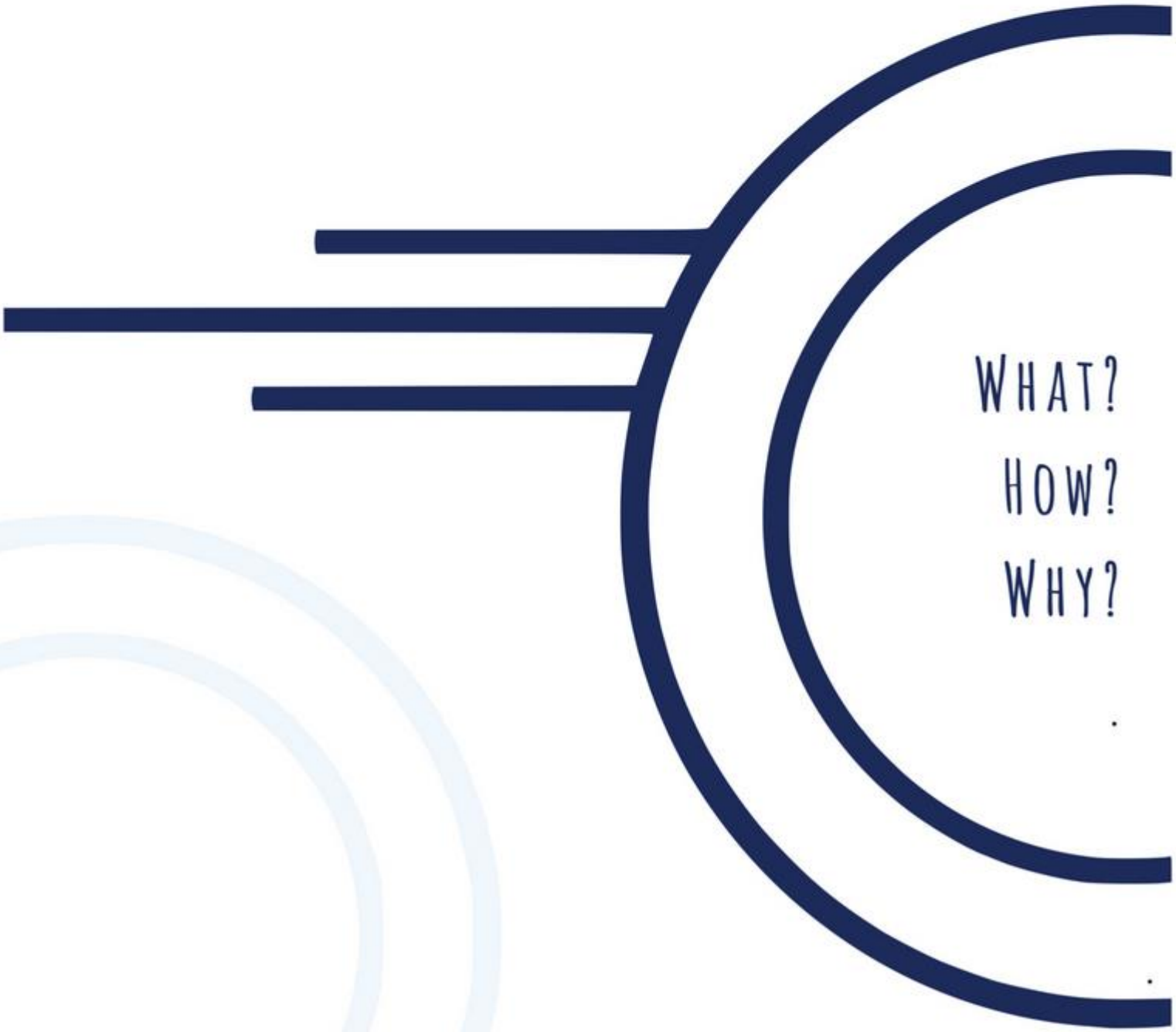
The Book of Abstracts

National Scientific Conference
"Zrozumieć Naukę"
II edition



National Scientific Conference

„Zrozumieć Naukę”

II edition

The Book of Abstracts

Lodz, September 29, 2018

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Address:
17/19/28 Kamińskiego st.
90-229 Lodz, Poland

KRS: 0000628361
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REGON: 364954217

e-mail: fundacja@promovendi
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CONFERENCE INFORMATION

The National Scientific Conference „Zrozumieć Naukę” 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

Business Center 'Faktoria' is a Lodz-based business and conference complex with a unique character. The facility providing 3,300 m² of office space, was created in 2002 on the basis of the existing architecture of the manufacturer from 100 years ago. Thanks to its history, Faktoria perfectly fits into the post-exhibition image of Lodz, creating at the same time offices that favor pleasant and effective work. In addition, the complex includes well-equipped training and conference rooms, as well as a restaurant providing catering services according to customer requirements. Due to the central location in the city and high standard, Faktoria stands out on the map of Lodz office buildings. Focusing on continuous development, in the near future our center will be expanded with further office buildings, also referring with its architecture to the factory tradition of Lodz.

CONFERENCE SCHEDULE

Business Center "FAKTORIA"

25 Dowborczyków st., Lodz

September 29, 2018 (Saturday)

General Schedule					
08:00 – 15:00	Registration *(Reception)*				
08:40 – 09:00	Opening of the Conference *(Hall 3)*				
09:00 – 11:00	Poster Session *(Hall 1)*				
11:00 – 11:20	Coffee Break *(Patio)*				
11:20 – 12:50	Workshop *(Hall 3)*				
Plenary sessions					
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Natural Sciences (NS)		**Law and Economic Sciences** (LES) **Humanities and Theological Sciences (**HTS**) Medical Sciences (**MS)		**Social Sciences (**SS**) Technical Sciences (**TS**)**	
13:00 – 13:50	Dinner	09:00 – 10:50	LES	09:00 – 11:10	SS
14:00 – 16:30	NS I	12:50 – 14:00	HTS	12:50 – 15:00	TS part I
16:30 – 16:50	Coffee Break	14:00 – 14:50	Dinner	15:00 – 15:50	Dinner
16:50 – 19:30	NS II	15:00 – 17:30	MS	16:00 – 17:40	TS part II
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Schedule		
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08:40 – 09:00	**Opening of the Conference** *(Hall 3)*	
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P-04	Cieciura-Olczyk Małgorzata	CHANGES IN THE CHEMICAL COMPOSITION OF EARLY POTATO
P-05	Cieciura-Olczyk Małgorzata	YIELD STRUCTURE UNDER THE INFLUENCE OF NATURAL AND MINERAL FERTILIZATION WITH NITROGEN
P-06	Cieciura-Olczyk Małgorzata	NATURAL AND ORGANIC FERTILIZATION OF POTATO

P-07	Duda Sylwia	ATTITUDES AND OPINIONS OF PARENTS OF CHILDREN IN AGE OF 6 YEARS OF THE LIABILITIES OF THE SILESIAN VOIVODESHIP ON SAFEGUARD VACCINATIONS DEPENDING ON THE IMPLEMENTATION OF MANDATORY VACATIONS
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P-10	Karpowicz Magdalena	HYDROGEN STORAGE IN SOLID PHASE
P-11	Krawczyk Dariusz	CONTROL SYSTEM OF THE MEDICAL ROBOT ROBIN HEART
P-12	Brankiewicz Wioletta	-
P-13	Kulik Aleksandra	ASSESSMENT OF FUNCTION OF THE ORGAN OF VISION IN PATIENTS WITH SELECTED OPHTHALMIC DISEASES IN TERMS OF DRIVING LICENSE CRITERIA
P-14	Litka Paulina	POLISH MESSIANISM AS HISTORIOGRAPHICAL MYTH. FROM 19TH-CENTURY TRADITION TO CONTEMPORARY PUBLIC DISCOURSE
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P-16	Maciejewska Natalia	FUTURE OF MEDICINE: PERSONALIZED ONCOLOGY
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P-18	Mikołajczyk Klaudia	THE INFLUENCE OF THE SELECTED CYTOSTATIC ON THE HUMAN MELANOMA RPMI-7951 CELL LINE
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P-23	Pszczółkowska-Krysztofiak Anna	DIABETES AND LIFE PLANS
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14:30 – 14:40	Kowalczyk Anita	FUNGAL ALTERATION OF PHYTOHORMONE-MEDIATED PLANT DEFENSE STRATEGY
14:40 – 14:50	Kowalczyk Anita	EFFECT OF VIRUS INFECTION ON PHYTOHORMONES ACTIVITY
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15:20 – 15:30	Dalka Agata	EVALUATION OF PROTEIN PURITY
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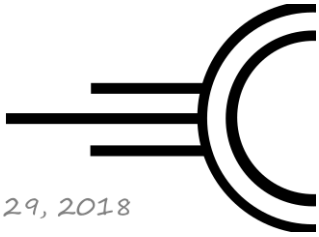
17:50 – 18:00	Kledzik Remigiusz	EVALUATION OF ECONOMIC EFFICIENCY OF IRRIGATION IN CORN FOR GRAIN PRODUCTION IN 2005-2016



18:00 – 18:10	Kledzik Remigiusz	EVALUATION OF THE IMPACT OF THERMAL CONDITIONS OF THE POLISH CLIMATE ON THE GROWTH AND OF CROPS
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09:40 – 09:50	Gładek Damian	PRISON SUBCULTURE "THIEF IN LAW" AND THE HERMETICITY OF RUSSIAN-LANGUAGE CRIMINAL GROUPS
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13:30 – 13:40	Głuchowski Marcin	ELEMENTARINESS OF CONTEMPORARY SACRED ARCHITECTURE
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13:50 – 14:00	Gospodarek Katarzyna	TEMPLATE MATCHING METHOD IN IMAGE ANALYSIS - PROBLEMS, LIMITATIONS AND MODIFICATIONS OF THE METHOD
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SESSION: TECHNICAL SCIENCES

POSTER SESSION

PROTECTION AGAINST HARMFUL BLUE LIGHT

Małgorzata Bartkiewicz

Wydział Fizyki, Uniwersytet im. Adama Mickiewicza w Poznaniu

mal.bartkiewicz@gmail.com

A few words about the author:

I am studying physics. I belong to the student scientific circle. I was involved in quantum informatics for two years and recently I deal with nanotechnology, especially tissue engineering.

Abstract:

Visible light is part of the electromagnetic radiation registered by the human eye. It is present since always and when is missing, we become drowsy due to the synthesis and release of melatonin. Melatonin is a hormone responsible mainly for regulating the daily cycle. Blue light with a wavelength around 400-490 can be particularly harmful to humans.It is emitted by LCD screens and LED lighting. Using these devices and light sources for a long time, especially in the evening, can cause dryness and irritation of the eyes, blurred vision and even insomnia. Excessive exposure to blue light inhibits the synthesis and release of melatonin. However, we can protect our eyes and the body against harmful radiation by using appropriate blue light filters.The aim of the work is to examine system blue light filters in selected models of mobile phones and spectacle lenses with an anti-reflective coating with a blue light filter. LCD and OLED displays were tested on selected smartphone models. The tests took into account different levels of intensity of system blue light filters.

Keywords:

blue light, eye protection, light filters

SEASONAL VARIABILITY OF BIOCENOSIS IN WATERCOURSES IN THE COASTAL LANDSCAPE PARK AREA

Emilia Bączkowska

Faculty of Civil and Environmental Engineering, Gdansk University of Technology

baczkowska.emilia@gmail.com

A few words about the author:

Engineer with the heart of the scientist. Student of Environmental Engineering completely devoted to microbiological research. Exaggerated perfectionist. I always think I could be better.

Abstract:

The Coastal Landscape Park is a very specific area in terms of the number of residents. Increased tourist traffic, which we can observe during the summer, has a significant impact on the quality of surface waters. With the seasonal increase in population density in the area of The Coastal Landscape Park, the amount of wastewater that needs to be treated also increases. As a consequence, more purified wastewater is discharged into surface waters.
The main goal of presented research was the assessment of the structural variability and abundance of bacteria in selected watercourses in the area of the Coastal Landscape Park.
The research area included selected surface watercourses located in the the Coastal Landscape Park and flowed directly into the sea Baltic Sea or the Puck Bay. Water samples were collected in an annual cycle: in July and November 2017 and in February and May 2018. The tests included: sampling and microbiological analyzes - cultured method on membrane filters (measurement of microbiological growth of Escherichia coli) and microscopic method in which polycarbonate filters and fluorescent dye called DAPI are used (assessment of the total number, biomass and average volume of bacterial cells and their morphological structure).
The reduction in E. coli bacteria amount in the off-season makes it possible to verify the thesis that an increase in the number of inhabitants causes a deterioration in the quality of surface water in the Coastal Landscape Park area.

Keywords:

surface water, microbiological testing, bacteriological quality, seasonal variability

CHANGES IN THE CHEMICAL COMPOSITION OF EARLY POTATO

Małgorzata Cieciura-Olczyk

Wroclaw University Of Environmental and Life Sciences

malgorzata.cieciura@upwr.edu.pl

A few words about the author:

I have graduated from Wroclaw University Of Environmental and Life Sciences in 2015 with master engineer degree. I began 3rd degree study in 2016. I specialize in potato fertilization.

Abstract:

The quality of tubers is determined by their chemical composition, which is genetically determined but it is modified by environmental and agrotechnical factors. The purpose of the study was to analyse changes in the chemical composition of tubers in cultivation under nonwoven crop cover and with diversifiednitrogen fertilization. A two-factor field experiment was conducted on soil valuation class IVa with low nutrient content. The effects of crop cover and two nitrogen doses of 60 N kg•ha - and 90 N kg•ha on the content of chemical composition after 90, 100, 110 days after planting and during harvest were determined. Nitrogen fertilization and the use of crop cover modified the content of dry matter and ingredients in potato tubers. The content of dry matter and nitrogen in tubers was higher in the case of cultivation of plants under nonwoven crop cover and after application of the fertilization dose of 90 N kg•ha. Higher content of phosphorus and sodium was characteristic for tubers grown under crop cover after application of the fertilization dose of 60 N kg•ha.

Keywords:

potato, nitrogen, cover, dry matter

YIELD STRUCTURE UNDER THE INFLUENCE OF NATURAL AND MINERAL FERTILIZATION WITH NITROGEN

Małgorzata Cieciura-Olczyk

Wroclaw University Of Environmental and Life Sciences

malgorzata.cieciura@upwr.edu.pl

A few words about the author:

I have graduated from Wroclaw University Of Environmental and Life Sciences in 2015 with master engineer degree. I began 3rd degree study in 2016. I specialize in potato fertilization.

Abstract:

Among the agronomic factors that determine the yielding of potato, fertilization plays the most important role. In a two-factor field experiment, the effect of natural manure fertilization and differentiated nitrogen fertilization on the tuber structure in BBCH 41, 43, 46 phases was analysed. The experiment was established on the soil of IVa class characterized by low content in nutrients. The applied fertilization and especially nitrogen modified the share of tubers in the analysed fractions. This was particularly evident in the final stage of development in the BBCH 46 phase – 90 days after planting, when a 10% higher share of the largest tubers under the influence of nitrogen applied at a dose of 130 N kg•ha was found.

Keywords:

potato, manure, nitrogen, structure

NATURAL AND ORGANIC FERTILIZATION OF POTATO

Małgorzata Cieciura-Olczyk

Wroclaw University Of Environmental and Life Sciences

malgorzata.cieciura@upwr.edu.pl

A few words about the author:

I have graduated from Wroclaw University Of Environmental and Life Sciences in 2015 with master engineer degree. I began 3rd degree study in 2016. I specialize in potato fertilization.

Abstract:

Proper fertilization of the potato allows not only to increase the yield, but also to improve the resistance of plants and storage capacity of tubers.
Effective fertilization of the potato requires consideration of several very important factors. These include the direction of use, the soil's richness in macro and micronutrients, as well as the level of agrotechnics. For fertilizing potatoes natural fertilizers (manure, slurry, slurry) are used, which are supplemented with appropriate doses of mineral fertilizers. In recent years, simplifications and specialization in plant production have led to a reduction in the use of manure, thanks to which a large amount of organic matter and live micro-organisms was absorbed into the soil. Currently, it is replaced with straw and green manures. Due to its properties, manure has become a very valuable and desirable fertilizer these days.

Keywords:

fertilization, potato, organic fertilzation, mineral fertilization, yield

ATTITUDES AND OPINIONS OF PARENTS OF CHILDREN IN AGE OF 6 YEARS OF THE LIABILITIES OF THE SILESIAN VOIVODESHIP ON SAFEGUARD VACCINATIONS DEPENDING ON THE IMPLEMENTATION OF MANDATORY VACATIONS

Sylwia Duda*, Aleksandra Kulik

Faculty of Public Health, Department of Toxicology and Health Protection, Medical University of Silesia, Bytom, Poland

*sduda@sum.edu.pl

A few words about the author:

I am a doctoral student at the Silesian Medical University in Katowice. I work as a senior technician at the Department of Toxicology and Addiction. The presented issue is the area of my scientific interests.

Abstract:

Introduction. Research shows that increases in the amount of parents resigning from children vaccinations and parents who deliberately delay the continuation of vaccination result in a recurrence of eradicated of illnesses or the incidence of sporadic illnesses.
Aim. The purpose of the work is to compare the parents declaring that they vaccinate children with parents who do not vaccinate their children.
Material and methods. The study enrolled a population of 302 parents of children aged 0-6, who were classified into two groups. The first group was parents who vaccinated their children, the second group were people who vaccinated their children, but who resign from selected vaccines, or who declared that they did not vaccinate their children at all.
Results. Parents declaring the vaccination of their children and resigning from selected vaccines have predisposition to extremely negative attitudes towards vaccination, negating their safety and efficacy.
Conclusions. Non-vaccinated parents show extremely negative point of view on vaccination, unlike parents who give their children vaccines, which in turn are more confident in vaccines. Parents of children declaring their children's vaccinations have low levels of trust in medical staff and their primary source of knowledge about immunization is the internet, as opposed to parents vaccinating their children whose knowledge of vaccination comes from medical personnel.

Keywords:

Vaccine, Immunization, vaccine injury, attitudes to vaccination

THE INVESTIGATION OF THE SURFACE PROPERTIES OF GRAPHENE OXIDE AND REDUCED GRAPHENE OXIDE BY INVERSE GAS CHROMATOGRAPHY

Justyna Jonik*, Henryk Grajek

Wojskowa Akademia Techniczna

*justyna.jonik@wp.pl

A few words about the author:

I am a Ph.D. student in the third year. I investigate the surface properties of graphene derivatives by inverse gas chromatography.

Abstract:

The relationship between adsorbate-adsorbent interactions and the properties of the adsorption system is important in the case of graphene derivatives due to the wide applicability of these materials in chemical analysis.
Therefore, in the present work, a detailed characteristic of specific and non-specific interactions occurring between the surfaces of the studied materials (graphene oxide and reduced graphene oxide) and the injected test substances was determined, as well as the chemical character of the surface of the studied materials. During the studies inverse gas chromatography was used.
In this method, the studied material (in this case graphene derivatives) is placed in the chromatographic column, and the test substances, which are injected on the column, have acidic, basic, amphoteric or neutral properties.
The result of a single measurement was the elution peak, which was subjected to the appropriate mathematical treatment. Then, further calculations were made to determine the basic retention and thermodynamic values, and ultimately to determine the specific and non-specific interactions between the adsorbent and the adsorbate and the acceptor-donor properties of graphene oxide and reduced graphene oxide.

Keywords:

Graphene oxide, reduced graphene oxide, inverse gas chromatography

HYDROGEN STORAGE IN SOLID PHASE

Magdalena Karpowicz

Military Univerisity of Technology

magdalena.karpowicz@wat.edu.pl

A few words about the author:

I am a PhD student. My faculty is Material Engineering. My research area is hydrogen storage in the solid phase. My interests are mainly science (materials science, chemistry, mechanics, physics) but also sports and an active and healthy lifestyle.

Abstract:

Hydrogen is one of the alternative energy sources. This is because during its combustion is released large amounts of energy, which is why it can be an ideal application in homes, industrial centers and in the automotive industry. The big advantage of H2 is also its ecological aspect-during the combustion process only H2O is released. The H2 heating value is also high (higher than coal or gasoline). Hydrogen, unfortunately, has a low degree of energy packing, so in order to be able to draw energy from it, it must be compressed or condensed under high pressure. Therefore, a very important aspect is the way of hydrogen storage. Currently, 3 storage methods are used: in the gas, liquid and solid phases. The main problem with storing hydrogen in the gas and liquid phase is the very high pressure at which H2 should be stored. This is dangerous because it can be explosive, it also generates high costs, especially for the liquid phase method, because the H2 must be kept constantly at the temperature of liquid nitrogen. An alternative to these two methods is solid phase storage. It is the latest and constantly developed technique. When H2 is stored, much lower pressures and temperatures are used. Hydrogen ab- or adsorbs on the surface of solids and the next one, thanks to the fuel cells, gets energy from it. Materials of special importance for this technique are magnesium hydrides, because thanks to them you can store large amounts of H2 which results into a greater amount of energy.

Keywords:

Alternative energy sources, hydrogen storage, solid phase, magnesium hydrides

CONTROL SYSTEM OF THE MEDICAL ROBOT ROBIN HEART

Dariusz Krawczyk(1)*, Łukasz Mucha(1), Krzysztof Lis(2)

(1) Pracownia Biocybernetyki, Fundacja Rozwoju Kardiochirurgii im. prof. Zbigniewa Religi
(2) Politechnika Śląska, Mechaniczny Technologiczny, Katedra Budowy Maszyn

*dkrawczyk@frk.pl

A few words about the author:

Dariusz Krawczyk graduated from the Faculty of Mechanical Engineering at the Silesian University of Technology in Gliwice. Electronic specialist at the Biocybernetics Laboratory of the Foundation of Cardiac Surgery Development in Zabrze.

Abstract:

The publication describes a control system designed for the Robin Heart medical robot. The robot consists of several elements integrated with each other, they are: a laparoscopic mechatronic tool equipped with force sensors, haptic sensor and a surgical robot. The individual elements of the system have been described in detail in the form of function blocks. Each of them presents used electronic components, especially microcontrollers with the software used. The method of communication between individual elements of the system is also described. Elements of the system presented in the publication will be used to build an integrated Robin STIFF-FLOP console that works with robots from the Robin Heart series.

Keywords:

Robin Hand, force feedback, haptic device, Robin Heart, Robin Stiff-Flop

ASSESSMENT OF FUNCTION OF THE ORGAN OF VISION IN PATIENTS WITH SELECTED OPHTHALMIC DISEASES IN TERMS OF DRIVING LICENSE CRITERIA

Aleksandra Kulik*, Sylwia Duda

Department of Toxicology and Health Protection, School of Public Health in Bytom, Medical University of Silesia, Katowice, Poland

*akulik@sum.edu.pl

A few words about the author:

I received education at the School of Public Health in Bytom. Since 2013 I have been working at the Department of Toxicology and Addiction in the capacity of research assistant. Presented topic is part of my doctoral dissertation.

