewicz (1)*, Piotr Ceranowicz (1), Wojciech Macyk (2), Jakub Cieszkowski (1), Beata Kuśnierz-Cabała (3), Katarzyna Gałązka (4), Zygmunt Warzecha (1)

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A few words about the author(s):

Agnieszka Stempniewicz is a PhD student at the Jagiellonian University Medical College. The purpose of her study is the influence of obestatin on oral ulcers in rat model.

Abstract:

Obestatin is a human peptide primary linked to the regulation of appetite, but recently known from its anti-inflammatory and protective effect in gastrointestinal mucosa injuries in animal model.

The aim of the study was to investigate if administration of obestatin alleviates the severity of lingual ulcers in rats. Lingual ulcers were evoked by acetic acid and animals were treated intraperitoneally twice a day with saline or obestatin (4, 8, or 16 nmol/kg/dose) for 6 days. Following parameters were examined: mucosal blood flow and mucosal pro-inflammatory IL-1β level. Obestatin given at the dose of 8 or 16 nmol/kg caused the strongest and similar therapeutic effect, whereas the effect of the dose of 4 nmol/kg was limited. This effect corresponded with a significant improvement in mucosal blood flow, as well as drop in IL-1β mucosal concentration was recorded. Treatment with obestatin increases healing of lingual ulcers in animal model. It is a promising factor in oral mucosal inflammation and requires further research.

Agnieszka Stempniewicz acknowledges the support of InterDokMed project no. POWR.03.02.00-00-I013/16

Keywords:

obestatin, oral mucositis, oral ulcers

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