

National Scientific Conference

NAUKA BADANIA ROZWÓJ

II edition

October 27, 2018 - Warsaw



National Scientific Conference

„Nauka Badania Rozwój”

II edition

The Book of Abstracts

Warsaw, October 27, 2018

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Promovendi Foundation

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CONFERENCE INFORMATION

The National Scientific Conference „Nauka Badania Rozwój” is organized especially for you.

The Conference has an interdisciplinary character, is addressed to young scientists, starting with first and second degree students, through Ph.D. students, to people who have obtained a doctoral promotion in the last 3 years.

Our initiative aims to create opportunities for exchange of experiences and good scientific practices by representatives of the scientific community. Additionally, it aims to underline the important role of young researchers in the development of Polish science.

In the Conference, two types of participation are possible: passive or active, with active participation giving the opportunity to choose an oral presentation or poster. The conference materials will be published in the form of the Book of Abstracts and Book of Conference Articles with assigned ISBN numbers.

Scientific part of the Conference is supervised by Scientific Committee which contains of doctors and independent research workers from various Polish and foreign universities and industry representatives.

CONFERENCE PLACE

The Golden Floor Plaza Conference Center is a Warsaw business and conference complex located at Aleje Jerozolimskie 123a. The location of the object provides convenient approach from all parts of Warsaw and from all parts of Poland due to the close location of the Central Railway Station and the Warsaw Ochota Station.

The Center consists of many modern conference rooms that provide the highest requirements for workshop, conference and symposia organizers.



CONFERENCE SCHEDULE

**Conference Center “GOLDEN FLOOR PLAZA”
 123a al. Jerozolimskie, Warsaw
 October 27, 2018 (Saturday)**

08:00 – 15:00	Registration	
09:00 – 09:20	Opening of the Conference	
09:30 – 11:30	Poster Session	
P-01	Biel Damian	FEM AND TLS IN DEFORMATION ANALYSIS OF MINING INFRASTRUCTURE - STATE OF THE ART
P-02	Biernat Szymon	MEASUREMENTS IN THE DECOPPERISATION PROCESS
P-03	Horodecka Katarzyna	GOLD NANOPARTICLES AS POTENTIAL NANOCARRIERS IN GENE THERAPY AGAINST HIV
P-04	Janczura Adriana, Nowicka Joanna	ANTIMICROBIAL ACTIVITY OF SELECTED LIPOPEPTIDES
P-05	Karlak Anna	MONITORING OF THE BEMOWSKI FOREST IN THE ASPECT OF THE NEIGHBORHOOD OF THE RUBBISH DUMP IN RADIOWO
P-06	Karpowicz Magdalena	HOW TO EFFICIENTLY STORE HYDROGEN?
P-07	Krysa Mikołaj	THE EFFECTS OF RHIZOBIAL NOD FACTORS ON THE GROWTH OF PEA (PISUM SATIVUM L. CV. BATUTA) AND VETCH (VICIA SATIVA L. CV. GRETA)
P-08	Kuzan Aleksandra	GLYCATION OF HISTONES IN THE CONTEXT OF ATHEROSCLEROSIS
P-09	Kuzan Aleksandra	RELATIONSHIP BETWEEN AGE AND SCAVENGER RECEPTORS CONTENT IN THE WALLS OF BLOOD VESSELS
P-10	Lisiak-Teodorczyk Karolina	IDENTIFYING THE POINT MUTATIONS OF THE DMD GENE IN POLISH PATIENTS
P-11	Łukasiewicz Justyna	ATTEMPTS TO CONTROL STRUCTURAL CHANGES IN THE Ti6Al4V ALLOY
P-12	Mikołajczyk Klaudia	THE INFLUENCE OF ANTIOXIDANT VITAMINS ON TUMORS OF VARIOUS HISTOLOGICAL MALIGNANCY GRADE
P-13	Rogoza Magdalena	DOG'S WELFARE IN AAI - OUR ETHICAL AND MORAL RESPONSIBILITY
P-14	Rzeszot Janina	ASSESSMENT OF THE KNOWLEDGE OF OBESE PEOPLE, ABOUT THE PROPER NUTRITION AND BENEFITS OF PHYSICAL ACTIVITY
P-15	Strzelczyk Rafał, Kluczny Robert	COMPARISON OF NATURAL VIBRATIONS FREQUENCIES OF ALUMINIUM AND COMPOSITE PANELLING OF A FIRE-FIGHTING VEHICLE BODY
P-16	Wielgórska Katarzyna	CAMERA TRAPS AS A TOOL IN MONITORING OF ANIMAL POPULATION
P-17	Zielińska Wioletta	THE LIMITING EFFECT OF NIACINAMIDE ON CHANGES INDUCED BY UV RADIATION IN HUMAN MELANOMA CELL LINE
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11:45 – 13:15	Workshop “Design thinking w pigulce”	
13:15 – 14:00	Dinner	
	Plenary Session	
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14:10 – 14:20	Zakrzyk Maja	THE EFFECT OF OXYGEN ON THE PHOTOSTABILITY OF METALLOPHTHALOCYANINES IN DMF

14:20 – 14:30	Kocot Karina	APPLICATION OF MODIFIED TITANIUM DIOXIDE PHOTOCATALYSTS IN WASTEWATER TREATMENT
14:30 – 14:40	Kocot Karina	HYBRID CATALYSTS IN PHOTOCATALYTIC OXIDATION OF 2-METHOXYPHENOL IN WATER
14:40 – 14:50	Biel Damian	AN ATTEMPT OF VERIFYING THE CAUSES OF HEADGEAR DEFORMATION USING TLS AND FEM
14:50 – 15:00	Malec Mirosław	A SELECTIVE REVIEW OF MEDICAL CANNABIS IN CANCER PAIN TREATMENT
15:00 – 15:10	Wyborski Piotr	ACTIVE AND PASSIVE PRESSURE IN THE ASHES UNDER THE CLIMATE INFLUENCE
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15:20 – 15:30	Leszczyński Kacper	DESIGNED AND ACTUAL FRAME GEOMETRY COMPARISON OF ELECTRIC MOTORCYCLE LEM THUNDER
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15:40 – 15:50	Stabła Paweł	COMPARATIVE ANALYSIS OF THE MOTORCYCLE SUBFRAME MADE OF COMPOSITE MATERIALS
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16:50 – 17:00	Siofer Jerzy	MAKING THE TROLLEY FOR SUFFING - ASPECTS OF RESEARCH AND DEVELOPMENT
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17:20 – 17:30	Madaj Rafał	BIODEGRADATION OF 3,5-DINITROSALICYLIC ACID USING VARIOUS WASTE MATERIALS
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17:40 – 17:50	Laszczkowska Zuzanna	ALEXANDER TECHNIQUE - FRAMEWORK, RESEARCH, APPLICATION
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18:10 – 18:20	Domańska Agnieszka	COOPERATION BETWEEN START-UP COMPANIES AND UNIVERSITIES IN POLAND AS AN EXAMPLE OF THE SCIENCE-BUSINESS COOPERATION. OUTLINE OF THE STUDY
18:20 – 18:30	Solarczyk Paweł	BIODYNAMIC AGRICULTURE AS A PRODUCTION SYSTEM PREDISPOSING TO OBTAIN MILK CHARACTERIZED BY A HIGH ANTIOXIDANT CAPACITY
18:30 – 18:40	Solarczyk Paweł	COMPARISON OF THE QUALITY OF COLOSTRUM DERIVED FROM INDIGENOUS CATTLE BREEDS: POLISH HOLSTEIN-FRIESIAN, POLISH RED, POLISH LOWLAND BLACK-AND-WHITE FARMED EXTENSIVE SYSTEM
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POSTER SESSION

FEM AND TLS IN DEFORMATION ANALYSIS OF MINING INFRASTRUCTURE - STATE OF THE ART

Damian Biel

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Faculty of Mining Surveying and Environmental Engineering,
Department of Mining Areas Protection, Geoinformatic and Mining Surveying*

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A few words about the author:

I am a PhD Student at AGH University of Science and Technology. My area of interests are Mining Surveying, especially construction deformation analysis, Terrestrial Laser Scanning and Finite Element Method.

Abstract:

The Finite Element Method (FEM) is widely used in civil engineering – both academic and industrial researches. It allows to analyse the construction stability, basing on 3D model created from technical project geometry. On the other hand, there is Terrestrial Laser Scanning (TLS), that provides data describing the real shape of an object. In contrast to classic surveying it takes less time and makes very detailed 3d modelling possible. The synergy of both allows to analyse not only the current state of construction's deformation and its origins, but also to foresee the upcoming changes by manipulating the initial and boundary conditions. The poster analyses the current state of the art and tries to determine the direction, in which the further research should be developed.

