National Scientific Conferencje

"Understand the Science"

V edition

on-line

September 25, 2021

What?
How?
Why?

The book of abstracts

National Scientific Conference
„Understand the Science”

V edition

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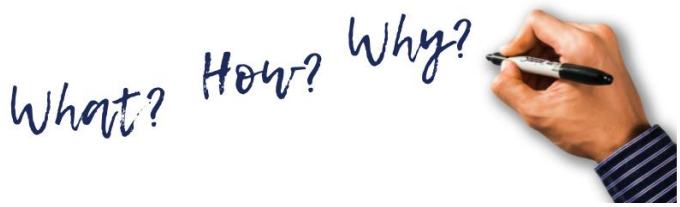
September 25, 2021



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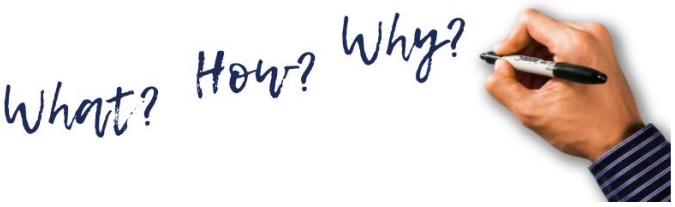

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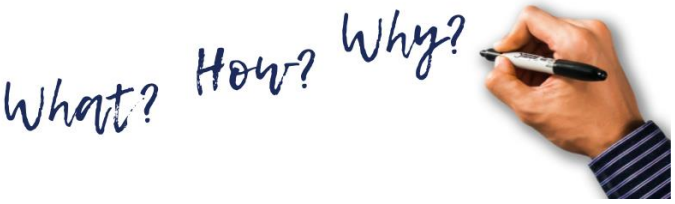
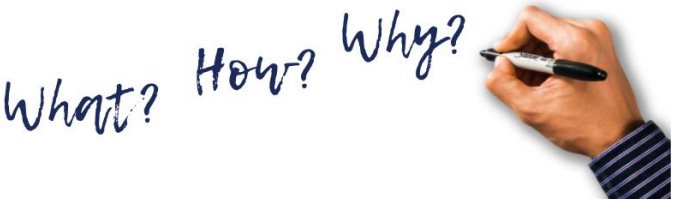
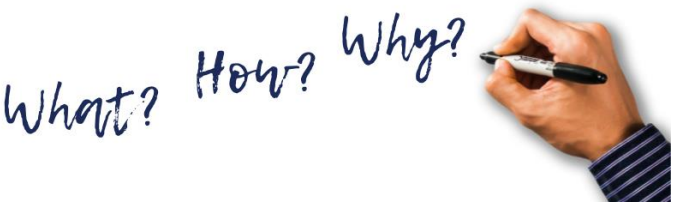
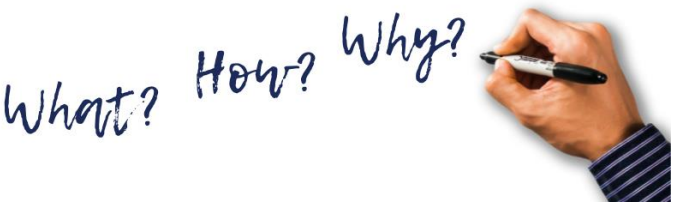