Abstract:

Introduction: A normally functioning organ of vision plays a key role in the group of active drivers as it allows normal, comfortable and safe driving. The study aimed to assess the function of the organ of vision in drivers suffering from cataract, glaucoma, diabetic and hypertensive retinopathy and AMD. Material and methods: A total of 117 patients with valid driving license were recruited to the study, including 82.9% (N=97) of men and 17.1% (N=20) of women. The patients underwent examinations of visual acuity, visual field, contrast sensitivity and glare sensitivity accompanied by history taking. Results: As many as 85.5% possessed lifetime driving license document and most frequently drove a vehicle every day. Among the study patients, 95.7% met the criteria of possessing a driving license in terms of vision acuity after correction. Only 4.3% failed to meet the criterion of glare sensitivity. As many as 83.8% had high contrast sensitivity performance. More than half of the patients (53.0%) did not meet the requirements for the visual field. Taking into consideration all the ophthalmic criteria, 45.3% of the study patients met the criteria that determine receiving a driving license for non-professional drivers. Conclusions: Clinically advanced vision disorders significantly deteriorate the quality of visual perception. There is a need for the development of precise criteria of the ophthalmic examination that determine issuing or prolongation of a driving license.

Keywords:

drivers, driving license, qualifications, vision disorders, ophthalmic examination

POLISH MESSIANISM AS HISTORIOGRAPHICAL MYTH. FROM 19TH-CENTURY TRADITION TO CONTEMPORARY PUBLIC DISCOURSE

Paulina Litka

Maria Curie-Skłodowska University, Department of Humanities, Institute of History, Department of History Methodology

paulinalitka@interia.pl

A few words about the author:

Graduate of historical studies at Maria Curie-Skłodowska University in Lublin (specialty: editorial and historical heritage of the region). PhD candidate in the humanities–history. The Chairwoman of the Methodological Group of Historians of UMCS.

Abstract:

Messianic myth dates back to Romanticism and it played a significant role in the 19th century Polish historiography. It would seem that the idea of Poland as the Christ of Europe has been long gone and will remain merely as a concept in the history of ideas, history of mentality and historical politics. However, in modern times, it turns out this concept might be making a comeback and surprisingly reviving in public life. The 19th-century Polish messianism addressed certain symbolical needs of the people confronted with a painful history perceived as a historical injustice and trauma. At times, it was a form of psychotherapy compensating for fears, and sustaining hope. Contemporary messianic discourse is a continuation of the Romantic tradition; resemblance on the level of heroic and martyrological values, treating the nation as the main value, following new rules and techniques when creating imaginary reality.
The idea of Polish messianism is an important element of creating a socio-political situation, by rooting in the consciousness of a collective myth, which is a category controlling the operation of the individual/human group, in the context of historical discourse (and not only). What messianism do we need? Has the spirit of Polish messianism returned? Can messianism be a way to modernity? Should we open a messianic invitation that we would receive from fate?

Keywords:

messianic invitation, messianic myth, Polish messianism, historiographical myth, Romantic heritage

THE ABILITY TO CONTROL STRUCTURAL TRANSFORMATIONS IN THE Ti6Al4V ALLOY

Justyna Łukasiewicz

Military University of Technology

justyna.lukasiewicz@wat.edu.pl

A few words about the author:

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

Abstract:

Currently, titanium and its alloys are used in many fields of science, including medicine, as a material for long-term orthopedic implants. In order to adapt the geometry of the endoprosthesis to the individual anatomical characteristics of the patient in their studies I use technology LENS (ang. Laser Enginereed Net Shaping). The obtained layer is characterized by a monophasic martensitic structure despite the use of a two-phase material. This is due to the rapid cooling process and heat transfer from the part after manufacture.
The paper attempts were made to control the structural transformations of the Ti6Al4V alloy using post-process heat treatment 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. 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 treatmant of titanium alloys

FUTURE OF MEDICINE: PERSONALIZED ONCOLOGY

Natalia Maciejewska*, Maciej Bagiński

Department of Pharmaceutical Technology and Biochemistry, Faculty of Chemistry, Gdansk University of Technology

*natmacie2@student.pg.edu.pl

A few words about the author:

I am a first year PhD Student in the Department of Pharmaceutical Technology and Biochemistry. My research interests lie in the fields of the molecular biology of cancer cells.

Abstract:

Understanding genetic and epigenetic mechanisms of tumorigenesis allows identifying many vital mutations affected the formation of various malignancies. This led to the discovery of a new therapeutic approach, based on molecular mechanisms in the world of medicine, which is called personalized medicine (PM). This review aims to outline the state of the art of the personalized medicine in treatment, taking into account anti-cancer therapy used in selected types of tumors and the difficulties that must be faced with a PM.

Keywords:

cancer, personalized oncology, personalized medicine

EFFECT OF FINENESS AND PHASES OF TITANIUM DIOXIDE NANOPOWDER ON THE AMIDOL DETERMINATION

Łukasz Magda

AGH University of Science and Technology

lukas.magda1989@gmail.com

A few words about the author:

Łukasz Magda, chemistry teacher at one of the Cracow schools and PhD student at the AGH University of Science and Technology in Cracow.

Abstract:

Modification of the electrode has to improve its metrological properties or obtain new functionality. Most often it seeks to improve parameters such as sensitivity, detection limit. It is also important range of linearity, response time and durability of the electrode. The spectrum of substances used for modification is very wide, from simple inorganic compounds, through complex compounds, organic substances and biological origin. In recent years, nanomaterials and, in particular, nano-carbon and metal have gained much popularity.
Introducing nanoparticles into the polymer matrix is designed to increase the contact surface area of the electrode with the analyte. This modification is to increase the sensitivity of the electrode to enable detection of lower concentration of test substances which is very important in the analysis of pharmaceuticals and environmental samples.
The degree of fragmentation of nanomaterials used to modify electrodes has a significant effect on the electroactive surface of modified electrodes.

Acknowledgements:
This study was carried out within the AGH – University of Science and Technology (Kraków), grant number 15.11.160.017.

Keywords:

nanoparticles, modyfied, glasyy carbon, rutyl, anatase

THE INFLUENCE OF THE SELECTED CYTOSTATIC ON THE HUMAN MELANOMA RPMI-7951 CELL LINE

Klaudia Mikołajczyk*, Wioletta Zielińska, Marta Hałas-Wiśniewska, Magdalena Izdebska, Alina Grzanka

Katedra i Zakład Histologii i Embriologii, Uniwersytet Mikołaja Kopernika w Toruniu, Collegium Medicum w Bydgoszczy

*klaudia199527@wp.pl

A few words about the author:

I am a first-year master's student in biotechnology. I am interested in research on the influence of chemotherapeutics on cancer cells and their combination with vitamins in order to strengthen the cytostatic effect.

Abstract:

Background: Cell cycle disorders, uncontrolled proliferation, genomic and chromosomal instability are a common features of human cancer. In order to disrupt the cell cycle, cause death or inhibit the development and division of tumor cells, cytostatic drugs are used. They are substances of natural origin or synthetic compounds, which are designed to effectively fight cancer cells with the least possible side effects.
Aim: The aim of the study was an evaluation of the influence of selected cytostatic used in clinical practice on the basic life processes of human melanoma RPMI-7951 cell line. To obtain it the cells were treated with increasing doses of the chemotherapeutic.
Materials and Methods: Evaluation of cells viability was elucidated by MTT assay. Cytometric analysis allowed to evaluate the cell cycle and cell death. Fluorescent staining of main cyloskeletal proteins was performed in order to determine its rearrangements after the treatment with cytostatic.
Conclusion: Most of currently applied therapies used in the treatment of tumors are characterized by low effectiveness. The key issue in the effective treatment of human melanoma is the selection of appropriate chemotherapeutics and concentrations of the drug that effectively stop the development of cancer cells with the lowest possible side effects.

Keywords:

cell cycle disorders, uncontrolled proliferation, cytostatic drugs, cells viability

MECHANICAL PROPERTIES AND STRUCTURE OF A HIGH MANGANESE STEEL WITH THE TWIP EFFECT

Karolina Kowalczyk*, Magdalena Jabłońska

Silesian University of Technology, Institute of Materials Engineering

*karolina.kowalczyk@polsl.pl

A few words about the author:

Area of research interest: SPD process, new AHSS steels for automotive industry TWIP steels.

Abstract:

More and more often when we speak about materials intended for vehicle safety elements we think about new steels considered to be a part of Advanced High Strength Steels (AHSS). They are characterized by properties, so far unobtainable in traditional materials, such as combination of very high strength properties and high plasticity at the same time. In the construction of vehicles for the reinforcements of the body and passenger cabin very high strength steels (BH, IF, TRIP, DP) are currently used, while on the elements used to absorb energy during the head-on collision and lateral impacts the usage of TWIP steel is provided. In this paper selected results of mechanical properties and analysis of the structure of steel with the TWIP effect subjected to static and dynamic stretching are presented. After conducted tests characteristics of mechanical properties were obtained and measurements of hardness of the tested steel were taken. Mechanical properties and the hardness of the steel increased as the speed of deformation increased. The analysis of the structure near the fraction has indicated the presence of deformation twins in the tested steel and the smallest share of their presence was revealed in steel stretched under static conditions and in the highest share in dynamic conditions.

Keywords:

TWIP effect, AHSS steel

OPTICAL PARAMETERS OF PURE AND GOLD NANOPARTICLES DOPED LIQUID CRYSTALS

Natalia Przybysz(1,2)*, Agnieszka Mackiewicz(1), Paweł Marć(1), Bennis Noureddine(1), Przemysław Kula(1), Emilia Tomaszewska(2), Jarosław Grobelny(2), Leszek R. Jaroszewicz(1)

(1) Institute of Applied Physics, Faculty of Advanced Technologies and Chemistry, Military University of Technology
(2) Department of Materials Technology and Chemistry, Faculty of Chemistry, University of Lodz

*natalia.przybysz@wat.edu.pl

A few words about the author:

My name is Natalia Przybysz and I am on my penultimate year of PhD studies Material Engineering at the Advances Technologies and Chemistry Faculty, Military University of Technology.

Abstract:

Stable nematic liquid crystal mixtures doped with gold nanoparticles (Au NPs) were prepared with the use of various size of molecules and concentrations of NPs in the colloids in a wavelength range of visible light and thereby in an area of surface plasmon resonance. As a result, in liquid crystal cells (thickness of 5 μm), filled with the prepared mixture, changes of refractive indices and optical birefringence of the LC-NPs system with increasing temperature was observed, therefore absorption of electromagnetic wave was not registered.
Implementation of the Au NPs to the structures of nematic liquid crystal mixtures improves its functioning, however Au NPs colloids and LC mixtures have specific physicochemical properties which allowed for the effective transfer of Au NPs from an organic solvent to a LC mixture. From that moment, the LC mixture becomes a new environment for the Au molecule. In this respect, the organic colloids of Au NPs and the LC mixtures must be modified to allow for Au NPs dispersion in the new environment.
Moreover, changes in the transmission with the temperature increase from 30 ºC to 55 ºC in the LC – NPs systems in the liquid crystal cells were measured. Measurements of Mueller matrix, ellipsometric, UV/ViS spectrometry, surface plasmon resonance and changes in the phase of light will be made at our earliest convenience.

Keywords:

photonic crystal fiber, Au NPs, gold nanoparticles, electrooptic properties of nematic liquid crystal

DIABETES INFLUENCE ON SOCIAL RELATIONS

Anna Pszczółkowska-Krysztofiak

Koło Naukowe Wczesnej Edukacji,
Wydział Nauk Społecznych, Uniwersytet Warmińsko-Mazurski w Olsztynie

aniap2540@poczta.onet.pl

A few words about the author:

I am students a five years pedagogics of the Uniwersytet Warmińsko-Mazurski w Olsztynie. I am interested in exploring impact diabetes on people's lives.

Abstract:

I explored the impact of diabetes on friends relationship by means of an open in-depth interview. The main purpose of the research was established a relationship between diabetes type 1 and relationships created by a diabetic in a peer group. Moreover research was conducted on a sample of six respondents in early adulthood in last year. On the one hand pay attention for small self-esteem and back away contact but the other hand scientists did not saw differences. In my research did not reveal this features. Perhaps diabetics were ill for several years and could have disappeared. However diabetics included more unpleasant situations e.g. ridicule or rejection for friends who caused shy. In sum, diabetes mellitus maybe affect on contact with other person but it is a individual matter .

Keywords:

Diabetes mellitus, diabetic, relationship

DIABETES AND LIFE PLANS

Anna Pszczółkowska-Krysztofiak

Koło Naukowe Wczesnej Edukacji,
Wydział Nauk Społecznych, Uniwersytet Warmińsko-Mazurski w Olsztynie

aniap2540@poczta.onet.pl

A few words about the author:

I am students a five years pedagogics of the Uniwersytet Warmińsko-Mazurski w Olsztynie. I am interested in exploring impact diabetes on people's lives.

Abstract:

I explored the impact of diabetes on the life plans by means of the survey. The main purpose of the research was established relationship between diabetes type 1 and affects the future life of diabetics. The subject of the research was the relationship between diabetics and their own life plans. Moreover research was conducted on a sample of fifty respondents in early adulthood in this year. Interview questionnaire the focus on two aspects- career and family.
On the one hand pay attention fear of motherhood and finding a job but the other hand respondents believe in own successes. In my research shown that women's more dreads related to family. Men think about financial stability and make dreams.
In sum, diabetes mellitus affect on future plans but it is not possible to determine whether positively or negatively. Someone resigned with career and dreams, other believe in success.

Keywords:

Diabetes mellitus, diabetic, life plans

ANALYSIS OF THE DECOMPOSITION LEVELS OF SELECTED ACTIVE COMPOUNDS BY MYCELIAL CULTURES OF ARMILLARIA MELLEA SPECIES

Agata Sośnicka

Department of Drug Chemistry and Pharmaceutical Biotechnology, Medical University of Warsaw

asosnicka@icloud.com

A few words about the author:

I am a second-year PhD student working in the field of Pharmaceutical Biotechnology. In my project I am trying to employ a species of native fungi to degrade some medicines residues being present in ground waters.

Abstract:

Studies being a part of the presented project aim to define an impact of the chosen xenobiotics, whose high concentration levels were found in the surface waters, on Armillaria mellea fungus biosynthesis of the extracellular ligninolytic enzymes belonging to oxidases group.
The aim of the presented project is to investigate the relationship between the activity of the oxidoreductases synthesised by A. mellea fungus into the subsoil that was enriched by a specific amount of an active pharmaceutical ingredients (further defined as xenobiotics) and the concentration of it. As a result, it is expected to observe an enzymatic degradation of the introduced into the subsoil xenobiotic.
The experiment involved examining a number of active compounds belonging to different therapeutic groups: antidepressants, angiotensin II receptor blockers, β-blockers, macrolide antibiotics and a few more.
The research involved bringing the fungus species submerged culture to the log phase, then adding methanol solution to the selected active compounds in such a volume that the final concentration was equal to 100 ng/ml. Samples were collected after the specified time periods and the concentration of active compounds was examined by LC-MS to assess their degradation level due to the influence of the fungal enzyme system.
The results obtained indicate a various degradation levels of examined pharmaceutical particles, which confirms the ability of the species to break down applied xenobiotics.

Keywords:

armilllaria mellea, honey fungus, oxidoreductases, xenobiotics, mycoremediation

ULTRASONOGRAPHIC IMAGING OF CARPAL JOINT IN DOGS

Angelika Tobolska

Department of Surgery and Radiology, Faculty of Veterinary Medicine, University of Warmia and Mazury, Olsztyn

angelika.tobolska@uwm.edu.pl

A few words about the author:

I graduated the veterinary medicine at the University of Warmia and Mazury in Olsztyn, Poland. I am PhD student at the Department of Surgery and Radiology. The purpose of my research is to develop methods for imaging the carpal joint in dogs.

Abstract:

Ultrasound examination of joints in small animals is not as well developed and studied as in human medicine. The aim of the study was to visualize the structures of the carpal joint in the group of seven healthy dogs. In each animal a linear probe was placed on the medial, lateral and palmar side of the carpus in order to locate the bones, tendons and ligaments. On the transverse sonograms, the distal row of the carpal bones with the accessory carpal bone, and the superficial and deep flexor tendons were visualized. These tendons were also visible on sagittal sonograms as intermediate echogenic structures. The collateral and accessory metacarpal ligaments have been identified only on the sagittal ultrasound images. The study shows the possibility of using this technique to examine the ligamentous apparatus and tendons of carpus in healthy dogs. In conclusion, these results suggest that ultrasound examination may be useful in diagnosis of diseases and trauma of these structures in dogs.

Keywords:

canine, carpus, ultrasonography

MUTUAL INTERACTIONS IN THE LIPID MEMBRANE – POLYPEPTIDE SYSTEM MODULATED BY CHLOROCHALCONES

Paulina Trombik*, Katarzyna Cieślik-Boczula

Wydział Chemii, Uniwersytet Wrocławski

*p.trombik@gmail.com

A few words about the author:

Paulina Trombik is starting PhD studies at the Faculty of Chemistry at the University of Wroclaw this year. The main field of her interest is medical chemistry. She spends her free time reading books and sewing.

Abstract:

Chalcones (benzylidene acetophenones) are an important group of naturally occurring compounds in plants, being precursors for flavonoid biosynthesis. They show various biological activities, e.g. antioxidative, antibacterial, antiviral, immunosuppressive [1]. In this study, two chalcone derivatives were investigated: 4-chloro-trans-chalcone (4CTCh) and 4,4-dichloro-trans-chalcone (4,4CTCh) to modulate a lipid membrane-polypeptide system. The model of negatively charged lipid membrane was created by using a mixture of dipalmitoylphosphatidylcholine (DPPC) and dipalmitoylphosphatidylglycerol (DPPG) lipids. The poly-L-lysine (PLL) was used as a model of positively charged basic proteins. The effect of 4CTCh and 4,4CTCh on DPPC/DPPG/PLL system was investigated with FT-IR spectroscopy and PCA analysis.

It was found that both chalcone derivatives under study modify the mutual interactions occurring in lipid-pepetide system but on a slightly different level. They change the temperature of the membrane's main phase transition, affect the number of trans isomers in hydrocarbon lipid chains and the degree of hydration in the membrane's interphase region.

1. S. Mandge, H.P. Singh, S.D. Gupta, 2007. Synthesis and Characterization of Some Chalcone Derivatives, Trends in Applied Sciences Research, 2: 52-56.

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Keywords:

phospholipids, FT-IR, PCA, chalcones

DIGITAL IMAGE CORRELATION USED IN ANALYSIS AND MONITORING OF MECHANICAL BEHAVIOR OF MACHINE ELEMENTS

Mateusz Wygoda

Department of Product Technology and Ecology, Faculty of Commodity Science, Cracow University of Economics

mateusz.wygoda@uek.krakow.pl

A few words about the author:

Mateusz Wygoda graduated from Faculty of Mechanical Engineering at the Cracow University of Technology. He currently works at the Cracow University of Economics. His main research interests focus on mechanics of materials.

Abstract:

The presented work shows additional possibilities offered by the up to date research methodknown as Digital Image Correlation (DIC), which becomes more and more popular in mechanical investigations of materials properties and machine components. Tensile tests of ultra-ductile steelareconducted byStrength Testing Machine - MTS Landmark 370.10. The samples are covered by the system of special pattern of pots (speckle patterns) and the change of the pattern set is registered by the photo-camera during the test.The registered pictures are analyzed by GOM-Correlate Softwarein order to obtain displacements and strains maps of the tested element. The purpose of the analysis is the verification and comparison of data received from the Strength Testing Machine (MTS 370.10) and by means of the research method (DIC). The displacements and strains are compared in selected measurement steps. Performed investigationsare the first step before the assessment of static and fatigue behavior of thin isotropic and anisotropic plates with various shapes of notches.

Keywords:

DIC, GOM-Correlate, experimental, investigations, analysis

THE EFFECT OF DOXORUBICIN ON RAT GLIOMA C6 CELL LINE

Wioletta Zielińska*, Marta Hałas-Wiśniewska, Magdalena Izdebska, Adrian Krajewski, Maciej Gagat, Alina Grzanka

Department of Histology and Embryology, Nicolas Copernicus University in Toruń, Faculty of Medicine, Collegium Medicum in Bydgoszcz

*wzielinska94@hotmail.com

A few words about the author:

I graduated with a degree in biotechnology. For almost 2 years I have been an employee of Department of Histology and Embryology, where we deal with issues related to the two most common causes of death - cardiovascular diseases and cancer.

Abstract:

In recent years attention of many researchers has been focused on the understanding of tumor cells nature. Among others the rat glioma (C6 cell line) has been used to analyze main features of brain tumors, especially in the context of treatment techniques. Doxorubicin is an example of anti-cancer drug characterized by the wide scope of effects. As literature data indicate, different concentrations of chemotherapeutic may induce various cell death pathways, however, the universal mechanism of DOX action remains to be elucidated.

The aim of the study was to determine the impact of doxorubicin on cytoskeleton structure and morphology of glioma cells. For this purpose C6 cells were incubated with doxorubicin (50, 100 and 200 nM). Morphological and ultrastructural changes in the cells were evaluated using light and electron microscope. In order to determine the structure and expression of F-actin, β-catenin and S-100 fluorescence staining was applied. In turn, cell death and cell cycle were evaluated by Tali ®Image-based cytometer.

The performed procedures showed a dose-dependent decrease in the survival of C6 cells after doxorubicin treatment. The changes in morphology, ultrastructure, and rearrangements of F-actin and β-catenin were also observed. The analysis of cell death showed a dose-dependent increase in the population of apoptotic and necrotic cells.

Keywords:

C6 cell line, glioma, doxorubicin, cytosceleton

AMALGAMS – TOOTH FILLINGS OF THE PAST IN THE MODERN DENTISTRY OF THE 21ST CENTURY

Karolina Żurek(1)*, Monika Kokot(2), Martyna Andreew(3)

Medical University of Silesia in Katowice,
(1) School of Health Science in Katowice, Doctoral Study,
(2) Department of Rehabilitation, School of Health Science in Katowice, Doctoral Study,
(3) Department of Internal Diseases, School of Public Health in Bytom, Students Scientific Society

*karolinka.zurek@gmail.com

A few words about the author:

Jestem lekarzem dentystą od 2004 roku, od początku czynna zawodowo, mam specjalizację lekarską Zdrowie Publiczne. Jestem absolwentką Śląskiej Akademii Medycznej a aktualnie prowadzę prace badawcze w ramach studiów doktoranckich na ŚUM.

Abstract:

Together with the dynamic development of science and technology, there has been a huge progress in the field of dental conservative treatment, which is linked, among others, with the improvement and discovery of new dental materials. Despite a wide selection of tooth fillings from various types of materials, amalgam continues to be used to reconstruct the dental hard tissue, because this kind of material is covered by the social insurance in Poland.
Amalgams are metallic materials – an alloy of silver with mercury – which are the basic materials in conservative dental treatment. Silver alloy is a fine powder mostly composed of silver, copper and tin. After mixing the silver alloy with mercury, a dental amalgam is formed. Currently in dentistry silver alloys are used with high copper content (13-30%). Amalgams are the most frequently used fillings of dental cavities. When placed in tooth cavities, they undergo two disadvantageous reactions: tarnish and corrosion
Low price of the amalgam fillings, quickness of their application and no added costs for the dental surgery (e.g. expensive binding systems for light-cured composite fillings) causes that it is only the amalgam that is the material refunded by social insurance to fill side teeth.
The aim of the paper is to present the amalgam fillings and show their benefits as well as potential side effects.