Keywords:

TLS, FEM, Research, Review, Synergy

MEASUREMENTS IN THE DECOPPERISATION PROCESS

**Adam W. Bydalek (1, 2)*, Szymon Biernat (2) , Grzegorz Boczkał (3),
Piotra Migas (4), Maciej Wędrychowicz (1)**

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A few words about the authors:

We are an interdisciplinary team. It consists of metallurgists, specialists in the field of material engineering and computer science. We conduct research in the field of copper metallurgy and casting of non-ferrous metals.

Abstract:

The article presents selected issues relating to measurements in copper metallurgy, especially in the decoppering process. The study does not show all research methods, but is considered the most important on the way to the knowledge of the effects of coagulation of the metallic phase in the liquid slag. Attention is paid to the effect of copper sedimentation in the slag and the method of its measurement, selected effects of structural analysis were shown. The very important effect of segregation of eutectics in the Cu - O system and the measurement methods was indicated. Authorized database allowing archiving of measurement data was indicated. The presented measurement results are only a fragment of extensive research, which allowed to determine the mechanism of copper separation during the process of decoppering slags.

Keywords:

slag, copper, measurements

GOLD NANOPARTICLES AS POTENTIAL NANOCARRIERS IN GENE THERAPY AGAINST HIV

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A few words about the author:

I am a student in my final year of Master studies in medical biotechnology, I have a B.Sc. in biotechnology. I recieved a student research grant founded by University of Lodz.

Abstract:

Gold nanoparticles stabilized with carbosilane dendrons were studied as potential nanocarriers of short nucleic acids in gene therapy against HIV. Positively charged gold nanoparticles interact with negatively charged antisense oligonucleotides (ODNs) to form nanocomplexes. The complexation will enable to reduce therapeutic doses, and thus diminish side effects. In addition, gold nanoparticles can protect ODNs against enzymatic degradation, which restricts the effectiveness of the drug. The research aimed at selecting the molar ratios of AuNP/ODNs optimal for further research by the methods of fluorescence polarization, zeta potential and electrophoresis.

Keywords:

nanomedicine, gene therapy, biophysics

ANTIMICROBIAL ACTIVITY OF SELECTED LIPOPEPTIDES

**Adriana Janczura (1)*, Joanna Nowicka (1), Magdalena Pajczkowska (1),
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A few words about the author:

I am an assistant at the Chair and Department of Microbiology of Wrocław Medical University. My research is focused around the activity of antimicrobial peptides. I teach students of the medical and dentistry departments.

Abstract:

Biomaterial-associated infections (BAI) caused by coagulase-negative staphylococci (CNS) occur relatively frequently and the relevant therapeutic strategies including antibiotic therapy or surgery are not always effective. There is a pressing need for new compounds to support traditional treatment. Antimicrobial lipopeptides (AMLPS) seem to be an interesting alternative in the treatment of the above infections. They are class of synthetic compounds whose structure is based on the architecture of antimicrobial peptides (AMPs) naturally occurring in humans and in other eukaryotic organisms.

The aim of the present study was to assess the antimicrobial activity of two lipopeptides Pal-KKKK-NH₂ and Pal-CKKKC-NH₂ against CNS strains isolated from biomaterial-associated infections.

The microdilution method using microtiter plates was used to determine the minimum inhibitory concentration (MIC) of the peptides against planktonic cultures in medium and against 24 h biofilm culture.

For the 10 tested strains, MIC values for the planktonic culture varied from 1 to 8 µg/ml, and for the biofilm culture between 8 and 32 µg/ml.

Both lipopeptides were active against the analysed strains, both in the planktonic and biofilm culture. Differences were observed in the MIC values of the analysed compounds. They were higher for biofilm-forming bacteria, which may be due to the difficulty in the penetration of antimicrobial compounds through the dense biofilm structure.

Keywords:

antimicrobial lipopeptides, coagulase-negative staphylococci, biomaterial-associated infection

MONITORING OF THE BEMOWSKI FOREST IN THE ASPECT OF THE NEIGHBORHOOD OF THE RUBBISH DUMP IN RADIOWO

**Beata Grzegorzółka (1, 2), Katarzyna Wielgórska (1), Magdalena Rogoza (1),
Anna Karlak (2)*, Katarzyna Bagińska (2), Julia Kaźmierska (2),
Joanna Gruszczyńska (1), Dominika Musiał (2)**

Warsaw University of Life Sciences - SGGW:

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(2) Scientific Association of Experimental and Laboratory Animals

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A few words about the author:

I study breeding and protection of accompanying and wild animals. My main interest in the field of study is molecular genetics, but I also explore the knowledge of animal monitoring.

Abstract:

Since a couple of years ago, close to the Bemowski Forest, there is a composting building and a rubbish dump, which is the reason for the stench that is given out in this place. In July of 2018, on the area of the Bemowski Forest some observations have been carried out to check the presence of the animals as well as to identify what species reside there. The monitoring has consisted in putting six phototraps in the north part of the forest that were recording 10-15 seconds films, as well as in looking for any tracks or evidence of the animals. The observed species were: elk, wild boar, red deer, roe deer, marten and badger. Additionally, it has also been noticed the worrying amount of the rubbish that people leave or the birds carry from the rubbish dump and drop in the forest.

Supported by „ŻYWIEC-ZDRÓJ” S.A., grant competition „Inicjatywy Po Stronie Natury Edycja 2018”

Keywords:

forest, monitoring, rubbish dump, wild animals

HOW TO EFFICIENTLY STORE HYDROGEN?

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A few words about the author:

I am PhD student from Military University of Technology in Warsaw - department of New Technology and Chemistry. My faculty is material engineering. Currently I am working with the storage of hydrogen in solid phase.

Abstract:

There are many methods and technologies for effective hydrogen storage. For over 30 years these techniques have been constantly developed, modernized and improved. Hydrogen is currently one of the alternative energy sources, therefore, the aspect of its correct, safe and effective storage is very important. Hydrogen can be stored in three main ways: in gaseous, liquid and solid state. These methods differ from each other in many respects (pressure, temperature, size and quality of tanks). But which technique is the safest and the most effective? This work answers this question.

Keywords:

Hydrogen storage, solid phase, magnesium hydrides

THE EFFECTS OF RHIZOBIAL NOD FACTORS ON THE GROWTH OF PEA (*PISUM SATIVUM* L. CV. BATUTA) AND VETCH (*VICIA SATIVA* L. CV. GRETA)

**Mikołaj Krysa (1)*, Dominika Kidaj (1), Iwona Komaniecka (1), Jerzy Wielbo (1),
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A few words about the author:

I am a student of Biotechnology on University of Maria Curie-Skłodowska. I am interested in neurobiology, human health and technology.

Abstract:

Leguminous plants have the ability to establish symbiosis with bacteria belonging to the genus *Rhizobium*. Rhizobia reduce atmospheric nitrogen to ammonia, distribute it to plant hosts and promote their growth. The first step of interaction requires specific plant flavonoids, that induce the synthesis of bacterial signal molecules, called Nod factors (LCOs). Biofertilizers containing rhizobial Nod factors can accelerate the process of establishing the symbiosis and improve growth and nodulation of leguminous plants.

Logarithmic cultures of *R. leguminosarum* bv. *viciae* (RvGR09) were induced with naringenin and incubated. The bacteria were removed and the liquid phase was condensed and extracted twice with n-butanol. Sterile seeds of pea (*Pisum sativum* L. cv. Batuta) and vetch (*Vicia sativa* L. cv. Greta) were soaked in serially diluted LCO solution (from 10⁻³ to 10⁻⁶) for 30 min. Seeds were sown into pots. The experiment was carried out in 2018 in a greenhouse of the Faculty of Biology and Biotechnology in Lublin. After 14, 21 and 42 days of growth, plants were harvested and fresh and dry mass of shoots and roots were estimated.

Seed treatment with biofertilizer, produced by RvGR09, significantly stimulated the growth of vegetative organs in pea and vetch plants. The effect of the treatment were most noticeable after 42 days of growth. The highest fresh and dry mass of shoots and roots was obtained after application on seeds Nod Factor solution diluted from 10⁻³ to 10⁻⁴.