HUMANITIES SCIENCES POSTERS

MEDICAL SCIENCES PRESENTATIONS

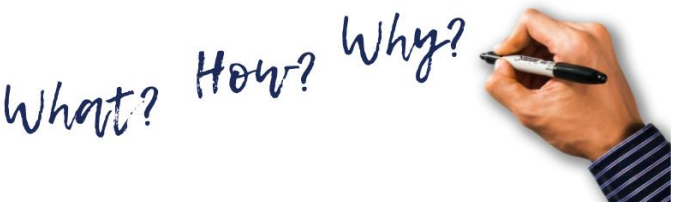


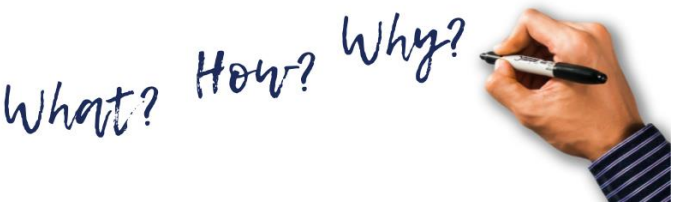




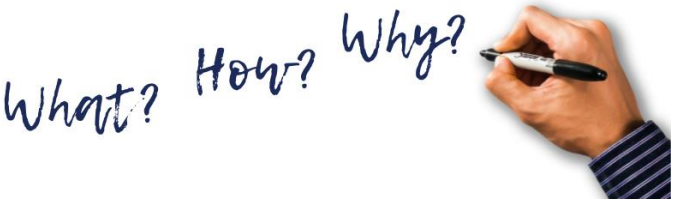
MEDICAL SCIENCES POSTERS

NATURAL AND TECHNICAL SCIENCES PRESENTATIONS





NATURAL AND TECHNICAL SCIENCES POSTERS



ABSTRACTS OF

PRESENTATIONS

HUMANITIES

SCIENCES

THE PERCEPTION OF SEXUAL MINORITIES IN POLAND IN SURVEYS

Natalia Kawiak

Faculty of Education, Institute of Political Science and Administration, Jesuit University Ignatianum in Krakow

nataliakawiakk@gmail.com

A few words about the author(s):

I am a student of administration and public policy. Main interests are policy, international relations and social problems.

Abstract:

The main aim of my paper was to research how sexual minorities are perceived in Poland and how their social situation is shaped. In order to illustrate it, two types of research were conducted – survey and focus group studies. I also conducted the overview of the selected subject literature in order to enrich my analyses with a broader context.

Keywords:

sexual minorities, tolerance, homophobia

EVALUATIVE CONDITIONING. INFORMATION ABOUT THE STIMULUS RELATION

Nina Kędziora

University of Warsaw

n.kedziora@student.uw.edu.pl

A few words about the author(s):

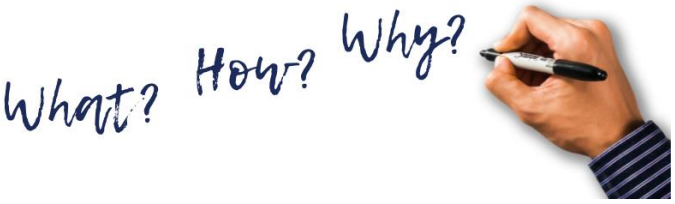
Psychology student. Literature lover. Keep photographer.

Abstract:

Evaluative conditioning (EC) is defined as a change in the evaluation of a neutral stimulus due it's coexistence with an affective stimulus. Balas, Gawronski, and Hu conducted a series of experiments investigating the influence of information about stimulus relations on the effects of EC. The resulting attitudes on the explicit level reflected the information about the stimulus relations but at the implicit level, their coexistence. The authors suspect that the discrepancy between the explicit and implicit attitudes is due to a problematic integration of information about stimulus relations. In order to verify this hypothesis, I designed an experiment. The main aim is to test whether there is a correlation between intelligence level and EC scores. To measure general intelligence (G factor), proposed by Spearman, I use Raven Progressive Matrices. If the hypothesis is correct, people with a higher level of intelligence will be able to integrate information and develop consistent attitudes at both explicit and implicit levels. The attitudes of the less capable will reflect information about the relation of stimuli at the explicit level, and their coexistence at the latent level.

Keywords:

evaluative conditioning, intelligence level, information intergration, g factor



ASSESSING THE IMPACTS OF CHINA'S FOREIGN AID ON CAMEROON, BETWEEN THE PERIOD OF 2009-2020

Polycap Mudoh

University of Szczecin

polycap.mudoh@phd.usz.edu.pl

A few words about the author(s):

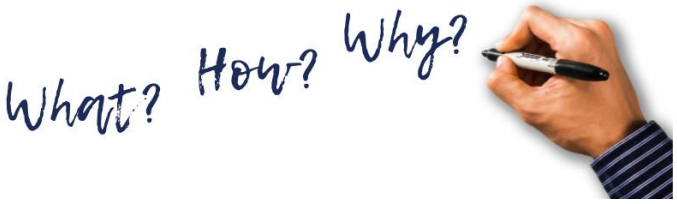
Polycap Mudoh is currently a Ph.D. research student in Political Science and Administration at the University of Szczecin – Poland.