Keywords:

amalgam filling, dental materials, metal alloys

NATURAL SCIENCES

PROCESSING CAPACITY AND CHARACTERISTIC OF CONVENTIONAL AND ORGANIC COURGETTES (CUCURBITA PEPO L.)

Klaudia Kopczyńska*, Katarzyna Król, Alicja Ponder, Renata Kazimierczak

Department of Functional Food, Ecological Food and Commodities,
Faculty of Human Nutrition and Consumer Sciences, Warsaw University of Life Sciences

*klaudia_kopczynska@sggw.pl

A few words about the author:

Klaudia Kopczyńska, Katarzyna Król, Alicja Ponder : PhD students at the Department of Functional Food, Ecological Food and Commodities, WULS. Their PhD thesis applies bioactive compounds in organic plants source for food and processing capabilities.

Abstract:

In this paper characteristic of Cucurbitaceae vegetable (courgette) was reviewed based on currently available literature. Despite courgette is a commonly used vegetable, it is underestimated on the market. The interest in its cultivation is growing recently in European countries, including the organic farming sector. Courgette, as other organic vegetables contain typically higher level of biologically active substances in comparison to conventional ones. Processing possibilities depends on the time of fruits harvest and their physical properties (size, shape). As a result of this characteristic, it can be said that organic and conventional courgette can be widely used for processing, because of an increased production and good physical-chemical properties.

Keywords:

Cucurbitaceae pepo., courgette, organic, vegetable preserves

HUMAN PATHOGENIC MICROORGANISMS

Ada Błaszczyk

Uniwersytet Mikołaja Kopernika w Toruniu

275295@stud.umk.pl

A few words about the author:

I am a biotechnology student at the Nicolaus Copernicus University in Toruń.

Abstract:

Microbiological contamination of plants, fresh fruits and vegetables is responsible for a significant proportion of food poisoning. According to the World Health Organization about 2 million people die from food poisoning every year. We have to face the necessity to understand the interactions between plants and human pathogens. For a long time, human pathogens were assumed to survive on plants after more or less accidental infection. Today we understand that those pathogens do not merely survive on or within plants, they actively infect plant organisms by suppressing their immune system.

Keywords:

Pathogens, Human pathogens, Food

THE INFLUENCE OF ENDOPHYTES ISOLATED FROM SALICORNIA EUROPAEA L. ON HUMAN PATHOGENIC BACTERIA

Ada Błaszczyk

Uniwersytet Mikołaja Kopernika w Toruniu

275295@stud.umk.pl

A few words about the author:

I am a student of the Nicolaus Copernicus University in Toruń, where I am completing my master's thesis. My interests are mainly focused on issues in the field of microbiology.

Abstract:

The increase in consumption of fresh vegetables increases the number of reports of diseases caused by human pathogenic microorganisms (HPMO), e.g. E. coli 0157:H7, Salmonella spp., Shigella spp., Listeria monocytogenes, Clostridium botulinum, Bacillus cereus. The presence of HPMOs in crops can be a consequence of using natural fertilizers and contaminated water for watering, but also wild animals living in natural conditions. A study was conducted to determine the role of plant growth promoting endophytes (PGPE) in alleviating the negative impact of pathogens on radish growth parameters.

Keywords:

Endophytes, Pathogens, Human pathogens

FUNGAL ALTERATION OF PHYTOHORMONE-MEDIATED PLANT DEFENSE STRATEGY

Anita Kowalczyk

Faculty of Biology and Environmental Protection, Nicolaus Copernicus University,
Center of Modern Interdisciplinary Technologies, Nicolaus Copernicus University

anittvisser@gmail.com

A few words about the author:

I am a MSc Biotechnology student at the Faculty of Biology and Environmental Protection (Department of Microbiology), NCU. My research interests include analysis of plant-microorganism symbiotic interactions involving phytohormones activity.

Abstract:

Plant and fungi ecological niches include a diverse, both hostile and favorable, environments. Consequently, those organisms had to adapt and optimize their responses to the constantly changing pool of antagonistic organisms. Plants defense strategy is based on the presence of small molecules, called phytohormones, exhibiting their activity in a very low concentrations varying from 10–6 to 10–5 mol/L, causing plants to be very susceptible to any changes concerning hormone biosynthesis. Phytohormones are crucial for plant's proper functioning in a response to the biotic and abiotic environmental stimuli. They also participate in many developmental processes from early embryogenesis to biological aging. As a counteraction, fungi have evolved virulence factors allowing them to distort plant physiology through interfering with interplay of phytohormones, facilitating further colonization and disease progression. Moreover, pathogenic fungi through plant hormone pathways can affect habitat structure in order to improve their nutrient intake and capability to diffuse.

Keywords:

phytohormones, plant physiology, microbiology, fungal infection

EFFECT OF VIRUS INFECTION ON PHYTOHORMONES ACTIVITY

Anita Kowalczyk

Faculty of Biology and Environmental Protection, Nicolaus Copernicus University,
Center of Modern Interdisciplinary Technologies, Nicolaus Copernicus University

anittvisser@gmail.com

A few words about the author:

I am a MSc Biotechnology student at the Faculty of Biology and Environmental Protection (Department of Microbiology), NCU. My research interests include analysis of plant-microorganism symbiotic interactions involving phytohormones activity.

Abstract:

Plant hormones, called phytohormones, play a major role in almost every aspect of plant physiology, whether acting in the site of their biosynthesis or as a mobile products operating in many different tissues. Changes in phytohormones concentration, sensitivity and transport are reflected in their quantitative distribution in the plant. Phytohormones and their "cross-talk" had been proven to be one of plants' defense strategies against biotic and abiotic stress factors. Viral infection is accompanied by perturbation of plant's normal development, metabolism and signaling (including phytohormones signaling pathways) that leads to further consequences of infection affecting host cellular functions. Recently published data suggest that plant viruses can directly manipulate plant defense responses through modification of phytohormones bioactivity, thus allowing viruses to boost replication rates and disease dissemination.

Keywords:

phytohormones, plant physiology, microbiology, viral infection

PHOSPHOLIPASES - ENZYMES INVOLVED IN THE DEGRADATION OF PHOSPHOLIPIDS

Bartosz Igliński

Nicolaus Copernicus University

bartosz.iglinski01@gmail.com

A few words about the author:

I am a biotechnology student. I am interested in cancerogenesis and biochemistry processes.

Abstract:

Phospholipids, glycolipids, glycerophospholipids and cholesterol are present in all living organisms and constitute important components of biological membranes. The structure of these elements got a tremendous importance in maintaining the stability and permeability of membranes, which protect the cell interior from threats flowing from the external environment. Phospholipids mainly consist of a glycerol backbone linked with an ester link with fatty acids and a phosphate group.
The enzyme that participates in the hydrolysis of phospholipids is called phospholipase. These proteins lead to the release of a variety of biologically active compounds such as lysophospholipids or free fatty acids. The phospholipid hydrolysis' products function as intra- and extracellular mediators that participate in cell signaling, regulation of inflammation, cell proliferation and death. Due to the mechanism of action and substrate specificity, phospholipases can be divided into four categories: phospholipase A1, A2, C and D. The first two groups belong to acylhydrolases, while phospholipases C and D are groups of phosphodiesterases.

Keywords:

Phoshopholipase A1, Phoshopholipase A2, Phoshopholipase C, Phoshopholipase D, enzymes, fatty acids

THE ROLE OF PHOSPHOLIPASES IN BREAST CANCER

Bartosz Igliński

Nicolaus Copernicus University

bartosz.iglinski01@gmail.com

A few words about the author:

I am a biotechnology student. I am interested in cancerogenesis and biochemistry procesess.

Abstract:

During over a dozen years, it has been proven that lipid metabolism is one of the fundamental changes in the biochemical pathways, and its dysregulation allows cancer cells to survive and maintain a fast rate of growth and proliferation.
Inappropriate phospholipase activity is a phenomenon typical for cancer cells. After releasing into the environment, the enzyme may act as a ligand for various receptors or attack phospholipids present in the environment, modifying the availability of fatty acids. This leads to a change in tumor signaling and metabolism, which in turn may lead to cancer cell growth, survival and the ability to migrate. The activity of phospholipases depends on the number of lipid relays, which in turn is conditioned by the type of cancer tissue changed and the type of enzyme involved in their release. Inappropriate expression of phospholipases has been associated with the pathology of many malignant tumors, including breast cancer. Changes in the synthesis and hydrolysis of fatty acids are an indispensable part of the neoplastic processes.

Keywords:

Phospholipase A1, Phospholipase A2, Phospholipase C, Phospholipase D, breast cancer

CHROMATOGRAPHICAL METHODS FOR PROTEIN PURIFICATION

Agata Dalka

Nicolaus Copernicus University in Toruń

agata_ira@wp.pl

A few words about the author:

I am a student of biotechnology postgraduate studies in Nicolaus Copernicus University and a member of scientific circle 'Biotechnologia thoruniensis'. My researches are related to role of phytohormone conjugates in plants' growth and development.

Abstract:

Proteins are one of the most important groups of organic compounds found, which plays a key role in all biological processes occurring in living organisms. They are made of amino acids linked by a peptide bond. One protein can be made up of several, up to several thousand amino acid residues. The properties of a protein depend on its amino acid composition. These features are solubility, size, hydrophobicity, charge or affinity for specific functional groups. Due to differences in protein properties, they can be separated by chromatographic methods. Chromatography is an analytical and preparative technique that allows separation of the mixture into individual components. They are divided between two phases - stationary and mobile one. Molecular filtration is based on differences in the size of proteins molecules. Differences in charge allow separation by ion exchange chromatography. If the protein consists of amino acids that give it a hydrophobic character, it can be separated from other, less hydrophobic proteins by hydrophobic chromatography. Proteins with affinities for specific chemical groups can be separated using affinity chromatography.

Keywords:

chromatography, proteins, protein purification

EVALUATION OF PROTEIN PURITY

Agata Dalka

Nicolaus Copernicus University in Toruń

agata_ira@wp.pl

A few words about the author:

I am a student of biotechnology postgraduate studies in Nicolaus Copernicus University and a member of scientific circle 'Biotechnologia thoruniensis'. My researches are related to role of phytohormone conjugates in plants' growth and development.

Abstract:

Protein purification aims to get knowledge of proteins themselves and their applications. Proteins can be isolated for utility or research purposes. One of the utility points is application in medicine and diagnostics. Thanks to the isolation of proteins from living organisms, they can be used as drugs instead of synthetic replacements, e.g. insulin in diabetes treatment. Enzymatic proteins can be used in diagnostics, such as horseradish peroxidase, used in immunochemical tests. The isolation process requires conditions similar to the natural ones. Therefore, the methods must be chosen in order to reduce the possibility of degradation of the protein molecules to minimum. Purification of enzymatic protein requires calculation of the protein content in the obtained fraction, its total activity and specific activity after each purification step. Therefore, it is possible to determine the degree of protein purification as well as the efficiency of the purification process. In order to check the purity of the purified protein, electrophoretic methods are used, such as electrophoresis under denaturing conditions (SDS-PAGE) or isoelectric focusing.

Keywords:

chromatography, protein purification, proteins, electrophoresis, enzymes

ECONOMIC EVALUATION OF THE EFFICIENCY OF IRRIGATION IN SELECTED CROPS

Remigiusz Kledzik, Michał Kropkowski*, Czesław Rzekanowski, Jacek Żarski

University of Science and Technology in Bydgoszcz

*mike89pl@interia.pl

A few words about the author:

I am PhD student. I am studying agriculture. I reaserch impact of irrigation on soybean.

Abstract:

The aim of the study was to evaluate the economic effects of irrigation three crops: potatoes, malting barley and corn grown for grain.
For the assessment of the economic efficiency of irrigation in selected crops presented in this paper, we used results obtained from field experiments conducted in 2006-2012 at the Research Station of the University of Science and Technology in Bydgoszcz by employees of the Department of Land Reclamation and Agrometeorology. These studies were focused on the effects of irrigation on the yield of potatoes, malting barley and corn grown for grain. To calculate the economic efficiency we used the method of calculation the increase in direct surplus. The results indicate that irrigation was economically justified not in the all cases. For potatoes the direct surplus was increasing along with the increasing of the irrigated area, the losses were noticed only in the case of 1-hectare variant. In contrast, there was no economic justification for the use of irrigation in the production of malting barley, regardless of the irrigated area. Same results of economic effects, as in the case of barley, were obtained using drip irrigation in corn grown for grain. The presented calculation shows that the cost irrigation per 1 ha decreases as the irrigated area increases.

Keywords:

irrigation, economic efficiency, potato, malting barley, corn

ASSESMENT OF FROST OCCURENCE AT THE HEIGHT OF 200 CM IN BEDGOSZCZ AREA BETWEEN 1981-2010

Michał Kropkowski

University of Science and Technology in Bydgoszcz

mike89pl@interia.pl

A few words about the author:

I am PhD student.

Abstract:

This paper's aim is to describe frost occurrence at the height of a Stevenson screen (200 cm) between 1981 - 2010, basing on the data covering the area of Bydgoszcz. Considering the duration, the period in question shall be regarded as representative. The data used in the paper were obtained from the Research Station run by the Faculty of Agriculture and Biotechnology at the University of Technology and Life Sciences in Bydgoszcz. The station is located in Mochełek, approximately 20 km from Bydgoszcz, within the area of low urban and industrial level. Frost is a climatic phenomenon having its negative effect on a field crop production in the growth period. There were 404 days of frost between 1981 and 2010 in total (13.46 days on average), out of which 253 fell in spring and 151 in autumn. Frosts occurred in every year during the researched period. Spring frosts occurred at the frequency of 100%, and 83.3% in case of autumn ones On average, the last spring frost took place on 27th April. The first autumn frost occurred most frequently on 18th October. Non-frost period lasted for 172 days. The longest non-frost period continued for 206 days, while the shortest for 128 days. The study did not reveal any substantial changing trends in frost indexes until the end of 1981 - 2010 period.

Keywords:

frost, height of 200, Bydgoszcz

NEW, UNKNOWN MECHANISM OF POST-TRANSCRIPTIONAL REGULATION OF GENE EXPRESSION

Karolina Majewska

Department od Cell Biology, Faculty of Biology and Environmental Protection, Nicolaus Copernicus University

karolinalewandowska94@gmail.com

A few words about the author:

I am the student of Biotechnology on Nicolaus Copernicus Uniwersity. I am very fascinated about the cell biology. Currently I am taking part in some research which concern the role of nuclear retention in the regulation of gene expression.

Abstract:

Most of the mRNA generated in the transcription process undergoes co-transcriptional maturation in the nucleus. This allows them to be immediately transported to the cytoplasm, where proteins are synthesized in the process of translation. However, sometimes the created transcripts can be retained, which concerns mature mRNA as well as pre-mRNA. These transcripts are detained in the area of nucleus. Their transport to the cytoplasm, and thus the process of translation, is temporarily or definitively stopped. It is suggested that this mechanism may be used to regulate the expression of some specific genes, the degradation of defective mRNA as well as the accumulation of mature transcripts in case of stressful conditions. This retained mRNA is observed in the nucleoplasm and in the area of nuclear bodies such as speckles or paraspeckles. Currently, we have been able to determine possible mechanisms for retaining transcripts in the nucleus involving nuclear retention factors. It is also suggested that splicing factors that build early spliceosom may have an influence on this process. Currently, one of many studies which concern the mRNA retention is focus on understanding the mechanism of retaining transcripts which is related with Cajal bodies. What is important, the nuclear retention of transcripts underlies many neurodegenerative diseases. Therefore further understanding of this process might be helpful for the treatment of this disease.

Keywords:

Cajal bodies, nuclear retention, neurodegenerative diseases

CHLOROPHYLL FLUORESCENCE ANALYSIS OF HIGHBUSH BLUEBERRY PLANTS DIFFERENTIALLY PROPAGATED

Marzena Mazurek*, Aleksandra Siekierzyńska, Beata Jacek

University of Rzeszow, Faculty of Biology and Agriculture,
Departament of Plant Biotechnologoy and Physiology

*marzena.guty@poczta.onet.pl

A few words about the author:

I concentrate in my research on the somaclonal variation in the context of propagation method for highbush blueberry plants.

Abstract:

The aim of the study was to investigate the impact of propagation method of the highbush blueberry 'Brigitta blue' plants on the chlorophyll fluorescence. The plants were propagated conventionally by stem cutting (SC) and by tissue culture (TC). The micropropagated plants originated from axillary (TC-Ax) and adventitious (TC-Ad) shoots were separated. The additional group consisted of plants propagated several times by stem cuttings, originated from TC mother plants (TC/SC). The fluorescence analysis were performed with the Imaging IMAGING-PAM M-Series Chlorophyll Fluorometer a MINI version manufactured by the Heinz. The measurements were made on dark-adapted leaves at least for 30 min in darkness. All analyses were performed on the fully expanded leaves located at the third or fourth node from the apex of each epigenotype. The leaves were collected in 3, 5, 7, 10, 15 and 20 day. Almost all of analyzed fluorescence parameters differed significantly among epigenotypes. The highest values of maximum (Fm), minimum (Fo) and variable fluorescence (Fv) were found in the case of TC-Ad plants. On the other hand maximum efficiency of photosystem II (Fv/Fm) and water uptake (Fv/Fo) were observed for TC/SC plants. TC-Ax plants, in contrast to other epigenotypes, exhibited lowest values of almost all analyzed parameters, except of Fo. Obtained data indicated that propagation method have impact on the chlorophyll fluorescence and it can lead to differences in photosynthesis efficiency.

Keywords:

micropropagation, adventitious shoots, axillary shoots, soft wood cuttings

MARINE VIRUSES IN THE GLOBAL ECOSYSTEM AND PREVALENCE OF NOVEL CHAPERONINS IN THE VIRIOPLANKTON

Marlena Szeligowska

Unit of Bacterial Genetics, Faculty of Chemistry, Gdansk University of Technology

marlenaszeligowska@gmail.com

A few words about the author:

I graduated from Gdansk University of Technology with engineering degree (Biotechnology). Currently, I am a Master`s degree student (Biotechnology, Gdansk University of Technology) and Bachelor's degree student (Oceanography, University of Gdansk).

Abstract:

Marine viruses are the most abundant forms of genetic material in the ocean. It was estimated that there are 1030 viruses in the seawater and their concentration in the surface waters is approximately 1010 per liter. Thus, they have the greatest contribution to the genetic diversity among other biological particles. The current state of knowledge of marine viruses shows that we should take them into consideration to understand biological and biochemical processes in the ocean since they have influence on nutrient cycling and the evolution of host organisms. Viral biology and ecology depends on the successful replication during which viruses rely on protein-folding machinery composed of chaperonins. This group is still poorly characterized and only a few phages are known to encode chaperonin genes. However, it was shown that chaperonin-carrying viruses are ubiquitous and widespread in marine ecosystems. The question is how chaperonins are linked to the biological features of virioplankton.

COMMENTS

1030 = ten to the power of 30
1010 = ten to the power of 10

Keywords:

Marine viruses, virioplankton, chaperonins

EVALUATION OF THE DENITRIFICATION RATE IN A PILOT REACTOR TREATING WASTEWATER IN THE PROCESS OF DEAMONIFICATION

Anna Wilińska*, Krzysztof Czerwionka

Politechnika Gdańska, Wydział Inżynierii Lądowej i Środowiska, Katedra Technologii Wody i Ścieków

*aniwill93@gmail.com

A few words about the author:

Engineer with ambitions for a scientist. Fanatic of research and discovering interesting phenomena. Privately, a pessimist who always thinks that I will break something.

Abstract:

The problem of excessive fertilization of the Baltic Sea waters is still valid. For this reason there are numerous research works aimed at reducing the load of biogenic compounds discharged into this basin. One of them is the IWAMA project, which aims to search for effective methods of wastewater treatment, resulting in lowering the concentration of biogenic compounds. As part of the project, pilot studies are carried out, including in the Gdańsk Wschód WWTP. The pilot technological system for wastewater treatment is based on the innovative Anammox process.

The main goal presented in the paper was to evaluate denitrification efficiency based on the results of a conventional denitrification rate test (NUR). Three sewage samples were analyzed after the mechanical-chemical stage carried out in the pilot bioreactor.

It has been demonstrated that the pilot treatmentsystem enables efficient removal of pollutants. It has been found that adequate amounts of organic compounds are not available in the row wastewater until complete denitrification is obtained. It has been shown that the denitrification process can only be a complement to the nitrogen removal in the deamonification process. The amount of available organic compounds is sufficient to carry out the denitrification process of nitrates (V) produced in the process of deamonification. The tests showed that the obtained values of NUR 1 and NUR 2 are typical for mechanically treated municipal wastewater.

Keywords:

Anammox, , deamonification, denitrification, NUR test, denitrification rate

SPECIES IDENTIFICATION OF ANTS BASED ON DNA BARCODING

Adam Staniszewski(1, 2)*, Patrycja Skowronek(2)

(1) Wydział Biologii i Biotechnologii, Uniwersytet Marii Curie-Skłodowskiej w Lublinie,
(2) Wydział Agrobioinżynierii, Uniwersytet Przyrodniczy w Lublinie

*aadam.staniszewski@gmail.com

A few words about the author:

Biotechnologist, entomology and molecular biology geek, breeder and keeper of exotic animals.

Abstract:

Over ten thousands ant species have been described and this number is still increasing. Some authors predict that over ten thousands of new species might be described within next couple of years.
It leads to conclusion - how and why so many ?
Difference between number of already described species and number of predicted ones is mainly the result of using new identification method based at molecular biology, which give us opportunity to far exceed possibilities offered by morphology based identification, but also created problems to solve.
One of the most commonly used and user friendly is DNA barcoding. This method is based on analysis of short sequence of gene present in all organism (in case of ants and other animals it is sequence of COI gene), but is different enough to be use at species level identification.
Isolated and amplified COI's sequence is sequenced and compared to data available in databases.
DNA based identification allow us to avoid problems connected with morphology based identification - damaged specimens, lack of certain caste which allow us to use ID key ect.

Keywords:

ants, DNA barcoding, COI, species identification, molecular biology

CAUSES AND HAZARDS ASSOCIATED WITH COLONY COLAPSE DISORDER

Patrycja Skowronek

Institute of Biological Basis of Animal Production, Faculty of Biology, Animal Sciences and Bioecenomy, University of Life Science in Lublin

patrycjaannaskowronek95@gmail.com

A few words about the author:

Student of Bioengineering, currently conducting research on beneficial insects including pollinators in the Student Scientific Circle of Environmental Protection - Environmental Biology Section at the University of Life Sciences in Lublin.