Keywords:

biofertilizers, Nod factors, *Rhizobium*, pea, vetch

GLYCATION OF HISTONES IN THE CONTEXT OF ATHEROSCLEROSIS

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A few words about the author:

I work at the Department of Medical Biochemistry in Wrocław Medical University as an adjunct. My doctoral thesis concerned with patomechanism of atherosclerosis. The results presented at the conference are a continuation of the research.

Abstract:

Glycation it is a nonenzymatic process in which reducing sugars react with the free amino groups of amino acids, proteins, lipoproteins, and nucleic acids.

It is postulated that histones might be prone to glycating agents, what would disturb their function, which is mainly epigenetic regulation of gene expression due the packaging of chromatin.

It was proved that pentosidine and AGEs is created on base of histones. These processes were most often described in the context of diabetes or cancer. Our goal was to investigate the issue in the context of atherosclerosis. The research hypothesis was that glycation of histones in the arterial wall is associated with accelerated atherogenesis.

The research material was aortic sections, the applied techniques were immunohistochemical method using ABC system and fluorescent markers.

It was observed that glycation products are located on the entire surface of the vessel wall. They concentrate in atherosclerotic plaques, particularly in the areas of macrophage infiltration. They also co-localize with extracellular matrix proteins. However, no co-localization of AGE with DAPI or areas labeled with the anti-histone H1 and anti-histone H2A was observed. It is concluded that in the walls of blood vessels the main proteins undergoing glycation are collagen, elastin and other matrix proteins, histones to a much lesser degree, unnoticeable using immunohistochemical techniques.

Keywords:

histones, glycation, atherosclerosis, immunohistochemical reaction

RELATIONSHIP BETWEEN AGE AND SCAVENGER RECEPTORS CONTENT IN THE WALLS OF BLOOD VESSELS

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I work at the Department of Medical Biochemistry in Wrocław Medical University as an adjunct. My doctoral thesis concerned with pathomechanism of atherosclerosis. The results presented at the conference are a continuation of the research.

Abstract:

As a result of glycation advanced glycation end products (AGEs) are formed that bind to the appropriate receptors (e.g., RAGE receptors, scavenger receptors, SR), galectin 3, lactoferrin and others) on the surface of many cells. This analysis concerns the SR-A and SR-BI scavenger receptors that function as AGE receptors, but also as receptors for high density (HDL) and low density (LDL) lipoproteins. Most likely, scavenger receptors are necessary for binding AGE-specific ligands and their degradation.

The studies were carried out on aortic sections using immunohistochemistry, immunoenzymatic ELISA and spectrofluorimetric methods.

Our observations show that the main places of SRA and SRBI expression are macrophages but certain amount of antigen is also present on some epithelial cells and fibroblasts. Concentration of antigens is observed in the atherosclerotic plaque, but the antigen also appears pointwise in the adventitia and on the edge of the lipid core.

The content of SR-A correlates with total AGE ($r = -0.3232$, $p = 0.025$), total pentosidine ($r = -0.3922$, $p = 0.0058$) and soluble pentosidine ($r = -0.4522$, $p = 0.0014$), but it is not correlated with AGE bound to proteins or with total soluble AGE.

The present study indicates a significant association between glycation and the class A scavenger receptor. It is planned to extend the study with further AGE receptors and to explore the influence of these receptors on atherogenesis.

Keywords:

glycation, atherosclerosis, scavenging receptors

IDENTIFYING THE POINT MUTATIONS OF THE DMD GENE IN POLISH PATIENTS

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A few words about the author:

young scientist, laboratory diagnostician

Abstract:

Duchenne muscular dystrophy (DMD) is a lethal X-linked recessive disease, caused by mutations within the dystrophin gene (DMD gene) and affect 1/3500 newborn males. The DMD gene is the largest human gene spanning approximately 2,5 Mbp and consisting of 79 exons. The protein product of this gene is dystrophin, which takes part in muscle cramp mechanism, stabilises cellular membrane and is a structural component in cells other than muscle cells. In approximately 60% of DMD patients, deletions of one or more exons are detected. Duplications cause about 6% of DMD cases. The remaining one-third of affected individuals has nucleotide substitutions or microlesions. Both deletions and duplications are clustered in two regions of the DMD gene, while point mutations are randomly distributed across the gene, and that why constitutes the serious diagnostic problem. We aimed to develop effective and non-invasive genetic tests identifying the point mutations in exons situated in the central part of the DMD gene. Here we report results of Sanger sequencing analysis of point mutations located in exon 37: c.5234G>A [p.(Arg1745His)], c.5209C>T [p.(Gln1737*)] and in exon 48 c.6943G>T [p.(Glu2315*)] c.7016A>C [p.(His2339Pro)]. The developed test may be an extension of the DMD molecular diagnostics tests used so far.

Project co-financed by the European Union from the European Regional Development Fund Subsidies for innovations - We invest in your future

Keywords:

Duchenne muscular dystrophy, DMD, point mutations, sequencing

ATTEMPTS TO CONTROL STRUCTURAL CHANGES IN THE Ti6Al4V ALLOY

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A few words about the author:

Justyna Łukasiewicz - PhD student of material engineering at the Military University of Technology. Interests: biomaterials – in particular titanium alloys and LENS technique.

Abstract:

LENS (eng. Laser Engineered Net Shaping) technology belongs to the family of incremental techniques. In the research, it is used for the production of Ti6Al4V alloy layers on a substrate made of native material. Due to the high cooling rate after the process, the material is characterized by a monophasic martensitic structure despite the use of a two-phase material.

The paper attempts were made to control the structural transformations of the Ti6Al4V alloy using post-process heat treatment, subjecting the elements to a static tensile test at 900°C and performing the registration of temperature changes in the substrate on which the detail is built. From the results it is noted that the additional heat treatment generates the formation of lamellar structure of a two-phase titanium alloy, whereas plastic processing generates the formation of a globular structure. From the information obtained during the experiment it can be concluded that the fastest increase effect of the measured value was observed for the sensors closest to the place of beam operation. The temperature stabilization in the whole volume of the substrate, after disconnecting the heat source after about 3 minutes.

The obtained information will be used for further research based on controlled transformations of Ti6Al4V alloy structure.

Keywords:

titanium alloys, additive manufacturing, LENS technology, heat treatment of titanium alloys

THE INFLUENCE OF ANTIOXIDANT VITAMINS ON TUMORS OF VARIOUS HISTOLOGICAL MALIGNANCY GRADE

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A few words about the author:

I am a student of the fifth year of Biotechnology. I am interested in issues in the field of oncology, in particular innovations in this field. My interest is also aroused by the use of natural compounds and vitamins in anticancer therapies.

Abstract:

Background: Antioxidants are compounds that have the ability to eliminate free radicals from the body. Antioxidative compounds include among others flavonoids, carotenoids and vitamins. The most interesting group of these compounds are vitamins. Vitamins activity include inhibition of cell proliferation, stimulation of apoptosis, inhibition of angiogenesis, growth of metalloproteinases in the extracellular matrix and strengthening of the immune system by increasing the activity of NK cells and T and B lymphocytes. All the mentioned features of vitamins may indicate their anti-cancer properties.

Aim: The study summarizes current knowledge about the potential role of antioxidant vitamins as compounds with anticancer properties. Antioxidants compounds supplementation in tumors of varying degrees of progression was taken into account.

Materials and Methods: The work was prepared based on the analysis of publicly available data. The information contained in the work comes from the resources of the National Library of Medicine and current articles in the field of medical and chemical sciences. The NCBI PubMed database has been searched for research on antioxidant vitamins and their involvement in cancer-related cellular processes.

Conclusion: Antioxidative vitamins have been increasingly recognized as compounds that can inhibit the process of carcinogenesis by using monotherapy or associating them with cytostatics, which aims to strengthen anti-cancer activity.

Keywords:

anti-cancer activity, antioxidants, vitamins

DOG'S WELFARE IN AAI - OUR ETHICAL AND MORAL RESPONSIBILITY

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A few words about the author:

My scientific interests concern animal welfare and their behavior, especially dogs. I am also interested in the use of molecular biology methods in studying the genetic variability of dogs of different breeds. In my spare time I like watching movies.