Abstract:

Since after the visit of Jia Quinglin from China in 1971 and formal President Ahmadou Ahidjo of Cameroon return visit to China in 1973, paving the way for Sino-Cameroon relations. Huge progress has been made towards advancing the cooperation of these two nations. This cooperation has had huge impact to both economies. China's relations to Cameroon have more or less been like an economic live-wire to Cameroon, though it cannot be rule out that it has its own drawbacks. Chinese presence in Cameroon has been growing and is very much involved in the private sector. Areas of Chines presence includes; construction, agriculture and medium size businesses. Cameroon has not only witness an enormous increase in Chinese investment and Chinese presence in Cameroon. Chinese aid to Cameroon in the past years have been very much consistent, the main question here is of how beneficial has this aid been to Cameroon and Cameroonians? Cameroon is of a China major partner in Africa and also a beneficiary to china's donation to Africa. China's foreign assistance has been gearing towards the development of the local economy. This paper therefore seeks to explore the contribution and impact of China's foreign aid on Cameroon.

Keywords:

foreign aid, impacts, China, Cameroon



THE RATIONALIZATION OF PARLIAMENTARIANISM IN POLISH CONSTITUTIONAL LAW

Małgorzata Niziołek

Jagiellonian University, Gołębia 24, 31-007 Cracow

malgorzataniziolek01@gmail.com

A few words about the author(s):

Małgorzata Niziołek – A law student at the Law and Administration Faculty of the Jagiellonian University, a stipendist of the Rector's Scholarship for the Best Students for the academic year 2020/2021.

Abstract:

The aim of the speech is to present the basic assumptions of the rationalization of parliamentarianism and the examples of its application in the contemporary Polish constitutional law based on the provisions of the Polish Constitution of the 2nd of April 1997.

In the first part of the speech, an attempt will be made to define the concept of the rationalization and to analyze the process of the formation of the Polish governance system. In addition, the current system will be characterized, considering the historical context and the selected solutions taken from the systems of other countries.

Then, within the analysis of this idea, during the speech, the connections between legislative and executive authorities will be adopted as a point of reference. In this regard, the focus will be made on the interpretation of the provisions of the Polish Constitution of the 2nd of April 1997 concerning three issues: the shortening of the Sejm's term of office by the President of the Republic of Poland, expressing a constructive vote of no confidence in the Council of Ministers and the role of the Senate in the legislative process.

In order to summarize, on the basis of the statistical data quoted in the speech concerning the expression a vote of no confidence in the government in several previous terms of the Sejm, an attempt will be made to assess the effectiveness of the assumptions of rationalizing parliamentarism and the legitimacy of applying solutions consistent with it.

Keywords:

rationalization, constructive vote of no confidence, governance system

EDUCATION IN THE FIELD OF LOGISTICS DURING THE COVID-19 PANDEMIC

Joanna Nowicka

PWSZ AS in Wałbrzych

jnowicka@pwsz.com.pl

A few words about the author(s):

Teacher, entrepreneur, author of publications in the field of logistics and management.

Abstract:

As one of the few, during the COVID-19 pandemic, logistics in general did not record significant drops in financial results. The effects of a pandemic and its impact on an economic entity were largely determined by the subject of activity, but also by the size of the entity and its operating strategy. The pandemic, however, in many cases created new or changed existing problems in this sector of the economy.The aim of the presentation is to answer the question to what extent the pandemic influenced the education process in the field of logistics. The author focuses on the teacher-student relationship in online teaching, but also on the components of the teaching process, e.g factors, conditions, strategies, methods and teaching techniques. The author reviews not only the methods of teaching so far effective in the full-time mode - comparing them with realities of remote education, but also defines the factors and criteria for the effectiveness and efficiency of online learning.