Abstract:

Over the past 20 years, as a result of the spreading anthropopressions, declines in the populations of many species of flora and fauna have been observed. Such falls are also observed among useful fauna, including pollinating insects. The increasing environmental pollution and modifications of natural habitats have very large consequences. There has been an increasing tendency to die off or poison among many bee species or even with their unexplained disappearing. The phenomenon of inexplicable disappearance of honey bees is called CCD (colony collapse disorder) and accumulates in its etiology: phenomena related to anthropopressure, environmental changes, weakening of the bee's resistance due to the aforementioned phenomena and parasites and pathogens. In spite of numerous attempts to strengthen bee colonies by supplementation and the number of research on the immune system, it is still not able to significantly hinder the progress of this phenomenon. The losses of honey bees populations is associated with large economic damages in the agriculture, horticulture and food industry sectors.

Keywords:

CCD, Nosema spp., honey bees

CAUSES, COURSE AND EFFECTS OF HONEY BEE INFECTION (APIS MELLIFERA) WITH NOSEMA SPP.

Patrycja Skowronek

Institute of Biological Basis of Animal Production, Faculty of Biology, Animal Sciences and Bioecenomy, University of Life Science in Lublin

patrycjaannaskowronek95@gmail.com

A few words about the author:

Student of Bioengineering, currently conducting research on beneficial insects including pollinators in the Student Scientific Circle of Environmental Protection - Environmental Biology Section at the University of Life Sciences in Lublin.

Abstract:

It is estimated that over 70% of plant production is obtained thanks to the activity of pollinating insects. Limiting pollinators, including honey bees (Apis mellifera), may contribute to large economic losses in the agricultural sector. Along with the growing pollution of the environment, the bee organism weakens and thus becomes easy prey for various origins of parasites and pathogens. One of the common parasites present in the body of this pollinator is Protist - Nosema, which causes a disease called nosemosis. The disease is transmitted mainly through plunder between beehives and bad beekeeping practice (poor hygiene). Nosema settles in the digestive system of the insect, taking as its target mainly the epithelium of the middle intestine. The first symptom of occurrence of the disease is acute diarrhea, distended abdomen, general motor deterioration and bahavioral changes of individual individuals (later the whole family). Diarrhea and other secretions (e.g. throat) of infected bees become a new source of disease. Parasite spores are resistant to external factors, and remain viable for 2 years in the dried stool, in dead bees for 1 year, and in honey for a period of about 9 months. In one infected bee, there can be up to 30 to 50 million spores.

Keywords:

parasite, pollinator diseases, symptoms, nosemosis

ENVIRONMENTAL THREATS OCCURRING IN OSMIA RUFA COMMUNITIES

Patrycja Skowronek

Institute of Biological Basis of Animal Production, Faculty of Biology, Animal Sciences and Bioecenomy, University of Life Science in Lublin

patrycjaannaskowronek95@gmail.com

A few words about the author:

Student of Bioengineering, currently conducting research on beneficial insects including pollinators in the Student Scientific Circle of Environmental Protection - Environmental Biology Section at the University of Life Sciences in Lublin.

Abstract:

Recently, due to the various factors, threats and diseases it is claimed that there is a high decrease in the population of bees kept in apiaries. Therefore, the so-called wild bees play an increasingly important role in nature, horticulture and agriculture. One of the species of solitary, wild bees is Osmia rufa which can be bred as a useful pollinator for commercial purposes. It lives in small tubular spaces at a height of 1-3 m and builds walls of soil particles inside the chosen nesting place, where it assembles brood chambers for eggs. The advantages of this insect include: a small amount of space for breeding, a gentle disposition and reduced sting. Recent research showed that mason bees, like other well-known species of useful insects, have numerous enemies and threats. Some of the main enemies of red mason bees include other species of insects with a similar way of nesting. They use mason brood chambers for their own development, often parasitizing on eggs / larvae / pupae of Osmia. Other research developed the optimization of breeding conditions and threats occurring in the natural environment. Overall, O. rufa so far is a solitary bee bred by professionals and amateurs in order to increase the number of pollinator in the natural habitats and in the cultivated areas.

Keywords:

solitary bees, enemies, wild pollinators

EXOTIC HONEY - ORIGIN, CHARACTERISTICS AND APPLICATION

Patrycja Skowronek

Institute of Biological Basis of Animal Production, Faculty of Biology, Animal Sciences and Bioecenomy, University of Life Science in Lublin

patrycjaannaskowronek95@gmail.com

A few words about the author:

Student of Bioengineering, currently conducting research on beneficial insects including pollinators in the Student Scientific Circle of Environmental Protection - Environmental Biology Section at the University of Life Sciences in Lublin.

Abstract:

Bee products have been very popular for many generations due to their versatile properties. The main and one of the most well-known and valued products is the honey produced by Apis mellifera bees from the nectar and pollen of melliferous plants or from honeydew. Depending on the food resorces on which the bee feed, different species of honey can be obtained. Among the most common honeys in Poland, exotic honeys produced in the furthest corners of the world has appeared on the market. Depending on the type of honey, its physical properties change (physical state, color), composition and content of individual substances, affecting their use. Taste and smell are also variable. Honey imported from other countries, obtained from the national unique flora (even endemic in the regions of Australia and other exotic islands) have their own specific compositions and properties. In addition, their original taste qualities make many people buy and taste a piece of Earth's paradise closed in jars. Their application is associated with many positive research results in the field of medicine, dietetics and human supplementation. Stimulates different in this shows a very positive effect on the human immune system.

Keywords:

honey, bees

DRUG RESISTANCE- WHAT IS IT AND HOW DOES IT WORK?

Iwański Bartłomiej*, Skowronek Patrycja, Staniszewski Adam

University of Life Sciences in Lublin

*iwanski.bartlomiej11@wp.pl

A few words about the author:

Biotechnology graduate, at the moment PhD student. I am interested in microbiology and virology.

Abstract:

The discovery of antibiotics at the beginning of the 20th century was a real breakthrough in the treatment of infections caused by microbial pathogenes. They have allowed the successive eradication of more and more diseases that threaten humanity. Discovery and successive bringing to use new antibiotics in the 1940s and 1950s was intended to lead to the complete elimination of pathogenic micro-organisms from the environment. Unfortunately, that did not happen. Mass abuses of antibiotics have led to a significant increase in their presence in the environment. As a result, microorganisms evolved a number of mechanisms to protect themselves against the bactericidal substances. These adaptations can, depending on the principle of operation, protect the cells from the action of individual antibiotics, their groups or in extreme cases can provide complete protection. The first time they were observed in the forties of the last century, since then they have been the main point in the struggles of doctors and pharmacists with new pathogens.
This study is intended to describe the functioning of the mechanisms of resistance, their spread and the presentation of the measures to be taken to ensure that antibiotics remain effective.

Keywords:

antibiotics, drug resistance, multi-drug resistance

EVALUATION OF ECONOMIC EFFICIENCY OF IRRIGATION IN CORN FOR GRAIN PRODUCTION IN 2005-2016

Remigiusz Kledzik*, Michał Kropkowski, Stanisław Dudek, Renata Kuśmierek-Tomaszewska, Jacek Żarski

University of Science and Technology in Bydgoszcz

*rkledzik@gmail.com

A few words about the author:

Uczestnik studiów doktoranckich na Uniwersytecie Technologiczno-Przyrodniczym w Bydgoszczy. Interesuje się ogólnie pojętą techniką, lubię wiedzieć jak coś jest zrobione, jak działa. Biegam, trenuje na siłowni w wolnych chwilach słucham muzyki.

Abstract:

To evaluate the economic efficiency of irrigation in corn cultivated for grain, production effects were used, which were obtained from studies conducted by researcher team from the Department of Land Reclamation and Agrometeorology at the Experiment Station of the UTP University of Science and Technology in Bydgoszcz in 2005-2016. The research covered the effect of irrigation on yielding of the crop. Economic efficiency calculations were made using the direct surplus increase calculation method. In each variant irrigation enhanced production effects. It was not always economically justified, however. The irrigation costs (for drip and sprinkler irrigation systems) per hectare were decreasing with an increasein acreage. Applying drip irrigation was economically unjustified in moist years and on average in the multi-year period. In the years with dry and average precipitation conditions the direct surplus was positive, except for irrigation of 1 ha. As for the sprinkler-irrigation system, a lack of economic efficiency was reported in moist years, whereas in dry and average years as well as on average in the multi-year period, except for 1 hectare acreage, corn sprinkler-irrigation was economically justified.

Keywords:

drip irrigation, sprinkler irrigation, economic efficiency, corn for grain, drought categories

PEDODIVERSITY CHANGES AND SOIL TRANSFORMATIONS IN THE MEDIUM-SIZED CITY (INOWROCŁAW, POLAND) FROM 1934 TO 2016

Sylwia Pindral(1)*, Rafał Kot(2), Piotr Hulisz(1), Przemysław Charzyński(1)

Nicolaus Copernicus University in Toruń, Faculty of Earth Sciences,
(1) Department of Soil Sience and Landscape Management,
(2) Department of Geomorphology and Quaternary Paleogeography

*syl.pindral@gmail.com

A few words about the author:

I am PhD student of geography at the Faculty of Earth Sciences in Nicolaus Copernicus University in Toruń. I am inerested in soil mapping, especially landscape diversity, soil erosion modelling, SUITMAs (soils within cities), and soil classification.

Abstract:

Pedodiversity is commonly defined as the variation of soil units, classes or properties within a specific area. In case of urban landscape the significant area is covered by Technosols. Inowrocław is a medium-sized, multifunctional city with industrial (especially mining and chamical), spa, transport, and agricultural function. This medium-sized, multifunctional city has got over 800-year history, developed from industial, salt mining city to the multifunctional, which include: industry (especially mining and chemical), spa, transport and agriculture. The aim of the study is to assess the pedodiversity within the city of Inowrocław and its changes from 1934, through 1978 to 2016. To create the map of pedodiversity, urban soil map was digitalized and four landscape metrics (Patch Richness, Total Edge, Shannon's Evenness Index and Simpson's Evenness Index) were calculated based on hexagonal grid. Final maps were created using the point bonitation method. It allowed to identify the areas where the biggest fragmentation of the landscape occurred, which is correlated with soil transformations and the development of the Inowrocław city from 1934 to 2016. Soils have many significant functions and are one of the most ephemeral and difficult to renew elements of the environment. Research on soilscapes changes was undertaken for creating comprehensive study of urban soils in medium-sized city. Final maps may be a valuable tool for spatial planning and environmental protection plans.

Keywords:

pedodiversity, SUITMA, soilscapes changes, Inowrocław

WHAT DOES THE MARS ROVER HAVE IN COMMON WITH THE WEATHER ON THE EARTH?

Luiza Wieczorek(1)*, Bartłomiej Cybulski(2)

(1) University of Lodz, Faculty of Geography, Department of Meteorology and Climatology,
(2) Lodz University of Technology, Faculty of Electrical, Electronic, Computer and Control Engineering

*wieczorek-luiza@o2.pl

A few words about the author:

I am a PhD student. In my scientific work, I focus on issues related to the weather and climate. Together with the co-author of the summary, Bartłomiej Cybulski, we are in the Raptors team, which constructs students prototype of the Mars rover.

Abstract:

Advanced weather observations have been conducted on Mars since 2012. This is of course related to the Curiosity Rover mission. However, before the equipment is sent into space, many tests are carried out on the earth surface. Hundreds of specialized scientists deal with this, but as it turns out, not only. A good example is the University Rover Challenge - a competition for students organized since 2007.Measurement experiments take place at NASA's Martian Research Station (MDRS) in the Utah desert. This natural environment is similar to Martian. The research was carried out as part of the University Rover Challenge.The test platform for this study was a Martian rover analog build by Raptors team from Lodz University of Technology. It is a six wheel mobile robot based on rocker-boogie suspension. The heart of the entire rover is the SB-Rio on-board computer. It communicates with individual components of the platform via the CAN interface. The operation of the research module (probe) is supported by dedicated electronics, which is managed by a 32-bit microcontroller from the STM32F4 family with the ARM Cortex-M4 core. Its task is to operate sensors to study the meteorological parameters of the atmosphere.
The following sensors were used: SHT75 temperature and humidity sensor, dust sensor, wind speed and direction sensor (anemometer).
It all shows that for science, solutions should be sought in all possible ways.

Keywords:

Mars rover, weather, desert

PHOTOSYNTHETICALLY ACTIVE RADIATION (PAR) - PRELIMINARY STUDIES

Luiza Wieczorek

University of Lodz, Faculty of Geography, Department of Meteorology and Climatology

wieczorek-luiza@o2.pl

A few words about the author:

As a PhD student I deal with meteorology and climatology. I am most interested in extreme weather and solar radiation.

Abstract:

The range of the wavelength of PAR radiation is similar to the range of visible light and ranges from about 400 to 800 nm. PAR is very important for the proper plant photosynthesis process. The study uses data from two measurement stations: on the field and in the swampy area. Data are recorded by PQS1 meter produced by Kipp & Zonen. Daily, monthly and yearly cycles will be presented for PAR radiation. Two different ecosystems will be a comparison in different meteorological conditions and for different seasons.

Keywords:

Radiation, photosynthesis, swamp

ANTIBIOTIC RESISTANCE OF LACTIC ACID BACTERIA GROWN IN THE PRESENCE OF ALGAE CHLORELLA VULGARIS

Sylwia Ścieszka*, Elżbieta Klewicka

Faculty of Biotechnology and Food Science, Institute of Fermentation Technology and Microbiology, Lodz University of Technology

*sylwia.scieszka@edu.p.lodz.pl

A few words about the author:

I am a PhD student and I work with the Probiotic Group Research in The Institute of Fermentation Technology and Microbiology. My interests are connected with fermented food, metabolism of lactic acid bacteria, diet and functional foods.

Abstract:

Algae are a great source of biologically active compounds and possess antibacterial, antiviral, and antifungal properties. Moreover, they are a rich source of natural antioxidants. Therefore, they have been used in many fields of industry, for instance chemical, pharmaceutical, cosmetic and food industry. Algae may also be used for construction of fermented functional food rich in lactic acid bacteria.

The aim of this study was to evaluate the susceptibility of lactic acid bacteria grown in the presence of algae Chlorella vulgaris to 10 antibiotics (amoxicillin, doxycycline, vancomycin, erythromycin, lincomycin, streptomycin, gentamicin, cefaclor, ofloxacin, piperacillin/tazobactam). Four strains of Lactobacillus brevis, isolated from beetroot, cucumber and cabbage silage, were used. The influence of algae in a concentration of 1.5% was investigated by the disk diffusion method.

The results shown that all tested Lactobacillus strains are sensitive to amoxicillin, doxycycline, erythromycin and piperacillin/tazobactam. However, they are resistant to vancomycin, streptomycin and ofloxacin. Moreover, lactic acid bacteria grown in the presence of Chlorella vulgaris possess smaller zones of inhibition to all tested antibiotics. Furthermore, Lactobacillus brevis strains cultured in the presence of algae were resistant to the piperacillin/tazobactam, no zone of inhibition was evident.

Keywords:

antibiotic resistance, lactic acid bacteria, Lactobacillus brevis, algae, Chlorella vulgaris

THE DISTRIBUTION REASONS FOR THE SHORTAGE OF DAIRY COWS FROM A FARM LOCATED IN PODLASKIE VOIVODESHIP

Sylwia Jakubowska*, Anna Tobojka, Tomasz Stachurski, Mateusz Walas

Szkoła Główna Gospodarstwa Wiejskiego

*sylwia_jakubowska@op.pl

A few words about the author:

Studenci II roku II stopnia zootechniki w Szkole Głównej Gospodarstwa Wiejskiego w Warszawie.

Abstract:

Changes in the main reasons for the shortage in dairy herds stem from the update of production trends. In the past, the main reasons were low productivity and random accidents. Nowadays, after achieving by means of breeding work, higher milk yield, the trends in production and selection indices have changed, and as a result the reasons for lacking in the herd. These are: udder diseases, diseases of the musculoskeletal system and disorders associated with the reproductive system.
The purpose of the work was to determine the reasons for the missing and their percentage share in the basic herd in the farm chosen for observation. The data collected during three years (2014-2016) concerning Holstein-Friesian cows, originating from a farm specializing in dairy cattle farms, located in the Podlaskie Voivodship, in the municipality of Krasnopol, in the village of Żłobin, were used for the analysis. The data came from the Milky Value Assessment reports from PFHBiPM. Studies have shown that the overall intensity of missing items was greater than the upper limit of the national focus measure of selection. The largest share was caused by diseases of the locomotor system and the disease lists the smallest metabolic diseases.

Keywords:

cull, cow, infertility

CROSSBREEDING DAIRY CATTLE

Paweł Solarczyk*, Grzegorz Grodkowski, Kamila Puppel

Cattle Breeding Division, Department of Animal Breeding and Production, Faculty of Animal Science, Warsaw University of Life Sciences

*pawel_solarczyk@sggw.pl

A few words about the author:

PhD student at the Faculty of Animal Science Warsaw University of Life Sciences.

Abstract:

Crossbreeding is a selection of individuals per parent generation who are genetically different from each other and come from different breeds. The aim of crossbreeding is to achieve heterosis effect. This term is used to describe the higher phenotypic value of the heterozygotic descendant generation than the mean homozygotic value of the parent couple. In order to achieve the desired effect, it is necessary to select two individuals from the line with the highest degree of homozygosity to the parent couple. Data derived from the assessment of milk yield and heifer cards - cows were the basis for obtaining information on milk yield. The obtained data contained information on selected cows for the second calving, which were developed. The development of breeding biotechnology and the use of sperm of only the best breeders and the promotion of high-production cattle breeds reduces the genetic diversity through the growth of inbreeding. The result of such action is the decline in the value of functional and production features, which is why in such a case one should look for alternative solutions to such a situation, one of them may be interracial crossbreeding. It is a simple method known for many years, which can quickly improve the traits that breeders care about due to the heterosis effect. It is a phenomenon contrary to inbreeding depression and affects not only functional features, but also production features.

Keywords:

crossbreeding, heterosis

METABOLIC PROFILE DAIRY COWS

Paweł Solarczyk*, Grzegorz Grodkowski, Kamila Puppel

Cattle Breeding Division, Department of Animal Breeding and Production, Faculty of Animal Science, Warsaw University of Life Sciences

*pawel_solarczyk@sggw.pl

A few words about the author:

PhD student at the Faculty Animal Science Warsaw University of Life Sciences.

Abstract:

In dairy cow herds priority is to maintain high milk production and animal health, which is the control of nutrition and metabolic status through blood biochemical analysis and determination of the "metabolic profile". The disproportion between the genetic conditions for milk production and limitations in the energy value of the dose may cause metabolic disorders, and the negative energy balance affects the functions of the hormonal balance and organs of the body. It appears in the perinatal transition period. The term "transitional" is used to emphasise the physiologically, metabolically and nutritionally important change taking place at that time. The way these changes occur, how they are diagnosed and detected are important because they are related to the clinical or subclinical condition of the disease, affecting performance and reproduction - factors that affect the profitability of production. Therefore, prevention of metabolic diseases is a priority for intensive milk production.

Keywords:

metabolic profile, negative energy nalance

LAW AND ECONOMICS SCIENCES

AUDIT AS A METHOD OF IMPROVING PROCESSES IN AN ORGANISATION

Paulina Bies

Management Faculty, Cracow University of Economics

paulina.bies1@gmail.com

A few words about author:

PhD student at the University of Economics in Krakow. I am interested in Lean Manufacturing and Management Systems, as well as their impact on the quality of the process.

Abstract:

The issue of improving processes in an organization is an important aspect of management. The article discusses the use of an audit by organizations. The purpose of the article is to verify whether the implemented auditing process has a positive impact on the processes and helps to improve the company. The auditing process was presented on the example of an organization from the service industry, where employees were also interviewed with regard to the impact of conducted audits on the functioning of the company.

Keywords:

Internal audit, improving organisation, PDCA, 5S method

A TALK ABOUT - AN AUTOBIOGRAPHICAL INTERVIEW

Hanna Kądziołka-Sabanty

Uniwersytet Łódzki, Wydział Zarządzania

haneczka@post.pl

A few words about author:

Lecturer, trainer, coach - at work, I analyze the competence and potential of employees, and plan their development. I am particularly interested in the system of managing older employees and the issues of age management in organizations.

Abstract:

Observations of demographic processes confirm that Europe is "getting older". The natural increase shows a clear downward trend - the forecasts are worrying because they indicate that by 2020, the population of 65+ will constitute about 25% of the European Union's population. Changes in the age groups of potential employees are also noticed in contemporary organizations. Employers report needs within human resources and communicate about problems in acquiring appropriate employees, having specific skills and experience. There is still a certain stereotype regarding older workers. However, the situation on the labor market is increasingly directing employers towards a group of 50+ people. Human resource management requires knowledge about the needs of people also in the context of various variables that describe them. Age is one of them. Due to the previously mentioned stereotypical perception of older people, it is necessary to redefine the description of their potential. In this situation, it is important to obtain information in this area - autobiographical interviews are an interesting source in the given area.

Keywords:

age management, professional activity of older workers, development of the potential of mature employees

TOURIST INFRASTRUCTURE OF THE PORTUGUESE WAY OF THE WAY OF ST. JAMES

Kajetan Suchecki

Uniwersytet Ekonomiczny w Katowicach

kajetan.suchecki@gmail.com

A few words about author:

PhD student in the University of Economics in Katowice. The President of the AZS UE Katowice Sports Club, traveler, badminton player. Science interests: tourism economy, CSR, the Way of St. James, sports management.

Abstract:

The Way of St. James is one of the oldest pilgrimage routes in Europe and one of the three most important (along with the roads leading to Rome and Jerusalem). Currently, it is pilgrimated by over 300,000 pilgrims annually (on foot and by bike), and several million come to Santiago de Compostela by road and air transport to visit the famous sanctuary. Thus, various elements of tourist infrastructure dedicated to pilgrims were created on individual pilgrimage routes, which is unique on a global scale.This work, based on source materials and own observation on the Portuguese Way, is to show how tourist development on the Way of St. James on the Porto - Santiago de Compostela route.

Keywords:

tourism infrastructure, Way of St. James, pilgrimage, Santiago, cultural route

THE AZS POLISH INTEGRATION CHAMPIONSHIPS AS AN EXAMPLE OF THE SOCIAL RESPONSIBILITY OF THE ACADEMIC SPORTS ORGANIZATION

Kajetan Suchecki

Uniwersytet Ekonomiczny w Katowicach

kajetan.suchecki@gmail.com

A few words about author:

PhD student in Department of Market and Consumption at University of Economics in Katowice, President of the AZS UE Katowice Sports Club, badminton player, traveler; science interests: the Way of St. James, tourism economy, CSR, sports management.

Abstract:

The AZS Polish Integration Championships are the youngest event organized by the Academic Sports Association (AZS). This idea was first implemented in 2016 and is becoming more and more popular among disabled students from year to year. It is a chance to activate and integrate students who have a disability certificate. At the same time, it is open to the world of people with disabilities through AZS.This work is to show the assumptions and organization of the Polish Integration Championships of AZS and to refer them to fulfillment of social responsibility by AZS.