Abstract:

Animal Assisted Intervention (AAI), otherwise known in Poland as kynotherapy, has been present in the world for over a century, and in Poland for 31 years. The benefits of AAI for humans have been mentioned in numerous scientific publications, while human influence on the dog working in AAI has been a neglected topic. It is worth noting that in some countries, including Poland, there are no legal regulations specifying the qualifications and preparation of dog handlers and dogs for work. Based on the available research results and data from scientific literature, the human impact on the dog during AAI classes was analyzed and described. The actual knowledge of dog guides on the subject of calming signals (CS) sent during the AAI classes was also presented. In addition, a procedure for preparing a human-dog team to work in AAI was proposed. It has been shown that there are some discrepancies in the conducted studies on human impact on the dog during AAI classes. In addition, it has been proven that there is a clear need to standardize training for future dog guides due to huge discrepancy of knowledge gained while preparing to work in AAI. It is necessary to create legal regulations related to the profession of a kynotherapist, because the unregulated legal status of a dog working in AAI leads to serious neglect of the dog's welfare during AAI classes.

Keywords:

welfare, Animal Assisted Intervention, calming signals

ASSESSMENT OF THE KNOWLEDGE OF OBESE PEOPLE, ABOUT THE PROPER NUTRITION AND BENEFITS OF PHYSICAL ACTIVITY

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A few words about the author:

In Poland, 61 percent of men and 50 percent of woman suffer from overweight and obesity.

Abstract:

The aim of the study was to examine the knowledge of obese people about the proper nutrition and the impact of physical activity on the fight against obesity.

The research material was collected among patients of the Clinic of Proper Nourishing and Weight Loss in Zwoleń and among parttime students who constituted a group of 30 respondents. Due to the nature of the work, the method of the diagnostic survey was used, the survey technique was used, for which the original questionnaire was created.

The analyses show that 95% of respondents are overweight, 4% of them are obese and 1% suffer from pathological obesity. Among the studied group very low knowledge about proper nutrition was observed, which results in permanent obesity. The conclusions drawn from the conducted studies show that the influence of nutritional habits is important in maintaining a healthy body mass, and the observed low physical activity among the respondents contributes to the lack of effects of the therapy.

Keywords:

overweight, obesity, proper nutrition, physical activity, therapy

COMPARISON OF NATURAL VIBRATIONS FREQUENCIES OF ALUMINIUM AND COMPOSITE PANELLING OF A FIRE-FIGHTING VEHICLE BODY

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Mechanical design engineer in Wawrzaszek Special Vehicles Engineering. Commenced third degree (PhD) studies in the field of technical sciences at Faculty of Mechanical Engineering and Computer Science at the University of Bielsko-Biala.

Abstract:

The work presents the application of the finite element method in terms of complex construction of special vehicles. In particular, focus was set on the use of thin composite structures as the main elements of a body panelling of special vehicles bodies in terms of stiffness and its natural frequency. Numerical models of composite materials were developed with the PPFA (Progressive Ply Failure Analysis) based on data obtained experimentally. The analysis used a solution of seeking harmonic vibrations based on the modal method, in response to a force caused by vibrations of the truck engine. The results obtained with FEM calculations indicate that special vehicle body with composite panelling has better vibration characteristics than the body with aluminium panelling. Obtained excitation frequencies are higher than forcing frequencies, which reduces the risk of resonance and has a beneficial effect on the acoustic values of the truck body.

Keywords:

FEM, hybrid, composite, natural vibrations, truck body

CAMERA TRAPS AS A TOOL IN MONITORING OF ANIMAL POPULATION

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A few words about the author:

My name is Katarzyna and I'm a PhD student at Warsaw University of Life Science. My interests are focused on the subject of large carnivores (especially wolves and bears) and monitoring of animal population.

Abstract:

Nowadays, the development of technology enables a modified methods of research into the monitoring of animal population, for example by tracking individuals through the use of telemetry. However, this type of surveys, in addition to accuracy, are also characterized by high invasiveness. By using tools like camera traps, it is possible to investigate the approximate population size of a specie in a study area in a non-invasive manner. Furthermore, camera traps allow observation of animals in their natural environment, with minimization of the anthropogenic factor, as the human presence is kept to a minimum. This method also enables the storage of collected data and reliable analysis of recordings, thanks to which the observed behaviors can be accurately described. Camera traps, by collecting the data about occurrence, approximate numbers and distribution of animals, can also be a perfect complement to an environmental monitoring, by confirming data obtained with other methods (tracking, fields observation, genetic monitoring). As a tool, camera traps are especially useful in research of species that are difficult to observe or catch or found in small densities.

Keywords:

camera traps, population monitoring, tracking, environmental monitoring

THE LIMITING EFFECT OF NIACINAMIDE ON CHANGES INDUCED BY UV RADIATION IN HUMAN MELANOMA CELL LINE

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A few words about the author:

I graduated from biotechnology and since then I have been an employee of Histology and Embryology Department of Collegium Medicum in Bydgoszcz.

Abstract:

Excessive exposure to UVA and UVB radiation is associated with damage to the cells structure and their genetic material. In humans this may lead to cancerous changes, especially within the skin. In the case of melanomas, inflammation associated with UV action is not only an initiator but also promoting factor of metastasis and angiogenesis. However, there are methods to protect against the harmful effects of UV radiation. One of them is the use of niacinamide, which in the case of cell line of normal hamster fibroblast turned out to significantly reduce changes induced by UV.

The human melanoma cells were treated with UV radiation, niacinamide or the combinations of both factors. The methods used include analysis of cell death and cell cycle (flow cytometer). The levels and recombinations of the main cellular proteins were visualized using fluorescence staining or western blot analysis. Moreover, the melanoma cells aggressiveness was evaluated by invasion assay.

The obtained results suggest the possibility of niacinamide usage in the aim to prevent negative impact of UV radiation. The compound used stabilizes the structure of the main cytoskeletal proteins and prevents increase of metastatic potential of melanoma cells.

Our results confirmed the negative effect of UV radiation on human melanoma cell line. Furthermore, niacinamide is able to limit changes induced by the factor. Moreover, the mechanism of action may be related to the stabilization of the cell cytoskeleton.

Keywords:

Melanoma, UV radiation, niacinamide, cytoskeleton

PLENARY SESSION

THE INFLUENCE OF SELECTED ELECTRON ACCEPTORS ON THE PHOTOSTABILITY OF PHTHALOCYANINE COMPLEXES WITH LANTHANIDES

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A few words about the author:

I am a PhD student at the chemistry department at Opole University. My scientific interests are physicochemistry of phthalocyanines and the interaction of metallophthalocyanines with electron acceptors

Abstract:

Phthalocyanines are synthetic analogs of the porphyrins. The sandwich complexes of phthalocyanine with the lanthanide metals, LnPc2 (Ln = lanthanide 3+ ion, Pc = C₃₃H₁₆N₈ phthalocyanine ligand), represent a group of especially interesting derivatives. These compounds are known for their high thermal resistance, semiconducting properties and in particular for their strong absorption of light from the UV-Vis range.

The photostability of europium and ytterbium phthalocyanine (sandwich structure and mono) was determined in dimethylformamide (DMF) under exposure to UV irradiation ($\lambda = 366$ nm). The influence of the electron acceptors, H⁺ and BF₃, on the stability of these phthalocyanine complexes was examined in DMF. The molecular system of the phthalocyanine macrocycle proved to be sensitive to the applied species. For instance, interaction with either of these acceptors with the sandwich LnPc2 complexes resulted in distinct color change of the explored solution from the initial blue into green. Studies have shown that the photostability of the YbPc2 complex is greater than that of EuPc2, which indicates for a stronger stabilizing effect of the Yb³⁺ ion on the phthalocyanine chromophore system than in the case of the Eu³⁺ one. The EuPcX and YbPcX complexes are much less stable than their sandwich counterparts, however, in this case, the more chemically stable and more resistant to UV radiation appeared the complex including the Yb³⁺ ion.

Keywords:

phthalocyanine, lanthanides, electron acceptor

THE EFFECT OF OXYGEN ON THE PHOTOSTABILITY OF METALLOPHthalOCYANINES IN DMF

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A few words about the author:

I am a PhD student at the chemistry department at Opole University. My scientific interests are physicochemistry of phthalocyanines and the interaction of metallophthalocyanines with electron acceptors

Abstract:

Phthalocyanines are synthetic structural analogues of the porphyrins. Its characteristic macrocycle contains a very stable, aromatic, chromophore system. These macrocyclic species offer a wide range of diverse molecular structures and hence versatile physicochemical properties. Particularly, metallophthalocyanines have been recognized for their excellent photochemical activity as well as relative high chemical and thermal stability. Therefore, these compounds have been considered good candidates as photosensitizers and/or photocatalysts in various chemical processes. The photostability of selected phthalocyanine complexes including Zn²⁺, Pb²⁺ and Yb³⁺ ions was examined in DMF solution. The photochemical process was carried out at 20°C (thermostated), under UV irradiation of 366 nm and irradiance I_{UV} = 500 μW/cm². Prior to photolysis, the solutions were saturated for 30 min with oxygen, whereas a reference probe was de-aerated using dry nitrogen.