Keywords:

logistics, teaching, education, remote education, teaching methods

GENETIC MODIFICATIONS BY THE CRISPR/CAS9 METHOD AND USAGE OF SUCH TECHNIQUE IN THE FUTURE

Monika Sarnat

Pedagogical University of Cracow. Institute of Phylosophy and Sociology

mon.sarnat@gmail.com

A few words about the author(s):

Human brain and mind are topics that fascinate me especially when it comes to using neurobiological knowledge in upgrading new technologies. In the future I hope to make a contribution to the world of science.

Abstract:

Although the history of genetic modifications isn't long, humanity has already achieved major successes in that field. One of the most important inventions that was made in order to edit genome is CRISPR/Cas9 method. These days many experiments regarding improving DNA of living organisms, using such method, are being carried out. This presentation is going to introduce the history of it and shortly present how does this technique work. Mainly it will focus on experiments that are carried out with CRISPR/Cas9 and possibilities it may have in the future starting from ending starvation and finishing at choosing ideal features for a child.

Keywords:

CRISPR/Cas9, genetic modifications

TOURISM DURING THE COVID-19 PANDEMIC. MOTIVES, PREFERENCES AND FEARS OF POLES REGARDING TOURIST TRIPS IN THE SECOND YEAR OF THE PANDEMIC

Monika Wróbel

Nicolaus Copernicus University in Torun

w_monika_1985@interia.pl

A few words about the author(s):

I am a student of the second year of master's studies at the Nicolaus Copernicus University in Toruń, majoring in history. I am interested in regional history, tourism, cultural studies and other fields of the humanities.

Abstract:

2021 is the second year of the covid-19 pandemic. The society, despite the difficulties related to epidemiological restrictions, tries to lead a normal lifestyle. Constant limitations, stress, uncertainty of events are very burdensome for every person, therefore rest and change of environment are invaluable in proper functioning. What did Poles' tourist trips look like in the holiday season of 2021? Were they traveling more willingly than the year before? What was their leisure like? How did the covid-19 restrictions affect their choice of destination? These and other questions were asked of the respondents during the surveys that delve into the phenomena occurring in tourism during the pandemic.

Keywords:

tourism and pandemic, Covid-19, holiday trips, travels

GAMIFICATION AS A RECRUITMENT TOOL IN THE RESOURCE BASED VIEV (RBV) CONTECTS

Mariola Budek

Cracow University of Economics

budek.mariola@gmail.com

A few words about the author(s):

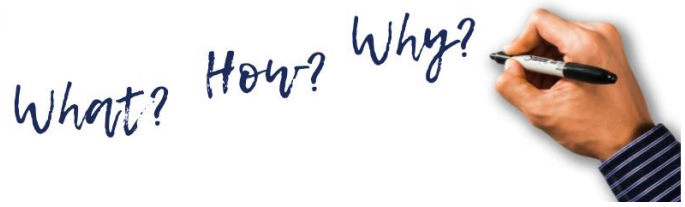
Master Degree of two courses:1st – Economic and Public Administration, 2nd – Organization and Management at the Cracow University of the Economics.

Abstract:

One of the most popular research approaches among business strategy theories is the Resource Based View (RBV) theory. This trend is linked by the belief that the core of an organization's activity and the possibilities of its development are determined by the key competences and/or abilities of the company obtained from the environment, thus "from the outside" of the organization. It is therefore worth taking a closer look at this gamification - one of the more and more popular and frequently used recruitment tools - fits in with the following concept. The gamification tool will be presented on the basis of a case study, which will enable a better understanding of its essence and the assumptions and aspects in the e Resource Based Viev (RBV) concept.

Keywords:

gamyfication, recruitment, recuitment tools, human resource management



ANTI-SYSTEM RHETORIC IN THE MEDIA DURING THE ELECTIONS

Kamil Jastrzębski

Jagiellonian University, Golębia 24, 31-007 Cracow

kamil.jastrzebski19@gmail.com

A few words about the author(s):

Graduate of BA studies in journalism and social communication. He studies public discourse, rhetoric, changes in the media system and issues at the interface between politics and media.

Abstract:

In this study, the author examines the rhetoric of anti-systemic groups during the parliamentary elections in Poland in 2011, 2015 and 2019. He takes into account the statements of the leaders and the most important representatives of these parties. The purpose of this is to compare the programs, the main passwords, and to see what patterns can be seen in these three cases. By "anti-systemic groups" is meant those which either called themselves this way or their nature indicated such a position on the political scene. Due to the relatively large dispersion within the spectrum, the author decided to take a look at only the largest of such formations, which are in chronological order: Palikot Movement, Kukiz'15 and Confederation.

