

# The Book of Abstracts

NATIONAL SCIENTIFIC CONFERENCE

"UNDERSTAND THE SCIENCE"

III EDITION

WHAT?

HOW?

WHY?



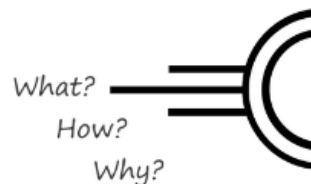
**National Scientific Conference**  
**„Understand the Science”**  
**III edition**

**The Book of Abstracts**

**Lodz, September 28, 2019**



National Scientific Conference  
"Understand the Science"  
III edition  
September 28, 2019  
Lodz



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## **CONFERENCE INFORMATION**

**The National Scientific Conference „Understand the Science”** is organized especially for you.

The Conference has an interdisciplinary character. It 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.

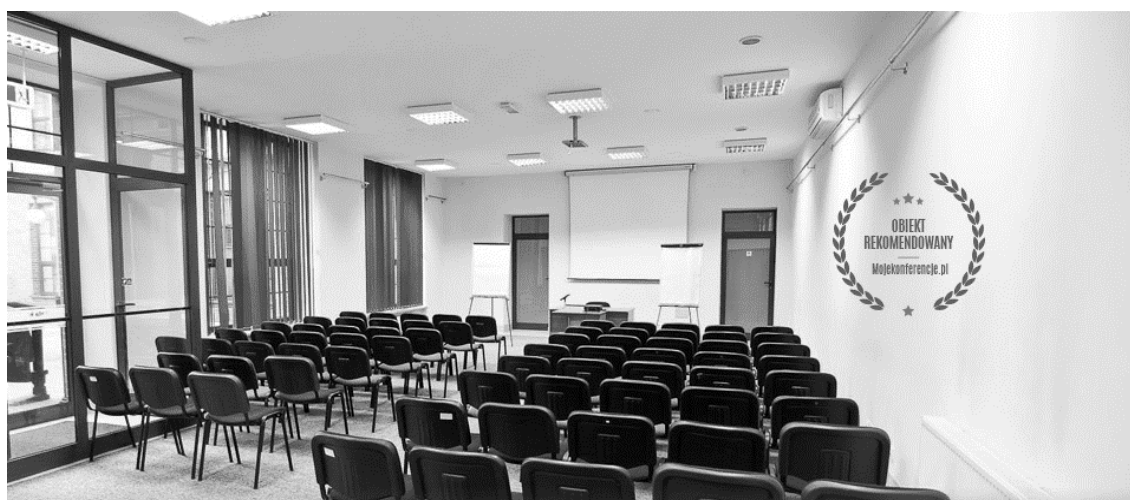
Our initiative aims to create opportunities for exchange of experiences and good scientific practices by representatives of the scientific community. Additionally, it aims to underline the important role of young researchers in the development of Polish science.

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 m<sup>2</sup> 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 28, 2019 (Saturday)**

08:00 – 15:00	<b>Registration</b> ( <i>Reception</i> )	
08:45 – 09:00	<b>Opening of the Conference</b> ( <i>Hall 3</i> )	
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P-02	Katarzyna Góralska	ANGER RUMINATION IN CARDIAC PATIENTS
P-03	Natalia Jeżewska	CREATIVE MATHEMATICS - OPERATIONAL REASONING IN PRE-SCHOOL EDUCATION
P-04	Weronika Kisiel	THE BRAIN OF THE READER
P-05	Aleksandra Bojke	QUALITATIVE AND QUANTITATIVE ANALYSIS OF LIPIDS OF HYLOBIUS ABIETIS BEFORE AND AFTER FUNGAL INFECTION
P-06	Alicja Hrehorowicz- Nowak	TOURIST ACTIVATION OF THE BAY OF DEAD HOTELS IN CROATIA. CHANCES AND DANGERS
P-07	Kacprzak Krzysztof	REVIEW OF METHODS AND TOOLS FOR MODELING PRODUCTION PROCESSES
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P-11	Monika Jakielaszek	CHANGES IN PHOTOCHROMIC MATERIALS AFTER ULTRAVIOLET RADIATION EXPOSURE
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P-18	Anna Haluch	BRITTLINESS INDEX AS AN INDICATOR OF NATURALLY FRACTURED SHALES WITHIN LOWER PALEOZOIC FORMATIONS FROM THE NORTHERN PART OF THE CALEDONIAN FORELAND BASIN (POLAND)
P-19	Małgorzata Mikołajczak	SYNTHESIS, CHARACTERIZATION AND EVALUATION OF BIOLOGICAL PROPERTIES OF NEW DERIVATIVES OF SALICYLIC ACID



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P-24	Agata Pyrzanowska	CANCER IMMUNOTHERAPY – BLOCKING PD-1 PATHWAY – LITERATURE REVIEW
P-25	Ignacy Gonkowski	THE CORRELATION BETWEEN SEX, TYPE OF SCHOOL AND PROVENANCE AND THE TIME OF TOBACCO SMOKING, NUMBER OF SMOKED CIGARETTES PER DAY AND TYPE OF USED TOBACCO PRODUCTS
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P-27	Przemysław Hałubiec	INFLUENCE OF CAROTENOIDS ON ABC-TRANSPORTERS' EXPRESSION AND ACTIVITY IN LNCAP HUMAN PROSTATE CANCER CELL LINE
P-28	Janina Rzeszot	MOVEMENT WITH A SUPPLEMENT TO DISEASES THAT AFFECT US
P-29	Dominik Miśkiewicz	ERROR PRONE-PCR IMPROVEMENT BY USING DIVALENT COBALT CATIONS
P-30	Martyna Mucha	RAPID DETECTION OF SALMONELLA BASED ON IMMUNOMAGNETIC SEPARATION COUPLED WITH PCR, REAL- TIME PCR OR CHEMILUMINESCENCE MICROPARTICLE IMMUNOASSAY- A LITERATURE REVIEW
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14:20 – 14:30	Aleksandra Biegalska	MORAL PERMISSIBILITY OF SUICIDE
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15:50 – 16:00	Paweł Błoński	THE CONVERGENCE OF THE ECONOMIES OF COUNTRIES JOINING THE EURO AREA
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16:30 – 16:40	Karolina Kiecana	FINGERPRINTS IN CRIMINAL INVESTIGATION
16:40 – 16:50	Mateusz Koksanowicz	FREEDOM OF EXPRESSION VS. FREEDOM OF RELIGION
16:50 – 17:00	Tomasz Kosicki	FINANCIAL INSTRUMENTS OF SOCIAL PARTICIPATION IN AUXILIARY UNITS OF MUNICIPALITIES
17:00 – 17:10	Tomasz Kosicki	REPORT ON THE STATE OF THE LOCAL GOVERNMENT UNIT - AN ATTEMPT TO EVALUATE THE NEW REGULATION
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17:40 – 17:50	Magdalena Łata	AESTHETIC VALUES IN PHYSICS
17:50 – 18:00	Aleksandra Mirek-Rogowska	MONOGRAPH OF MUSIC MAGAZINE "NON STOP"
18:00 – 18:10	Radosław Miśkiewicz	A DEFAMATION IN THE ANCIENT ATHENIAN LAW
18:10 – 18:20	Natalia Nieużyła	TO WHAT EXTENT DOES STRESS DURING DRIVING A CAR AFFECT EVERYDAY LIFE?
18:20 – 18:30	Marcin Pawełczyk	FEAR OF CRIME IN CRIMINOLOGICAL RESEARCH - AN OUTLINE OF THE PROBLEM
18:30 – 18:40	Agnieszka Pietrzak	TRANSLATIONS OF THE POLISH PENAL CODE INTO GERMAN – DOCTORAL DISSERTATION PROJECT AND RESULTS OF PILOT STUDIES
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19:00 – 19:10	Agnieszka Truszkowska	TOO BIG TO FALL? REASONS FOR SPECTACULAR BANKRUPTCIES IN RECENT YEARS
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09:10 – 09:20	Emil Dadański	ASSESSMENT OF PSYCHOLOGICAL ASPECTS RELATED TO METHOD AND INSTRUMENTS OF SUICIDE
09:20 – 09:30	Jakub Maciejewski	USEFULNESS OF ANALYSIS OF POSTHUMOUS VASCULAR RELATED LESION IN THE FORENSIC INVESTIGATION
09:30 – 09:40	Sebastian Masłowski	MOLECULAR BASIS OF DEPRESSION PATHOGENESIS
09:40 – 09:50	Sebastian Masłowski	BIOMARKERS IN THE DIAGNOSIS OF DEPRESSIVE DISORDERS
09:50 – 10:00	Grzegorz Niedrygas	THE ROLE OF PHYSIOTHERAPY IN BREAST CANCER SURVIVORS: A REVIEW OF SYSTEMATIC REVIEWS

10:00 – 10:10	Adam Pytlewski	AGE RELATED SKELETON CHANGES AND THEIR IMPACT ON FINDINGS IN FORENSIC AUTOPSY
10:10 – 10:20	Grzegorz Rotuski	VISUAL FIELD DISTURBANCES DEPENDING ON THE DAMAGE LEVEL IN THE VISUAL SYSTEM
10:20 – 10:30	Paulina Wigner	THE EFFECTS OF CHRONIC MILD STRESS AND TREATMENT OF AGOMELATINE ON THE EXPRESSION AND METHYLATION STATUS OF GENES INVOLVED IN TRYPTOPHAN CATABOLITES PATHWAY
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10:40 – 10:50	Karol Wiśniewski	ROLE OF SELECTED CYTOKINES (TNF-A, IL-6 AND IL-10) IN DIFFERENT CARDIAC DISEASES (ACUTE MYOCARDIAL INFRACTION (AMI), HEART FAILURE (HF) AND CARDIOMYOPATHIES)
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11:00 – 11:10	Iwona Wierzbicka	BURNOUT SYNDROME AT WORK OF NURSES WORKING IN SOCIAL CARE HOMES
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15:00 – 15:10	Kacper Kopczyński	ELECTROCATALYTIC PROPERTIES OF NICKEL/LANTHANUM ALLOY
15:10 – 15:20	Justyna Czerwińska	OCCURRENCE OF PHOTOCHEMICAL SMOG IN LODZ IN THE YEARS 2014-2017
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16:40 – 16:50	Artur Chachlica	ESTIMATION OF THE DISTANCE USING RADIO SIGNAL STRENGTH
16:50 – 17:00	Andrzej Jaeschke	COMPRESSOR MONITORING AND CONTROL WITH USE OF COMPACTRIO AND LABVIEW

17:00 – 17:10	Andrzej Jaeschke	TOWARDS DIGITAL TWIN. FUTURE OF COMPRESSOR MONITORING AND CONTROL
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17:40 – 17:50	Katarzyna Król	BIOACTIVE COMPOUNDS IN TWO DIFFERENT POLISH HAZELNUT VARIETIES AND THEIR SKINS
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# **POSTERS SESSION**



## SECURITY OF INFORMATION FLOW IN THE SUPPLY CHAIN MANAGEMENT OF INTERNATIONAL COMPANIES

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### **Abstract:**

The "Security of information in the process of supply chain processes" is an up-to-date and important issue in the management of modern enterprises. This is due to the changes occurring in modern dawn. The territorial impact of the companies varies. It also changes the asset validity rating for the enterprise. Once this availability of physical resources has decided on the success of the project now in the most serious cases it decides "knowledge". What was unattainable for companies operating 10 years ago now became a mere practice. Nobody is already unstrange to be in constant contact with people on the other side of the globe. This happens both in the business realm and in the private sphere. But these early changes have a common denominator, namely the process of processing information. And as it is a non-measurable process, it must be subject to a certain security. In the course of the analysis of the issue, it will be crucial to clarify many of the issues considered to be of both technical and technological nature, but also ethical. I would like to point out here, for example, that the problem of data protection has become so important that it has even decided to deal with them in a systematic manner by the European Commission by amending the EU rules on the protection of personal data. Rodo. Legislation is currently in the company's introduction and is a major problem for businesses. There is no person in the European Union who would not encounter these provisions.

### **Keywords:**

information, security, supply chain, intermodal enterprises, information flow

## ANGER RUMINATION IN CARDIAC PATIENTS

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### **Abstract:**

Almost half of all deaths in Poland are caused by cardiovascular diseases. The research results show the growing importance of psychosocial properties for the development and course of these diseases (Lambiase et al., 2015; Boehm et al., 2011; Opuchlik, Wrzesińska, Kocur, 2009). The specific human properties have protective functions and despite numerous burdens and cumulative stressors they help in constructive coping with life difficulties (Szwajca, 2014), in maintaining mental well-being (Boehm et al.; 2011) and in counteracting the negative effects of stress (Poprawa, 1996; Mudyń, 2003). One of the factors disturbing the remedial processes are ruminations, and in particular - anger ruminations. Ruminating anger is negative not only with the mental state. Due to changes in the circulatory system, anger irritation also has a negative effect on the somatic state. The aim of this study was to measure anger rumination in the group of cardiac patients.

### **Keywords:**

anger, rumination, cardiac patients



## CREATIVE MATHEMATICS - OPERATIONAL REASONING IN PRE-SCHOOL EDUCATION

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### **Abstract:**

Maturity to learn mathematics is very important problem in pre-school education. It concerns: children counting, operational reasoning, emotional maturity, good organization during the lesson and work on particulars and symbols. These skills need children to learn in primary school. Research show, that the teachers focus on skills: reading, writing and possibly counting in school. There is not enough space for operational reasoning.

### **Keywords:**

mathematics, creative, kindergarten

## THE BRAIN OF THE READER

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I am a PhD student at the Faculty of Educational Sciences at the University of Lodz. I specialize in the initial learning of reading and writing. I work as a teacher in a primary school every day.

### **Abstract:**

The human brain is an extremely complex structure, which is characterized by exceptional flexibility that allows you to master reading - an activity to which, incidentally, it was not created. The ability to read is closely related to cognition. At present, we are dealing with such a high degree of reading automation that when we see a word we can not refrain from reading it (Stroop, 1935). All the more surprising is the fact that currently the deteriorating level of students' skills is just noticed in reading and writing (Jurek, 2012).

In order to facilitate the learning of this complex activity, it is worth using methods corresponding to children's learning opportunities. Glottodidactics (Rocławski, 2008) takes into account the assumptions of neuroscience. The use of appropriate teaching methods, even in the case of deep disorders caused by damage to large areas of the brain, allows us to achieve surprising results (Rocławska-Daniluk, 2008). The results of the presented research confirm that the use of Glottodidactics contributes to the growth of the reading rate and changes in the attitude towards books and reading of children at a younger school age.

### **Keywords:**

reading, brain, reading speed, neurodidactics

## QUALITATIVE AND QUANTITATIVE ANALYSIS OF LIPIDS OF HYLOBIUS ABIETIS BEFORE AND AFTER FUNGAL INFECTION

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I am a Ph.D. student at the Faculty of Chemistry at the University of Gdansk. I research the influence of fungal infection on the composition of lipids of selected species of insects.