It was found that the studied phthalocyanines while exposed to UV radiation undergo degradation, nevertheless their photostability apparently depended on the molecular structure of the complex. The most resistant one appeared the ytterbium sandwich complex, YbPc₂ (Pc = C₃₂H₁₆N₈, phthalocyanine ligand), while the least stable compound proved to be PbPc featuring a concave structure. It must be emphasized, that in the presence of oxygen the observed photolysis process was considerably accelerated.

Keywords:

phthalocyanine, photostability, oxygen

APPLICATION OF MODIFIED TITANIUM DIOXIDE PHOTOCATALYSTS IN WASTEWATER TREATMENT

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A few words about the author:

I am a PhD student at the Faculty of Chemistry at the University of Opole. My scientific interests are photocatalysis, mainly catalysts used in purifying the aquatic environment.

Abstract:

Drinking water and groundwater pollution as well as wastewater treatment have become a still unsolved worldwide problem. During the last decades a new generation of catalysts has been developed, particularly dedicated to these issues. Titanium dioxide appeared a very promising semiconducting material, which proved effective as a photoactive component of diverse catalytic systems. A wide range of TiO₂ modifications meant to improve its photocatalytic performance have been proposed so far by using its various polymorphs, composites with metals and non-metals and polymer-coatings or impregnating it with dyes that effectively absorb sunlight.

Keywords:

titanium dioxide, photocatalysis, wastewater treatment

HYBRID CATALYSTS IN PHOTOCATALYTIC OXIDATION OF 2-METHOXYPHENOL IN WATER

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I am a PhD student at the Faculty of Chemistry at the University of Opole. My scientific interests are photocatalysis, mainly catalysts used in purifying the aquatic environment.

Abstract:

Along with the development of industry, contamination of natural water resources is a still increasing worldwide problem. One of the most dangerous chemical compounds are phenols, in particular 2-methoxyphenol. Photocatalytic degradation of such compounds has been considered a very promising idea to remove phenol derivatives from the water ambient. Titanium dioxide (TiO₂) is a photoactive semiconductor, and particularly its polymorphic form anatase has demonstrated excellent catalytic performance in photooxidation of phenols in an aquatic environment. In order to increase the efficiency of photodegradation, hybrid catalyst systems have been designed, namely TiO₂ impregnated with dyes. Metallophthalocyanines are considered one of the most efficient light scavengers to be applied in TiO₂@dye composites.

Photodegradation of 2-methoxyphenol in an aqueous solution using the following photocatalysts TiO₂, TiO₂@ZnPc, TiO₂@GdPc₂ and TiO₂@YbPc₂ was investigated. Photodegradation of 2-methoxyphenol was realized during a period of 300 min. Two relevant reaction stages had been identified, i.e. the creation of intermediate products and their consecutive mineralization. Without the use of the photocatalyst, only a slight and very slow progress of photodegradation was observed. Compared to the pure TiO₂, the use of TiO₂@LnPc₂ composites resulted in significant acceleration of the process rate, both the formation of intermediates and their following degradation.

Keywords:

2-methoxyphenol, titanium dioxide, photocatalysis

AN ATTEMPT OF VERIFYING THE CAUSES OF HEADGEAR DEFORMATION USING TLS AND FEM

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A few words about the author:

I am a PhD Student at AGH University of Science and Technology. My area of interests are Mining Surveying, especially construction deformation analysis, Terrestrial Laser Scanning and Finite Element Method.

Abstract:

Terrestrial Laser Scanning (TLS) is a popular method of determining the true shape of analysed construction, as it is faster than classic surveying and provides much more information. By 3D modelling it is possible to determine the objects' tilt and torsion, as well as elements' displacement. It allows to check the stability of a construction and if no disaster is to happen. However, as the construction is under permanent influence of environmental loads and mining activity, both dynamic changes and long-term deformation are observed. To carry out if the deformation is going to intensify, a proper theoretical model of a headgear, based on technical drafts, was prepared. An analysis using Finite Element Method (FEM) was conducted and shape changes were obtained. The comparison of theoretical (FEM) and real shape model (TLS) allowed to verify the origins of construction deformation and proposed the direction of further research.

Keywords:

FEM, TLS, Headgear, Deformation, Load

A SELECTIVE REVIEW OF MEDICAL CANNABIS IN CANCER PAIN TREATMENT

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Pharmacist, traveler. A graduate of the Faculty of Pharmacy at Poznan University of Medical Sciences. Currently PhD student at the Department of Clinical Pharmacy and Biopharmacy and the Department of Anaesthesiology and Intensive Pediatric Therapy.

Abstract:

Insufficient handling of chronic and neuropathic pain associated with cancer adversely affects the quality of life of the patient. Patients who do not respond well to opioid analgesics or suffer severe side effects from traditional painkillers need alternative therapeutic options. There is evidence to suggest that marijuana has the potential to deal with pain in this patient population effectively. This paper presents and summarizes a selective review of the literature published in the PubMed and Scopus databases in the years 1975 - 2017 assessing the impact of THC or CBD on cancer pain control. Five studies in which THC oil capsules, THC: CBD, THC: CBD salivary sprays or THC oral aerosols were evaluated revealed some evidence of reduced cancer pain associated with these therapies. Higher THC doses correlated with increased pain relief in some studies. Some of the side effects reported include drowsiness, hypotension, mental haziness, and nausea and vomiting. There is evidence to suggest that medical marijuana reduces chronic or neuropathic pain in patients with advanced cancer. However, many studies lacked statistical power, in some cases due to the limited number of subjects. Therefore, there is a need for further double-blind, placebo-controlled clinical trials with large sample sizes to determine the optimal dose and efficacy of different cannabis-based therapies.

Keywords:

Medical cannabis, cancer, pain, CBD, THC

ACTIVE AND PASSIVE PRESSURE IN THE ASHES UNDER THE CLIMATE INFLUENCE

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A few words about the author:

Civil Engineer, social activist. Interests: history, travel, sport.

Abstract:

In the homogeneous material of ground we were observed strong climate influence in its strength and mechanical parameters. Particularly clearly this phenomenon is visible in the case of ashes. They are occurring in large quantities and they are posing many threats for the stability of deep excavations. Frequent case when the water volume of infiltration or evaporation on at surface are caused important changes of saturation inside substrate. In this paper was indicated the method of extended analytical determination of earth pressure value. Authors presented computational cases for illustrating gains of earth pressure in comparison to the classical approach that did not take into account the influence of negative pore pressure in the ground. The basic concept of determining the effective suction in vertical profile was spotted and described. The impact on soil strength characteristics was measured and it was presented in often used practical aspects of unsaturated soil mechanics.

Keywords:

active earth pressure, passive earth pressure, ashes, suction profile, unsaturated soil

COMPARISON OF STRENGTH ASSESSMENT BETWEEN LEM MOTORCYCLE CHASSIS FRAMES USING FEM ANALYSIS

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A few words about the author:

Mgr inż. Piotr Konieczny - doktorant PWr, 4-letni członek Koła Naukowego Pojazdów i Robotów Mobilnych mający w swoim doświadczeniu udział przy projektach tworzenia Lekkich Elektrycznych Motocykli: MOS, LEM Napoli, LEM Bullet, LEM Falcon i LEM Thunder

Abstract:

Paper presents comparison of strength assessment between two motorcycle chassis frames of Students Association of Vehicles and Mobile Robots – LEM Falcon and LEM Thunder. The comparison was done using FEM software – Abaqus CAE, that include four different analyse cases: gravity, acceleration, braking and quadruple gravity. The reason of presented article was author desire to check and compare improvements in construction between frames. Paper also shows basic data of the two motorcycles, materials used in the two constructions and their thickness. Also there is presented methodology in preparation shell mode, discrete and calculation models, it's boundary conditions and loads for each frame.

Keywords:

Strength assessment, chassis frame, electric motorcycle, LEM, FEM

DESIGNED AND ACTUAL FRAME GEOMETRY COMPARISON OF ELECTRIC MOTORCYCLE LEM THUNDER

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A few words about the author:

I am PhD student in the Department of Maintenance and Operation of Logistics, Transportation and Hydraulic Systems at the Wrocław University of Science and Technology and member of scientific association where I design and build electric motorcycles.