Keywords:

AZS, sports event, disabilities, IMP, CSR

HOW DOES THE CHANGE OF THE OPEC CARTEL'S SUPPLY POLICY INFLUENCE THE GLOBAL PRICES OF CRUDE OIL – AN EVENT STUDY ANALYSIS

Jacek Suder

Cracow University of Economics, Faculty of Finance and Law

jaceks1027@gmail.com

A few words about author:

My name is Jacek Suder. I am a student at the University of Economics in Krakow. In addition, I work at the National Bank of Poland in Warsaw as analyst.

Abstract:

The aim of the article was to examine the impact of OPEC cartel decisions taken in November 2016, specifically the transition from a strategy of maximizing market share toward that reducing the supply of raw materials, on the global prices crude oil. The countries of the oil association have decided for such a move following two factors translating into drop in oil prices, specifically a significant increase in global oil stocks and a strong increase in production of raw materials among countries outside the OPEC cartel (mainly in the US). The research methodology comes down to the analysis of events as one which is usually applied in the literature to assess the impact of extraordinary unexpected event, which cause significant fluctuation in prices of financial instruments. As a result of the conducted research, it was found that the decision taken by the cartel to introduce restrictions on production finally led to increase in the price of the crude oil.

Keywords:

event study, crude oil, cartel OPEC, the US shale revolution, trade war

GRAVE LACK OF DISCRETIONARY JUDGEMENT AND TOTAL SIMULATION - THE COMPATIBILITY OF THE GROUNDS FOR THE NULLITY OF MARRIAGE

Małgorzata Koterba

Wydział Teologiczny Uniwersytet Jana Pawła II w Krakowie

malgorzatakoterba@gmail.com

A few words about author:

A PhD student from Pontifical University of John Paul II in Cracow.

Abstract:

Looking at total simulation and grave lack of discretionary judgement as separate grounds for nullity we have to remember about the constitutive elements of these grounds with respect to the question of their compatibility. These elements are also what the judges should have in their mind when they decide about the nullity of the particular marriage. The practice of not treating the grounds together and why the practice of subordinating them will be presented in this presentation.

Keywords:

consensual incapacity, exclusion of marriage, total simulation, grave lack of discretionary judgement, defects of the consent

THE PROOF OF FREE TO MARRY STATUS MEMBERS OF THE CHURCH OF ENGLAND AT THE ROMAN CATHOLIC CHURCH FORUM

Małgorzata Koterba

Wydział Teologiczny Uniwersytet Jana Pawła II w Krakowie

malgorzatakoterba@gmail.com

A few words about author:

A Phd student from Pontifical University of John Paul II.

Abstract:

The presentation describes procedure to establish free status of a member of the Church of England in the Roman Catholic Church. An introduction to the subject is the approximation of the history and the doctrine of the Anglican Church, with particular emphasis on the sacrament of marriage. The comparison with the doctrine of the Roman Catholic Church points at the fundamental differences in understanding the sacramentality of marriage. This is crucial especially in the light of the admitting de facto dissolution of the marriage in the Church of England, the recognition of a civil divorce and the possibility of remarriage by persons divorced at the forum of the Church of England.

Keywords:

free to marry, Church of England, Catholic Church,

WHITE - COLLAR CRIME IN POLAND

Aleksandra Lempart

Krakowska Akademia im. Andrzeja Frycza Modrzewskiego

olalempart@gmail.com

A few words about author:

I am a PhD student at the Andrzej Frycz Modrzewski Krakowska Akademia Faculty of Law. My research focuses on white - collar crimes in general. Currently I work as prosecutor assistant in the Regional Prosecutor's Office in Krakow.

Abstract:

White – collar crime is the term that was first defined by Edwin Sutherland in 1939, as „a crime committed by a person of respectability and high social status in the course of his occupation". Modern criminology rather rejects a limitation of the term by reference and classifies the type of crime and the topic. It is significant that while in the USA research on the mentioned phenomenon is common, it is not enough studied in Poland, nor is it presented with statistics related to it. Autor of the paper will focus primarily on presenting arguments for the vulnerability of researching the phenomenon of white collar crime, willing to prove that these studies can be very useful. Firstly, conducting research in this area may reveal the reasons of this interesting phenomenon and contribute to its eradication. It is also important to realize that white collar-crime is not a synonym for economic crime – as it is widely understood in Poland. Therefore understanding white-colar crime is the first step that must be taken to successfully prevent it and reduce it.

Keywords:

white-collar crime, white-collar criminal, criminal law, sutherland edwin, criminology

HUMANITIES AND THEOLOGICAL SCIENCES

POLISH MESSIANISM AS HISTORIOGRAPHICAL MYTH. FROM 19TH-CENTURY TRADITION TO CONTEMPORARY PUBLIC DISCOURSE

Paulina Litka

Maria Curie-Skłodowska University, Department of Humanities, Institute of History, Department of History Methodology

paulinalitka@interia.pl

A few words about author:

Graduate of historical studies at Maria Curie-Skłodowska University in Lublin. PhD candidate in the humanities–history. The Chair of the Student Research Group - Methodological Group of Historians of UMCS Lublin.

Abstract:

Messianic myth dates back to Romanticism and it played a significant role in the 19th century Polish historiography. It would seem that the idea of Poland as the Christ of Europe has been long gone and will remain merely as a concept in the history of ideas, history of mentality and historical politics. However, in modern times, it turns out this concept might be making a comeback and surprisingly reviving in public life. Therefore, the subject of the study is classical historiographical narratives and related non-academic discourses analyzing the very presence and ways in which messianic myth functions. The 19th-century Polish messianism addressed certain symbolical needs of the people confronted with a painful history perceived as a historical injustice and trauma. At times, it was a form of psychotherapy compensating for fears, and sustaining hope. Contemporary messianic discourse is a continuation of the Romantic tradition; resemblance on the level of heroic and martyrological values, treating the nation as the main value, following new rules and techniques when creating imaginary reality. The new myth of Poland as the Christ of nations, which in a way is becoming a tool for explaining the world around us, appears in different shapes. It no longer only belongs to the history of ideas, but plays a crucial part in current cultural wars for Poland's place in Europe and the world.

Keywords:

messianic myth, Polish messianism, historiographical myth, messianic idea, Romantic heritage

PSYCHOLOGICAL CONSEQUENCES AND THERAPY OF PEOPLE SUFFERING FROM ATOPIC DERMATITIS

Michał Murgrabia

Uniwersytet SWPS

mmurgrabia@st.swps.edu.pl

A few words about author:

My name is Michał Murgrabie and I am a student of the fourth year of psychology at the SWPS University in Warsaw. My scientific interest is focused on issues related to psychosomatic diseases.

Abstract:

Among skin diseases, Atopic Skin Dermatitis (AD) is diagnosed more and more often. It is a chronic, annoying and difficult condition to cure, and its symptoms are visible to the environment. It has its psychological consequences, experienced both by patients and their relatives. The causes of the disease are related to the deterioration of the mental state of the patient (Bartoszek, 2010). In addition to pharmacological therapy, it is increasingly postulated that psychological support is an important factor influencing the condition of patients. As demonstrated by the meta - analysis of research (Chida, Steptoe, Hirakawa, Sudo and Kubo, 2007) there are many effective ways to improve the functioning of patients with AD, from relaxation training, to psychoeducation, to cognitive-behavioral therapy. Studies have shown (Staab et al., 2006) that proper psychological care brings an improvement in the clinical condition, as well as an increase in the sense of quality of life. This approach significantly affects the course of therapy of people suffering from Atopic Skin Dermatitis.

Keywords:

Atopic dermatitis, psychosomatics, skin diseases, mental health

JUVENILE OFFENDERS. CAUSES AND WAYS OF UNDERSTANDING THOSE OF CRIMINAL BEHAVIOR

Szymon Peterman

University of Opole

szymon_peterman@yahoo.ie

A few words about author:

I am a PhD student in the second year of the humanities at the University of Opole. I am addressing the issue of the pathology of family life and its impact on the phenomenon of crime.

Abstract:

Wanting to understand nonconformist attitudes of children and youth and try to see the cause of their criminal behavior should be referred first to their upbringing. One should focus on the basic social cell which is the family, find out which families they come from, where they were born, how they grew up. Only this knowledge can allow us to understand some of the problems they faced and the desires that they had when they grew up. In every anti-social behavior of children and young people there is even a substitute of their internal pain, suffering or hate with which they had to contend, often growing up in pathological families. On socialization, person learns social behavior, shapes his values so necessary for functioning in adult life. This is not an attempt to justify their criminal acts, but an empathic, objective and real look at their behavior through the prism of their past, negative experiences.

Keywords:

nonconformist attitudes, anti-social behavior, pathological family, socialization

HERITAGE OF ANTIQUITY IN MODERN MILITARY

Łukasz Szewczyk

Maria Curie-Skłodowska University in Lublin, The Humanities Department, History Institute, Establishment of Ancient History

lllszewczyk@wp.pl

A few words about author:

My name is Łukasz Szewczyk. I am student at the Maria Curie-Skłodowska University in Lublin,the Faculty of Humanities. I am member of Methodological Circle of UMCS Historians.My research interests include: military history and historical heritage.

Abstract:

The legacy of antiquity in modern military technology is an important but also difficult subject, which has never been analyzed in the sphere of scientific domain. This is a significant issue as the military has been changing in the blink of an eye. Antiquity with its unsurpassed heritage has been a major factor shaping the military. Therefore, it must be thoroughly examined. Is antiquity important in reference to the issue discussed? Is the influence of antiquity respected by modern military affairs? Can we still find examples of classical weaponry after so many centuries? Can we even talk about antiquity nowadays? One question remains: what did antiquity leave us? What is the legacy of antiquity in modern military?

Keywords:

Military, Antiquity, Heritage,Army,Modern

MEDICAL SCIENCES

WHAT ARE THE CONSEQUENCES OF BRCA1 GENETIC DYSFUNCTION - THE CODING PROTEIN RELATED TO PRESERVATION OF GENOME INTEGRITY?

Barbara Kołodziej

Nicolaus Copernicus University in Toruń

barbarakatarzynakolodziej@gmail.com

A few words about author:

First year student of biotechnology postgraduate studies at UMK in Toruń. Moreover, I am proactive member of scientific circle "Biotechnologia thoruniensis". Besides, my master's disseration is implementing in NZOZ Pracownia Genetyki Nowotworów.

Abstract:

More than half of hereditary breast cancers cases are associated with BRCA1/BRCA2 (Breast Cancer genes) mutations. In most of the described populations, eg in the Polish or Norwegian ones, the so-called founder effect can be observed. The consequence of this is occurrence only a few defects characteristic for an every population in more than 90% mutant women-carriers. The most common BRCA1 genetic defects in Poles are: 5382insC, C61G and 4153delA. In the sequence of BRCA1 protein, important regions were identified in the process of tumorigenesis, including domain of zinc finger and BRCT region.
The role of this protein in maintaining genome integrity through direct participation in DNA repair is supported by their expression related to the cell cycle and the change of cellular localization under the influence of accumulation of DNA damage. Its dependent on co-occurrence in vivo within complexes containing the RAD51 protein, which participates in homologous recombination and recombinant repair of double-stranded DNA breaks. DNA repair is essential to maintain genomic stability and integrity, and significant changes in it can substantially affect the genotype and cell phenotype.

Keywords:

carcinogenesis, BRCA1, genome integrity

DETERMINATION OF THE METABOLIC PROFILE BASED ON THE CYTOCHROME P450 ENZYMATIC ACTIVITY

Barbara Kołodziej

Nicolaus Copernicus University in Toruń

barbarakatarzynakolodziej@gmail.com

A few words about author:

First year student of biotechnology postgraduate studies at UMK in Toruń. Moreover, I am proactive member of scientific circle "Biotechnologia thoruniensis". Besides, my master's disseration is implementing in NZOZ Pracownia Genetyki Nowotworów.

Abstract:

P450 cytochromes are a rich family of enzymes responsible for the metabolism of endo- and exogenous substances, of which particular attention is paid to the medicines used in clinical diagnostics. CYP450 possesses many highly polymorphic isoforms occurring in nature, whose function is, above all, the catalysis of the first phase of xenobiotics metabolism. This mechanism is an enzymatic process where hydrophilic products are created from lipophilic chemical compounds. The number of functioning alleles of a every isoform, and consequently the level of enzymatic activity, is a criterion for dividing patients into drug metabolizers as an intense, normal, lowered and slowed method. For this reason, in clinical therapy is based on genetic tests, the aim of which is to simplify the diagnostic procedure, including in anticipating the effectiveness of treatment of mental disorders (schizophrenia, depression), cancer diseases or setting doses of medicines administered to patients undergoing transplantology. Therefore, the analysis of the role of cytochrome P450 polymorphism in the body's response to the drugs used is an important tool in the optimization of drug therapy tailored individually to the patient's phenotype profile.

Keywords:

cytochrome P450, enzymatic activity, drug biotransformation, metabolic profiles

CHILDREN'S DENTAL CARIES AND THE KNOWLEDGE OF PARENTS ABOUT THE PROPHYLAXIS

Karolina Żurek(1)*, Monika Kokot(2), Martyna Andreew(3)

Medical University of Silesia in Katowice,
(1) School of Health Science in Katowice, Doctoral Study,
(2) Department of Rehabilitation, School of Health Science in Katowice, Doctoral Study,
(3) Department of Internal Diseases, School of Public Health in Bytom, Students Scientific Society

*karolinka.zurek@gmail.com

A few words about author:

Jestem lekarzem dentystą od 2004 roku, pracuję od początku z dziećmi, mam specjalizację lekarską Zdrowie Publiczne. Jestem absolwentką Śląskiej Akademii Medycznej a aktualnie prowadzę prace badawcze w ramach studiów doktoranckich na ŚUM.

Abstract:

Dental caries is a communicable disease caused by Streptococcus mutans. It is mentioned – next to the ischemic heart disease, cancer, type 2 diabetes and allergies – as the contemporary disease of affluence, mainly caused by the environmental conditions.
The aim of the paper is to assess the health conscious behaviour in children and their parents as well as their knowledge on the prophylaxis preventing caries in children.
The study group comprised of 510 children aged 3-18 and their parents.
The authors' original, anonymous questionnaire was used in the survey, filled-in by the patient's parent. Establishing the CFE index was carried out based on the data from the patient files.
Results: The level of parents' knowledge depends significantly on the age group of children. Slightly more than a half of the respondents (54.5%) presented average knowledge on the causes of caries.
Conclusions: An effective method way to improve health can be to raise the level of health education, in particular in the field of caries.

Keywords:

dental caries, caries prevention

THE NEW FACE OF MEDICINE – THE USE OF GOLD NANOPARTICLES

Katarzyna Pieklarz*, Zofia Modrzejewska, Michał Tylman

Lodz University of Technology, Faculty of Process and Environmental Engineering

*katarzyna.pieklarz@edu.p.lodz.pl

A few words about author:

MSc. Katarzyna Pieklarz – PhD student at the Lodz University of Technology Faculty of Process and Environmental Engineering. Her research interests focus on issues related to biomedical engineering and nanotechnology.

Abstract:

The currently observed development of nanotechnology sciences is not limited only to chemical synthesis and industrial applications. A significant part of the research is devoted to the possibility of using nanoparticles, among others gold nanoparticles (AuNPs) as molecules that enable the synthesis of new, highly effective pharmaceuticals in clinical therapies.
Gold nanoparticles, due to their antibacterial properties, are often used in the form of tool coatings in hospitals, preventing patient infections, e.g. during surgery.
In turn, due to the ease of attachment of different ligands, AuNPs can be used in medical diagnostics. In combination with lipid ligands, they enable the diagnosis of cancer, while macrophages - atherosclerosis. They are also used in radiotherapy and photothermal therapy. In addition, the nanogold is used as the core of nanoparticles with other coatings. In this way, it is used as a carrier of drugs, peptides, proteins and nucleic acids.
Despite the promising results of many in vitro tests, comprehensive work is needed to improve the delivery systems of AuNPs to the body and limit their potential interactions, including with serum proteins.

Keywords:

Nanomedicine, gold nanoparticles, medical diagnostic

PROGRESS IN REGENERATIVE MEDICINE – THE STEM CELLS APPLICATION

Katarzyna Pieklarz*, Zofia Modrzejewska, Michał Tylman

Lodz University of Technology, Faculty of Process and Environmental Engineering

*katarzyna.pieklarz@edu.p.lodz.pl

A few words about author:

MSc. Katarzyna Pieklarz – PhD student at the Lodz University of Technology Faculty of Process and Environmental Engineering. Her research interests focus on issues related to biomedical engineering and nanotechnology.

Abstract:

Regenerative medicine is an interdisciplinary field of science covering issues in the field of medical biology, biophysics and biotechnology. Its main goal is to create new solutions to improve the functioning of tissues and organs damaged by injury, disease or aging. Therefore, research into the use of stem cells, which are precursor cells that show the ability to proliferate, keep their numbers at a constant level, and the production of daughter cells characteristic of the organ from which they originate, are perfectly relevant to the above issues.
The most important subject of research on stem cells are adult stem cells (ASCs), which, unlike embryonic stem cells (ESCs), are generally available in the body. An additional advantage of ASC is the fact that these cells allow the regeneration of damaged tissues.
Current literature reports indicate that stem cells of the bone marrow can be successfully used in anti-cancer therapies. In addition, clinical trials were undertaken using stem cells for the treatment of eye diseases, e.g. age-related macular degeneration (AMD). The proposed method of treatment consists in the transplantation of pigmented retinal epithelial cells obtained by differentiating human pluripotent stem cells. It is also worth noting that in recent years a significant part of research has been devoted to the use of mesenchymal stem cells in regenerative medicine.

Keywords:

Regenerative medicine, stem cells, clinic tests, cell therapy

UNDERNUTRITION, CACHEXIA OR ANOREXIA OF AGEING? – ETHIOPATHOGENESIS, CLINICAL IMPLICATIONS, NUTRITIONAL THERAPY AND PREVENTION, IN ELDERLY

Martyna Andreew(1)*, Monika Kokot (2)

Medical University of Silesia in Katowice,
(1) Department of Internal Diseases, School of Public Health in Bytom, Students Scientific Society,
(2) Department of Rehabilitation, School of Health Science in Katowice, Doctoral Study

*martyna.andreew@med.sum.edu.pl

A few words about author:

I am a clinical dietitian and masters student of psycho-dietetics. I passionate about nutrition therapy of elderly people, especially in neurodegenerative diseases. Co-author is physiotherapist and is studing on doctoral studies.

Abstract:

Decline of body weight may escalate along with advancing age. This phenomenon is driven by multi reasons lying at the bottom of old people physiology. Lean tissue is lost the most frequent, mainly skeletal muscle, favourable for sarcopenia. This condition is more clear when initial body mass is low, contributing to many adverse outcomes. As the PolSenior project (the first polish nationwide research of polish seniors) reports, poor nutritional status refer to 44,2% of subjects.
Weight loss in elderly is often unintentional and can arise from protein-energy undernutrition, cachexia, anorexia of ageing or mixture of mentioned. Most common among this group is anorexia of ageing, especially among women. It has physiological underground – main: diminished apetite or lack of it, lack of hunger and reduced caloric intake; pathological conditions and social factors. Late diagnosis can lead to multisystem organ failure. Early intervention is important not only for patient, but also for caregivers. Effects of hypothalamic corticotropin-releasing factor (CRF) and catabolic effect of melanocortins are alike. Changes connected to melanocortin system may have potential link with anorexia and cachexia in old groups, which had been clinically tested on rats.
Poor nutritional staus lead to overlong hospitalization, greater treatment costs
and increased morbidity and mortality. Optimization of nutritional status of seniors is one of the most significant target in geriatrics.

Keywords:

undernutrition, cachexia, anorexia of ageing, elderly

SIGNIFICANCE OF FOOD CONSISTENCY IN SWALLOWING DISORDERS - THE NEWEST GUIDELINES

Martyna Andreew(1)*, Monika Kokot(2)

Medical University of Silesia in Katowice,
(1) Department of Internal Diseases, School of Public Health in Bytom, Students Scientific Society,
(2) Department of Rehabilitation, School of Health Science in Katowice, Doctoral Study,

*martyna.andreew@med.sum.edu.pl

A few words about author:

I am a clinical dietitian and masters student of psycho-dietetics. I passionate about nutrition therapy of elderly people, especially in neurodegenerative diseases. Co-author is physiotherapist and is studing on doctoral studies.

Abstract:

Dysphagia is a condition in which food passage to stomach, through mouth, throat and oesophagus, is straitened. Odynophagia is soreness sensation during swallowing. Knob pharyngeal is a sense of existence of the obstacle at a height of throat. Aphagia is complete inability of swallowing – food of solid and liquid consystency. Dysphagia hurts approximately 8% people in the World.
The International Dysphagia Diet Standardisation Initiative came out with the newest guidelines.
Consistency modification became one of the most popular forms of interventions in dysphagia, as solution providing safety and effectiveness of swallowing. For defining character of fluid and it is measurement, „syringe" test should be applied.10 ml syringe is used, after filling by fluid, content will be gradually dropped for 10 s, then syringe wiil be blockaded and remaining amount of liquid will be gauged. Test is sensitive, despite own's simplicity – it shows changes in consistency, depending on serving temperature. „Spoon" test enables determining if material can maintain it is shape. „Fork" test is used to investigation of concentrated fluids' flow and pureed consistency. 8 consistency levels can be pointed: regular, soft, minced&moist, purred/extremely thick, liquidised/moderately thick, mildly thick, slightly thick, thin.
Swallowing difficulties become more common, mainly due to brain strokes, Alzheimer's disease or Parkinson's disease which gain position of public health problems.

Keywords:

swallowing disorders, food consistency, terminology

ERGONOMIC ASPECTS OF THE RESUSCITATION

Anna Kuklińska

Poznan University of Medical Science

annakuklinskaa@gmail.com

A few words about author:

I am a physiotherapist and PhD student at Poznan University of Medical Science. I focus on ergonomics aspects of work overload in my research.

Abstract:

Ergonomics, in general, is knowledge of how to use our body at work for staying healthy and in good condition. It plays a huge role in organising workplaces and teaching employees how to work to avoid work-related illnesses. Physiotherapy uses principles of ergonomics to show patients how to do activities with care of their bodies.
Ergonomics has various ways to examine something for being ergonomic. The most known tests for examining workplaces for being ergonomic for musculoskeletar system are OWAS, RULA and REBA scales. They are used by ergonomic specialists all over the world. They are based on point scales of overload individual parts of the body.
It is important to examine all types of workplaces to set some rules and standards for each. In my research, I focus on ergonomics during resuscitation performed by paramedics. They help people and rescue their lives but how much strain do they put on their own bodies? How dangerous is it for them? It is very important to measure this danger for their musculoskeletar system and use the technical achievements to protect their bodies and ensure proper workplaces.