### Abstract:

*Hylobius abietis* is an economic pest living in various parts of Europe. It feeds on a sap of young conifers, which can be a big threat to spruce and pine forests. The biological methods of insect control include the use of entomopathogenic fungus, among which we can distinguish *Beauveria bassiana*.

Due to the fact that this fungus is not pathogenic for plants, animals, and people, it can be used as an insecticide. Therefore, it was decided to check the effect of *B. bassiana* on the composition of *H. abietis* lipids. All insects, both male and female were cultured under identical conditions and infected by immersion in a mixture of spores. The beetles were homogenized in a mixture of chloroform and methanol. The lipids were analyzed by gas chromatography (GC) combined with mass spectrometry (GC/MS).

Initial studies have shown large differences in the composition of lipids between infected and non-infected insects. In the lipids of males and females fatty acids, fatty acid methyl esters, alcohols, amino acids and other organic compounds were identified. The results indicate a higher lipid content in uninfected males and females than in pests that were exposed to the fungus.

**Acknowledgments:** The research was carried out thanks to the funding of the project of Young Researchers (BMN:538-8610-B250-18): "Effect of *Beauveria bassiana* on the lipids composition of *Hylobius abietis* beetles"

### Keywords:

*Hylobius abietis*, *Beauveria bassiana*, lipids composition, gas chromatography-mass spectrometry

## **TOURIST ACTIVATION OF THE BAY OF DEAD HOTELS IN CROATIA. CHANCES AND DANGERS**

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### **Abstract:**

There are many abandoned places on the Adriatic coast, where you can see traces of former glory and later civil war. Kupari Bay is located near Dubrovnik and consists of six hotels. The oldest of them was built at the beginning of the 20th century. A critical moment for Kupari turned out to be 1991, when at the very beginning of the civil war the resort was attacked and then completely devastated it. Until today, despite many attempts, nothing has been rebuilt.

In 2015, a revitalization plan was announced, which assumed the reconstruction of the Grand Hotel, as well as the demolition of the remaining ones, in place of which it was planned to build new hotels with a high standard. To this day, such activities have not been finalized, however, the prospect of tourist activation of this area is getting closer. The Dalmatian coast is one of the most visited by tourists and over the last 10 years many post-war ruins have been revitalized, rebuilt or redeveloped. Tourist traffic is a huge opportunity for the Durbán-Neretva County. However, it must be channeled so that the most valuable areas of cultural heritage and natural resources are not lost as a result of pressure from tourists, which, according to data from the Ministry of Tourism, is increasing every year. Every year Croatia welcomes 90 million tourists, mainly on the waterfront, which is the area with the most valuable monuments for European culture.

### **Keywords:**

Croatia, hotels, kupari, revitalisation

## DEPOSITION OF CERIUM FROM A DEEP EUTECTIC SOLVENT AND ITS ELECTROCATALYTIC PROPERTIES

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### **Abstract:**

Recently discovered deep eutectic solvents are considered as analogs for ionic liquids. They are created by mixing of two non-toxic and safe substances which are capable of creating eutectic mixtures.

Modern methods of electrochemical deposition of metals allow the synthesis of coatings impossible to obtain in an aqueous environment. At later stage, they can be used as an effective catalyst for example for water decomposition reaction. The development of materials used in the hydrogen production process leads to obtain efficient catalysts, which are able to obtain hydrogen in more economical way.

Thanks to the use of deep eutectic solvents a coating made of cerium was deposited on the steel surface. The obtained material was tested for electrocatalytic properties in the reaction of hydrogen evolution from the potassium hydroxide solution. The methods of linear voltammetry, electrochemical impedance spectroscopy and chronopotentiometry were used. The obtained coating showed good electrocatalytic properties for the hydrogen evolution reaction.

The authors would like to acknowledge gratefully the financial support from the National Science Centre of Poland, grant No 2016/23/N/ST4/02719.

### **Keywords:**

deep eutectic, deposition, cerium, catalysis

## MECHANICAL PROPERTIES OF FERRITIC IF STEEL AFTER THE DRECE PROCESS

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PhD student at Silesian University of Technology; scientific interests: steels for the Automotive industry (mechanical properties and structure), SPD processes; hobby: snowboarding, books (crime stories), music.

### **Abstract:**

This research paper shows the influence of a repeated SPD (Severe Plastic Deformation) plastic forming with the DRECE technique (Dual Rolls Equal Channel Extrusion) on hardening of low carbon IF steel. 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. The developed method is based on equal channel extrusion with dual rolls and uses a repeated plastic forming to refinement of structure and improve mechanical properties of metal bands. 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.

### **Keywords:**

SPD process, interstitial free steel, microstructure, mechanical properties

## STRUCTURAL MODIFICATION OF Ti6Al4V ALLOY - CYCLIC HEAT TREATMENT

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### **Abstract:**

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

The paper attempts were made to control the structural transformations of the Ti6Al4V alloy using post-process cyclic heat treatment. From the results it is noted that the additional heat treatment generates the formation of lamellar structure of a two-phase titanium alloy. The obtained information will be used for further research based on controlled transformations of Ti6Al4V alloy structure.

### **Keywords:**

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



## INFLUENCE OF AGROTECHNICS ON SHAPING THE QUALITY CHARACTERISTICS OF EDIBLE POTATO

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I have graduated from Wrocław 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:**

Potato is undemanding about forecrop, but very demanding as to soil culture. They are most often grown after cereals, and better soils are intended for more demanding plants. In addition, this plant is a very good forecrop for other crops, because it leaves the soil weed, with a lot of humus and minerals. In practice, spring cereals are usually grown on potato stands.

Potato is characterized by good morphological recognition features that are immutable, i.e. the color of the skin, flesh, light germs and flowers. It also has slightly and significantly changing features. They are conditioned by agrotechnics, potato varieties, seed potatoes and soil. Agrotechnika has a very large impact on improving the quality characteristics of edible potato. Thanks to significant mechanization, its crops have become more efficient and do not require large financial outlays. In addition, modern plant protection products and fertilizers provide the right amount of nutrients and protection against threats such as fungal, bacterial, viral diseases, during the east, during vegetation and storage. Thanks to the development of agricultural technology, the harvest of potatoes requires the involvement of fewer people than was the case in the recent past. Due to the transport possibilities, farmers can afford an unlimited area of cultivation of this plant.

### **Keywords:**

agrotechnics, potato, yield, quality

## FERTILIZATION OF POTATO

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### **Abstract:**

Natural and organic fertilizers are a rich source of micro and macro elements as well as humus in the soil. They have a significant impact on the improvement of soil structure and improve the use of mineral fertilizers by plants. Edible potato for high yields and achieving the desired qualitative characteristics needs mineral fertilization combined with natural or organic fertilization. The best fertilizer used for potatoes is manure. It is a rich source of macronutrients (N, P, K, Ca, Mg) and micronutrients (Mn, Zn, Cu, M, Fe, Mo) It should be used in an amount of about  $25 \text{ t} \cdot \text{ha}^{-1}$ . This dose introduces into the soil about  $125 \text{ kg} \cdot \text{ha}^{-1}$  nitrogen (N),  $75 \text{ kg} \cdot \text{ha}^{-1}$  phosphorus ( $\text{P}_2\text{O}_5$ ),  $180 \text{ kg} \cdot \text{ha}^{-1}$  potassium ( $\text{K}_2\text{O}$ ),  $125 \text{ kg} \cdot \text{ha}^{-1}$  calcium ( $\text{CaO}$ ) and about  $50 \text{ kg} \cdot \text{ha}^{-1}$  magnesium ( $\text{MgO}$ ). Potatoes in the first year after application of manure can use up to 50% of the maximum. When applying organic fertilizer when setting doses of mineral fertilizers, this should be borne in mind. By reducing them by 20-40 kg N when using manure. Due to the decline in the animal population in Poland, fertilization with the use of manure is trying to replace the potato crop after catch crops. Such practices are mainly used on light soils. The growing importance of catch crops increases their use not only due to the change, but also due to the increasing amount of organic matter in the soil.

### **Keywords:**

fertilization, potato, manure, mineral, intercrop

## **YIELD AND QUALITY OF SUGAR BEET DEPENDING ON FERTILIZATION WITH MICROELEMENTS**

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### **Abstract:**

The experiment investigated the effect of fertilization with silicon and magnesium and sulfur on yield and quality of sugar beet. Field tests were carried out in the season of 2018 on soil class IIIa, belonging to the good wheat complex. Sugar beet was grown in a post after corn harvested for grain. In the autumn, cultivation and winter plowing were carried out, and cultivation with the use of cultivating harrow was applied in spring. The highest root yield was formed by beets fertilized with magnesium and sulfur, while the highest sugar content was obtained in plants with foliar feeding with silicon. The greater mass of a single root was distinguished by plants fertilized with magnesium and sulfur. There was no significant increase in fertilization on root morphological features such as length, width and thickness. Application of magnesium fertilization with sulfur influenced the increase of magnesium content in the roots.

### **Keywords:**

fertilization, yield, quality, microelements, sugar beet

## **FIBRINOGEN DISORDERS IN PLATELETS AND MEGAKARYOCYTES FROM PATIENTS SUFFERING ON MULTIPLE SCLEROSIS**

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We are representing the research team, which from years focusing on research which the aim is to analyze functional disorders of the hemostatic system in patients with multiple sclerosis, which is associated with a high risk of ischemic events.

### **Abstract:**

Multiple sclerosis (MS) is a chronic, demyelinating immune-mediated disease of the central nervous system with axonal degeneration. Epidemiological studies indicate a high risk of cardiovascular events in MS patients. As we have shown before, blood platelets have increased pro-thrombotic properties in the course of MS. One of the key proteins responsible for platelet aggregation is fibrinogen (Fg). Our previously results indicate a significantly increased number of platelet aggregates in MS patients compared to control group. Many studies have shown that despite the lack of the nucleus, platelets are capable of synthesizing proteins by transcripts derived from megakaryocytes. However, our results of gene expression using qPCR method revealed that platelets and megakaryocytes in both MS patients and controls contain only small amounts of transcripts for the Fg chains. Even that, we have proved increased Fg levels in MS compared to control, both in platelets and megakaryocytes using ELISA method. While differences in Fg concentration between MS and controls were not demonstrated in plasma. Statistical analysis has shown a high correlation between level of Fg in platelets and level of Fg in megakaryocytes in MS ( $Rho=0.63$ ;  $P=0.003$ ), as well in control group ( $Rho=0.51$ ;  $P=0.032$ ). Therefore, we hypothesize that higher platelet pro-thrombotic activity in MS may be associated with their increased ability to store Fg.

### **Keywords:**

multiple sclerosis, blood platelets, fibrinogen disorders

## VISUALISATION AND ASSESSMENT OF IMPACT OF NANOPARTICLES ON SELECTED CELL ORGANELLES

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### **A few words about the authors:**

Szymon Porębski is a student of the second year of biotechnology at the University of Lodz. Agnieszka Grzelak PhD is lecturer at the Department of Molecular Biophysics.

### **Abstract:**

The technology of nanoparticles is a common standard in many products of everyday life. Many information and proves about their cytotoxicity were recently showed, although the mechanism of it is still unknown. Key role in this problem could act visualisation of effects of nanoparticles, mostly presents metal oxides with confirmed cytotoxicity, on selected cell organelles. In this case, lysosomes and mitochondria were analysed, since many articles show that nanomaterials cytotoxicity is connected with excessive amount of reactive oxygen species (ROS) generation and another one contain hypothesis of a hard correlation between nanoparticles toxicity and changes in amount and characteristics of lysosomes. Aim of this research project was realised with techniques of fluorescent microscopy, which obtains visualisation of impact and spectrofluorometry, which gives numerical data able to statistical analysis of observed phenomena. Staining with fluorescent dyes were optimised to reduce the number of the artificial effect of this process. Also, the concentration of nanoparticles in solution were chosen lower than, confirmed in previous researches, releasing toxic effects on analysed, a cellular model of HepG2 line to prevent of generation artificial modified data during spectrofluorometric measurements. Received data will be used in the determination of future aims in discovering the mechanism of nanoparticles cytotoxicity

### **Keywords:**

nanomaterials, spectrofluorometry, fluorescent microscopy, cytotoxicity

## THE INCREASED LEVEL OF PLATELET'S GLYCOPROTEIN IIB/IIIA IN ACUTE CORONARY SYNDROMES

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### A few words about the authors:

Our research team focus on determination of the molecular basis of the observed functional changes in blood platelets in ACS and help in better understanding of the molecular mechanisms responsible for intracoronary thrombus formation.

### Abstract:

**Introduction:** Acute Coronary Syndromes (ACS) are a terms used to described a range of conditions associated with reduced blood flow in coronary arteries. The most important risk factor in the cardiovascular system disturbance, associated with the occurrence of thromboembolic complications, is pathological activation of blood platelets. Their unique anatomy, in which we can distinguish many surface receptors, determine platelets as highly reactive type of cells. For this reason, platelet surface receptors represent important targets in pharmacological therapies, especially glycoprotein IIB/IIIA (GPIIb/IIIA) responsible for the formation of aggregates and enlargement of the forming thrombus.

**Methods:** RNA samples isolated from blood platelets were reverse transcribed to cDNA, and the relative (according to 18S rRNA) expression of ITGB3 and ITGA2B genes (coding GPIIIa and GPIIb subunit respectively) were measured by qRT-PCR. Furthermore, the concentration of GPIIIa in platelets was measured by ELISA.

**Results:** Estimated mRNA levels were significantly higher in patients with ACS in comparison to healthy controls ( $p < 0.001$ ). Furthermore, the concentration of GPIIb/IIIA in blood platelets was also significantly increased in study group ( $p = 0.019$ ).

**Conclusion:** Platelets from ACS patients showed an augmented amount of mRNA transcripts for GPIIb/IIIA and higher concentration of the GPIIIa subunit, suggesting the potential explanation of hyperactivity of platelets in ACS patients.

### Keywords:

acute coronary syndromes, platelet, glycoproteins, gene expression

## **BRITTLENESS INDEX AS AN INDICATOR OF NATURALLY FRACTURED SHALES WITHIN LOWER PALEOZOIC FORMATIONS FROM THE NORTHERN PART OF THE CALEDONIAN FORELAND BASIN (POLAND)**

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### **A few words about the authors:**

Structural geologists specializing in analysis of fracture and fault patterns, 2D/3D seismic interpretation and 1D burial-erosion thermal modelling.

### **Abstract:**

Lower Paleozoic shale formations from the northern part of the Caledonian foreland basin contain prospective formation for unconventional hydrocarbon resources. Hydrocarbon extraction from the low-permeable shales is performed by using the hydraulic fracturing technique which induce new or pre-existing fractures. Understanding the interaction of a hydraulic fracture with the pre-existing fracture network could improve the production rates. The spatial distribution of natural fracture network of the Ordovician and Lower Silurian shales formation from the northern part of the Caledonian Foreland Basin was examined in several exploration wells. It was established that high fracture density occurs within the beds of high quartz content, especially that of a biogenic origin. Thus application of the mineralogical derived brittleness index based on Jarvie's equation served for indication of mechanical behavior of naturally fractured shales.