Abstract:

The purpose of the lecture is to present the process of motorcycle frame creation and compare a designed structure to a real frame. It will cover issues such as:

1. How to design motorcycle frame?
2. What is Light Electric Motorcycle project?
3. How to make a motorcycle frame?
4. What is the way to check the geometry of the frame?
5. How to compare designed frame and actual frame?

Keywords:

frame, deviation, motorcycle, geometry

ELECTRIC MOTORCYCLE'S BATTERY CONSTRUCTION

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A few words about the author:

I am a PhD student of Wrocław University of Science and Technology, my fields of interest consist of tribologic properties of 3D printing materials and electric vehicles.

Abstract:

In this article there is presented construction of the battery dedicated for an off-road electric motorcycle. Nowadays with electric vehicles getting into all areas of life, battery construction is crucial for proper functioning of cars, motorcycles etc. This article presents construction solutions, identified errors and failures and proposes improvements for next models of this battery.

Keywords:

Battery, electromobility, construction, motorcycle,

COMPARATIVE ANALYSIS OF THE MOTORCYCLE SUBFRAME MADE OF COMPOSITE MATERIALS

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A few words about the author:

I am a beginning PhD student, who has been participating in Students Association building electric motorcycles.

Abstract:

In this paper a comparison of two motorcycle subframes made of different composite material layups is presented. The first sample is manufactured purely from the carbon and carbon-aramid wovens. The second sample contains additionally a foam core. The elements were tested on a strength machine in order to obtain the curve of force-displacement. Especially dedicated experimental equipment was constructed as well. The tests revealed that the proposed layup including the foam core does significantly decrease the durability of the subframe. Nonetheless, there is a great possibility to improvement, especially in the area of manufacturing the final element. The subframe comes from a prototype motorcycle, so the technology is on ideally optimized. A further work is going to be proceeded.

Keywords:

composite materials, electric motorcycle, motorcycle subframe, foam core

INTERACTIVE MAT FOR CHILDREN'S REHABILITATION

Ewelina Smółkowska (1), Paulina Gembara (1)*, Monika Osińska (2),
Bartłomiej Burlaga (1), Maciej Gorzkowski (1), Tomasz Merda

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A few words about the authors:

We are a group who realizing a project within Wojewodskie Innowacje Społeczne which is founded by the European Social Fundns. Our group consist of four students and two experts: physiotherapist and programmer.

Abstract:

This article describes the results of an accomplished project, which is implemented within the WINS. The aim of the study is to create a system, which supports rehabilitation of children with multiplicitous disabilities. The goal of the exercises is to improve self-efficacy, communication, motility, activisation of the sitting position and the visual fixation. It is particularly designed for people who suffer from cerebral palsy or autism. This is accomplished by an interactive mat for children's rehabilitation. The system consists of three projectors ,two of them create an image on the floor and the last one projects a picture on the wall, Kinect sensor, speakers and a computer achieve immersion. An integration part of the system is an application based on a therapeutic plan. The application consist of four modules: activation, therapy, hush and summary. The first and the third module consists of graphics and music, which are well known to the users. Pictures are displayed in a form of a slideshow. The therapy module is the main part of the rehabilitation procedure and it involves the interaction between the user and the objects projected on the mat. The user can choose a body part, which will be used to control the game . After the session the picture communication symbols are shown allowing the player to select one of two options: continue or finish the game. At the end of the session a physiotherapist fills in a questionnaire and generates a final report.

Keywords:

virtual reality, kinect, rehabilitation, cerebral palsy, autism

INFLUENCE OF THE USE OF PCM HEAT ACCUMULATOR ON THE TEMPERATURE IN THE HEATING NETWORK

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Abstract:

The necessity of further development of heating systems technology and their modernization is dictated by the urgent need to reduce "low emissions" and the need for rational energy management. Therefore, comprehensive energy, economic and ecological efficiency of district heating systems can be included, among others actions concerning the increased use of renewable energy sources and measures regarding the increased use of waste heat. However, a key step in the modernization of heating systems should be energy saving before the system itself needs to be modified.

The work confirmed the possibility of improving the efficiency of the heating system by adjusting the return temperature using dispersed heat accumulators using the heat of phase change.

Heat storage in the heat distribution network on the return side of low parameters has a significant impact on the return temperature of the heating network. The main element that has an impact on reducing the temperature difference resulting from the use of the regulatory table and the differences in the perception of heat by users is the capacity of the heat accumulators. The use of PCM heat accumulators on heat distribution units allows to reduce the temperature difference of the return of the heating network by up to 50%, which has a positive effect on improving the network regulation.

Keywords:

PCM heat accumulator, district heating system, heating network

INVENTORY MEASUREMENTS AND DEFORMATION ANALYSIS OF THE SELECTED UNDERGROUND MONUMENTS IN POLAND

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A few words about the author:

A PhD student at AGH in Kraków (Geoinformation and Mining Surveying) strongly involved in the work of scientific student associations. Coordinator of many projects in the field of geodesy, mining surveying and geoinformatics.

Abstract:

Underground historical objects are an inseparable element of cultural heritage. In Poland, there are many underground monuments and mines of historical importance - some of them are registered in the UNESCO World Heritage List. The stability and safeness of this kind of objects is influenced and threatened by various of factors. The most common and dangerous are: tectonic or rock mass movements, anthropological movements of the rock mass and hydrogeological conditions (underground water movements). In spite of the fact that the majority of underground historical objects are properly secured, there are many cases where historical bas-reliefs carved in salt or old types of mining housing is deformed or even destroyed. For this reason, observations of rock mass movements and their consequences are very crucial. It is needed to implement special methods (especially non-invasive) and specialist protection. In this report authors presents methods of inventory measurements and deformation observations of historical underground objects located in Poland based on their own experience.

Keywords:

mining surveying, underground historical objcets, TLS, heritage, inventory surveys

ANALYSIS OF LOAD-BEARING CAPACITY OF CYLINDRICAL SHEEL OF STEEL SILO MADE OF CORRUGATED SHEETS SUPPORTED BY A SKIRT

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A few words about the author:

Substantive coordinator, head of the construction department at FEERUM S.A. in Chojnów. He graduated from MBA studies at the Technical University of Łódź, Mechanics and Machine Design and Computer Science at the University of Zielona Góra.

Abstract:

Paper presents a new solution of steel silos made of corrugated sheets produced by Feerum S.A. company. The paper briefly shows advantages of this solution. Authors show and comment code rulings of calculation load-bearing capacity of vertical stiffeners of steel silo shells made of corrugated sheets. Authors point out a very conservative approach in which rigidity of elastic support of compressed stiffener is calculated. Authors also point out a real risk of bending in stiffeners, which is omitted in code rulings. The correct estimation of the resistance of vertically ribbed silos made of steel corrugated sheets is critical from the standpoint of a structural safety, because most of collapses of silos are related to the exceeding of the resistance of a stiffener. The paper show results of finite element analysis. A linear buckling and non-linear buckling analysis with geometric and material non-linearity were carried out with a perfect and an imperfect silo shell. Authors considered one type of initial geometric wall imperfections. Authors determined factor of load-bearing capacity by taking into account axisymmetric and non-axisymmetric loads imposed by a bulk solid. Results showed that skirt is a critical area of cylindrical shell due to instability. The largest bending in stiffeners occur in transition area. New solution of steel silos reduced material use and difficult technological processes.

Keywords:

steel silos, stiffener, buckling, geometric imperfections, FE analysis

THE INFLUENCE OF PYRETHROID INSECTICIDES ON THE PRODUCTION OF ANTIOXIDATIVE ENZYMES IN ENTOMOPATHOGENIC FUNGI

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A few words about the author:

My name is Anna Litwin. The subject of my dissertation is the influence of insecticides to entomopathogenic fungi. I do my research at the Department of Industrial Microbiology and Biotechnology at the University of Lodz.

Abstract:

The widespread use of synthetic insecticides disturbs the balance of the natural environment and has a negative impact on living organisms. Based on their chemical structures, insecticides are divided in the several classes including pyrethroids. The widespread use of these substances can cause oxidative stress in soil inhabiting fungi.

The aim of the study was to determine the activity of antioxidant enzymes (catalase or superoxide dismutase) in entomopathogenic fungi stimulated by pyrethroids.