Keywords:

physiotherapy, ergonomics, resuscitation, paramedics

ASSESSMENT OD THE KNOWLEDGE OF OBESE PEOPLE, ABOUT THE PROSPER NUTRITION AND BENEFIS OD PHYSICAL

Janina Rzeszot

Wyższa Szkoła Społeczno - Przyrodnicza

danuta.rz@op.pl

A few words about author:

In Poland, 61 procent of MEN and 50 procent of woman surfer from overweight and obesity.

Abstract:

The aim od the study was to examine the knowledge of obese people about the proper nutrition and the impact of physical activity on the against obesity. The research material was collected among patients of the Clinic of Proper Nutrition end Weght Loss in small town and among parttime students who constituted a group of 30 respondents. Due to the nature od the work, the metod of the diagnostic survey was used, the survey teehniquewas used, for which the orginal questionnaire was created. The analyses show that 95% of respondents are overweight, 4% of them are obese and 1% surffer from pathological obesity. Among the studied group very low knowledge about proper nutrition was obeserved, which results in permanent obesity. The conclusions drawn from the conducted studies show that influence of nutritional habits usługi important in maintaining a healthy body mass, and the obeserved low physical altivity among the respondents contributes to the lack of effects of effects of the therapy.

Keywords:

Obesity, knowledge of obese people, physical activity, diet.

HEALTH-PROMOTING PROPERTIES OF CURCUMIN

Mirosław Malec

Faculty of Clinical Pharmacy and Biopharmacy

miroslawmalec90@gmail.com

A few words about author:

A graduate of the Faculty of Pharmacy at the Poznan University of Medical Sciences. Currently a PhD student at the Department of Clinical Pharmacy and Biopharmacy at the Poznan University of Medical Sciences.

Abstract:

Curcumin is the main ingredient of turmeric (Curcuma longa). Turmeric which has long been used in both the kitchen and medicine of the Far East also has many therapeutic applications that can be used in modern medicine. The golden powder comes from India, where it is made from a root plant, the appearance of which is remarkably similar to that known to all ginger. Properties of curcuma (as this root is called) are especially appreciated in Asian cuisine, in which the beginning of the history of its use dates back to the sixth and seventh century AD. Turmeric was also used there not only as an addition to dishes but also to dye them. The characteristic yellow-orange color is the merit of a substance called curcumin. It has primarily anti-inflammatory, antihyperlipidemic and antimicrobial effects. Turmeric and curcumin are non-mutagenic and non-toxic. Oral use of curcumin and curcumin at specified doses has no toxic effect on reproduction in animals. Human studies did not show any toxic effects, and curcumin was safe at a dose of 6 g/day co-administered orally for 4-7 weeks. However, certain side effects may occur, such as gastrointestinal upset. Also, curcumin is known as a generally safe substance. This review reviews the use, safety, and toxicity of turmeric and curcumin in medicine.

Keywords:

tumeric, curcumin, phytotherapy, pharmacy, health

NUTRITIONAL AND HEALTH VALUE OF FUNGI

Mirosław Malec

Faculty of Clinical Pharmacy and Biopharmacy

miroslawmalec90@gmail.com

A few words about author:

A graduate of the Faculty of Pharmacy at the Poznan University of Medical Sciences. Currently a PhD student at the Department of Clinical Pharmacy and Biopharmacy at the Poznan University of Medical Sciences.

Abstract:

Nutritional value of fungi results from the content of high-assimilable proteins, polysaccharides, essential unsaturated fatty acids as well as minerals and vitamins. Many cultivated and wild growing species also show pro-health properties. They are related to the presence of bioactive components, mainly polysaccharides, triterpenoids and phenolic compounds. The immunostimulatory, antibacterial, antiviral, anti-inflammatory, anti-cancer, anti-diabetic and antiallergic effects of various fungal species have been documented. Substances obtained from fungi also have the ability to lower cholesterol and triacylglycerols in the blood, normalize the pressure, and also protect the liver. Currently, fungi are considered functional food. A positive effect on health can be obtained by direct consumption of fruiting bodies or the use of dietary supplements in the form of preparations containing fungal extracts.

Keywords:

fungi, bioactive substances, functional food, nutrients

STUDIES OF DRUG DELIVERY SYSTEMS BY HOT MELT EXTRUSION: DICLOFENAC IN THE EUDRAGIT EPO AND RL PO MATRIX

Kinga Biedrzycka(1,2)*, Ewa Andrzejewska(2), Marta Para-Harisullah(2)

(1) Applied Manufacturing Science Sp. z o.o.,
(2) University of Technology in Poznan, Department of Chemical Technology

*kinga.biedrzycka@ams-pharma.org

A few words about author:

Formulation Specialist in Applied Manufacturing Science - GMP-licensed manufacturing of complex pharma products via hot melt extrusion and particle engineering technologies. PhD student in University of Technology in Poznan.

Abstract:

The aim of the study was to investigate the possibility of using Eudragit as a matrix for the incorporation of drugs for hot melt extrusion technique. Two polymers were selected for the study, Eudragit: E PO and RL PO, which were combined with the model drug - Diclofenac and plasticizer / lubricant - Compritol 888 ATO.
In this work tablets were obtained by compression method. The compositions were prepared in two series. The first series were the polymer matrix and the active ingredient, the second series - the active substance, the polymer matrix and 10 wt % of a plasticizer. TGA analysis was performed. It is particularly applicable in processes with high temperatures, because often the optimum temperature program that is set for a process can cause simultaneously degradation of the active substance. The thermal properties (characteristic
temperatures) of the analyzed systems were characterized. A rheological analysis was also performed, and the results obtained can be used as data to determine parameters process in hot melt extrusion technique.
During the study it was found that Diclofenac improved the processability of Eudragit RL PO and E PO polymer matrices. The lower viscosities of the polymer / drug systems than the polymer, indicate that the drug is dissolved in the matrix. The results of these studies showed that Ibuprofen significantly reduce the glass transition temperature of Eudragit matrices.

Keywords:

polymer matrix, Diclofenac, rheology

STUDIES ON THE PRODUCTION OF DRUG DELIVERY SYSTEMS BY HOT MELT EXTRUSION: IBUPROFEN IN HYDROXYPROPYL METHYLCELLULOSE MATRIX

Kinga Biedrzycka(1,2)*, Ewa Andrzejewska(2), Katarzyna Podkowa(2)

(1) Applied Manufacturing Science Sp. z o.o., Krzemowa 1 Złotniki, 62-002 Suchy Las,
(2) University of Technology in Poznan, Department of Chemical Technology, Berdychowo 4, 60-965 Poznan

*kinga.biedrzycka@ams-pharma.org

A few words about author:

Formulation Specialist in Applied Manufacturing Science - GMP-licensed manufacturing of complex pharma products via hot melt extrusion and particle engineering technologies. PhD student in University of Technology in Poznan.

Abstract:

The aim of the research was to conduct preliminary studies on the use of HPMC-AS as matrix for the incorporation of drugs by hot-melt extrusion technique. Compritol 888 ATO was applied as a plasticizer and Ibuprofen was used as a model drug.
The work is divided into two parts, the part of the literature and experimental examination. The theoretical part contains information about polymers used in drug delivery systems and briefly characterizes selected technologies for modified – release dosage forms. This work includes characteristics and application of HPMC-AS polymer. It also presents technology of hot-melt extrusion and its application in the pharmaceutical industry.
The HPMC-AS/drug mixtures were prepared in various weight ratios by a solvent method with or without addition of a plasticizer / lubricant - Compritol 888 ATO. Intermolecular interactions between the components of composition were observed using FTIR technique and a study of thermal properties (characteristic temperature) were realized with the use of differential scanning calorimetry.
The study showed that HPMC-AS plastified with Compritol 888 ATO can be considered as matrix in design of modified drug delivery systems. In both systems, Ibuprofen significantly reduces the glass transition temperature. The drug have plasticizes effects.

Keywords:

thermal stability, Ibuprofen, HPMC-AS, hot-melt extrusion

FREE RADICAL IN THERMALLY STERILIZED OPHTALMIC DRUG - EPR SPECTROSCOPY EXAMINATIONS

Wojciech Rogóż*, Izabela Rozmus, Paweł Ramos, Barbara Pilawa

Department of Biophysics, School of Pharmacy and Laboratory Medicine in Sosnowiec, Medical University of Silesia in Katowice

*wrogoz@onet.eu

A few words about author:

We are students of the Silesian Medical University in Katowice.

Abstract:

EPR spectroscopy was used to examination of free radicals in thermally sterilized pilocarpine. Conditions of thermal sterilization were chosen according to the pharmaceutical norms. The aim of this work was to determine concentration and free radical properties of thermally sterilized pilocarpine. EPR spectra were recorded in the range of microwave power of 2.2-70 mW. g-Factor, amplitudes (A), integral intensities (I), and linewidth (ΔBpp) of the spectra were determined. Free radical concentration (N) in the heated samples was determined. EPR spectra were not obtained for the non heated pilocarpine. EPR spectra were detected for the all thermally sterilized samples. The spectra revealed complex character, their asymmetry depends on microwave power. The lowest free radicals concentration was found for the pilocarpine sterilized at temperature 180oC during 30 minutes. EPR spectroscopy is proposed as the method useful to optimization sterilization process of drugs.

Keywords:

free radicals, thermal sterilization, pilocarpine , EPR spectroscopy

SOCIAL SCIENCES

WHAT WORRIES CANDIDATES FOR ADOPTIVE PARENTS

Jarosław Czapliński

Katedra psychologii, Wydział Nauk Społecznych, Katolicki Uniwersytet Lubelski Jana Pawła II

jar.czaplinski@gmail.com

A few words about author:

Master in psychology, theology and environmental protection, paramedic, PhD student of psychology at the Catholic University of Lublin.

Abstract:

According to the World Health Organization problems with fertility are now referred to as a disease of civilization. The lack of offspring calls the different effects which can be seen at least on three levels: the individual level, family level system and at the social level. Adoption is becoming more and more "attractive" with the successive failures of alternative therapies, and is one of the two most popular forms of foster care (besides the foster family).
Research was carried out to see if experiencing worries and their level is related to anxiety and hope for success. The study involved people preparing for the role of an adoptive parent (N = 80) and used: KNS Snyder test in the Polish adaptation of Laguna, Trzebiński and Zięba (2005), inventory of ISCL in the study of Spielberger, Strelau, Tysarczuk and Wrześniewski (2011) and questionnaire KZKRA prepared by Czapliński and Lachowska (in print). As expected, the level of anxiety was positively related to the level of worries experienced by candidates for adoptive parents. It was also found that the higher level of hope for success is accompanied by lower intensity of worries.

Keywords:

Adoption, Family, Anxiety, Worry, Hope for success

EMPATHY - AS A TOOL USED IN THE DESIGN PROCESS

Karol Dobrakowski

Department of Polymer Processing, Institute of Mechanical Technologies, Faculty of Mechanical Engineering and Computer Science, Czestochowa University of Technology

dobrakowski@ipp.pcz.pl

A few words about author:

Karol Dobrakowski - Master of Science in Mechatronics, PhD student at the Częstochowa University of Technology. Interests:primarily Design Thinking - a certified moderator of the DT process, co-funder the DTworkspace brand.

Abstract:

The article is devoted to the presentation of empathy as a tool used in the process of designing products or services. In the article, empathy has been presented as an inseparable element of the whole Design Thinking process, which is based on getting to know your target audience. Another element that has been touched is the tools used, such as interviews, observations that are an inseparable element for effective understanding of the recipients' needs and their daily problems.

Keywords:

Design thinking, empathy, design process, research methods

FEDERAL SECURITY SERVICE – INTELLIGENCE AGENCY OR EXTRAORDINARY CASTE?

Damian Gładek

Police Academy in Szczytno

damian.gladek@gmail.com

A few words about author:

Damian Gładek was born in 1996. He graduated first-cycle studies in the Police Academy in Szczytno. He continues his studies at the second level of study in the field of "internal security". Member of the student's criminological circle "Causa Mali".

Abstract:

Security agencies in the Russian Federation have a significant role in shaping the internal policy. In 1995, after the liquidation of the USSR's Committee of State Security and the partitioning of its tasks in the internal cells of the Ministry of Security of the Russian Federation, the Federal Security Service was established.
Vladimir Putin entrusted to people belonging to this unit a wide range of powers, including the responsibility for protecting the stability of authority in the Kremlin and stabilizing the entire state. Gleb Pavlovsky, Kremlin's former adviser, in an interview for the "Guardian" said, "Putin belongs to a very large group of people who are unrepresented in society. They are people who in the late 1980s sought revenge for the collapse of the Soviet Union". When Vladimir Putin became president, as many as 77% of managerial positions in government administration were taken over by former employees of the Committee for State Security. People who join this unit are associated with it for the rest of their lives. Based on the examples, the speaker will indicate that the Federal Security Service of the Russian Federation is a tool in the hands of the authorities. It is a tool which drifts between the limits of legality and illegality.

Keywords:

Russian Federation, security service, policy

PRISON SUBCULTURE "THIEF IN LAW" AND THE HERMETICITY OF RUSSIAN-LANGUAGE CRIMINAL GROUPS

Damian Gładek

Police Academy in Szczytno

damian.gladek@gmail.com

A few words about author:

Damian Gładek was born in 1996. He graduated first-cycle studies in the Police Academy in Szczytno. He continues his studies at the second level of study in the field of 'internal security'. Member of the student's criminological circle 'Causa Mali'.

Abstract:

Organized crime is invariably a permanent threat to the internal security of the Russian Federation and neighboring countries. Criminal groups in the Union of Soviet Socialist Republics were formed on the basis of a prison subculture which is called "thief in law". This is a literal translation of the Russian phrase "вор в законе". People who obtained the status of "Vor" were playing and still play a significant role in the Russian criminal underworld. This subculture could be lost if it was not characterized by hard, internal rules. How has this subculture changed over the years? How does "Vor" find itself in contemporary reality? The speaker will answer these questions on the basis of review of Russian literature and current events.

Keywords:

organized crime, Russian Federation, USSR

POLITICAL AND ECONOMIC ACTIVITY IN BILATERAL RELATIONS

Piotr Andrzej Glogowski

Cracow University of Economics

p.glogovski@gmail.com

A few words about author:

My research focuses around Japan and the geopolitic of East Asia. In my work I use a various of methods depends on the current issue.

Abstract:

Political and economical ties between countries are crucial to understand how the bilateral relations works and to predict the future shape of them. In the current presentation I would like to explain basic factors on peculiar bilateral cases placed in East Asia where countries seen themselves from the perspective of the potential confrontation.
The main goal of the presentation is to discuss and introduce the result of analysis concerning the main factors of political and economic activity between two countries. The auxiliary goal is to present the redesign SWOT analysis for bilateral relations for each region of the world.

Keywords:

bilateral relations, economy, politics, activity

THE GEOPOLITICS OF THE XXI CENTURY

Piotr Andrzej Glogowski

Cracow University of Economics

p.glogovski@gmail.com

A few words about author:

My research focuses around Japan and the geopolitic of East Asia. In my work I use a various of methods depends on the current issue.

Abstract:

In the XXI century issues related to the international relations do not become easier. To solve problems and understand the basic factors, which rules the world stage, it is necessary to discuss the crucial role of the geopolitics. Nonetheless, to make the entire analysis clearer and to obtain an additional approach we need to focus on a few interpretations and propositions from the contemporary geopolitics.
During the presentation a few examples will be shown, together with the broad explanation of the analysis of the chosen international cases. While the main goal of the presentation is to find the most valuable geopolitical theories for the XXI world stage issues.

Keywords:

Geopolitics, XXI Century, policy

DIGITAL MARKETING AS A FACTOR DETERMINING SUCCESS ON POLISH DANCE SCHOOLS MARKET

Ewelina Kostępska

Jagellonian University

ewelinakostepska.uj@gmail.com

A few words about author:

Ewelina Kostępska is a student in Jagellonian University with a specialization Social Media in Management . Additionally, the author owns state entitlements of a certified Instructor of Physical Recreation with dance specialization.

Abstract:

The success of dance schools in Poland depends on many factors amongst which can be mentioned the recruitment of qualified instructors cadre, selection of localization, establishment of cooperation with companies that offer sport cards and especially usage of Digital Marketing as the most effective mean of promotion for this kind of business. Dance schools are aware that there is no need to ponder whether exist online or not, but how to maximize your presence on the Internet. Depending on budget and employee competences companies decide to lead the advertising campaign on their own or outsource it to specialized agencies. The potential clients of dance schools are acquired mainly online. Schools which belittle their presence on the Internet or are not capable to use it effectively go bankrupt shortly, however the ones that follow the trends in Digital Marketing become the market leaders.

Keywords:

Digital Marketing, dance schools

PERSPECTIVE OF CRIMINAL PROFILING

Katarzyna Król

Studenckie Koło Nauk Kryminalistycznych Wyższej Szkoły Policji w Szczytnie

kasia467c@wp.pl

A few words about author:

I am a student of the II year of studies II degree in the field of Internal Security at the Police Academy in Szczytno. I am the chairwoman of the Student Circle of Forensic Sciences. I am interested in Criminology, Forensics and Psychology.

Abstract:

The concept of a crime scene is impressive and is a shock to public opinion. As a rule, the first thought on the message of committing this type of act is directed towards the victim, but we quickly change the way of thinking and we think about who could do something so horrible. We often analyze information provided by the media. Based on our own thoughts and intuitions, we are looking for a guilty party. A small part of us know that we doing this moment criminal profile.

Currently, psychological profiles in Poland are prepared by qualified police officers who deal with police psychology applied. There are many concepts and profiling models. These techniques are not perfect, either from a methodological or a practical point of view. Often, they are also associated with pretenses and assumptions. Nevertheless, there is some evidence to support the use of profiling for certain types of crime.

During her speech, the lecturer will characterize and discuss the concept of criminal profiling, which can significantly improve the investigation conducted by law enforcement agencies, and also be compared to the tools that support them. He will also present a classic profiling model by Holmes. Indicate the processes occurring in the creation of the profile, paying attention to its specificity. The speaker will also discuss the usefulness of the field and its perspective.

Keywords:

criminal profiling, profile, murder, psychology

THE SELECTED TOOLS AND TECHNIQUES USED IN DESIGN THINKING METHODOLOGY

Katarzyna Mordal

Student Science Association Design Thinking Space, Institute of Mechanical Technologies, Faculty of Mechanical Engineering and Computer Science, Czestochowa University of Technology

kmordal@iop.pcz.pl, katarzyna.199212@gmail.com

A few words about author:

I am a PhD student at the Czestochowa University of Technology and vice- president in SSC Design Thinking Space. My interests are: biomedical engineering, medical diagnostics, numerical modeling, biomaterials, Design Thinking, project management.

Abstract:

Design Thinking is the methodology, which is aimed at creation of innovative, sometimes original solutions, i.e. new products or services. This presentation refers to tools and techniques applied during design process carried out in accordance with assumptions, rules and the spirit of DT. The examples of them have been given and these selected tools (e.g. empathy maps, brainstorming etc.), which are the most popular and used, have been described in detail. Additionally, the notion of this method and five stages of Design Thinking (empathizing, defining the problem, generating ideas, prototyping and testing solutions) have been concisely discussed. Summarizing, basing design process on structured form, basic rules and application of different DT tools stimulates creativity of team group and drives effectiveness of their members. This, in turn, leads to generation of sometimes unconventional, abstract ideas and hence innovative solutions.

Keywords:

Design Thinking, Design Thinking tools, innovations, , creativity, brainstorming

HUMAN TRAFFICKING AS A MODERN SECURITY THREAT

Marika Sokół

Wydział Dowodzenia i Operacji Morskich, Akademia Marynarki Wojennej w Gdyni

marika.sokol@wp.pl

A few words about author:

Sokół Marika - MA, graduate of the University of Wrocław in the field of European diplomacy 2005, currently a PhD student at the Naval Academy in Gdynia; area of research interest: international relations, international security, asymmetrical threats.

Abstract:

The aim of the speech is to answer three questions: what am I doing scientifically? In what way am I doing the research? Why am I interesed in it?
The subject of my research is the phenomenon of human trafficking. Trafficking in human beings, a form of modern slavery, is a real and serious threat to security. Due to the high degree of organization and transnationality, combating this form of crime requires special efforts both state services and non-governmental organizations. In addition, the victim of crime, who is also a victim of human rights violations, requires special protection and assistance.
In my research, I focus on the standards of combating human trafficking and prevention activities. Scientific research mainly involves the analysis of legal acts. I am based on many different scientific sources like scientific publications or reports. Statistic description of the phenomenon is hampered by the small number of deeds disclosed. On the basis of secondary data analysis, it is possible to characterize a portrait of a victim of human trafficking. In turn, surveys are a source of knowledge about the level of knowledge of the problem of human trafficking among respondents.
Trafficking in human beings is not a new phenomenon. Due to the scope of the issue, the current research results and the considerations based on them do not exhaust the whole issue. Insufficient number of Polish-language publications about human trafficking has made me interested in this problem.

Keywords:

human trafficking, human rights, transnational crime, international security

THE QUESTION ORDER EFFECT, IS THIS REALLY WORKING?

Anna Wąsiewicz

Uniwersytet Humanistyczno - Społeczny SWPS II wydział Psychologii

Awasiewicz1@st.swps.edu.pl

A few words about author:

I am studying psychology at USWPS, I am mainly interested in question order effects and the differences that occur in results by changing the scale, which respondents should refer to.

Abstract:

Question order is an almost forgotten topic nowadays, but it should not be that way. The most popular article by Schuman, Presser and Ludwig was written in 1981. They said that this research should be just a beginning, not an end of exploration. Unfortunately today their article is still the most popular one, we are definitely lack of replications. Most of similar experiments took place in 80's or 90's.
Nowadays researchers used to think, that results of their work are just how they see it. They may sometimes consider a bias or too, but it is rare to mention the question order, as a force which may influence the results. And as Schuman (1981) has shown, it really works, even with such an important topic as legal abortion.
Oral presentation includes literature overview and and how results of this experiments affect us today.

Keywords:

Question order, abortion

TECHNICAL SCIENCES

DETERMINATION OF AMIDOL USING GLASSY CARBON ELECTRODES MODIFIED WITH TITANIUM DIOXIDE NANOPOWDER (P25)

Łukasz Magda

AGH UST University of Science and Technology

lukas.magda1989@gmail.com

A few words about author:

Łukasz Magda, chemistry teacher at one of the Cracow schools and PhD student at the AGH University of Science and Technology in Cracow. Research topics are the use of nanomaterials for modification of electrodes used in voltammetry.

Abstract:

Amidol is an organic chemical compound. It has reducing properties, it is used in a number of photographic developers, both in black and white and color photography. At room temperature, it forms colorless crystals with strongly reducing properties. It quickly oxidizes, dissolves easily in water.
Voltammetric methods, due to its numerous advantages are a tool often used by the modern scientists. They are characterized by high sensitivity, selectivity for molecules electroactive, a wide range of linearity, portable, inexpensive apparatus and a large variety used electrodes. The great advetage is possibility to determine very low concentrations of substances in very small samples. The research technique used is cyclic voltammetry.
At present, a relatively frequently used modifier of various electrochemical sensors is poly (3,4-ethylene-1,4-dioxythiophene). PEDOT is a conductive polymer susceptible to various modifications. PEDOT can be modified, for example, by means of various types of ceramic powders with nanometric particle sizes. An example of such a nanometric ceramic powder is titanium oxide (IV), and the modification with its use significantly increases the usable potential of permanent electrodes.