The core samples were provided by the Polish Oil and Gas Company. The research was conducted in the frame of the ShaleMech project funded by the Polish National Centre for Research and Development (NCBiR), grant no. BG2/SHALEMECH/14.

### **Keywords:**

brittleness, fractures, shales



## SYNTHESIS, CHARACTERIZATION AND EVALUATION OF BIOLOGICAL PROPERTIES OF NEW DERIVATIVES OF SALICYLIC ACID

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### **A few words about the author:**

I am a student of Chemistry at the University of Adam Mickiewicz in Poznan. I develop my scientific interests in the Material Synthesis Team at the Science and Technology Park of the Foundation of University of Adam Mickiewicz in Poznan.

### **Abstract:**

Elicitors are organic chemical compounds that have the ability to induce natural resistance (SAR) in a plant by activating metabolic pathways that enable a plant to defend against pathogen attack [1]. Starting the immune response in plants is a potential target for the design of new, ecological plant protection products.

The aim of the work is to synthesize and investigate the application potential of new salicylic acid derivatives for the induction of plant resistance against diseases occurring in greenhouse and field conditions. As part of the project, biological tests are carried out to test new salicylic acid derivatives for induction of resistance and to determine the conditions of application and to determine the optimal dose of substance use.

The project "New plant inductors and their use as an innovative approach to protecting plants from pathogens" is implemented as part of Team Tech (POIR.04 / 04.00-00-5BD9 / 17-00) Foundation for Polish Science co-financed by the European Union from the European Regional Development Fund.

[1] Gozzo et al., J. Agric. Food Chem. 2013, 61, 12473-12491.

### **Keywords:**

acquired systemic resistance, plant protection, elicitors, salicylic acid

## SYNTHESIS, CHARACTERIZATION AND EVALUATION OF THE BIOLOGICAL PROPERTIES OF NEW THIOSALICYLIC ACID DERIVATIVES

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### A few words about the author:

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### Abstract:

SAR (Systemic Acquired Resistance) is called as a result of infection of the plant with a pathogen. It appears in a short time after the pathogen's attack, leading to the coordinated activation of many metabolic pathways in which elicitors are produced - substances that activate the mechanisms responsible for the generation of systemic immunity [1].

Research on the synthesis of new organic compounds that exhibit biological activity as inducers of resistance is associated with a modern strategy of protecting plants from pathogens. The substances obtained stimulate the immune mechanisms of plant organisms, increasing their resistance against viruses, bacteria or fungi, and thus allow to reduce the use of environmentally harmful pesticides.

The work is aimed at obtaining new, functionalised organic compounds - thiosalicylic acid derivatives that will not only be characterized by spectroscopic methods, but also examined for biological properties.

The project "New plant inductors and their use as an innovative approach to protecting plants from pathogens" is implemented as part of Team Tech (POIR.04 / 04.00-00-5BD9 / 17-00) Foundation for Polish Science co-financed by the European Union from the European Regional Development Fund.

[1] Gozzo et al., J. Agric. Food Chem. 2013, 61, 12473-12491.

### Keywords:

acquired systemic resistance, plant protection, elicitors, thiosalicylic acid

## SMART CITY - A MULTIDIMENSIONAL IDEA OF CONTEMPORARY CITIES DEVELOPMENT

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### **A few words about the author:**

She is professionally involved in spatial planning, particularly at a regional level. Her research interests concern urban planning, socio-economic geography, local and regional development and the use of mathematical and statistical methods.

### **Abstract:**

In the era of globalization, growing consumption and increasing urbanization, more and more attention is paid to the condition and quality of life. New concepts of the cities and modern solutions which go along with them try to meet these changes, they attract town planners and scientists' attention. One of the concepts is a smart city. Based on technological innovations (e.g. ICT, e-administration, low-carbon transport), smart cities are complex urban systems, able to improve the functionality of any city through a network of mutual connections between people, technologies and data. The aim of this research is to present the smart city concept and its components and examples in relation to urban spaces.

### **Keywords:**

smart city, components of smart city, urban spaces, spatial planning

## TRAFFIC NOISE AS ONE OF THE MOST IMPORTANT FEATURES OF THE RESIDENTIAL MARKET – ON THE EXAMPLE OF POLISH CITIES

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### **A few words about the author:**

Adam Senetra (Ph.D.) is an author of numerous scientific publications in the field of geography, regional studies, land management, landscape and real estate market. Patrycja Szarek-Iwaniuk (PhD student) is professionally involved in spatial planning.

### **Abstract:**

The article presents the correlations between traffic noise and apartment prices. The research included selected housing estates of two cities in Poland – Olsztyn and Białystok. The analyzed secondary real estate market period includes transactions between 2016-2018. The analyzed data are characterized by similar values of the main attributes which influence apartment prices. Local acoustic city maps are a source of data on the level of traffic noise. The long-term indicator of average noise level A on every day of the year in view of the time of day (LDWN) was used in analyses. Pearson's correlation coefficient describes the statistical relationships between the dependent variable (apartment price per unit area) and the independent variable (traffic noise). It was shown that traffic noise level raises the apartment prices in housing estates in Polish cities. The Noise Sensitivity Depreciation Index (NSDI) was calculated. The indicator illustrates the percentage change in apartment price induced by 1 dB increase in traffic noise. The results are the indication for potential buyers looking for best quality places of life. This translates into higher apartments prices. On the other hand, buyers looking for financial savings are aware that the lower price also translates into worse living comfort in noisy city districts. The methodology is a useful tool for local real estate agents and real estate appraisers.

### **Keywords:**

traffic noise, real estate market, soundscape, apartment price, acoustics map

## GENETIC PRENATAL DIAGNOSTICS

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### **A few words about the authors:**

We are a couple of students from various fields and we often discuss different topics from two points of view - sociologist and biologist. This is very informative and allows us to discuss the issue from a wider perspective.

### **Abstract:**

The topic of scientific research that we present is genetic prenatal diagnostics. These tests aim to analyze the genetic material of the fetus for the presence of genetic diseases or congenital defects in the unborn child. We can divide prenatal diagnostics into invasive and non-invasive. Non-invasive prenatal tests are screening and include: fetal ultrasound, biochemical tests, magnetic resonance and the Harmony test. In the case of abnormalities in non-invasive tests and the presence of risk factors in pregnant women, it is recommended to perform invasive diagnostics, i.e. tests: amniocentesis, trophoblast biopsy, cordocentesis or fetoscopy. These tests almost completely confirm or exclude the occurrence of a genetic disease in the fetus. Genetic counseling is the process of providing information on problems related to the occurrence of risk or the presence of a genetic disease in the family. It is extremely important because it allows family and doctors to prepare for the born of a sick child. This is an important aspect not only from the medical point of view, but also from the social. Parents who are not ready to take care of a child with a genetic defect are often scared and confused. The consequence of this may be the abandonment of such a child or negligence from parents. Prenatal tests provide greater psychological comfort of parents and the possibility of taking such forms of behavior that will allow the best possible adjustment of a sick family member.

### **Keywords:**

genetic, prenatal, diagnostics, fetus, disease

## **CANCER IMMUNOTHERAPY – BLOCKING PD-1 PATHWAY – LITERATURE REVIEW**

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### **A few words about the authors:**

We are students interested in immunology. We wish that our cooperation lead to development of science and enable connect distant fields.

### **Abstract:**

The PD-1 pathway acts as a natural inhibitor of T cell activity, which is responsible for peripheral tolerance of T cells. PD-1 is a type I transmembrane glycoprotein. The attachment of ligands such as PD-L1 or PD-L2 leads to the activation of protein tyrosine phosphatases. It inhibits the activity of TCR (T-cell receptor) and CD28 receptors which results in the inhibition of T cells activity. Moreover, attachment of the ligand to PD-1 can directly block T cells transcriptional factors which, in consequence, may inhibits their activation, proliferation and effector functions. Blocking of the PD-1 pathway is used in cancer therapy. Tumor cells use PD-L1 as a molecular shield to attenuate cytotoxicity of T cells, which allows them to avoid immune surveillance. The use of anti-PD-1 and anti-PD-L1 antibodies enables the induction of an anti-tumor immune response. The highest antitumor activities of single-agent PD-1 blockade therapy have been observed in carcinogen-induced cancers or malignancies driven by viral infections. Compared with chemotherapy, the PD-1/PD-L1 inhibitors had a significantly lower risk of all- and high- grade fatigue, sensory neuropathy and other side effects such as diarrhea, nausea and hematologic toxicities. Currently, clinical treatment includes monoclonal antibodies against PD-1 and PD-L1. Further research is essential, to focusing on stimulating adaptive T cell mediated elimination of tumor.

### **Keywords:**

cancer immunotherapy, PD-1 pathway, T cells

**THE CORRELATION BETWEEN SEX, TYPE OF SCHOOL  
AND PROVENANCE AND THE TIME OF TOBACCO SMOKING,  
NUMBER OF SMOKED CIGARETTES  
PER DAY AND TYPE OF USED TOBACCO PRODUCTS**

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**A few words about the authors:**

We are students of fourth year of medicine studies at Collegium Medicum UWM in Olsztyn. We are very interested in scientific activity and we expand it by membership in Student Science Club at Department of Patophysiology.

**Abstract:**

Despite its detrimental effects on health and growth, tobacco smoking is still a significant problem among Polish youth. Lately the e-cigarettes have been implemented which intend to have less toxicity than casual tobacco products but their effects aren't well known yet. We have studied the scale of this occurrence in the learning youth of northern Mazovia. We have also analyzed correlation between sex, provenance (city or village) and type of school and the time of tobacco smoking, number of cigarettes smoked per day and type of tobacco products they used – e-cigarettes or casual. For this purpose we used anonymous survey on pupils of high and technological school. We hope the results of our studies will point out the most endangered group of youth, where the additional preventive measures are the most needed.

**Keywords:**

smoking, tobacco products, provenance

## IMPACT OF PROLONGED TOBACCO SMOKING ON GROWTH AND SUBJECTIVE PHYSICAL FITNESS OF YOUTH

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### **A few words about the authors:**

We are students of fourth year of medicine studies at Collegium Medicum UWM in Olsztyn. We are very interested in scientific activity and we expand it by membership in Student Science Club at Department of Patophysiology.

### **Abstract:**

Detrimental effect of tobacco smoking is a very well known fact in the society. Exposure to tobacco smoke is a risk factor of occurrence of many various diseases such as atherosclerosis, myocardial infarction and lung cancer. Despite the adverse effects, smoking is still a very popular habit in Polish society even among youth. In this group smoking has additional effect as inhibition of growth and physical fitness. We have decided to investigate the impact of smoking tobacco for three years or longer on the height and subjective physical fitness of school students on an example of high school, and technological school students of northern Mazovia by using anonymous survey. In our poster we would like to present the scale of tobacco smoking among youth and its effect on their growth. Additionally we would like to emphasize the importance of this problem and encourage society to increase the education of youth about effects of smoking.

### **Keywords:**

smoking, growth disorders, physical fitness



## **INFLUENCE OF CAROTENOIDS ON ABC-TRANSPORTERS' EXPRESSION AND ACTIVITY IN LNCAP HUMAN PROSTATE CANCER CELL LINE**

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Bartosz Gąsioriewicz, Oskar Szafrąński**

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### **A few words about the authors:**

Our team is currently working on wide issue of carotenoids and their impact on prostate cancer. The main tutor is PhD J. Dulińska-Litewka. The remaining authors are students from Medicine Faculty of Jagiellonian University Medical College.

### **Abstract:**

Introduction - ATP-binding cassette (ABC) transporters are proteins utilizing energy from ATP hydrolysis to transport various compounds across cell membranes. In Eucaryota, they serve mainly as exporters of substances out of the cells. Some are able to control (positively or negatively) growth of tumor cells. Prostate cancer remains the second cause of cancer-related death in men. Carotenoids are a group of natural pigments. In human they serve as e.g. antioxidants or provitamin A substances. Their influence on ABC transporters might open up new possibilities for prostate cancer treatment.

Aim - Investigation of the effect of carotenoids on the expression of ABC transporters in LNCaP cell lines.

Materials and Methods - LNCaP cell lines were treated with carotenoids (and ethanol, rosiglitazone, PC-liposomes, arachidonic acid as a control). ELISA-LDH was used as a cytotoxicity assay. After 24 h incubation with abovementioned substances cells were harvested and mRNA was purified. Then cDNA was synthesized and amplified via PCR. Then microarray analysis was conducted.

Results:

- $\beta$ -carotene, lycopene and fenretinide increases ABCG1 expression in LNCaP cells;
- all-trans retinoic acid and 9-cis retinoic acid do not change ABCG1 expression;
- fenretinide upregulates ABCG2 and ABCC4.

Conclusion - Carotenoids must be considered as new factors regulating the expression of ABC transporters in prostate cancer cells, which may result in development of new therapeutic options for prostate cancer.

### **Keywords:**

ABC transporters, carotenoids, retinoids, prostate cancer, LNCaP

## MOVEMENT WITH A SUPPLEMENT TO DISEASES THAT AFFECT US

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### **A few words about the author:**

Janina Rzeszot, future doctor of health sciences.

### **Abstract:**

**Introduction:** Diet supplement- a foodstuff whose purpose is to supplement a normal diet, being a concentrated agent of vitamins or minerals or other substances that have a nutritional or other physiological effects. They are placed on the market in a dosage form in the form of capsules, tablets, dragées and other similar forms, powder pods, likuid ampoules, dropper bottles and other liquids, powders intendend for consumption. Supplements are usually produced, marketed in a form that allows their precise and easy dosing, which in combination with the often-encountered sale in pharmacies can be confused with medicines.

**Aim of the study:** Discussion of problems related to the impact of movement on diseases such as: osteoporosis, menopause, mental illness (depression).

**Methods:** Comparative analysis of selected articles.

**Conclusions:** Women who systematically udertook appropriate exercises to prevent the escape of calcium from the bones, had a higher quality of life and greater independence. Scientific research confirms that the women's lifestyle is reflected in the symptoms accompanying menopause. According to the WHO, currently 300 million people suffer from depression in the world. Research proves that intense regular physical exercise shows a strong anxiolytic and anti-depressant effect.

**Summary:** Movement in every from is the best free and generally available supplement for ailments that lower the standard of living and uncomfortable well-being.

### **Keywords:**

diet supplement, movement, diseases, research, scientific research

## ERROR PRONE-PCR IMPROVEMENT BY USING DIVALENT COBALT CATIONS

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### **A few words about the authors:**

We are biotechnology and biology students at Adam Mickiewicz University in Poznań grouped in Synthetic Biology students' research group with Przemysław Nuc as our scientific supervisor.