During the studies insecticides (λ -cyhalothrin, α -cypermethrin, deltamethrin) and entomopathogenic fungi (*Metarhizium*, *Isaria*, *Paecilomyces*, *Beauveria*) were tested.

CAT and SOD activity was determined according to the modified method described by Słaba et al. (2015).

Among the tested samples, an increase in CAT activity was noticed in *B. bassiana* cultures incubated for 24h with 5 mg/l λ -cyhalothrin, α -cypermethrin or deltamethrin and in *P. variotii* cultures incubated with λ -cyhalothrin and deltamethrin. An increase in SOD activity was observed only in 24h *P. variotii* cultures with 5 mg/l deltamethrin.

The research was financed by a grant from the National Science Center in Krakow (Poland), contract number UMO-2016/23/B /NZ9/00840.

Bibliography: Słaba M., Różalska S., Bernat P., Szewczyk R., Piątek M.A., Długoński J.: Efficient alachlor degradation by the filamentous fungus *Paecilomyces marquandii* with simultaneous oxidative stress reduction. *Bioresource Technol.* 197, 404–409 (2015).

Keywords:

insecticides, pyrethroids, antioxidant enzymes, entomopathogenic fungi

BIODEGRADATION OF 3,5-DINITROSALICYLIC ACID USING VARIOUS WASTE MATERIALS

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A few words about the author:

Young scientist fascinated by biotech and chemistry

Abstract:

Aromatic nitrocompounds are xenobiotics posing a serious threat to the environment due to their recalcitrance to biodegradation and insufficient number of microorganisms capable of carrying it out. However, their presence in the environment can be limited by biodegradation conducted by certain microorganisms. They have developed metabolic pathways providing degradation of compounds like 2,4,6-trinitrotoluene or 3,5-dinitrosalicylic acid(DNS). Safe and efficient biodegradation is provided by white rot fungus *Phanerochaete chrysosporium*, known for its resistance to toxic pollutants and synthesis of low-specific enzymes. The continuous process of 3,5-DNS biodegradation was investigated in a newly-constructed apparatus, in which its solutions of various initial pH were flushed through diverse waste materials (polyurethane foam, sugar beet pulp, beech wood chips), being the immobilization matrices for the fungus. These experiments enabled to find the relationship between the initial pH and reduction of 3,5-DNS concentration as well as changes in levels of nitrate(III) and nitrate(V) ions. It was observed that the highest efficiency of biodegradation was achieved at the initial pH of 6.5, yielding up to 99% decomposition of 3,5-DNS within 4 weeks,. The immobilization matrices used affected the process– the best results were obtained for sugar beet pulp, while the worst for polyurethane foam. The results of HPLC-MS/MS analyses suggest DNS degradation in reductive manner.

Keywords:

White rot fungi/*Phanerochaete chrysosporium*/Nitroaromatic compounds

HARD COAL PRODUCTION AND METHANE EMISSION CHANGES IN THE UPPER SILESIAN COAL BASIN IN 1997-2016

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A few words about the author:

I have been living in the Upper Silesian region since I was born. When I graduated University of Silesia with master's degree, I decided to continue my research focused on hard coal production changes and methane hazards.

Abstract:

The Upper Silesian Coal Basin is located in Poland (5600 km²) and in Czech Republic (1900 km²). It is the largest coal basin in Poland and of the largest in Europe. In the entire research period hard coal production has been constantly falling from 133 million ton in 1997 to 66 million ton in 2016. From year to year Polish mines need to reach deeper lying coal seams to maintain profitability and keep thousands of workplaces safe. Reaching deeper coal-bearing formations is highly risky due to increasing methane danger. Methane (CH₄) is one of the most dangerous natural hazard in coal openings. It is chemically and physically connected with coal and liberates during coal extraction. Methane is a colourless, odourless gas which displaces oxygen from air, making the atmosphere non breathable. When CH₄ is mixed with air in proper proportions (over 12% of oxygen and methane content 5-15%) an ignition and explosion can take place. The methane-rich atmosphere can be ignited by spark, open fire or hot items. Absolute methane emission describes how many cubic meters(m³) of methane is released to coal openings during time period (day/year). From 1997 to 2016 absolute methane emission has increasing and decreasing periods but in last two years of studies (2015-2016) methane emission exceeded 900 million m³ of liberated CH₄ per one year. It is highly probable that CH₄ emission will maintain high values in future due to extraction carried out at greater and greater depths.

Keywords:

hard coal production, the Upper Silesian Coal Basin, methane emission, methane hazard

ALEXANDER TECHNIQUE - FRAMEWORK, RESEARCH, APPLICATION

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A few words about the author:

Currently a Phd candidate on University of Warsaw (Faculty of Psychology). My research is focused on Alexander Technique, especially within psychological background.

Abstract:

When Nikolaas Tinbergen received a Nobel Prize in 1973, he devoted half time of his speech to Alexander Technique, its benefits and problem of its unpopularity (Kędzior, 1993; Tinbergen, 1974). Raymond Dart called the technique one of the most underrated achievements of the 20th century (Gelb, 1981). It is the main goal of this project to discover this method's potential to make a difference.

The Alexander Technique is an educational process created by Frederick Matthias Alexander. The goal of work with the technique is to recognize and reduce harmful habits that affect functioning of the human organism. The process is typically focused on body posture and physical tensions, although the mental activity is also involved.

The presentation will concentrate on basic concepts of Alexander Technique, short summary of current scientific knowledge concerning the method and possibilities of practical application of the technique.

Keywords:

Alexander Technique, psychology

EFFECT OF REPLACEMENT OF SUGAR WITH XYLITOL, STEVIA, COCONUT SUGAR AND DRIED BANANA ON PHYSICOCHEMICAL PROPERTIES AND SENSORY ATTRIBUTES OF CRUST PASTRY

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A few words about the author:

PhD student from WULS-SGGW, Faculty of Human Nutrition and Consumer Sciences, Department of Functional, Organic Food and Commodities.

Abstract:

The aim of this study was to evaluate the possibility of substituting sugar with its natural substitutes, such as stevia, xylitol, coconut sugar, as well as dried banana. Physical and chemical properties of prepared confectionery were measured during the tests. Their sensory test was also carried out. The cakes with xylitol were used had the closest color, smell and taste to the control test in which sucrose was used. However, they differed to a significant extent with water activity and brittleness, which was confirmed with sensory evaluation. The cakes with coconut sugar were characterized by the texture closest to the control sample and the intensity of the sweet taste, however were different in color from other samples. The cakes with dried banana have a significantly reduced hardness compared to control sample. This attempt was also rated as the least sweet and the moistest, which affected their low desirability.

Keywords:

crust pastry, xylitol, stevia, coconut sugar, dried banana

THE INFLUENCE OF HYPOTHETICAL BIAS AND FRAMING EFFECT ON VALUATION OF PRIVATE CONSUMER GOODS – EXPERIMENTAL APPROACH

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A few words about the author:

I'm a PhD student at the University of Warsaw (Faculty of Economic Sciences). I am interested in experimental economics, behavioral economics and marketing.

Abstract:

Many of the research methods, commonly used to eliciting consumer's willingness to pay (WTP) involve hypothetical questions that do not have real financial consequences for respondents. Several authors have pointed out that hypothetical WTP values exceed actual values, a phenomenon called

hypothetical bias. In our study we check if the hypothetical data is of lower quality than the actual data. We examine whether the tendency to violate rationality is attenuated when the reported WTP values have no real consequences for the participants. We focus on the framing effect, in which

decisions depend on how the information is presented. In our study experimental verification of these behavioral effects and their impact on the willingness to pay for private consumer goods was conducted. We

formulated the following research hypotheses:

H1: Hypothetical bias influences the valuation of the good.

H2: Framing effect influences the valuation of the good.

H3: Hypothetical bias and framing effect interact.

In order to verify the presented research hypotheses the methods of experimental economics were used. We conducted the laboratory experiment with the use of mascaras (N=167). The participants

were randomly assigned to experimental conditions (hypothetical vs. real eliciting WTP, a positive attribute framing vs. negative attribute framing). In the experiment we used direct estimation of WTP, as well as BDM procedure.

Keywords:

framing effect, hypothetical bias, laboratory experiment

COOPERATION BETWEEN START-UP COMPANIES AND UNIVERSITIES IN POLAND AS AN EXAMPLE OF THE SCIENCE- BUSINESS COOPERATION. OUTLINE OF THE STUDY

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A few words about the author:

Professor of the Warsaw School of Economics. Lecturer at SGH and numerous foreign universities, among others Univ. of Coimbra (Portugal), Economic Univ. in Prague, Ilia State Univ. in Tbilisi. Scholarshipholder of a few of the EU and other grants.