Acknowledgements:
This study was carried out within the AGH – University of Science and Technology (Kraków), grant number 15.11.160.017.

Keywords:

nanoparticles, titanium dioxide, voltammetric, glassy carbon

SEPARATION OF BIOGAS COMPONENTS BY ADSORPTION ON ACTIVATED CARBON

Ewelina Brodawka

Department of Coal Chemistry and Environmental Sciences , Faculty of Energy and Fuels, AGH University of Science and Technology

brodawka@agh.edu.pl

A few words about author:

Ewelina Brodawka - hold a Master's Degree in Chemical Technology. She currently is PhD student at the Department of Coal Chemistry and Environmental Sciences, AGH UST in Kraków. She does research in Chemical Engineering and Adsorptive Separation.

Abstract:

Today the huge challenge is to increase the production of fuels and chemical products by using innovative 'green' technologies. Although, biogas is environment friendly renewable energy source, needs to purification by minimizing CO2 and maximizing CH4 content before using. Biomethane from biogas can be treated as local source for production electric and heat energy or fuels. This work presents adsorptive technologies for biogas upgrading and gives a special focus to PSA technology. Additionally, removing CO2 from biogas by pressure swing adsorption was verified in experimental unit. Preliminary results shown that using activated carbon, it was possible to enrich 50% CO2/50% CH4 mixture up to at over 90% of methane.

Keywords:

Biogas, pressure swing adsorption, activated carbon, methane, carbon dioxide

DEDICATED DIAGNOSTIC SYSTEM FOR AN ELECTROSTATIC PRECIPITATOR (ESP) AS A NEW APPROACH TO CONDITIONT ASSESSMENT OF THE ELECTROSTATIC DEVICE

Aleksandra Czajkowska

University of Science and Technology, Profesora Sylwestra Kaliskiego 7, 85-796 Bydgoszcz, Poland

czajkowska.aleksandra91@gmail.com

A few words about author:

PhD Student on Mechanical Engineering Faculty at the University of Science and Technology in Bydgoszcz. Specialization in terms of the electricity generation, diagnosing and operation of the ESP. Currently she works in IT company, as Product Manager.

Abstract:

The electrostatic precipitator is used for example in conventional thermal power stations, this device is for the purification the exhaust gas from the particles of ashes. Maintenance for high efficiency the device is very important for protection the environment against the particulate matter emissions (PM2.5 and PM10). Currently diagnosing the technical state of the electrostatic precipitator shall take places for the investor in Poland. A principal chooses specification of the basic parameters, next this values are diagnosed in order to present the condition device, on the other hand the Research and Testing Centre for Power Plants are responsible for fulfillment the measurement. This company has specialized in the research for Power Plants. The development of Dedicated Diagnostic System for an Electrostatic Precipitator (ESP) aims at improvement of control process and for the condition assessment of the device. This process can be realised through standard terms of necessary parameters for control during the normal life, it also use the process algorithm of recognition the technocal state ESP. All activities are proposed in order to improve the veryfication of the condition device during the operation, and standardised terms of necessary parameters during the ESP's research.

Keywords:

an electrostatic precipitator, the diagnostic, the condition assessment, pollen emisison, maintenance for high efficiency the device

THE GENESIS PROCEDURE OF TECHNICAL STATE AN ELECTROSTATIC PRECIPITATOR (ESP), WHICH CAN LOCATE THE DAMAGES IN DEVICES

Aleksandra Czajkowska

University of Science and Technology, Profesora Sylwestra Kaliskiego 7, 85-796 Bydgoszcz, Poland

czajkowska.aleksandra91@gmail.com

A few words about author:

PhD Student on Mechanical Engineering Faculty at the University of Science and Technology in Bydgoszcz. Specialization in terms of the electricity generation, diagnosing and operation of the ESP. Currently she works in IT company, as Product Manager.

Abstract:

The scope of the procedure include the genesis of device's technical state (the electrostatic precipitator – ESP), it can be useful during the device operation (ESP). The genesis based on symptoms is a new and innovative approach, it allows the registration of values about device parameters or the ESP diagnostic data, also it could show the conditon device during the operation. The use of the genesis based on symptoms allows thus to determine the result of detectable causes and conditions of the disablement state device. This procedure shall be based on the data collected and the condition assessment. In order to ensure the sound operation of this modern systems for operating machines from an area power plants and conventional thermal power stations is the need to develop methodology, which will allow estimation of the technical state device during the ESP operation (The genesis procedure of technical state an electrostatic precipitator based on symptoms).

Keywords:

the genesis procedure, the damages, the technical state control, the electrostatic precipitator (ESP), the modernization of electrostatic devices

ELEMENTARINESS OF CONTEMPORARY SACRED ARCHITECTURE

Marcin Głuchowski

Laboratory of Elementary Architecture, Faculty of Architecture, Cracow University of Technology

marcin.gluchowski@pk.edu.pl

A few words about author:

Doctor of Technical Sciences, assistant professor at the Faculty of Architecture, Cracow University of Technology, Laboratory of Elementary Architecture, the owner and the chief designer of the architectural studio Marcin Głuchowski Architekt.

Abstract:

This oral presentation presents a research topic the author is preparing a research paper on. The following study addresses the issues resulting from the subject area of the scientific conference, i.e. subject matter, method and motivations behind the choice of the subject matter.
Elementariness is a design idea, i.e. a way of organizing space, a thought leading to simplicity and the basics.
The method of conducting research manifests itself in two aspects. The first one concerns the analysis of existing structures, while the second encompasses experiences from the author's own design practice.
The primary reason for the undertaken scientific activities is to demonstrate the importance of elementariness in contemporary sacred architecture. The collation, comparison and systematization of the most valuable realizations and design projects will serve to find and present the positive features of this kind of architecture. We strive for beauty and perfection through simplicity.

Keywords:

elementariness, contemporary sacred architecture

AN ANALYSIS OF THE CONTROL SOFTWARE AND THE SOLUTION OF THE INVERSE KINEMATICS PROBLEMS FOR THE 5-DOF DIDACTIC MANIPULATOR

Katarzyna Gospodarek

Institute of Computer and Information Science of the Częstochowa University of Technology

kgospodarek@icis.pcz.pl

A few words about author:

Katarzyna Gospodarek, PhD student at the Institute of Computer and Information Science of the Czestochowa University of Technology. The main scientific interests include robot programming methods and the broadly understood use of video information.

Abstract:

This paper presents an analysis of the issues related to the implementation of control software for the 5-DOF didactic manipulator. Particular emphasis has been placed on the parts of the software responsible for generating the motion trajectories and calculating the inverse kinematics. The geometric method was used to solve the problem of inverse kinematics. For this method it is characteristic that it can be used to identify all possible solutions. This approach makes it necessary to take into account the hardware limitations of the controlled object, for example rotation range of used motors. The proposed solutions have been implemented and tested as a control system for the simple didactic manipulator. The software was built based on the Arduino microcontroller board.

Keywords:

5-DOF manipulator, control software, inverse kinematics

TEMPLATE MATCHING METHOD IN IMAGE ANALYSIS - PROBLEMS, LIMITATIONS AND MODIFICATIONS OF THE METHOD

Katarzyna Gospodarek

Institute of Computer and Information Science of the Częstochowa University of Technology

kgospodarek@icis.pcz.pl

A few words about author:

Katarzyna Gospodarek, PhD student at the Institute of Computer and Information Science of the Czestochowa University of Technology. The main scientific interests include robot programming methods and the broadly understood use of video information.

Abstract:

This paper deals with problems of dynamic object recognition in specific conditions in video sequences using the template matching technique. Particular emphasis has been placed on finding solutions that increase the precision of detecting and selecting objects using the chosen method. There are many similarities criteria for template matching. In this study, the metod based on normalized cross correlation (NCC) was used and analysed. The solutions proposed in the paper, for example the dynamic limitation of the analysed image area, allowed to improve the accuracy of the basic pattern matching method. On the basis of the conducted research it has been shown that using additional modifications it is possible to limit the negative influence of such factors as: size of the object, its rotation and speed of change its position. and various types of noise appearing in the analysed image. The selected and used solutions improved the precision of the match templating method, especially in relation to the analysis of images characterised by various types of noise.

Keywords:

template matching, image analysis, objects detection

THE FIRST JESUIT SCHOOLS - THE IDEA OF THE CURRICULUM AND ITS REFLECTION IN ARCHITECTURE

Klara Kantorowicz

Faculty of Architecture, Warszaw University of Technology

klarakantorowicz@yahoo.com

A few words about author:

Klara Kantorowicz is a PhD student at Faculty of Architecture at Warsaw University of Technology. She is interested in history of architecture and also in conservation and protection of historical monuments.

Abstract:

The key to the huge success of Jesuit education in Europe in 16th and 17th century was the curriculum which met the needs of baroque society. Combining the idea of humanism and scholasticism the Jesuits created a method based on Spiritual Exercises by Saint Ignatius of Loyola. This specific educational system required appropriate spacial arrangement of school buildings. In this presentation I will focus on first Jesuit school buildings built in Italy and Poland.

Keywords:

Jesuit architecture, school buildings, Baroque, Ratio Studiorum

WHEN THE ICE STOPS…

Małgorzata Bratnikow*, Tomasz Kolerski

Gdańsk University of Technology

*margarita.migoramini@gmail.com

A few words about author:

Eternal optimist with great dreams who is not afraid to face problems. I am always looking for interesting solutions.

Abstract:

During long frosts, ice forms in being created in the rivers. From frazil ice to the ice cover. However, what will happen as flowing ice will stop at some obstacle? In the flow calculations, it is assumed that there is no flow in the part of the cross section occupied by the ice jam. This is how the thesis to be verified was created. The first stage of the research was the execution of a test stand at the Hydraulic Laboratory of Gdańsk University of Technology. Then, on the first approach, it was noticed that the thesis is a great simplification. This caused the change of the thesis. In the second stage, the analysis of measurements was carried out together with verification of the thesis flow in blockage as an equal flow in porous media. During the calculations, the basic hydraulic laws were used, stating that the type of motion occurring in the modeled block is only similar to the filtration flow in the soil.

Keywords:

Environmental Engineering, ice jam, laboratory, measurements, the flow filter

ULTRA-HIGH MOLECULAR WEIGHT POLYETHYLENE (UHMWPE) AND ITS APPLICATION IN BIOMEDICAL ENGINEERING AND MEDICINE

Katarzyna Mordal

Department of Bioengineering and Plastic Forming, Institute of Mechanical Technologies, Faculty of Mechanical Engineering and Computer Science, Czestochowa University of Technology

kmordal@iop.pcz.pl, katarzyna.199212@gmail.com

A few words about author:

I am a PhD student at the Czestochowa University of Technology and vice- president in SSC Design Thinking Space. My interests are: biomedical engineering, medical diagnostics, numerical modeling, biomaterials, Design Thinking, project management.

Abstract:

The presentation has been devoted to one of polymeric biomaterials, applied in bioengineering, biomechanics, dentistry and other fields of medicine, which is ultra-high molecular weight polyethylene (UHMWPE). At the beginning the issues related to requirements for biomaterials, i.e. biocompatibility, biotolerance, have been outlined. Moreover, the basic information about polymeric materials and the examples of their application in various branches of bioengineering have also been presented. The main applications of UHMWPE and its properties, which are key for implants, have been discussed in detail. Furthermore, it has also been the issues referred to forming, processing and modification of UHMWPE. The presenting a comprehensive overview of UHMWPE applications used in biomedicine, bioengineering, biomechanics and its properties has been the aim of the presentation.

Keywords:

polyethylene, UHMWPE, biomedical engineering, endoprostheses, biocompatibility

FORCE FEEDBACK HAPTIC DEVICE

Łukasz Mucha*(1), Dariusz Krawczyk(1), Krzysztof Lis(2)

(1) Fundacja Rozwoju Kardiochirurgii,
(2) Politechnika Śląska

*lmucha@frk.pl

A few words about author:

Mgr inż. Łukasz Mucha, absolwent Politechniki Śląskiej, Wydział Mechaniczny Technologiczny. Specjalista w Pracowni Biocybernetyki Fundacji Rozwoju Kardiochirurgii im. Profesora Zbigniewa Religi. Kierownik projektu Lider VIII.

Abstract:

This paper presents the design stages, construction, operating principle and preliminary tests of the developed RobinHand control device. This device allows manipulation of the surgical robot. The concept and methods of implementation of the force to which the tool exerts on the given body (force feedback) are presented. Individual development variants of the developed devices and a brief description of their construction are presented.

Keywords:

Haptic, RobinHand, Robin Heart, haptic device

STUDY ON DISSOLUTION CONDITIONS OF MANGANESE OXIDE AND SILVER FROM TANTALUM CAPACITORS SCRAP

Andrzej Piotrowicz*, Stanisław Pietrzyk

AGH University of Science and Technology, Faculty of Non-Ferrous Metals,
Department of Physical Chemistry and Metallurgy of Non-Ferrous Metals

*andpio@agh.edu.pl

A few words about author:

I am a graduate of two fields of study at AGH: Metallurgy (Faculty of Non-Ferrous Metals, master's degree) and Chemical Technology (Faculty of Energy and Fuels, bachelor's degree). Currently, I am PhD student at the Faculty of Non-Ferrous Metals.

Abstract:

Tantalum has been classified as a critical raw material for the EU economy. It is caused by its unique properties and various applications, especially in the electronic industry as tantalum capacitors (TC). Waste of Electrical and Electronic Equipment belongs to the most important secondary source of tantalum.
One of the challenges of the tantalum recycling is related to the internal multilayered composition of capacitors. The TC consists of the following layers: epoxy resin, silver (Ag), graphite, manganese oxide (MnO2), Ta2O5 and metallic tantalum. Ag and MnO2 may interfere with the further tantalum processing, and on the other hand they constitute secondary sources of these materials. For example, it is possible to remove the MnO2 by hydrochloric acid, however, it causes the release of chlorine gas, which disqualifies this way from an ecological point of view. Therefore, it becomes important to develop an effective and environmentally friendly method, which would allow the removal of Ag and MnO2 from TC and their recovery/recycling.
This work contains the results of study on the dissolution of manganese and silver layers from TC in solution free of chlorides and alkalis. Effectiveness of dissolving the above-mentioned layers by selected solutions under various process conditions was investigated. In addition, the contents of each material were determined, and possible ways of the recovering manganese and silver from the after-leaching solutions were suggested.

Keywords:

tantalum capacitors, tantalum recycling, eco-friendly recycling, transition metals recovery

ANALYSIS OF CONE BEAM COMPUTED TOMOGRAPHY QUALITY CONTROL PHANTOM TEST

Joanna Redutko

Czestochowa University of Technology, Faculty of Mechanical Engineering and Computer Science

joanna.redutko@iop.pcz.pl

A few words about author:

PhD student at the Częstochowa University of Technology. Graduate of 1st degree studies in the field of Biomedical Engineering, with the specialty of Rehabilitation Engineering, and second degree studies in the field of Mechanics and Machine Design.

Abstract:

Cone beam computed tomography (CBCT) is a modern method of diagnostic imaging, getting more and more popular in dental practice and clinical use. The greatest advantage of this method is a significant reduction of the X-ray dose compared to conventional tomography, that is why this method gains new group of supporters. It is very important to maintain a high quality of CBCT projection that guarantees an appropriate level of diagnostic value.
The aim of the research was to determine how Hounsfield units were changed in the projections made by of two types of phantoms. Homogeneous (water) phantom and phantom with PMMA core and several cylinder shaped elements of materials differing from each other by density assembled in the core. Phantoms were specially made for quality testing purposes. The analysis was carried out to assess the discrepancies in Hounsfield unit values obtained in subsequent layers.

Keywords:

Phantom test, Quality assurance, Cone Beam Computed Tomography, CBCT, Dental imaging

THE ROLE OF CUSTOMIZATION IN PLANNING THE PRODUCTION PROCESS

Natalia Bartczyk*, Monika Robak

Student Science Level Up, Faculty of Management and Production Engineering, Lodz University of Technology, Łódź

nataliabartczyk@interia.pl

A few words about author:

We are students of the Lodz University of Technology from the Faculty of Management Engineering. We are interested in fields related to marketing and production processes.

Abstract:

In the age of the Internet and easy access to a variety of information sources, customers have a wide selection and easy comparison of offers available on the market. Therefore, customization is rapidly developing in the field of marketing communication. It consists of individualizing the product offer, thanks to which customers feel special. Currently, competition in the personalized products industry is very large, resulting in difficulties in maintaining a high position on the market. The consequence is that manufacturers must constantly search for and implement new solutions and technology to meet the expectations of customers.

An example of a company in which massive customization is used is Ikea. A survey has been carried out to investigate whether BESTA and PAX systems at Ikea are based on the same ideology and the introduction of optimization in production processes. The conducted research allowed to indicate what values the producers are particularly interested in when planning production processes on a mass scale.

Communication should be innovative and creative enough to attract and retain customers, using personalized offers for specific likes and preferences. The greater customer satisfaction, the greater the financial gain for the company.

Keywords:

personalization, customer, innovative , ideas, customization,

TOWARD SPATIAL AWARENESS FOR STAND ALONE MOBILE DEVICES

Izabela Perenc

Lodz University of Technology

iperenc@kis.p.lodz.pl

A few words about author:

Izabela Perenc is a Ph. D. student at Lodz University of Technology. Interested in artificial intelligence and bioinformatics, mainly focused on neural networks. Currently, involved in project concerning simultaneous localization and mapping.

Abstract:

Spatial awareness is the ability to state own position in the environment. It is obvious for humans, but more complex issue for mobile devices. The technology for spatial awareness is developed together with growing number of mobile devices. There exist a variety of methods that are frequently used in positioning. The majority of mobile devices use transmitters in respect to which they are positioned, many takes advantage of environment features that are acquired by sensors like camera or LIDAR. Finally, some devices are using data about linear and angular acceleration in order to estimate displacement from known position. Mentioned methodologies are described, together with examples of technologies. The article presents a review of chosen positioning technologies with regard to incorporated algorithms.

Keywords:

Localization, Spatial awareness, Algorithms

MECHANICAL PROPERTIES OF THE IF AND DC01 STEELS AFTER APPLICATION OF THE DRECE PROCESS

Karolina Kowalczyk*, Magdalena Jabłońska

Silesian University of Technology, Institute of Materials Engineering

*karolina.kowalczyk@polsl.pl

A few words about author:

PhD student at the Silesian University of Technology, Institute of Materials Engineering; Area of research interest: SPD process, New AHSS steels for automotive industry.

Abstract:

This research paper shows the influence of a repeated SPD plastic forming with the DRECE technique on hardening of IF and DC01 steels. The influence of number of passes through the device on change of mechanical properties, such as tensile strength TS and yield stress YS, of tested steel was tested. As a part of SPD techniques an unconventional method of deformation developed at VŠB – Technical University in Ostrava was used. This method uses a repeated plastic forming to refinement of structure and improve mechanical properties of metal bands. The developed method is based on equal channel extrusion with dual rolls - DRECE (Dual Rolls Equal Channel Extrusion). The forming process is based on extrusion technology with zero reduction of metal sheet thickness while achieving a high degree of deformation in the formed material, which results in a significant improvement in mechanical properties of the initial material. For the tested steel the increase of strength properties after the DRECE process was confirmed after the first pass in relation to the initial material. The biggest strain hardening is observed after the fourth pass.

Keywords:

sheet metal, HSS, SPD process,

ABRASION OF ENAMEL CAUSED BY FORCES OF DENTAL RESTORATIONS ACTING ON NATURAL TEETH

Weronika Czepułkowska

Institute of Material Science and Engineering, Faculty of Mechanical Engineering, Lodz University of Technology

weronika.czepulkowska@p.lodz.pl

A few words about author:

I graduated from the Medical University of Lodz and I have a master's degree in Dental Techniques. Actually i am in 3rd degree studies at the Lodz University of Technology.

Abstract:

The aim of this paper was to analyze the method of testing retentive forces of clasps and friction between the enamel and dental materials. The focus was also on the quality of the enamel volume wear tests when using materials from which the removable partial denture clasps are made. Abrasion of enamel caused by dental restoration is related to the mechanical properties of the materials used. Dental ceramics or metal alloys, acting by forces, cause the formation of enamel defects, which can significantly weaken natural teeth. There are a few studies on the volume wear tests of the enamel caused by dental clasps. They do not relate to changes in retention forces that decrease as a result of the length of use. By using FEM in near future it will be possible to know the data associated with enamel damage caused by long-term use of removable partial dentures.

Keywords:

Dental clasps, removable partial dentures, wear tests, enamel, dental materials

INFLUENCE OF THE GROOVE ON STRESS DISTRIBUTION AND DEFORMATIONS IN THE CASE OF A SINGLE INCISOR IN REMOVABLE PARTIAL DENTURE METAL FRAMEWORK

Joanna Taczała

Institute of Materials Science and Engineering, Lodz University of Technology

joanna.taczala@p.lodz.pl

A few words about author:

Ph.D. student and researcher on Lodz University of Technology. I am graduated Dental Techniques on Medical University of Lodz on bachelor level. Then I continued this on MSc. I studied Computer Graphics and Multimedia Techniques too.

Abstract:

Partial denture metal framework is a specific kind of prosthetic restoration where Dental Technician has a problem with breaking off of single incisor from the dentures. It happened because in this part is a smaller area to put acrylic resin than for example in part with molars. A popular solution to improve connectivity between false acrylic tooth and acrylic denture base plate is to make a groove in the central area of the tooth. This paper focuses on this kind of solution.

The static numerical analysis was performed to check how the stresses and deformations distributed. To this analysis, the ANSYS program was used. The results show that most stresses concentrate on the part where acrylic resin do not have enough thickness. So this stresses can happen to break off the tooth. Groove does not influence on improving the bond in case of addition force at an angle to the incisal edge of the tooth. In the case of tensile analysis, grove makes that the largest deformation show on the groove.

Keywords:

removable partial denture metal framework, finite element method, stress distribution, PMMA, incisor

OBJECT DETECTION IN THE IMAGE BASED ON COLORS ANALYSIS

Joanna Kulawik

Institute of Computer and Information Sciences, Czestochowa University of Technology, Czestochowa, Poland

joanna.kulawik@icis.pcz.pl

A few words about author:

MSc. computer science, currently a PhD student of the Czestochowa University of Technology. Academic work in the field of computer science, he conducts in the analysis and processing of digital images.