### **Abstract:**

Traditional Error Prone-PCR uses  $Mn^{2+}$  cations alongside  $Mg^{2+}$ . We substituted  $Mn^{2+}$  with  $Co^{2+}$  as a cofactor in order to keep thermostable DNA polymerase work less precisely.  $Co^{2+}$  cations seem to perform better in EP-PCR than  $Mn^{2+}$  because they do not decrease efficiency of reaction. The loss in efficiency can be probably caused by  $Mn^{2+}$  ability to catalyze nonenzymatic phosphorylation in presence of ATP when reaction is conducted in high temperature. We are testing our method on bacterial promoters induced by sugars combined with green fluorescence protein. It allows us to improve two things at once: random mutagenesis and bacterial promoter itself. We perform an easy in vivo functional test of mutagenized sequences in transformed E. coli cells, before sequencing. We are trying to establish a reliable protocol for an easy to control  $Co^{2+}$  driven EP-PCR by optimizing cations concentration, time and temperature profile, and improve efficiency of sugar induced bacterial promoters.

### **Keywords:**

Error Prone - PCR, divalent cations, mutagenesis, bacterial promoter

## **RAPID DETECTION OF SALMONELLA BASED ON IMMUNOMAGNETIC SEPARATION COUPLED WITH PCR, REAL - TIME PCR OR CHEMILUMINESCENCE MICROPARTICLE IMMUNOASSAY- A LITERATURE REVIEW**

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### **A few words about the authors:**

Currently we are studying Microbiology on University of Lodz. Our main interest is immunology. In the future we want to have a contribute to the development of science.

### **Abstract:**

In 2017 over 10,000 cases of food poisoning in Poland was caused by Salmonella- one of the most dangerous food borne pathogens. It spreads through directly or indirectly contact with contaminated faeces which cause eggs, meat or vegetables infected. Salmonellosis occurs with diarrhea, fever and abdominal cramps which can lead to hospitalization or even death. To prevent from outbreaks there is a need for sensitive, rapid and reliable method of detecting Salmonella in different materials without culture enrichment. Solution of the problem might be combination of immunomagnetic separation (IMS) with methods like polymerase chain reaction (PCR), real- time PCR or chemiluminescence microparticle immunoassay. IMS depends on antibodies coating magnetic beads that bind to antigens on the surface of cells thus capturing the cells and facilitate their concentration. Isolated cells of Salmonella can be used to analyze of food, blood and feces by using qPCR, PCR or chemiluminescence microparticle immunoassay. It has investigated that those methods are more sensible and reliable than the plate- counting method. Time of detection process significantly reduced to 8 hours with a very low detection limit. Those methods can also mark different serotypes of Salmonella. In conclusion recent studies have shown new methods to quantitative detect Salmonella. It can be use not only during outbreaks for rapid and reliable detection but also to help prevent development of new cases of salmonellosis.

### **Keywords:**

salmonella, detection, PCR, immunomagnetic, IMS

# **MEDICAL SCIENCES**



## **DRUGS' IMPACT ON NIGHT AWAKENING AMONG PATIENTS WITH SLEEP APNEA**

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### **A few words about the author:**

I am MSc of dietetics and a specialist of clinical dietetics and psycho-dietetics. I am passionate about nutrition therapy of elderly people, especially in neurodegenerative diseases.

### **Abstract:**

Sleep apnea means stop breathing in an involuntary way during sleep. The most frequent diagnosed type of sleep apnea is obstructive sleep apnea. It is caused by many risk factors, but one of them are stimulants, such as alcohol, caffeine.

or nicotine. Consumption or use of them is linked with many clinical implications and one of them are night awakenings. The aim of this research was the issue - how the stimulants (alcohol - type and frequency of consumption, coffee - type and the number of drinks consumed daily and cigarettes - the number of cigarettes smoked per day along with the length of nicotine addiction) affect night awakenings in people with sleep apnea or symptoms which indicate of the need for diagnosis in its direction. In this study 103 patients with sleep apnea.

or symptoms indicate of the need for diagnosis in its direction, hospitalized in the area of Śląskie Voivodeship, were investigated. The research methods used in the work were: author's research survey and analysis of data from the history of patients' diseases. Stimulants: drinking beer (46.9%), real coffee (44%), smoking (34.6%) were linked with nocturnal awakenings among patients. It was estimated that drinking alcohol (especially beer at least once a week), drinking coffee (real, drinking up to 1 coffee per day), smoking (up to 10 pieces per day, nicotine addiction up to 15 years) was related to the occurrence of awakenings at night among people with sleep apnea or with symptoms which indicate it.

### **Keywords:**

stimulants, fragmentary dream, sleep apnea

## ASSESSMENT OF PSYCHOLOGICAL ASPECTS RELATED TO METHOD AND INSTRUMENTS OF SUICIDE

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Marta Bociąga, Katarzyna Ciuk**

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### **A few words about the authors:**

4th year medical students from Jagiellonian University Medical College involved in forensic medicine research projects.

### **Abstract:**

Suicide death is one of the most tragical global phenomenon occurring throughout whole life span and is the second cause of death among young adults. It can be performed using different methods which can be determined by many factors such as, psychological, cultural, social and biological influences.

The objectives of the study are to show the different suicide's patterns by the example of suicides by hanging and try to investigate association with biological, social and cultural aspects.

There were 1373 cases in the archives of the Department of Forensic Medicine of Jagiellonian University Medical College in Cracow in years 2008-2018 which was analyzed in terms of suicide's pattern and possible psychological aspects of their deaths.

### **Results:**

- 1) women significantly more often used parts of clothing and pieces of fabric as hanging instrument (35.56% of people who used a piece of clothing,  $p < 0.001$ , and 29.79% of people who used a piece of fabric  $p < 0.001$ );
- 2) people who commit suicides in hospitals use different types of nooses;
- 3) people who used pieces of fabric were younger than others (43.56 vs. 48.06  $p < 0.05$ );
- 4) people who used a tow rope were older (60.09 vs. 47.77  $p < 0.05$ ).

In conclusion, the method that takes away life of a person has a great symbolic significance, which doubtlessly is connected to age, gender and financial status but can also reflect the culture differences as well as the differences in availability of particular methods.

### **Keywords:**

suicide, forensic medicine



## USFULNESS OF ANALYSIS OF POSTHUMOUS VASCULAR RELATED LESION IN THE FORENSIC INVESTIGATION

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### **A few words about the authors:**

4th year medical students from Jagiellonian University Medical College involved in forensic medicine research projects.

### **Abstract:**

In order to determinate the cause of death, forensic specialist usually perform an autopsy. During this procedure it is very important to look for vascular related lesion such as Simon's bleeding. Simon's bleeding is hemorrhage on the ventral surface of the intervertebral disks of the lumbar part of spine and is belived to be vital sign of premortem hanging. According to literature the frequency of Simon's bleeding is estimated between 40-50%.

The aims of this study were to determine the usefulness of Simon's bleedings in cases of hanging.

There were 1373 cases in the archives of the Department of Forensic Medicine of Jagiellonian University Medical College in Cracow in years 2008-2018. 1294 (94.25%) of them had documented full forensic autopsy.

We found 159 cases with the Simon's bleedings (12.34%), Simon's bleeding was correlated with younger age (medium age of suicides with Simon's bleeding 36.53 vs. medium age of suicides without Simon's bleeding 49.10, p-value<2.2). There was no connection between gender and the presence of Simon's bleeding.

In conclusion, the frequency of Simon's bleeding in our study was much lower than in literature but the results of the study indicate that it may be usefull for forensic investigation in younger age group.

### **Keywords:**

forensic medicine, investigation, Simon's symptom

## MOLECULAR BASIS OF DEPRESSION PATHOGENESIS

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### **A few words about the author:**

The subject of my experimental work is the immobilization of enzymes involved in the metabolism of purines for biomedical applications. I am passionate about molecular foundations of mental disorders.

### **Abstract:**

In recent years, depression has become a civilization disease. Although the disease is common, the molecular mechanisms responsible for its development are not clear. Currently, the most popular theory explaining the pathomechanism of depressive disorders is the hypothesis of catecholamines and indolamines. This hypothesis assumes that the concentration of amines important for neurotransmission, is lowered in patients. The current treatment of depressive disorders is focused on blocking serotonin reuptake. An important role is played by the P2X7 receptor, which is responsible for the secretion of proinflammatory cytokines. Cytokines such as IL-1 $\beta$  are neurotoxic and are responsible for inhibiting adult brain neurogenesis within the hippocampus by inhibiting brain-derived neurotrophic factor (BDNF) expression. Weakening of neurogenesis has a negative influence on the occurrence of depression symptoms. Oxidase activity. Inflammation in the central nervous system is an important factor from the point of view of depressive disorders. The generation of inflammation within the central nervous system may be caused by the abnormal functioning of the hypothalamus-pituitary-adrenal axis. Some studies emphasize the role of HPA axis dysfunction in depression pathogenesis. Depression is a very complex disorder with numerous interactions between genetic, neuroendocrine and metabolic pathways of synthesis and release of neurotransmitters.

### **Keywords:**

depression, P2X7, HPA axis, serotonin, IL-1 $\beta$

## BIOMARKERS IN THE DIAGNOSIS OF DEPRESSIVE DISORDERS

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### **Abstract:**

Depressive disorders are characterized by unknown interactions between genetic and neuroendocrine factors and the functioning of metabolic pathways of synthesis and release of neurotransmitters. Although depression is diagnosed very often, the diagnosis is based on anamnesis. Diagnostics currently do not include testing for the presence of any biomarkers. Research into depression-specific biomarkers could enable better choice of drugs. Methods based on serum analysis may have the greatest chance of being introduced into clinical practice. Recent studies confirm the relatively high effectiveness of diagnosis based on the presence of specific biomarkers in the serum. Analysis of cerebrospinal fluid samples and their potential application in clinical practice is doubtful due to relatively high costs and high invasiveness of the method.

Research on biomarkers of depressive disorders may lead to the introduction of laboratory-based diagnostic methods in clinical practice in the future, giving a higher probability of correct diagnosis and the introduction of effective targeted therapy.

### **Keywords:**

depression, biomarkers, cerebrospinal fluid, serum

## THE ROLE OF PHYSIOTHERAPY IN BREAST CANCER SURVIVORS: A REVIEW OF SYSTEMATIC REVIEWS

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Student of The Jerzy Kukuczka Academy of Physical Education in Katowice and bachelor of physiotherapy. Currently working as physiotherapist in Maria Skłodowska-Curie Institute – Oncology Centre (MSCI), branch in Gliwice.

### **Abstract:**

**BACKGROUND:** Breast cancer (BC) is the most common type of cancer in women, but it has high survival rate. Optimal, evidence-based and individualized physiotherapy of post-treatment effects is needed to improve patients' quality of life. This review evaluate the current evidence on physiotherapy treatment in patients' during and after receiving breast cancer treatment. **METHODS:** A search for articles was carried out using PubMed. Search terms included types of surgery for breast cancer e.g. 'mastectomy', 'lumpectomy', 'axillary lymph node dissection', 'sentinel node biopsy', types of 'physiotherapy' e.g. 'exercise', 'stretching', 'physical activity' and dependent variables e.g. 'quality of life', 'pain', 'mobility', 'postural control'. This review included published systematic review articles in the English language between the years 2009 to 2019. **RESULTS:** 94 articles met all the eligibility criteria and were included in the review. Role of physical activity and lymphedema treatment were widely described. There is good evidence for physiotherapy in the improvement of lymphedema, shoulder mobility, upper limb strength, pain, fatigue, quality of life. There were inconclusive results for manual therapy, fascial manipulation, stretching and methods to improve postural control and neuropathy. **CONCLUSIONS:** Physiotherapy has the potential for being included as important part of the process of recovery from breast cancer treatment and should improve patients quality of life.

### **Keywords:**

oncology, rehabilitation, physiotherapy, breast cancer treatment, quality of life

## AGE RELATED SKELETON CHANGES AND THEIR IMPACT ON FINDINGS IN FORENSIC AUTOPSY

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### **Abstract:**

Osteoporosis is a disease in which bone density is lowered, thus they are prone to break. Osteoporosis Foundation claims that statistically 1/3 women and 1/5 men will suffer from osteoporotic fractures therefore osteoporosis is large problem affecting both patients' lives and all medical facilities.

The objective of our study is to determine how the age-related bone changes could influence on the result of forensic autopsy by the example of suicide associated injuries.

There were 1294 cases in the archives of the Department of Forensic Medicine of Jagiellonian University Medical College in Cracow from recent 10 years. Every case had documented full forensic autopsy, which was analyzed by researchers. R software was used for statistical analysis.

Results: Mean age of a suicide was 48 years old, and gender ratio (F:M) was 1:7. We found 141 cases of thyroid cartilage fracture (10.9%), 88 cases of hyoid bone fracture (6.8%), 16 cases of vertebrae fractures (1.2%). The cases with the hyoid bone fracture were significantly older than the other cases (51.89 vs 47.22  $p < 0.05$ ). The hyoid bone and the thyroid cartilage fractures were independent of each other ( $p < 0.05$ ).

Generally the force of gravity causing asphyxia is too low to cause bone fracture, but a higher frequency of the hyoid bone fractures in older people group can correspond with possibility of osteoporosis. This indicate that age-related changes in bone structure could influence on the results of forensic autopsy.

### **Keywords:**

forensic medicine, autopsy, human skeleton

## VISUAL FIELD DISTURBANCES DEPENDING ON THE DAMAGE LEVEL IN THE VISUAL SYSTEM

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### **A few words about the author:**

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### **Abstract:**

Disturbances in the visual field can be caused by an ophthalmic disease, but they can also be related to a disorder located across all the visual system transmitting light stimuli from the retina to the cortex. The blind area correlates with the affected segment, but has to be verified through neuroimaging. Causes include intracranial tumors (which can also be metastatic), aneurysms, cysts or an inflammatory condition. This means that ocular symptoms can reflect a systemic disease. Therefore, noticeable visual field loss might be the first alarming sign of a central nervous system ailment, as headaches and fatigue are non-specific.

### **Keywords:**

visual field, visual system

## THE EFFECTS OF CHRONIC MILD STRESS AND TREATMENT OF AGOMELATINE ON THE EXPRESSION AND METHYLATION STATUS OF GENES INVOLVED IN TRYPTOPHAN CATABOLITES PATHWAY

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### **A few words about the author:**

I am a PhD student at the Faculty of Biology and Environmental Protection at the University of Lodz. As part of my scientific work, I research the molecular basis of the development of a depression disorder.

### **Abstract:**

Previous studies conducted so far suggest that disorders of tryptophan catabolites pathway may cause the development of depression. Our study shows the chronic administration of agomelatine may modulate mRNA and protein level of expression and methylation status of IDO1, KATI and KATII genes in the brain and blood in chronic mild stress (CMS) model of depression. For this, the mRNA and protein expression, and the methylation status of their promoters were measured in peripheral mononuclear blood cells and brain structures by TaqMan Gene Expression Assay, Western blot and methylation-sensitive high-resolution melting techniques. In our study, we found that mRNA expression levels of KATI and KATII were increased in the stressed group as compared to control rats. KATI expression was higher but KATII expression was lower in the PBMCs than brain tissue in all the studied groups. Moreover, CMS significantly reduced the level of IDO1 protein in the cerebral cortex and basal ganglia. However, CMS caused an increase in the level of the IDO1 protein while agomelatine decreased the protein level in the hippocampus. Moreover, the protein expression of KATII in the hypothalamus, amygdala and hypothalamus was significantly increased as an effect of the antidepressant therapy. Our results confirm that CMS and agomelatine therapy modulate mRNA and protein expression of genes involved in tryptophan catabolites pathway.