Abstract:

The issue of broadly-understood ties and collaboration between business and science is one of the key issues constituting the foundations for modern knowledge-based economy which relies on innovations and competitiveness in technically and scientifically advanced branches. Thus, the rapid rise in commercial knowledge transfers from universities to market, usually referred to as "university–industry technology transfer" is considered one of the basic factors of today's economies' international competitiveness.

The goal of the hereby presentation is two-fold. Firstly, it attempts to outline the picture of the Polish start-up ecosystem (in fact consisted of few ecosystems but functioning under the same scheme), i.e. its main actors and relations among them with the special focus put on the ways and "channels" through which the cooperation between start-ups and universities and other knowledge-based institutions is to be realized. Secondly, it presents the schedule which I devised to constitute the framework for my future work on the cooperation between subjected companies and the knowledge-based institutions in Poland (universities, scientific institutes, research centers etc.).

Keywords:

cooperation between business and science, start-up companies, support for start-up companies

BIODYNAMIC AGRICULTURE AS A PRODUCTION SYSTEM PREDISPOSING TO OBTAIN MILK CHARACTERIZED BY A HIGH ANTIOXIDANT CAPACITY

**Paweł Solarczyk (1)*, Anna Krzyczkowska (1), Grzegorz Grodkowski (1, 2),
Kamila Puppel (1), Tomasz Sakowski (2)**

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A few words about the author:

PhD student on WULS, interests in livestock breeding, music and volleyball.

Abstract:

Biodynamic agriculture is one of the section of organic farming. By acting with accordance with nature, it has a beneficial effect on antioxidant potential of milk.

Conducted experiment was consisted of comparison milk quality from Polish Holstein-Friesian race (PHF) in two different systems: biodynamic and intensive. The object of this paper was to characterize influence of animals maintenance system to milk quality. The study compares: the basic composition of milk; content of vitamins, SFA, MUFA, PUFA (PUFA n-3 and PUFA n-6), SCFA, MCFA, LCFA and CLA formation level.

The research have shown a higher level of basic composition, β - carotene and vitamin K2 in milk form intensive system. The milk from the above-mentioned system has also less saturated fatty acids. However, milk from biodynamic system has fovourable thrombogenic and atherogenic index, also higher level of PUFA n-3 acids and lower level of PUFA n-6 acids. Milk produced by animals form biodymanic system has higher content of EPA, DHA and also vitamins A and E. Additionally, the content of CLA cis 9 trans 11 and CLA sum were higher in milk from biodynamic farm.

Keywords:

biodynamic agriculture, milk, intensive system, CLA

COMPARISON OF THE QUALITY OF COLOSTRUM DERIVED FROM INDIGENOUS CATTLE BREEDS: POLISH HOLSTEIN-FRIESIAN, POLISH RED, POLISH LOWLAND BLACK-AND-WHITE FARMED EXTENSIVE SYSTEM

**Paweł Solarczyk (1)*, Grzegorz Grodkowski (1, 2), Kamila Puppel (1),
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A few words about the author:

PhD student, interested on livestock breeding, music and volleyball.

Abstract:

Colostrum is the first and also the most important food calf. It is from its quality will depend on the health and proper development of the offspring. Colostrum is formed passive immunity (colostral) newborn calves in its composition contains bioactive components immunosuppressive: immunoglobulins, lactoferrin, lysozyme, lactoperoxidase, α -lactalbumin, β -lactoglobulin or fat which is the carrier of important vitamins and polyunsaturated fatty acids. The concentration of all these compounds is very variable and depends on many factors: breed, age, cows, nutrition, time of year or production system.

It has been shown that the highest concentration of immunoglobulins contained colostrum from cows of the breed PC (86.2 g / l 1. downloading, 41.6 g / l 7. download), and the smallest is derived from cows of PHF (77.84 - 3, 84 g / l). In turn, cows PHF in the first retrieval (minutes to 2 hours postpartum) the concentration of α -lactalbumin, β -lactoglobulin, and lactoferrin was high, was as follows: 6.51 g / l, 26.02 g / L and 3.01 g / l. However, in subsequent samples studies showed a significant reduction in the level of the bioactive colostrum whey protein. In cattle, PC and NCB contents of the above-mentioned compounds at a lower level in the 1st downloading, but in subsequent measurements, there was no such large fluctuations in the concentration of whey protein - as has been demonstrated in the case of cows PHF.

Keywords:

colostrum, immunoglobulins contained



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Errata

Strona nr 20 przyjmuje brzmienie:

GLYCATION OF HISTONES IN THE CONTEXT OF ATHEROSCLEROSIS

**Aleksandra Kuzan (1)*, Diana Indyk (1), Karolina Nowakowska (2),
Katarzyna Rajtczak-Wielgomas (3)**

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A few words about the author:

I work at the Department of Medical Biochemistry in Wrocław Medical University as an adjunct. My doctoral thesis concerned with pathomechanism of atherosclerosis. The results presented at the conference are a continuation of the research.

Abstract:

Glycation it is a nonenzymatic process in which reducing sugars react with the free amino groups of amino acids, proteins, lipoproteins, and nucleic acids.

It is postulated that histones might be prone to glycation agents, what would disturb their function, which is mainly epigenetic regulation of gene expression due the packaging of chromatin.

It was proved that pentosidine and AGEs is created on base of histones. These processes were most often described in the context of diabetes or cancer. Our goal was to investigate the issue in the context of atherosclerosis. The research hypothesis was that glycation of histones in the arterial wall is associated with accelerated atherogenesis.

The research material was aortic sections, the applied techniques were immunohistochemical method using ABC system and fluorescent markers.

It was observed that glycation products are located on the entire surface of the vessel wall. They concentrate in atherosclerotic plaques, particularly in the areas of macrophage infiltration. They also co-localize with extracellular matrix proteins. However, no co-localization of AGE with DAPI or areas labeled with the anti-histone H1 and anti-histone H2A was observed. It is concluded that in the walls of blood vessels the main proteins undergoing glycation are collagen, elastin and other matrix proteins, histones to a much lesser degree, unnoticeable using immunohistochemical techniques.

Praca została sfinansowana ze środków Narodowego Centrum Nauki (numer decyzji DEC 2017/01/X/NZ9/00599)

Keywords:

histones, glycation, atherosclerosis, immunohistochemical reaction

RELATIONSHIP BETWEEN AGE AND SCAVENGER RECEPTORS CONTENT IN THE WALLS OF BLOOD VESSELS

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Wydział Lekarski, Uniwersytet Medyczny im. Piastów Śląskich, Wrocław:

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A few words about the author:

I work at the Department of Medical Biochemistry in Wrocław Medical University as an adjunct. My doctoral thesis concerned with pathomechanism of atherosclerosis. The results presented at the conference are a continuation of the research.

Abstract:

As a result of glycation advanced glycation end products (AGEs) are formed that bind to the appropriate receptors (e.g., RAGE receptors, scavenger receptors, SR), galectin 3, lactoferrin and others) on the surface of many cells. This analysis concerns the SR-A and SR-BI scavenger receptors that function as AGE receptors, but also as receptors for high density (HDL) and low density (LDL) lipoproteins. Most likely, scavenger receptors are necessary for binding AGE-specific ligands and their degradation.

The studies were carried out on aortic sections using immunohistochemistry, immunoenzymatic ELISA and spectrofluorimetric methods.

Our observations show that the main places of SRA and SRBI expression are macrophages but certain amount of antigen is also present on some epithelial cells and fibroblasts. Concentration of antigens is observed in the atherosclerotic plaque, but the antigen also appears pointwise in the adventitia and on the edge of the lipid core.

The content of SR-A correlates with total AGE ($r = -0.3232$, $p = 0.025$), total pentosidine ($r = -0.3922$, $p = 0.0058$) and soluble pentosidine ($r = -0.4522$, $p = 0.0014$), but it is not correlated with AGE bound to proteins or with total soluble AGE.

The present study indicates a significant association between glycation and the class A scavenger receptor. It is planned to extend the study with further AGE receptors and to explore the influence of these receptors on atherogenesis.

Praca została sfinansowana ze środków Grantu Dla Młodych Naukowców Uniwersytetu Medycznego we Wrocławiu STM.A040.17.040.

Keywords:

glycation, atherosclerosis, scavenging receptors

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