Abstract:

Image analysis in present times is the basis in many areas of life. The produced vehicles have built-in systems based on image analysis obtained from small video cameras.Examples are parking and reversing systems or rain sensors. It should also be mentioned here about robotics, where steering is most often based on images obtained from cameras. Verification on production tapes is largely automated thanks to imaging.
In the tests carried out, detection was based on the colors of pixels in the image. Implementation of four example methods was prepared. The first method detects all elements with a red, green or blue color in the analyzed RGB image.
The second method makes detection based on the level of color of the central point of the reference image. First of all, the percentage of each of the three basic colors R, G or B being the components of the color of a given pixel is calculated. Only the most dominant color is subjected to analysis.
The third of the prepared detection methods is a modification of the second method presented. The difference between the percent level of the dominant color and the percentage level of the other two colors was analyzed.
A fourth method was also prepared, which bases its analysis on the basis of the arithmetic mean of the central point of the model image and the nearest 24 pixels. In the analyzed image, each pixel is examined individually.
The result of each of the four methods is a binary image.

Keywords:

detection with color, image analysis

ESTIMATION OF DISTANCE TO OBJECTS BY STEREO VISION

Joanna Kulawik

Institute of Computer and Information Sciences, Czestochowa University of Technology, Czestochowa, Poland

joanna.kulawik@icis.pcz.pl

A few words about author:

MSc. computer science, currently a PhD student of the Czestochowa University of Technology. Academic work in the field of computer science, he conducts in the analysis and processing of digital images.

Abstract:

Stereo vision is a specialized part of the sciences dealing with the analysis of digital images. The control of motor vehicles is to a large extent based on built-in sensors such as, for example, rangefinder. There is also a solution based on the analysis and processing of digital images. The use of two digital cameras or a specialized stereo vision camera allows also to obtain information about the distance from the analyzed object. In addition, it provides the ability to detect and identify objects in front of the vehicles.
In the conducted research a research stand consisting of two web cameras and a computer set was prepared. We analyzed single frames of a recorded video stream from both devices at the same time. Conducting the research should have been preceded by camera calibration. Fifteen pairs of pictures containing a checkerboard have been prepared. On this basis, a characteristic points, an auxiliary point (Checkerboard origin) and parameters were detected. Then, face detection in the image was performed, and its distance was determined after taking into account the parameters of the previous calibration. The results obtained are shown in the example images.

Keywords:

stereo vision, image analysis, image processing

NEW THIOCARBOHYDRAZONE DERIVATIVES OF FLAVANONES

Paulina Błazińska*, Elżbieta Łodyga-Chruścińska, Anna Sykuła

Lodz University of Technology, Faculty of Biotechnology and Food Sciences, Institute of General Food Chemistry

*paulina.blazinska@edu.p.lodz.pl

A few words about author:

PhD student at the Lodz University of Technology.

Abstract:

In nature, the precursor in the formation of flavonoid subclasses is flavanone. The group of flavanones include compounds which are modification of structure of flavanone.
In addition, it is an important natural compound with great potential in the prevention of many civilization diseases such as cardiovascular diseases or cancer. Flavanone Schiff bases/imines may be classified to this group. These specific compounds are formed with primary amines. One of them is thiocarbohydrazide which belongs to an important class of chemical compounds applicable in many fields such as organic chemistry, biology and medicine.
The detection of innovative routes of synthesis and chemical modification is a new trend in research on flavanone. Additionally, obtaining information about correlation between the structure of compound and its biological activity. It is very important and helpful in understanding the mechanisms of their interactions, which in turn will facilitate the receipt of potential substances with the desired pharmacological effect.
The present work is devoted to reveal physicochemical properties and several biological actions of new derivatives of flavanone.
The aim of this work was to obtain of new azomethine compounds derived from flavanones and examine their spectroscopic properties and interaction with DNA.

Keywords:

flavonoids, flavanones, schiff bases, azomethine compounds, spectroscopy

OPTIMIZATION OF THE MAGNETIC LEVITATION OF YBCO SUPERCONDUCTOR

Grzegorz Centała

Faculty of Physics, Adam Mickiewicz University in Poznan

grzegorz.centala@gmail.com

A few words about author:

Fifth-year student of medical physics.

Abstract:

Development of civilisation is inseparable connected with population growth and traveling more than ever before. Few decades ago engineers invented a train which uses magnetic levitation in place of classic wheels. This kind of improvement made it possible to reduce friction and noise. The physical phenomena of magnetic levitation exist owing to flux pinning effect. The flux pinning effect is the interaction between magnetic field and high temperature superconductor. Taking into consideration recent publications on superconductors the one made of YBaCuO was chosen as most promising. Numerical calculation were made on simple model of superconductor levitation above the straight track made of neodymium magnets. Calculations were made with Comsol Multiphysics software.

Keywords:

Magnetic levitation, YBCO, Superconductor

TEXTURING THE SURFACE OF TITANIUM ALLOYS, WITH USAGE OF PLASMA METHODS, IN ORDER TO IMPROVE MATERIAL'S PROPERTIES FOR BIOMEDICAL APPLICATIONS, WITH AN INDICATION OF ORTHOPEDIC IMPLANTS

Agata Serafińska

Division of Biomedical Engineering and Functional Materials, Lodz University of Technology, Institute of Materials Science and Engineering

agata.serafinska@edu.p.lodz.pl

A few words about author:

I am a PhD student in Materials Engineering at the Lodz University of Technology. My interests are involved with texturing and surface modifications by plasma methods, in order to improve material's properties, especially for biomedical applications.

Abstract:

Surface texturing is the result of the etching process, it means removing unnecessary parts of layers by knocking atoms out of the material surface, through bombarding ions. The first step towards plasma etching is to choose the most suitable process atmosphere – ie. etching gas. A particular plasma etches the material, when its interaction with the surface leads to the formation of a stable volatile compound and to the removal of "fine" matter. Another crucial aspect is the control of the process parameters, like selectivity and directivity of etching – the latter one by determining the anisotropy coefficient. The main goal is to form a textured titanium surface with the desired topography and given pattern, consistent with the template of mask applied before process. The textured surface of the titanium orthopedic implant, in comparison to the smooth one, has a number of advantages. It is characterized by significant development of the implant surface adjacent to the bone, improvement of osseointegration processes, support of osteoblast's growth, more even distribution of pressure on surrounding tissues and better biomechanical interactions of the implant with the bone. In recent years, interest in this subject has increased, which is confirmed by the rising number of scientific publications, concerning this thematic scope.

Keywords:

surface texturing, plasma modifications, plasma etching, titanium alloys, orthopedic implant

UNEXPECTED COURSE OF THE 1,3-DIPOLAR CYCLOADDITION OF (E)-2-ARYL-1-CYANO-1-NITROETHENE WITH DIAZAFLUORENE

Karolina Kula*, Radomir Jasiński

Cracow University of Technology, Institute of Organic Chemistry and Technology

*kkula@chemia.pk.edu.pl

A few words about author:

M.Sc. Eng. Karolina Kula is PhD candidate in Institute of Organic Chemistry and Technology, Cracow University of Technology.

Abstract:

Conjugated nitroalkenes (CNA) allow for the synthesis several interesting compounds, for example nitronic acid esters, amines, oximes and many other. CNA have a highly electron-withdrawing nitro group, which are stimulate π-deficiency of a double bond. In consequence, this effect which activates these compounds in stereocontrolled reaction with nucleophilic reagents such as dienes, 1,3-dipoles and etc.
The reaction between alkenes and diazafluorene as 1,3-dipole are known from the beginning of 20th century. In effect, dipolar cycloaddition are formed Δ1-pirazoline systems. Class of this reaction are realized under mild conditions giving high yields. The products are used as bioactive compounds, for example medicines and pesticides.
In present work, we can be prepared nitrofunctionalyzed pirazoline systems via 1,3-dipolar cycloadditions between diazafluorene and homogenous series of (E)-2-aryl-1-cyano-1-nitroethenes. It was found, that, by the reaction it possible to create two regioisomeric adducts. However, during the reaction other products are created.

Keywords:

1,3-dipolar cycloadditions, Δ1-pirazolines, diazafluorene, conjugated nitroalkenes

(E)-3,3,3-TRICHLORO-1-NITROPROP-1-ENE AS A DIPOLAROPHILE IN THE SYNTHESIS OF Δ1-PYRAZOLINES

Karolina Kula*, Radomir Jasiński

Cracow University of Technology, Institute of Organic Chemistry and Technology

kkula@chemia.pk.edu.pl

A few words about author:

M.Sc. Eng. Karolina Kula is PhD candidate in Institute of Organic Chemistry and Technology, Cracow University of Technology.

Abstract:

Conjugated nitroalkenes (CNA) containing trihalomethyl group vicinal with respect to the nitro group are promising and intensively studied compounds. The first vicinal trihalomethylnitroethenes have been synthesized in the second half of last century.
Compounds of this type are potential physiologically active substances, for example (E)-3,3,3-trichloro-1-nitroprop-1-ene is known for fumigant and nematocidal activity. Furthermore, highly reactive trihalomethylnitroethenes are used as building blocks for preparation of pharmacologically active peptides and various classes of organic compounds.
CNA allow for the synthesis several interesting connections, for example nitronic acid esters, amines, oximes and many other. Moreover, trihalomethylnitroethenes can participate in 1,3-dipolar cycloaddition with diazocompounds, nitrone, nitryle oxides, nitrylimines and other. Class of this reaction are realized under mild conditions giving high yields.
In present work, we have been realized 1,3-dipolar cycloaddition reactions between (E)-3,3,3-trichloro-1-nitroprop-1-ene and 1,3-dipoles allenyl type. Consequently, in the course of every reactions, it possible to create two regioisomeric adducts.

Keywords:

1,3-dipolar cycloadditions, Δ1-pirazolines, (E)-3,3,3-trichloro-1-nitroprop-1-ene, 1,3-dipoles allenyl type

EDGE PLANE PYROLYTIC GRAPHITE ELECTRODE AS A TOOL IN THE VOLTAMMETRIC DETERMINATION OF BIOLOGICALLY ACTIVE COMPOUNDS

Kinga Konecka*, Mariola Brycht, Sławomira Skrzypek

University of Lodz, Faculty of Chemistry, Department of Inorganic and Analytical Chemistry

*kinga.kaczmarska@o2.pl

A few words about author:

I am in the 3rd year of my Ph.D. studies at the University of Lodz, Department of Inorganic and Analytical Chemistry. My research is focused on the voltammetric determination of biologically active compounds using carbon-based electrodes.

Abstract:

Nowadays, the monitoring of drugs in the environment, and in particular the development of new and sensitive procedures for their quantification is of high importance. Until recently, mainly spectrophotometric, and chromatographic techniques were applied to pharmaceutical analysis. In connection with the idea of respecting the priorities of green chemistry and minimizing the harmful impact of conducted analyzes on the natural environment, currently electrochemical techniques are increasingly being used. An extremely important aspect in electrochemical studies is to use environmentally friendly working electrodes. In this case, an edge plane pyrolytic graphite electrode (EPPGE) was applied in the analysis of the selected drugs, such as teriflunimide, oxolinic acid, and bithionol.

In the present work, the impact of a supporting electrolyte on the electrochemical behavior of drugs was studied using a differential pulse voltammetry (DPV), square wave voltammetry (SWV) or square wave adsorptive stripping voltammetry (SWAdSV) in Britton-Robinson buffer solutions (pH range of 2.0–12.0). The effect of the influence of the DPV, SWV or SWAdSV parameters was also tested. The linear calibration curves for each drug were constructed. The EPPGE provided the excellent results for DPV, SWV or SWAdSV determinations of drugs, and this electrode can be applied for the sensitive determinations of teriflunimide, oxolinic acid, and bithionol.

Keywords:

edge plane pyrolytic graphite electrode, teriflunomide, oxolinic acid, bithionol, voltammetry

VOLTAMMETRIC ASSAY OF VETERINARY IONOPHORE ANTIBIOTICS AND THEIR DETERMINATION IN NATURAL MATRIXES

Konrad Rudnicki*, Monika Wrońska, Sławomir Domagała, Sławomira Skrzypek

Department of Inorganic and Analytical Chemistry, University of Lodz

*rudnik503@gmail.com

A few words about author:

Konrad Rudnicki - a PhD candidate at the Department of Inorganic and Analytical Chemistry at the University of Lodz. His research is focused on analysis of biologically active compounds using elelctrochemical methods.

Abstract:

Until recently, mercury electrodes have been applied in voltammetric studies of the electrochemical processes. Nowadays, the development of novel environmentally-friendly sensor materials that could replace Hg due to its toxicity is one of the trends of green analytical chemistry. One of the electrodes harmless to the natural environment is the renewable silver amalgam film electrode (Hg(Ag)FE) constructed by Polish scientists from Cracow.
Environmental pollution caused by drugs and antibiotics has become a serious problem in the recent years, so the development of novel, rapid, sensitive and cheap methods for the determination of drug residues in the environment is a very important task. Ionophore antibiotics are a group of organic compounds that exibit antibactericidal activity. Examples of important ionophore antibiotics are: salinomycin, monensin, lasalocid or maduramicin.
This work presents the results of electrochemical studies for two selected antibiotics (salinomycin and monensin) carried out by square wave voltammetry (SWV) using Hg(Ag)F electrode. The developed voltammetric methods were successfully applied for the quantitative determination of test compounds in natural matrixes (soil and horse feed).

The authors acknowledge the financial support obtained from the University of Lodz, Poland (Grant No. B1611100001288.02)

Keywords:

Voltammetry, electroanalysis, ionophore antibiotics, renewable silver amalgam film electrode

ELECTROCHEMICAL STUDY OF THE VETERINARY DRUG CLORSULON ON A GLASSY CARBON ELECTRODE MODIFIED WITH SINGLE-WALLED CARBON NANOTUBES

Konrad Rudnicki(1)*, Mariola Brycht(1) , Kurt Kalcher(2), Sławomira Skrzypek(1)

(1) Department of Inorganic and Analytical Chemistry, University of Lodz,
(2) Karl-Franzens University, Institute of Chemistry - Analytical Chemistry

*rudnik503@gmail.com

A few words about author:

Konrad Rudnicki - a PhD candidate at the Department of Inorganic and Analytical Chemistry at the University of Lodz. His research is focused on analysis of biologically active compounds using elelctrochemical methods.

Abstract:

Clorsulon (Clo) is a veterinary drug belonging to the benzenesulfonamide family. This compound is applied in veterinary medicine as a drug against hepatopathy in cattle farming as a suspension for an oral use or injectable formulations for subcutaneous administrations.
In this work, a glassy carbon electrode modified with single–walled carbon nanotubes (SWCNTs/GCE) was used as a working electrode for a square–wave voltammetric (SWV) study of Clo. A preliminary study were performed in order to check the electrochemical behavior of Clo over a wide pH range, together with Britton–Robinson buffer (B–R) and phosphate buffer (PBS) solutions. The best SWV signal was recorded at the potential about +1.05 V versus an Ag/AgCl/3 mol L–1 KCl reference electrode in PBS at pH 6.8. The effect of various factors, such as buffer composition, and SWV parameters (amplitude, frequency and step potential) on current response of Clo was also investigated. The linear relationship between peak current versus concentrations of Clo was defined using the SWCNTs/GCE, and the limits of quantification (LOQ) and detection (LOD) were also calculated. Further, cyclic voltammetry (CV) was applied in order to supply the information about Clo at SWCNTs/GCE regarding the electrode reaction mechanism as well as the character and reversibility of electrochemical process.

The authors acknowledge the financial support obtained from the University of Lodz, Poland (Grant No. B1711100001602.02).

Keywords:

veterinary drug, clorsulon, electroanalysis, voltammetry, glassy carbon electrode

THE APPLICATION OF AN INNOVATIVE SENSOR BASED ON CARBON NANOHORNS FOR THE VOLTAMMETRIC DETERMINATION OF THE SELECTED VETERINARY DRUG

Karolina Sipa*, Mariola Brycht, Sławomira Skrzypek

University of Lodz, Faculty of Chemistry

*karolina.sipa@gmail.com

A few words about author:

I am PhD student at the Department of Inorganic and Analytical Chemistry. I am strongly interested in electroanalytical investigation of biologically active compounds. In addition, an aim of my work is to develop new sensors based on nanomaterials.

Abstract:

Single–walled CNHs (SWCNHs), also called carbon nanohorns (CNHs), are a kind of carbon nanomaterials such as carbon nanotubes and graphene. SWCNHs have a tubular structure made of a single graphene sheet, which is similar to the single–walled carbon nanotube (SWCNT), however, SWCNHs differ considerably from SWCNTs. The SWCNHs are characterized by high dispersibility, high conductivity, and large specific surface area.
Nitroxinil is a substituted halogenated phenolic veterinary drug which is used in the prophylaxis and the treatment of liver fluke, a few gastrointestinal roundworm species and myiasis.
In the present work, glassy carbon electrode (GCE) modified with carbon nanohorns (GCE–CNHs) was considered as a working electrode. The procedure for the nitroxinil determination was developed using a square–wave voltammetry (SWV). Analytical signal was obtained at a potential ca. +1.25 V. The measurements were performed in a Britton–Robinson buffer at pH 2.0, and the SWV parameters, i.e. an amplitude, a frequency, and a step potential, were optimized. The linear relationship between peak current vs. increasing concentrations of nitroxinil was defined using the GCE–CNHs, and the limit of quantification (LOQ) and detection (LOD) were also calculated. Moreover, the electrochemical behavior of nitroxinil at the GCE–CNHs was characterized by a cyclic voltammetry (CV).

The authors acknowledge financial support of the University of Lodz (grant no. B1811100001859.02).

Keywords:

carbon nanohorns, veterinary drug, nitroxinil, electroanalytical chemistry, voltammetry

PESTICIDES IN THE ENVIRONMENT – THEIR VOLTAMMETRIC ANALYSIS IN THE REAL SAMPLES AND SELECTIVITY STUDY OF THE DEVELOPED METHOD

Karolina Sipa*, Mariola Brycht, Sławomira Skrzypek

University of Lodz, Faculty of Chemistry

*karolina.sipa@gmail.com

A few words about author:

I am PhD student at the Department of Inorganic and Analytical Chemistry. I am strongly interested in electroanalytical investigation of biologically active compounds. In addition, an aim of my work is to develop new sensors based on nanomaterials.

Abstract:

Pesticides are one of the most dangerous contaminants with high toxicity because of its bioaccumulation and long-term effect on living organisms. Dichlorophen (Dcp) is a veterinary fungicide which eliminates the tapeworm infections in dogs and cats, while metobromuron (Mbn) is a herbicide applied in fields of common beans, potatoes, tomatoes, tobacco, maize and sugar beet.

In this work, the voltammetric procedures for the determination of Dcp and Mbn were developed using a square–wave adsorptive stripping voltammetry (SWAdSV) and a square–wave voltammetry (SWV), respectively. Glassy carbon electrode modified with β–cyclodextrins and multi–walled carbon nanotubes (β–CDs–MWCNTs–GCE) was used as a working electrode for the Dcp determination, while ultra trace graphite electrode modified with graphene nanoplatelets (GNPs–UTGE) was applied as a working electrode for the Mbn determination. The calibration curves were constructed for both pesticides, and the results showed that the proposed methods exhibited acceptable analytical performance in terms of very low detection limits (LOD = 1.4×10^{-8} mol L^{-1} for Dcp, and LOD = 4.9×10^{-8} mol L^{-1} for Mbn). The determination of both pesticides in the spiked river water samples was carried out, and the selectivity of the developed methods was also tested.

The authors acknowledge financial support of the University of Lodz (Grants No. B1611100001291.02 and B1711100001602.02).

Keywords:

pesticides, dichlorophen, metobromuron, voltammetry, real samples

CHANGES IN THE COMPOSITION AND CONTENT OF POLYPHENOLS IN CHOCOLATE RESULTING FROM PRE-TREATMENT METHOD OF COCOA BEANS AND TECHNOLOGICAL PROCESS: A REVIEW

Bogumiła Urbańska*, Andrzej Lenart, Dorota Miarka, Jolanta Kowalska, Katarzyna Pobiega, Boris Poleganow

Warsaw University of Life Sciences, Faculty of Food Sciences, Department of Biotechnology, Microbiology and Food Evaluation

*bogumila_urbanska@sggw.pl

A few words about author:

Ph.D. student in Faculty of Food Sciences at Warsaw University of Life Sciences . 22 years of professional experience in retail chains.

Abstract:

Chocolate is one of the most desired confectionery product in the world. Its production technology includes a series of processes conducted in appropriate conditions of the temperature and time. Most of these operations contribute to the degradation of valuable, natural and desired bioactive compounds, hence producers search for novel technologies and solutions that would enable minimizing these losses. In 2012, the EFSA confirmed the beneficial effect of the components contained in cocoa powder on health.
This review is focused on analyzing the effect of particular stages of the production process, with consideration given to the type of raw material and properties of the finished product on the content of the bioactive compounds in the products made of cocoa beans subjected to the "traditional" treatments using high temperatures and low temperatures. Due to the high temperature used during roasting, it is one of the key processes affecting the quality and sensory properties of the cocoa beans and products made of them. Each cultivar differs in size and color of the beans, resistance to the climatic conditions, and bean composition. Collected data allows to establish which stages and which processes require further studies and analyses to be useful for chocolate manufacturers not only in terms of the manufacturing repeatable products but also in developing assortment of products having beneficial effect on human health and well-being.

Keywords:

Cocoa; Chocolat; Polyphenols; Bioactive compounds; Effect on health; Process; Antioxidants

THE APPLICATION OF CARBON-BASED NANOMATERIALS FOR THE VOLTAMMETRIC DETERMINATION OF NOVEL FUNGICIDE BIXAFEN

Karolina Kowalewska*, Mariola Brycht, Sławomira Skrzypek

University of Lodz, Faculty of Chemistry

*kowalewska.karolina94@gmail.com

A few words about author:

I am in my first year of my Ph.D. study. My research is focused on the voltammetric determination of pesticides using carbon-based electrodes, such as for example graphite paste electrode, graphene paste electrode, and boron-doped diamond electrode.

Abstract:

Over the past two decades, carbon-based nanomaterials have attracted great attention in the area of electrochemistry. The representative of carbon-based nanomaterials are graphite and graphene.
In this work, novel paste electrodes based on the graphite (GrPE) and graphene (GPE) were prepared. The advantages of carbon–based paste electrodes are mainly easy and rapid preparation, low cost, simple surface renewal, low residual current in a wide potential window, and ease of modification with even labile compounds. Further, as–prepared paste electrodes were applied as working electrodes for the analytical purposes. The square–wave voltammetric (SWV) procedures for the determination of pesticide bixafen were developed. Bixafen is a pyrazole–carboxamide fungicide which belongs to a new generation of SDH (succinate dehydrogenase) inhibitors. It was developed specifically for foliar application to control important cereal diseases, such as septoria leaf blotch (Septoria tritici) in intensive cereal growing regions. The linear relationships between peak current vs. increasing concentrations of bixafen were defined using both electrodes, and the limits of detection and quantification were calculated. The obtained results showed that GPE possess advantages in terms of linearity and detectability when compared to the GrPE.

This work was supported by the National Center for Science (NCN) in Cracow, Poland (Grant no. UMO–2014/15/N/ST4/02285).

Keywords:

nanomaterials, graphene, graphite, paste electrode, bixafen

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