This study was funded by the NCN of Poland grant (2015/19/BN27/00410).

### **Keywords:**

depression, chronic mild stress, tryptophan, expression, methylation

## CLINICAL SYMPTOMS AND PREVALENCE OF CO-EXISTING AUTOIMMUNE DISEASES IN PATIENTS WITH HASHIMOTO'S THYROIDITIS

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### **A few words about the author:**

I am a student of medicine at University of Warmia and Mazury in Olsztyn. This work was prepared as a part of my activity in Pathophysiology academic circle.

### **Abstract:**

Hashimoto's thyroiditis (HT) is one of the most common autoimmune disorders in the world . Currently its prevalence is about 0,8% worldwide and it is still increasing. It is currently known that women are at least 8 times more likely to be affected than men and that prevalence of HT is increasing with age. Due to the fact that HT affects level of thyroid hormones, symptoms of HT are unspecified and varying in each patient. The aim of this study was to estimate the frequency of reporting each symptom at presentation and to check the prevalence of co-existing autoimmune disorders in patients with HT.

The study group comprised 65 patients with HT who decided to complete the survey posted on Polish Facebook groups.

The three most common reported symptoms were: Fatigue (77%), sleepiness (60%) and weak concentration (57%). This triad of symptoms occurred in 40 % of all patients. The prevalence of : Rheumatoid arthritis, Coeliac disease, Systemic lupus erythematosus, Diabetes mellitus type 1, inflammatory bowel disease and Atopic dermatitis was shown to be higher than in general population.

The findings in this study suggest that there is a higher relative risk for some autoimmune disorders for people with HT. This study has also shown that the most common symptoms of HT at presentation are fatigue, sleepiness and weak concentration.

### **Keywords:**

Hashimoto's thyroiditis, autoimmune diseases, symptoms, Co-existing diseases



## **ROLE OF SELECTED CYTOKINES (TNF- $\alpha$ , IL-6 AND IL-10) IN DIFFERENT CARDIAC DISEASES (ACUTE MYOCARDIAL INFRACTION (AMI), HEART FAILURE (HF) AND CARDIOMYOPATHIES)**

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### **A few words about the author:**

I am a student of medicine at University of Warmia and Mazury in Olsztyn. This work was prepared as a part of my activity in Pathophysiology academic circle.

### **Abstract:**

Heart diseases, with about 120 000 deaths in 2015, are one of the main cause of deaths in Poland. Despite having huge knowledge about pathophysiology, the role of cytokines – small proteins, which are responsible for communication between cells, in cardiac diseases is still being investigated. It is currently known that some of them play positive role and others contribute to development of cardiac injury. It also seems that not only the level of each cytokine, but also the ratio between pro-inflammatory and anti-inflammatory cytokines is a very important factor. Although, there are numerous works associated with heart disorders and cytokines, most of them focus only on one cytokine or disorder. This presentation will focus on presenting in a comprehensive way, currently available knowledge about the role of selected cytokines (TNF- $\alpha$ , IL-6 and IL-10) in different cardiac diseases (acute myocardial infraction (AMI), heart failure (HF) and cardiomyopathies).

### **Keywords:**

cytokines, heart diseases, TNF- $\alpha$ , IL-6, IL-10

## **NURSING CARE FOR A PATIENT WITH ACUTE PANCREATITIS - A CASE STUDY**

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### **A few words about the author:**

Nursing student at Kazimierz Pulaski University of Technology and Humanities in Radom.

### **Abstract:**

Introduction: Acute pancreatitis is a disease of rapid progression and requires intensive treatment in a hospital setting. The down-play of the first symptoms of this disease can even lead to death. The most common cause of this disease is alcohol abuse or cholelithiasis.

The aim: Presenting the role of a nurse in the process of taking care of the patient suffering from acute pancreatitis.

Research methods: interview, observation, conversation during hospitalization periods 10 days.

Results: The nurse observes the patient for bio-psycho-social changes. He works with a therapeutic team and participates in nutritional treatment. The nurse's task is to constantly monitor the patient's condition by measuring vital signs and documenting them: body temperature, blood pressure, saturation, diuresis, and glycemia.

Conclusions: The studies have shown that the nurse plays an important role in the care of the patient with acute pancreatitis. The nurse taking care the patient during illness. Educates and prepares him for self-care and prevent complications. In the care she engages family members thanks to which the patient's a well-being improves. The actions taken by the nurse improved the patient's quality of life and motivated him to comply with the diet.

### **Keywords:**

acute pancreatitis, nursing care, prevention

## **BURNOUT SYNDROME AT WORK OF NURSES WORKING IN SOCIAL CARE HOMES**

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Nursing student at Kazimierz Pulaski University of Technology and Humanities in Radom.

### **Abstract:**

**Introduction:** Work under constant stress caused by increasing demand from the families of patients affects occupational burnout among nurses. They bear too high psychological costs, which results in the fact that their work ceases to give them satisfaction.

**Objective:** Recognizing the scale of the problem of burnout among nurses working in social welfare homes.

**Material and methods.** The study involved 100 nurses working in social care homes in the Mazowieckie Voivodeship. In the work, a questionnaire of own authorship was used.

**Results.** The research shows that over half of the respondents are emotionally exhausted. As the main reason, work with an elderly and terminally ill person requires a lot of emotional commitment and understanding from nursing staff. Among the nurses examined, 60% recognize depersonalization. Respondents believe that working in social care homes doesn't provide opportunities for development and a career.

**Conclusions.** Nurses working in social care homes are burned out professionally. Most of the respondents feel emotional exhaustion caused by work and a reduced sense of personal achievement. They indicate that they suffer from such disorders as depression, insomnia and can't cope with stress. Research indicates that respondents do not get satisfaction from their job due to excess duties. The remuneration received is not a motivation for them because of its low value. The work of burned people significantly worsens the quality of services provided.

### **Keywords:**

burnout syndrome, nurses, social welfare home



# **NATURAL AND TECHNICAL SCIENCES**



## THE USE OF PROBLEM SOLVING TOOLS ON THE EXAMPLE OF A SERVICE COMPANY

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### **A few words about the author:**

Doktorantka Uniwersytetu Ekonomicznego w swojej rozprawie podejmuje rozważań nad skutecznością wdrożenia narzędzi optymalizacyjnych w wybranych przedsiębiorstwach.

### **Abstract:**

Topics related to problems occurring in enterprises and the methodology of solving them is an important aspect today. The article discusses the issue of Problem Solving tools. The aim of the article is to show the possibility of implementing the A3 report in order to solve problems occurring in the structures of enterprises. The use of the A3 report was presented on the example of a service company.

### **Keywords:**

Problem Solving, 5W2H, Pareto-Lorenz analysis, Ishikawa diagram, A3 report

## IT SYSTEMS FOR SIMULATION MODELLING OF PRODUCTION AND LOGISTICS PROCESSES

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### **A few words about the authors:**

The authors of the paper are students of the Faculty of Management at the Warsaw University of Technology, members of the Student Scientific Association "Manager". In the works of the Association, they deal with the problems of processes modelling.

### **Abstract:**

The paper concerns the analysis of information systems for simulation modelling of production and logistic processes. The methods of modelling the production and logistic processes as well as the IT systems used for the simulation modelling of these processes are discussed. Characteristics of selected models of the production and logistic problems proposed in the literature are given. This applies to, among others, the models in form of mathematical programming problems, dynamic models, discrete event models and simulation models. Selected commercial computer systems available for simulation modelling of different kinds of problems are described. The features of use of these systems were pointed out and their functionality was discussed. The areas in which individual computer systems can be used are presented. The possibilities of using these systems in the IT environment supporting production management and logistics of the company are characterized.

### **Keywords:**

modelling of production processes, simulation modelling



## **MECHANICAL PROPERTIES AND MICROSTRUCTURAL EVOLUTION OF ULTRA-LOW CARBON STEEL AFTER SEVERE PLASTIC DEFORMATION PROCESS**

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### **A few words about the author:**

PhD student at the Silesian University of Technology, scientific interests: steels for the Automotive industry (mechanical properties and structure), SPD processes. Hobby: snowboarding, books (crime stories), music.

### **Abstract:**

This article presents the impact of continuous plastic deformation SPD with the DRECE technique on a structure and properties of low carbon steel. The impact of numbers of passes on a change of mechanical properties of tested steel, such as tensile strength TS and yield strength YS, was tested. Within the SPD techniques an unconventional method of deformation was used, which is DRECE - Dual Rolls Equal Channel Extrusion developed on VŠB – Technical University in Ostrava. This technique uses reproducible plastic deformation to refine the structure and improve the mechanical properties of a metal band. Numerous changes in the structure and they were associated to evolution of a dislocation structure and grain refinement were observed. In the case of the tested steel the increase of resistance properties was confirmed after the DRECE process after first pass through the device. The biggest hardening of the material is observed after the fourth pass.

### **Keywords:**

SPD process, interstitial free steel, microstructure, mechanical properties

## ELECTROCATALYTIC PROPERTIES OF NICKEL/LANTHANUM ALLOY

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### **A few words about the author:**

Ph.D. student in Institute of Chemistry and Technical Electrochemistry at the Poznań University of Technology. Scientific interests: chemical power sources and electrolysis.

### **Abstract:**

Hydrogen is considered to be fuel of the future. The thermodynamic water stability at 298 K and 1 atm is 1.23 V. Due to the occurrence of among others, activation overvoltage, the water does not decompose until the electrolyser reaches 1.8 V or even 2.6 V. Activation overvoltage is largely dependent on the material from which the electrodes are made. As a result, electrocatalysis plays a key role in water decomposition processes.

Electrochemical deposition using eutectic mixtures as a solvent has many advantages over process conducted in a water environment or in an ionic liquid. They have a wide range of potential, low vapor pressure, tolerance to the presence of water without deterioration of properties, are characterized by low price and are biodegradable.

Thanks to the use of deep eutectics the nickel-lanthanum alloy was tested for their electrocatalytic properties in relation to the reaction of hydrogen evolution from the potassium hydroxide solution. The methods of linear voltammetry, electrochemical impedance spectroscopy and chronopotentiometry were used. The obtained coating showed a reduced overpotential of hydrogen evolution by more than 200 mV and the exchange current for this reaction was increased.

The authors would like to acknowledge gratefully the financial support from the National Science Centre of Poland, grant No 2016/23/N/ST4/02719.

### **Keywords:**

hydrogen, deep eutectic, nickel, lanthanum

## OCCURRENCE OF PHOTOCHEMICAL SMOG IN LODZ IN THE YEARS 2014-2017

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### **A few words about the author:**

PhD student of chemical engineering. The author's research area includes air pollution and methods of reducing emission of pollution from waste incineration plants.

### **Abstract:**

Ozone occurring naturally in the upper atmosphere is not harmful and even fulfills an important role. It forms a protective layer that protects against the harmful effects of ultraviolet rays reaching from the sun. On the other hand, it is dangerous if it occurs in the ground level. It is not directly emitted to the atmosphere but is generated as a result of chemical reactions, including volatile organic compounds (VOCs) and nitrogen oxides (NO<sub>x</sub>) under the influence of sunlight, which is why it is called secondary pollution. High concentration is most often found in cities, where the concentration of car exhaust is high (one of the NO<sub>x</sub> sources), in hot sunny weather, i.e. mostly in summer.

The paper analyzes the course of episodes of photochemical smog in the Łódź agglomeration. The data from the summer months recorded at the monitoring station of the Provincial Inspectorate for Environmental Protection in Lodz were analyzed. They were compared with the meteorological conditions prevailing during this period. The analysis covers the years 2014-2017.

### **Keywords:**

photochemical smog, ozone

# **INFLUENCE OF METHANE EMISSION AND HARD COAL PRODUCTION IN THE UPPER SILESIA COAL BASIN (POLAND) ON GREEN HOUSE EFFECT INCREASING IN POLAND IN 1994-2017**

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## **A few words about the author:**

Earth Sciences PhD student, connected with underground coal industry and studying methane hazards in Polish coal mines.

## **Abstract:**

The Upper Silesian Coal Basin (USCB) as the most industrialized region in Poland is the largest coal basin in the country and one of the largest in Europe. Hard coal is being extracted from deeper and deeper coal seams every year, which magnifying amounts of emitted CH<sub>4</sub> and number of tremors. During hard coal exploitation, over 500 thousand Mg of methane (CH<sub>4</sub>) was released annually to the coal workings enlarging the danger and making coal production very difficult and expensive at the same time (Kotarba & Ney 1995). In the USCB from 410 to 530 thousand Mg of CH<sub>4</sub> were emitted yearly but emissions in entire Poland were much higher – from 1.86 to 2.25 million Mg of methane (Raport ...1998-2017). CH<sub>4</sub> is also the second strongest greenhouse gas after the carbon dioxide, but its radiative power is 21-25 times stronger than the radiative power of CO<sub>2</sub>. Polish coal mines release 490 thousand Mg (average) of CH<sub>4</sub> yearly and it provides to greenhouse effect increasing.

## **Keywords:**

Upper Silesia Coal Basin, methane emission, greenhouse effect, coal extraction

## MECHANISM OF ANTIFUNGAL ACTIVITY OF HUMAN LYSOZYME

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### **A few words about the author:**

Katarzyna Grygorczuk-Planeta is a PhD student in her final year of studies at the Department of Immunobiology at UMCS, Lublin investigating the mode of action of human lysozyme on *Candida albicans* cells.

### **Abstract:**

This research examines the influence of human lysozyme on *Candida albicans* cells. Human lysozyme, present in many body fluids, is an enzymatic protein that belongs to glycoside hydrolases family. It represents c-type lysozymes known to be active against bacteria. Previous studies provided information on the lysozyme activity against fungi. *Candida albicans* is a component of the physiological microflora of nasopharyngeal mucous membranes, gastrointestinal tract and human skin. Due to imbalance at the pathogen-host line, surface or even systemic candidiasis may arise. Taking into consideration that no chitinolytic and glucanase activity of human lysozyme was found in a preliminary study, the aim of this research was to examine whether human lysozyme leads to apoptosis of *Candida* cells. Activation of metacaspase, an early marker of apoptosis, in lysozyme-exposed *Candida* cells was detected using a fluorescent caspase inhibitor which binds to activated caspases. The initial studies shown that *C. albicans* cells treated with human lysozyme exhibited apoptotic features.

### **Keywords:**

lysozyme, *Candida albicans*, caspase, apoptosis

## TYPES OF THERMOVISION AND ITS USEFULNESS

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### **A few words about the authors:**

Anna Rudziak, Edyta Lipińska, Kamil Piwowarek, Katarzyna Pobiega and Bogumiła Urbańska are PhD students from Department of Biotechnology, Microbiology and Food Evaluation, Faculty of Food Sciences Warsaw University of Life Sciences.

### **Abstract:**

Infrared radiation was first mentioned in the early nineteenth century, when William Herschel began researching this phenomenon. Infrared radiation is emitted by objects with a temperature above absolute zero. It includes a wavelength spectra from 0.7 to 1000  $\mu\text{m}$ ; the range between visible light and microwaves. Thermovision is based on non-invasive measurements of the emitted or reflected, by the analyzed object, infrared radiation in real-time using a thermal imaging camera.

Studies concerning thermovision and thermography belong under the category of non-invasive and non-destructive diagnostic methods. The goal of these studies is to register and analyze the temperature distribution of the tested objects in a remote and non-invasive manner. Thermography is based on the recording of the infrared spectrum and the conversion of data into the form of a colored isothermal decomposition - a thermogram. A thermogram, also known as a thermal map, portrays the temperature distribution on the surface of the tested object.

The relatively simple methodology of conducting measurements and the non-invasiveness of thermovision methods, speaks for their versatility and application in many areas of life. These methods have been found to be useful in the military, industrial and individual solutions, as well as in medicine; when used in medical equipment.

### **Keywords:**

thermovision, thermal imaging camera, thermography, types of thermovision

## RESEARCH ON THE USE OF THERMOGRAPHIC METHOD IN THE ASSESSMENT OF MICROBIOLOGICAL QUALITY OF FOOD

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Anna Rudziak, Edyta Lipińska, Kamil Piwowarek, Katarzyna Pobiega and Bogumiła Urbańska are PhD students from Department of Biotechnology, Microbiology and Food Evaluation, Faculty of Food Sciences Warsaw University of Life Sciences.

### **Abstract:**

Traditional microbiological methods for assessing the microbiological quality of food are being more commonly replaced by modern and faster techniques. An interesting alternative could be the use of a thermovision camera. Thermography is one of the methods used for object diagnostics, based on the measurement of radiation in the infrared band. This type of measurement results in a thermogram, also known as a visible image of the temperature distribution on the surface of the measured object.

Attempts to use a thermal imaging camera to assess the microbiological quality of food are justified by the fact that micro-organisms produce heat as a result of their metabolic activity.

The aim of this study was to assess the use of such a camera in controlling the microbiological quality of food, an example being animal products. Mortadella, contaminated with Gram-negative bacteria - *Proteus mirabilis* ATCC 35659, which are often responsible for the deterioration of meat products, was used in the research. The measurement was calculated by the use of active thermovision. Infected sites were found to have a higher temperature compared to the control area, still the effectiveness of the measurement mostly depends on the time the sample was activated.

### **Keywords:**

thermography, thermal imaging camera, *Proteus mirabilis*, microbiological quality of food

## THE SIGNIFICANCE OF MALE ACCESSORY GENITAL GLANDS ON THE EXAMPLE OF THE NEW ZEALAND WHITE RABBIT – MORPHOLOGY AND MORPHOMETRY

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### **A few words about the authors:**

Joanna Skonieczna is PhD student working on rabbit's urethra.

PhD DVM Jan Madej, Assoc. Prof. is experienced in morphology of lymphatic system.

Prof. Romuald Będziński focuses on the application and development of methods of experimental mechanics.

### **Abstract:**

Rabbits are laboratory animals commonly used for experiments and are a proper model for studies of the urogenital system functions and disorders. The accessory genital glands are located around the pelvic part of the urethra. These glands comprise the vesicular gland (glandula vesicularis), prostate (prostata) and the bulbourethral gland (gl. bulbourethralis). Some authors include the glands of ampulla (gll. ampullae) as well. The research was carried out on seven male New Zealand White rabbits weighing 2.1-3 kg. The slices were stained with haematoxylin-eosin (H&E) and Movat-Russell modified pentachrome stain. The morphology and morphometry of the accessory genital glands were performed. The aim of this study was to show the importance of these glands for modern science. This knowledge might be helpful for analysing the influence of selected drugs on these organs. Furthermore, they are useful topographic markers to identify the segment of the urethra, e.g. in surgical procedures.

### **Keywords:**

rabbit, accessory genital glands, morphology, morphometry



## EFFECT OF PRELIMINARY DEKSTRYNIZATION ON THE FERMENTATION YIELD OF MASHES CONTAINING NATIVE STARCH

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### **A few words about the author:**

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### **Abstract:**

The distillery industry is a producer of spirit used as a bio-component of fuels, as well as for the food industry, which means that this branch of industry is forced to look for and use pro-ecological methods in production. The new technologies developed in the production of agricultural distillate, in addition to the high efficiency of distillation processes, are focused on reducing water and energy consumption, while obtaining high quality distillates.

The research aimed to compare the effect of the activation phase (initial dextrination) on the performance of the alcohol fermentation process of native rye starch. Mash fermentations were carried out using dried Ethanol Red yeast (*S. cerevisiae*), (Lesaffre, France) in a 3-day system ( $35 \pm 1$  °C).

On the basis of the conducted research, it was found that omitting the step of activation affects the improvement of the degree of saccharification. It has been observed that the initial dextrination step allows for release of about 10% of reducing sugars. In terms of yield, this does not affect the statistically significant improvement in alcohol yield, which was reported for  $80.7 \pm 2.3\%$  of the theoretical experiment for activation trials, with the use of sugars by  $88.4 \pm 3.6\%$  for yeast. However, in the case of samples prepared without activation, the efficiency was recorded at  $78.8 \pm 2.2\%$  with the use of sugars at a higher level than in the trials with activation ( $90.3 \pm 2.8\%$ ).

### **Keywords:**

pre-hydrolysis, activation step, native starch, fermentation

## LOCATION SYSTEM OF THE AUTONOMOUS MOBILE ROBOT IN THE AREA OF WIRELESS SENSOR NETWORK

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### **A few words about the author:**

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### **Abstract:**

The location system of the mobile robot is proposed. The autonomous robot works in the area of a wireless sensor network. Measurement of radio signal strength and odometry algorithms are used. The autonomous robot moves according to planned tasks using the odometry algorithm in the area of sensor range. The cyclic measurement determines the distance and direction in which the selected sensor is located in relation to the autonomous mobile robot. Based on the received data, the location of the mobile robot is determined. Eliminated is the problem of increasing error in time that occurs in odometry. The mobile robot can move relative to only one sensor. The problem of the kidnapped robot is resolved, location is detected and a new starting position is provided.

### **Keywords:**

autonomous robot, odometry, radio location

## ESTIMATION OF THE DISTANCE USING RADIO SIGNAL STRENGTH

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### **Abstract:**

Estimation of the distance between two known radio nodes using the signal strength is a scientific challenge. Radio signals are exposed to noise. With a constant distance of modules, the value of received signal strength changes over time in classic measurement. This effect is caused by moving people, objects and other disturbances, such as transmitters and noise. In addition, the signal strength distribution is not Gaussian.

The proposed, innovative solution is to use the rotatable directional antenna and build full omnidirectional characterization of the signal strength. The obtained results on the built prototype indicate a stable possibility of estimating the distance. Results show the relationship between the shape of signal strength characteristics and distance of measure. There are significant differences with measuring from different distances.

### **Keywords:**

signal strength, antenna, directional distance

## COMPRESSOR MONITORING AND CONTROL WITH USE OF COMPACTRIO AND LABVIEW

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### **A few words about the author:**

PhD student at the Institute of Turbomachinery, Lodz University of Technology. Interested in shape optimization, mathematical modeling and unstable phenomena in radial compressors.

### **Abstract:**

Compressors are used in the wide range of industries. Very often they are the core of installations, such as production lines or transport engines. Therefore, their failure can generate significant financial losses. To avoid failures it is indispensable to constantly monitor their operation and control them in efficient way.

This talk presents monitoring and control setup used for experimental test stand of VRK-3 compressor. It is based on the CompactRio device which is responsible for collecting measurements and controlling the compressor by means of real-time or FPGA algorithms created in the LabView environment.

### **Keywords:**

turbomachinery, compressors, monitoring, control

## TOWARDS DIGITAL TWIN. FUTURE OF COMPRESSOR MONITORING AND CONTROL

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PhD student at the Institute of Turbomachinery, Lodz University of Technology. Interested in shape optimization, mathematical modeling and unstable phenomena in radial compressors.

### **Abstract:**

Compressors are used in the wide range of industries. Very often they are the core of installations, such as production lines or transport engines. Therefore, their efficient operation and early detection of developing failures is extremely important for the business.

The constant development of computing tools and big data analysis techniques creates an opportunity to take monitoring and control to the entirely new level. Digital twin is an approach in which by collecting and merging large amount of information about the compressing unit both from the design process and on-site operation one can obtain a digital replica of the compressor. This digital object can be used for control of the real compressor as well as for predicting failures and maintenance.

This talk presents the idea behind the digital twin and an overview of the literature.

### **Keywords:**

turbomachinery, compressors, monitoring, control

## ESTIMATORS FOR RULE QUALITY ASSESSMENT IN ANFIS SYSTEM

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### **A few words about the author:**

Izabela Perenc is a Ph. D. student at Lodz University of Technology. Interested in artificial intelligence and bioinformatics, mainly focused on neural networks and fuzzy logic.

### **Abstract:**

Machine learning yields outstanding results when it comes to learning patterns in data sets. Yet it is often difficult to extract relationships that create learnt patterns, especially from neural networks systems. However there exist approaches as ANFIS that allow to learn data and interpret learned knowledge in a form of logic rules.

The article presents two estimators that allow to evaluate each rule in the system, what in future can lead to a major improvement of computational complexity during ANFIS learning. The idea of evaluating only one rule in ANFIS system is a novelty and no literature on the subject was found. Both estimators were compared on artificially generated dataset, with different configurations of ANFIS system.

Presented estimators allow to identify which rule can be improved by increasing the number of linguistic values. The rule evaluation can help improve ANFIS in terms of lowering the number of rules thus lowering the computational complexity, which is currently its major drawback – so called dimensionality explosion.

### **Keywords:**

machine learning, ANFIS, neuro-fuzzy

## THE ROLES OF AUXIN AND GIBBERELIN IN PODS AND SEEDS DEVELOPMENT IN LUPINUS LUTEUS, AS REVEALED BY TRANSCRIPTOME SEQUENCING

**Wojciech Glinkowski\* (1, 2), Milena Kulasek (1, 2),  
Krzysztof Jaworski (1), Paulina Glazińska (1, 2)**

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### **A few words about the authors:**

The main objective of our research team is to study the phenomenon of abscission in yellow lupine on a molecular level and gain better understanding of origins and causes of this process. Our main focus is directed on small non-coding RNAs (sncRNA).

### **Abstract:**

Yellow lupine (*Lupinus luteus* L.) is an important leguminous crop plant. As any member of the Fabaceae family, lupine can form a symbiotic relationship with nitrogen-fixing bacteria, which helps the plant to grow in barren soil. Unfortunately, unlike other legumes such as soybean or chickpea, lupine's regulator pathways remain still mostly undiscovered. This includes mechanism governing seed and pod development, which holds the utmost importance from the agricultural point of view. Not surprisingly, these growth and maturation processes, just like almost every aspect of plant physiology, are heavily influenced by changes in various phytohormones concentrations and perception. During the transcriptome data analysis we identified many genes responsible for phytohormone synthesis, metabolism and perception. Our preliminary data strongly suggests that plant hormones such as Auxins and Gibberelins play a major role in yellow lupine's pod development and precise control over their metabolism and perception is required for proper fruit development.

### **Keywords:**

NGS, transcriptome, yellow lupine, phytohormone, development

## STUDY ON THE APOPTOSIS AND NECROSIS OF HUMAN FIBROBLAST INDUCED BY T-2 MYCOTOXIN

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### **A few words about the author:**

The author of the presentation in doctoral thesis focuses on mechanisms of cytotoxic and genotoxic action of fungal toxins produced by *Aspergillus* and *Fusarium* genus.

### **Abstract:**

T-2 toxin is a fungal secondary metabolite belonging to the type A Trichothecenes and among Trichothecene family, T-2 mycotoxin is the most cytotoxic substance. T-2 toxin is generally found in wheat, oats, barley and rice. T-2 causes a spectrum of adverse effects on humans or animals and induces multiple toxic reactions in a wide range of the cell types. T-2 mycotoxin is known also to inhibit protein synthesis and also reported to induce changes in DNA. In our study, we evaluated the necrotic and apoptotic pathway induced by T-2 mycotoxin in normal human fibroblast cell line (Hs68). The apoptosis and necrosis of cells were evaluate using flow cytometry with FITC Annexin V Apoptosis Kit. While caspase activity was measured using CellEvent™ Caspase-3/7 Green Detection Kit. Our findings showed that T-2 toxin causes necrosis depending on the dose used. Results clearly affirmed the case study observation where contamination of skin by T-2 toxin results its strongly necrotic changes.

### **Keywords:**

T-2 toxin, flow cytometry, fibroblasts, necrosis, caspases



## BIOACTIVE COMPOUNDS IN TWO DIFFERENT POLISH HAZELNUT VARIETIES AND THEIR SKINS

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### **A few words about the author:**

Katarzyna Król - Doktorantka na Wydziale Nauk o Żywieniu Człowieka i Konsumpcji. W swojej pracy prowadzi nad polskimi orzechami laskowymi i olejami tłoczonymi na zimno.

### **Abstract:**

Concentration of bioactive compounds, mainly flavonoids and phenolic acids in two cultivars (Webba Cenny and Olbrzym z Halle) of hazelnut were investigated. Phenolic acids were examined using high pressure liquid chromatography (HPLC). Hazelnuts were roasted under specific condition: 130°C and 30 min. In addition tocopherols content were presented. Eleven different compounds were quantified in hazelnut samples. Phenolic acids were almost 65% of the total bioactive compounds. Concentration of total phenolic compound ranged between 36,58 and 41,31 mg/kg for raw nuts, while for roasted skin 8078,61 and 9054 mg/kg. Higher concentration of phenolic compounds in roasted hazelnut skin were observed, followed by natural and roasted hazelnuts, which is more than 2000 times higher than for hazelnuts without the skins. The most abundant in hazelnuts was alpha-tocopherol. As a phenolic compound-dense part of nuts, skins are being started to be suggested for reevaluation in industries such as food, pharmaceuticals and cosmetics.

### **Keywords:**

hazelnut, bioactive compounds, tocopherol, roasting

## THE EFFECT OF DICALCIUM CARBONATE NANOPARTICLES INJECTED IN OVO ON CHICKEN EMBRYOGENESIS

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### **A few words about the author:**

Arkadiusz Matuszewski is a PhD candidate at Warsaw University of Life Sciences. His personal interests focus on poultry breeding and production, animal origin food quality, bird biology and ecology.

### **Abstract:**

Calcium carbonate is a common substance found in rocks, most notably as a limestone. This chemical compound is common inorganic source of calcium in poultry nutrition. However the another sources or forms of this mineral are still the object of interests, because of their possibly better bioavailability. One of the alternatives could be nanoparticles because of their biocompatibility, bioactivity and osteoconductive properties. The intensive selection in broiler chicken flocks in the direction of weight gain led to a strong bone load which leads to various pathologies of the legs such as deformities, osteoporosis and a number of different infections. One of the opportunities is the in ovo technology which may improve skeletal system at first day of life. The dicalcium carbonate nanoparticles (DC-NPs) due to their size could be used in in ovo technology and then for example used in poultry nutrition. So, the aim of the study was to determine the interaction and effect of different concentrates of DC-NPs hydrocolloids applicated in ovo on chicken embryo development evaluated by mortality, oxidation status and different bone parameters in 20th day of incubation. The results showed that DC-NPs did not negatively influenced on embryogenesis and contributed to affect selected parameters.

### **Keywords:**

dicalcium carbonate nanoparticles, in ovo, chicken embryo development

## ORGANIC FOOD PROCESSING BARRIERS IN POLAND

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### **A few words about the author:**

Karolina Misztal work as a research assistant in the Chair of Organic Food in the Faculty of Human Nutrition and Consumer Sciences at the Warsaw University of Life Sciences (SGGW).

### **Abstract:**

Consumers increasingly appreciate high quality and nutritional value of organic products. The organic food market is rapidly growing and the organic food industry needs to develop and innovate to keep the pace. Workshop was conducted with 25 entrepreneurs from the organic food sector, whose main purpose was to define the biggest barriers to the development of organic food processing. Polish organic food producers point out the most barriers of development in the technology aspect. The most difficult for them is availability of high-quality raw materials. Other inhibitory factors are complicated and complex legislation, problem with promotion and reliable information about organic food and still low consumer awareness of organic products and nutrition. The results of the workshop provide a lot of information about the current situation on the organic food market in Poland from the perspective of organic processors and can be the basis for working out facilities for them.

### **Keywords:**

organic food processing, barriers

## CHONDRODYSPLASIA - OCCURRENCE AND GENETIC BACKGROUND OF DIFFERENT ANIMAL SPECIES

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PhD candidate at the Department of Genetics and Animal Breeding. My scientific interests include broadly understood animal genetics and molecular mechanisms underlying the processes taking place in the organism.

### **Abstract:**

Skeletal dysplasia is a heterogeneous group of disorders associated with the development of bone and cartilage tissue. One of the major groups of these disorders is a chondrodysplasia, also known as chondrodystrophy. There are many types of chondrodysplasia, each of which has a different genetic background. This disease has been reported in many animal species. So far, in animals, the disease has been conditioned by mutations in the genes of EVC2 (EvC Ciliary Complex Subunit 2) – in domestic cattle, FGF4 (Fibroblast Growth Factor 4), ITGA10 (Integrin alpha 10), SLC13A1 (Solute Carrier Family 13 Member 1) – in domestic dog, FGFR3 (Fibroblast Growth Factor Receptor 3), SLC13A1 – in sheep and COL10A1 (Collagen Type X Alpha 1 Chain) – in domestic pig. The main phenomenon leading to this disorder is a messy proliferation and maturation of cartilage cells, resulting in abnormalities in cartilagenous osteosis. Consequently, bones in limbs and spine may be shortened (dwarfism), together with excessive growth of skull bones. Although the chondrodysplasia phenotype is desirable for many breeds of animals, it is important not to forget that chondrodysplasia is a genetic disease that causes discomfort, pain and suffering in affected specimens. Studies on its genetic background will hopefully lead to developing reliable screening tests, enabling to eliminate both affected (homozygous) animals and heterozygous carriers from breeding.

### **Keywords:**

chondrodysplasia, genetic background, dwarfism

## **TICK-BORNE ENCEPHALITIS (TBE) - VIRUS STRUCTURE AND DISEASE TRANSMISSION MECHANISM**

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### **A few words about the author:**

PhD candidate at the Department of Genetics and Animal Breeding. My interests include hunting, forestry and the use of modern technologies in these two fields of science.

### **Abstract:**

Tick-borne encephalitis - TBE is an infectious viral disease transmitted to humans via ticks belonging to the genus Ixodid. The main hosts of Tick-borne encephalitis virus - TBEV are small rodents that do not get sick when infected with the virus, while humans are random hosts, where the disease mainly attacks the central nervous system. TBEV genome is a RNA that codes all virus proteins in a single reading frame (ORF). The peptide is proteolytically cut into 3 structural proteins (C, E, M) and 7 non-structural proteins. Protein E plays a key role in the life cycle of the virus because it takes part in the binding of the virus to the host cell and the virus's penetration into the intracellular space. The protein also has antigenic properties. There are 3 subtypes of the virus. Ticks become infected by the virus through the consumption of blood from infected animals and may also be infected by transmission of the virus between infected and noninfected ticks and from female to progeny. Human infection occurs through the bite of an infected tick and the consumption of unpasteurised milk from goats and sheep during the viraemic period or raw milk products. This is possible because the TBEV has a pH resistance of gastric juice and can survive at pH levels between 1.42 and 9.19. It remains infectious in the stomach for up to 2 hours after consumption.

### **Keywords:**

Tick-borne encephalitis, Tick-borne encephalitis virus, transmission mechanism



**HUMANITIES SCIENCES**





## THOMAS MANN'S „THE MAGIC MOUNTAIN” AS AN INSPIRATION FOR A POLEMIC ABOUT THE VALUES OF LITERATURE

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### **A few words about the author:**

Karolina Król studies Polish Philology at Adam Mickiewicz University in Poznań. She is interested in the literature of 20th and 21st century.

### **Abstract:**

The aim of the article is to reconstruct the supposed reasons for which the discussion of the New Wave poets, initiated by Stanisław Barańczak's „The changed voice of Settembrini", focused on Thomas Mann's „The Magic Mountain". The main thread of the article relates to the inspiring evocativeness of one of the characters, Leon Naphta. The author emphasizes the special place of „The Magic Mountain" in Mann's work, published after the release of „Considerations of a nonpolitical man". The novel was written when the writer's views were changing due to the experience of the First World War. The article considers the similarities between the situation of Hans Castorp and Polish poets in the 1970s – it was necessary to define their views, taking into account the reasons represented by people with extremely different beliefs. The author also notices the similarities between the popular discourse on diseases and the imagery of the poetic texts of the New Wave.

### **Keywords:**

Stanisław Barańczak, Thomas Mann, „The Magic Mountain", poetry, values in literature

## **SPEECH DISORDERS AND EFFECTIVENESS OF ORTHOPHONIC EXERCISES IN THE LIGHT OF INDIVIDUAL ACTIVITIES**

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### **A few words about the author:**

I am PhD student on the first year at University of Silesia. I am working a Kindergarten. I am interested in speech disorders, maturity to learn mathematics and creativity in education and also intersemiotic translation.

### **Abstract:**

Speech disorders are big problem a society. In his spech I would like to tell about „dyslalia”. Orthophonic exercises turn out to be effective in fight with speech disorders. The research show, that regular use orthophonic exercises help children with problems in speech.

### **Keywords:**

speech disorders, individualization experiment, orthophonic exercisec

## ABOUT GLOTTODIDACTICS AND GLOTTODIDACTICS. POLISH EDUCATION IN INITIAL TEACHING

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### **A few words about the author:**

I am a PhD student at the Faculty of Educational Sciences at the University of Lodz. I deal with Glottodidactics - a method of learning to read and write. Every day I work in primary school as a teacher of initial education.

### **Abstract:**

On Glottodidactics (B. Ročlawski, 2008) consists of knowledge, program, methods and skills that allow teachers and parents to stimulate the proper development of the child's language, and above all allow to teach each child a complex art of reading and writing. So why is Glottodidactics practically non-existent in pre-school / school reality? What makes the method that positively influences the quality of education is not used by educators? My research has shown that children working on the aforementioned conglomerate of methods present a much higher level of reading pace (phonemic scale of Prof. Ročlawski), compared to these scientists using the simultaneous - sequential (syllable) method. A similar situation occurs when we analyze the spelling skills of these pupils.

Glottodidactics allows for the education of mature and conscious readers, which nowadays it is quite a challenge. What is the power of Glottodidactics? Unusual didactic aids, and maybe approaches to education and children presented by glottodidactics? Glottodidactics fights with "mediocrity" in education, resigns from multiplication of dyslexics, dysgraphics, dysortografików, and meets children's needs and abilities.

### **Keywords:**

Glottodidactics, teaching, reading, starting education, children

## IMPACT OF SATISFACTION WITH SEXUAL LIFE ON THE RELATIONSHIP BETWEEN STUDY ADDICTION AND DEPRESSIVENESS

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### **A few words about the authors:**

Authors are members of the Exterior Psychological Research Group. Presented study is overseen by PhD Paweł Atroszko. Authors take special interest in the field of behavioral addictions (especially compulsive studying, working and shopping).

### **Abstract:**

Our study extends the literature by examining the association between study addiction and satisfaction with sexual life. Study addiction may take its toll on many aspects of well-being, such as decreased quality of life or impaired health, including depression. Complete focus on studying may hinder development of intimate relationships and/or impair sexual life in young adults. Also, chronically high levels of stress experienced by study addicts may influence interest in sexual activities and quality of sexual life. Since satisfying sexual life is a protective factor against depression, it was hypothesized that dissatisfaction with sexual life will mediate between study addiction and depressiveness. A total of 1252 students from different universities in Polish region of Pomerania took part in the study (719 women, 57.4%). Multidimensional Inventory - Learning Profile of a Student has been used as a measure of study addiction and WHOQOL-Bref - as measure of general satisfaction with sexual life. Beck Depression Inventory was used to measure depressiveness. The results showed that satisfaction with sexual life was a mediator between study addiction and depressiveness. These findings suggest that compulsive overinvolvement in study may impair sexual life of young adults and this in turn may result in higher risk for depression and lower general quality of life. There is a clear need for systematic studies on the mechanism involved in dissatisfying sexual life of study addicts.

### **Keywords:**

compulsive studying, study addiction, satisfaction with sexual life, depressiveness

## CRYPTOGRAPHIC CURRENCY BITCOIN

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### **A few words about the author:**

I study economics – postgraduate study. I am interested in finance and the global market.

### **Abstract:**

Bitcoin is a digital cryptographic currency - cryptocurrency, based on the Peer-to-Peer network, operating in blockchain technology. It is identified by the BTC code. The first block in the Bitcoin chain was dug by the creator of the network, a person or team hiding under the pseudonym Satoshi Nakamoto. Since then, the Bitcoin network has been growing and is becoming increasingly used. Payments and Bitcoin-based investment are gaining increasing popularity due to the fact that the currency is non-inflationary, and inflation is a problem for many countries, and the speed of transfers to any end of the world. On the other hand, Bitcoin has increasing competition from alternative cryptocurrencies, which are rapidly growing and may prove to be technologically superior.

### **Keywords:**

Bitcoin, currency, blockchain, cryptocurrency

## THE CONVERGENCE OF THE ECONOMIES OF COUNTRIES JOINING THE EURO AREA

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### **Abstract:**

Convergence criteria have been put in place to measure progress in countries' preparedness to adopt the euro currency, and are defined as a set of economic indicators, which focus on: price stability, sound public finances ensuring they are sustainable, exchange-rate stability demonstrating that a member state can manage its economy without recourse to excessive currency fluctuations, long-term interest rates assessing the durability of the convergence. The Treaty also calls for an examination of other factors relevant to economic integration and convergence. These additional factors include the integration of markets and the development of the balance of payments. Their assessment is also seen as an important indication of whether the integration of a member state into the euro area would proceed smoothly.

### **Keywords:**

convergence, criteria, euro zone

## UNIVERSITY AND HIGHER VOCATIONAL SCHOOL - IS THIS DIVISION WRONG?

**Przemysław Chmielecki**

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### **A few words about the author:**

Assistant Professor at the Department of Philosophy at the Department of Systematic Theology of the Baptist Theological Seminary in Warsaw. Doctor of philosophy, master of Information Technology, master of cognitive science and resocialization.

### **Abstract:**

The area of higher education is considered one of the most influential for shaping the young generation in the axiological perspective, understood both individually and socially. However, the modern university stands in the gap between the traditional idea of a European university and the model of an entrepreneurial university.

The above dissonance in shaping the organizational vision of the university has wider consequences, because it introduces a division into general types of schools and universities geared to practice and a close relationship with the dynamically changing labor market. However, it should be strongly emphasized that none of them is in essence worse or better, but simply adapted to other needs.

The question posed in the title seems to be still valid in the contemporary context, where this division is being blurred. One can get the impression that all higher education institutions try to become a University in the long or short term, retaining, however, the current model of practical education. This seems to be a sign of a complete misunderstanding of the concepts and differences between the two main categories.

The aim of the speech is therefore to present the fundamental differences between the concepts of the University and the Higher Vocational School and an attempt to answer the question whether this division, known and still present in Western European countries, is a missed or accurate and necessary distinction in Poland.

### **Keywords:**

university, higher vocational school, education, education

## THE CONSTRUCTION OF A CIRCULAR SHIELD IN LATE ANTIQUITY AND EARLY MIDDLE AGES

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### **A few words about the author:**

I am a student of Lodz archeology, I belong to the experimental archeology association harjis, I am interested in late antique and early middle-age period.

### **Abstract:**

My presentation talks about the process of building a circular shield based on archaeological finds and iconography from the late antiquity and the early Middle Ages. I will discuss the materials that were used to make the shield and share with you the acquisition acquired from the construction process of your own circular shield.

### **Keywords:**

shield, boss, row hide, plank, defence



## MIGRATION VS. LANGUAGE DEVELOPMENT

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### **A few words about the author:**

PhD student at the University of Lodz, Faculty of Philology.

### **Abstract:**

The European integration has significantly increased people's mobility. This phenomenon leads to various changes not only at the socio-cultural but also at a linguistic level. One sign of this is the emergence of ethnolects in countries with a high proportion of migrants. In Germany, the processes of free movement have contributed to the development of Kiezdeutsch – a new multi-ethnic language variety.

### **Keywords:**

migration, Germany, Kiezdeutsch

## FINGERPRINTS IN CRIMINAL INVESTIGATION

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### **A few words about the author:**

I am a student in Jagiellonian University at Faculty of Law and Administration. My interests are mainly focused on criminology and criminal law.

### **Abstract:**

One of the most effective methods of identifying the criminal is dactyloscopy. Dactyloscopy, known also as fingerprint identification, is an investigative technique that deals with comparative fingerprinting and bases on the analysis of patterns observed in individual prints. Galton's law states that every human being has unique, unchangeable and indelible fingerprints. Fingerprints, which arise on the fifth day of life, last a lifetime of a human and do not change until decay of the rotting body after death. What is more, worn skin slats undergo natural regeneration together with the epidermis in the original shape, so if the dermis has been damaged, scars are created that cause the characteristic features of the fingerprint. The purpose of the article is to present method of analyzing fingerprints, including different patterns and individuals characteristics termed „minutiae”.

### **Keywords:**

fingerprint, dactyloscopy, identification, criminal

## **FREEDOM OF EXPRESSION VS. FREEDOM OF RELIGION**

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### **A few words about the author:**

I am a student of the Faculty of Law and Administration at the University of Warsaw. My scientific interests are related to the field of constitutional law with particular emphasis on issues concerning protection of human rights and religious matters.

### **Abstract:**

The main purpose of the presentation is to discuss the fields of conflict between freedom of religion and freedom of expression under the regulations of the European Convention on Human Rights and the Constitution of Poland. The first part of the presentation will be focused on Polish regulations; it will be considered whether applying criminal law provisions is actually necessary when dealing with the cases of insulting religious beliefs. This segment will also include presenting the most controversial cases connected with violation of human rights which were analysed by Polish courts, especially the Polish Constitutional Court. The presentation will be an attempt to assess judgments in these matters as well.

The second part of the presentation will be based on analysing jurisprudence of the European Court of Human Rights in order to present the solutions and ideas proposed to achieve balance between freedom of conscience and religion on the one hand and freedom of speech and expression of one's own views on the other hand.

### **Keywords:**

freedom of expression, freedom of religion, European Convention on Human Rights, Constitution, religious feelings

## FINANCIAL INSTRUMENTS OF SOCIAL PARTICIPATION IN AUXILIARY UNITS OF MUNICIPALITIES

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### **A few words about the author:**

Lawyer, PhD student at the Department of Administrative Law at the Faculty of Law and Administration of the University of Gdańsk. He deals with administrative law, disciplinary law and educational law. Author of scientific publications in this field.

### **Abstract:**

It is legitimate to say that the participative instruments developed so far are the achievement of the last few years, which is in constant evolution. The issue of social participation in local government, as well as the instruments by which it is possible, as well as auxiliary units of municipalities, has been thoroughly examined by the doctrine. Nevertheless, due to the constantly changing legal, economic and social reality, as well as the growing awareness of local communities, it seems reasonable to undertake more detailed research on the above issues. The main objective of the article will be to characterize and evaluate financial instruments of social participation in auxiliary units of communes, i.e. the participatory budget and the village council fund, and in consequence to work out *de lege lata* applications. These instruments, despite their importance, are still not fully used. Thus, it is impossible to fully assess their potential and impact on the development of auxiliary units.

### **Keywords:**

village councils, ancilliary units, territorial self-government, participatory budget, village fund

## **REPORT ON THE STATE OF THE LOCAL GOVERNMENT UNIT - AN ATTEMPT TO EVALUATE THE NEW REGULATION**

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### **A few words about the author:**

Lawyer, PhD student at the Department of Administrative Law at the Faculty of Law and Administration of the University of Gdańsk. He deals with administrative law, disciplinary law and educational law. Author of scientific publications in this field.

### **Abstract:**

The report on the status of a local government unit (commune, poviast, voivodship) is a new legal instrument that has been implemented three Polish self-government laws by the Act of January 11, 2018 on amending certain laws to increase the participation of citizens in the process of selecting, functioning and controlling some public bodies. The report is to summarize the work of the executive body (mayor of the mayor, city president, poviast board, province board) for the previous calendar year. This implemented instrument, since the entry into force of the Amendment Act, poses many difficulties not only to the legal doctrine, but above all to the local authorities. There is no doubt that it is also of great importance for the local community that can take part in the debate on this report. The aim of the paper is to characterize the above instrument, the stages of its creation, giving a vote of confidence to the executive body, as well as an indication of how the first report preparation was in practice this year. Therefore, the results of the author's forensic work will be presented.

### **Keywords:**

report, commune, poviast, voivodship, social participation, vote of confidence

## PHILOSOPHICAL DIALOG AS A LITERARY GENRE

**Sara Kurowska**

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### **A few words about the author:**

Doctoral student at the Department of XX and XXI Century Literature at the University of Lodz. She is particularly interested in the works of Witkacy and Sławomir Mrożek. She is fascinated by classical music.

### **Abstract:**

In my speech I will present the philosophical dialogue as the heart of the humanities. For this purpose I will follow the development of this literary genre from ancient times. It seems that in the nineteenth century this genre dies. Is it really? I will try to answer this question in my speech.

### **Keywords:**

philosophical dialogue, literary genre

## ARTIFICIAL INTELLIGENCE AS A SUPPORTIVE TOOL FOR SENTENCING

**Monika Lower**

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### **A few words about the author:**

Monika Lower studies law at the University of Wroclaw. She is interesting of criminal law and the procedure for issuing judgments.

### **Abstract:**

According to D. Li Chen's and H. Spamann's research judge's decision regarding content of sentence is influenced by political and collegial factors or his psychophysical condition, e.g. the sense of hunger, sadness or joy. The level of punishment in fact reflects not just the guilt of defendant but also judge's emotional states. According to a report of international research done by GfK Verein over half of people in Poland do not trust the judges. As an alternative to judge - human solutions based on the artificial intelligence are created. As an example in USA judiciary there is a COMPAS system using artificial neural network which estimates the probability of further accusations by the defendant. Sentences issued over several decades have been input to the COMPAS system - both fair and unfair. Thus the system has learned e.g. being racist (ProPublica, 2016). Another proposition is the project of the author – fuzzy inference model, which uses rules built based on the legal regulations and doctrines of law. The model can be used by the judge to relativize his decisions. In the model rules should be determined by select group of experts because the system will have the same quality as those who set the rules. The disadvantage of the system can be that the decisions of system would be repetitive and predictable. However, the system would be under constant control of the judge - it should not replace him, but only limit impact of emotions and external factors on the sentence.

### **Keywords:**

fuzzy logic, criminal law, artificial intelligence

## AESTHETIC VALUES IN PHYSICS

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### **A few words about the author:**

Artistic education in the field of fine arts, interdisciplinary interests, completed Interdisciplinary Humanistic Doctoral Studies at the University of Warsaw.

### **Abstract:**

The scientific goal of the project is to examine the sources of and the fundamental importance of aesthetic terms in the field of philosophical reflection on physics. Although modern physics research published in specialized physical journals are generally more often lacking philosophical reflection, we find them in philosophy of physics research, history of science, biographies and autobiographies of academics and in popular science literature. Mentioned values play the role of non-empirical criteria for the evaluation and acceptance of scientific theories. A special place in the reflection on aesthetic values falls into the category of beauty, which The at the dawn of European civilization was related to science. The most important is the legacy of Pythagoreans, whose views still echo in the history of natural science. Aesthetic values in physics can have at least three roles - the first two seem positive, the third one is negative:

- 1) beliefs of scientists about the beauty, harmony or simplicity of the world undoubtedly affect the directions of the search of new scientific theories;
- 2) in the case of different empirically adequate theories and in the absence of sufficient empirical data, aesthetic values are those which constitute the criterion of choice between competing theories;
- 3) the beliefs of scholars about "how the world should be", including aesthetic beliefs, sometimes play the role of an epistemological obstacle and prevent them from accepting new ideas.

### **Keywords:**

beauty, aesthetic values, philosophy of physics, non-empirical, epistemology



## MONOGRAPH OF MUSIC MAGAZINE "NON STOP"

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### **A few words about the author:**

The author has just started her journey as a researcher. She is a PhD student in media sciences on The Pontifical University of John Paul II in Cracow. She is also a journalist and a musician. Particularly interested in advertising, media and music.

### **Abstract:**

In recent years, media developed and became an element of many aspects of everyday life. However, the current state of research indicates there are still not enough analysis that would combine popular music issues with the methodology of media sciences, especially in regards to the music press and its role in the times of the PRL period, including advertising.

The main purposes of my current research are: to broaden knowledge of one of the main music magazines of the PRL period - Non Stop, to show its role in creating musical canons, shaping musical tastes or pro-cultural and counter-cultural attitudes. Among the hypotheses are those referring to its development, the way of presenting the Polish and foreign music world, as well as questions about language, journalistic genres, etc. Moreover, it is believed that in PRL the advertising did not exist, during my research I will be able to verify whether this is true.

In my research I will utilize the method of content analysis and specific tool which I will be using is the categorization key. It will be based on the analysis of the explicit content of the message, as well as on its quantitative, systematic description. An additional tool will be a direct interview with the creators of the magazine.

Detailed analysis of the Non Stop magazine develops a scheme for analyzing music magazines and then comparing them. In addition, research on their contents reveal many issues worth examining.

### **Keywords:**

music magazine, "Non Stop", advertising, press, content analysis

## A DEFAMATION IN THE ANCIENT ATHENIAN LAW

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### **A few words about the author:**

The student of history and law in the University of Warsaw within College of Inter-area Individual Studies in the Humanities and Social Sciences. He is interested in development and history of legal institutions.

### **Abstract:**

Free speech (gr. *παρρησία*) was one of the well-established component of Athenian democratic ideology in the antiquity. As always in the state, which is distinguished by rule of law, there are the limits of citizens freedoms. Among the norms - instituted by the archaic legislator Solon (Plutarch, "Solon" 21,1) - we can find the regulations against evil-speaking (*κακῶς λέγειν*) about both dead and living people. We may learn how this legislation was working by analysing the athenian judicial speeches, written by greek logographers (activity, which is similiar to modern advocats, but (!) not the same).

In my presentation I will indicate the limits of free speech in ancient Athens in reference to law against slander and defamation between the citizens of the polis. By analysing the sources (like orations of Demosthenes, Lysias) I am going to point out, which values was protecting in democratic state and try to answer the fundamental question: why these norms was enacted? This is the important issue to compare nowadays and ancient freedom of speech - the problem, which reflects the roots of democracy.

### **Keywords:**

ancient history, defamation, Athenian law, law of Solon, democracy

## TO WHAT EXTENT DOES STRESS DURING DRIVING A CAR AFFECT EVERYDAY LIFE?

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### A few words about the author:

I am a student at the Pedagogical University in Krakow. In October I will begin the third year of psychological studies. The field that interests me the most is clinical psychology. After graduation, I plan to go abroad and work there professionally.

### Abstract:

Nowadays, the number of people driving a car is constantly increasing, which is associated with the risk of experiencing a road accident or crash. This is due to the growing number of cars and drivers. The above-mentioned situations are associated with experiencing stress. The aim of this study was to check whether and to what extent the stress experienced while driving the car affects everyday life. By stress, we mean the state of increased nervous tension, which is a reaction to the effects of negative stimuli. Individuals surveyed using the online questionnaire have determined what are the stressful situations on the road for them and what problems of everyday life result from them. The questionnaire has 20 questions, including 14 closed ones. The number of people who completed the questionnaire is 103 people of all ages and from different social and professional positions. Research shows that the vast majority of drivers experience greater or lesser stress when driving a car. Its effects are felt by a smaller number of respondents, but still significant, as evidenced, among others, by 10.7% of respondents, in whom the stress experienced led to mental disorders.

### Keywords:

stress, driving a car, problems in everyday functioning

## FEAR OF CRIME IN CRIMINOLOGICAL RESEARCH - AN OUTLINE OF THE PROBLEM

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### **A few words about the author:**

Student of Interdisciplinary Individual Studies College at University of Silesia. Studying both Law and Psychology as well as Philosophy. Mostly interested in criminological research, specifically in field of juvenile delinquency and crime in general.

### **Abstract:**

The speech presented the theoretical outline of some research techniques of fear of crime. The presentation also presented the most important theories, hypotheses and research paradigms that describe the problems of measuring fear of crime. The concept of fear of crime occurs in many perspectives and ranges, which affects the diversity of this issue on the level of empirical analysis. During the presentation, the key issues for the discussed subject were presented and selected factors influencing the examination of fear of crime were described. The theories developed in criminology were also subject to analysis by the author during the speech.

### **Keywords:**

fear of crime, fear of victimization, analysis of fear

## **TRANSLATIONS OF THE POLISH PENAL CODE INTO GERMAN – DOCTORAL DISSERTATION PROJECT AND RESULTS OF PILOT STUDIES**

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### **A few words about the author:**

PhD student at the Institute of German Philology at the University of Lodz.

### **Abstract:**

The paper presents the results of a pilot study conducted as part of a doctoral dissertation project on professional terminology and translation strategies used in three printed translations of the Polish Penal Code into German.

### **Keywords:**

Penal Code, legal translations, specialised terminology

## KNOWLEDGE ECONOMY

**Olga Szczepańska\*, Agata Wiacek, Hanna Podjaska**

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### **A few words about the author:**

We are economics students. We belong to the students scientific association of Investment and financial market. We actively participate in the life of the university and enjoy taking up new challenges.

### **Abstract:**

The expansion of a new type of knowledge economy is one of the most momentous changes we can observe in the modern world. The transition to a knowledge economy manifests itself in the increase in the competitive advantage of countries, regions, and enterprises that use effective science and advanced technologies. Therefore, knowledge and innovation are recognized as one of the most important factors determining the pace and quality of economic growth. As a consequence, the main subject of research conducted in developed countries is the search for sources of new knowledge and methods for building the innovation potential, which become the basis for creating a knowledge economy.

The knowledge economy is an important phenomenon of the global scene. This new economy, which is characterized by the dominating share of the services sector in the production of GDP and employment, is based on the comprehensive use of knowledge and information. In order to the economy of knowledge could develop, it is necessary to cooperate in three areas: governmental, scientific and business.

### **Keywords:**

knowledge economy, innovation

## IMPACT OF AUTHORITY 3.0 ON SYMBOLIC CONSUMPTION AMONG CHILDREN AND YOUTH

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### **A few words about the author:**

I am a second-year student, second-degree on pedagogy, pre-school and early-education specialization at the Faculty of Pedagogy and Psychology in Białystok.

### **Abstract:**

Authority 3.0 is a new type of authority, which was born in social media and its impact is more and more influential on our behaviour and make people desire to follow portals, blog news and buy more and more fashionable products. This article goal is to show the results of survey showing impact of Authority 3.0 on symbolic consumption in group of kids. Method, which I used in problem verification was an experiment.

### **Keywords:**

Internet, consumption, symbolic consumption, Authority 3.0

## **TOO BIG TO FALL? REASONS FOR SPECTACULAR BANKRUPTCIES IN RECENT YEARS**

**Agnieszka Truskowska**

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### **A few words about the author:**

Master Student of Economy. President of the Marketing Scientific Organisation at the EZIT in Jelenia Gora.

### **Abstract:**

The bankruptcy of some of the largest companies and corporations is always echoing loudly. Companies that are affected by this problem are often at the top of the most profitable and recognizable brands in the world. Equally many emotions are caused by uncertain economic situations of countries. Why then, does the fall and suspension of the activities of so many strong players come to an end? What are the main causes of the failures of individual economies? In the speech will be talking about examples of the largest bankruptcies of companies and countries and their main reasons.

### **Keywords:**

bankruptcy, company's fall, top brands





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