Keywords:

anti-system, public discourse, rhetoric

DEVELOPING SPEECH IN CHILDREN IN KINDERGARDEN

Natalia Jeżewska

University of Silesia

nj8055@gmail.com

A few words about the author(s):

My name is Natalia Jeżewska. I am PhD student at the University of Silesia and I am studing Pedagogics. I am a Teacher. I am interested in intersemiotic translation literary text into the language of art and theater in work with children.

Abstract:

Preschool children often find it difficult to pronounce correctly.

It is very important to recognize the child's difficulty as early as possible and start appropriate speech therapy, which I want to mention in my speech. I will also show the results of research in recognizing speech difficulties in preschool children.

Keywords:

speech, Kindergarten, speech therapist, exercises

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REASONS FOR RECOGNIZING „FAKE NEWS" AS DEMERIT GOODS AND PROSPECTS FOR REGULATING INFORMATION MARKETS

Przemysław Koch

Wroclaw University of Economics and Business

przemyslaw.koch@poczta.fm

A few words about the author(s):

A student of economics at the Wroclaw University of Economics and Business. His scientific interests are mainly in the fields of microeconomics, institutional economics and public choice theory.

Abstract:

In the knowledge-based economy, information is one of the most important determinants of effective economic activity and improving well-being. However, with increased digitization, the prevalence and importance of false information - "fake news" – has also increased. In view of treating information as a good, especially a public good, "fake news" seems to be a demerit good - a good whose consumption is undesirable due to its harmfulness to consumers and society. Modern states usually take measures to limit these negative effects by regulating markets. However, the phenomenon of "fake news" is characterized by significant definition problems that should be resolved before formulating any regulations. The author concludes that "fake news", even in broad terms, seems to meet the criteria for being considered a demerit good, although with some justified doubts. The author also analyzes the papers dealing with the issues of "fake news" regulation, most of which suggest that the regulation of information markets in this area will be ineffective, and sometimes even counterproductive. In order to verify these claims, empirical research on a given phenomenon should be carried out.

Keywords:

demerit good, fake news, information markets, regulation

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METHODS AND TOOLS FOR MOTIVATING CREATIVE EMPLOYEES

Artur Łabuz

University of Szczecin

artur.labuz@usz.edu.pl

A few words about the author(s):

The author is a Ph.D. student at the University of Szczecin.

Abstract:

Motivation is one of the important factors influencing the performance of tasks entrusted to employees, it also affects the efficiency of work and is one of the perfect impulses for creating creative solutions. It should be noted that creative individuals will not necessarily be motivated by material methods, on the contrary, it may lead to worse results. In order to properly motivate creative employees, the organization must mainly focus on the internal motivation of employees, which is much more effective in this case than other types, and use the methods and tools related to it to maximize creative behavior among employees. Managers must build creative teams by selecting appropriate units, and then by observing employees, apply the appropriate forms of motivation through methods and tools. The presentation provides an overview of the methods and tools used to motivate creative employees.

Keywords:

creativity, methods, tools, employees, motivation

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PROPER NAMES IN TRANSLATION: OUTLINE OF THE ISSUE, REVIEW OF TRANSLATION TECHNIQUES AND ANALYSIS OF EXAMPLES

Natalia Łaniecka

The Faculty of Modern Languages and Literatures, Adam Mickiewicz University in Poznań

2438099u@gmail.com

A few words about the author(s):

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

Abstract:

The aim of this presentation is to analyse the problem of translating proper names.

The author focused first on the issue of proper nouns - their types and functions in translation. Moreover, the techniques of translating proper names and numerous examples from various cultural texts are presented.

In almost every language there are much more proper names than common names.

Creating proper nouns is motivated by human and community needs. For the purpose of identification as well as orientation in space- places, people and objects must be termed by language. Proper names are not only part of the language, but most of all - they reflect culture. They play an important role in literary works and are important elements of the diegetic world.

The inconvenience of translating proper names is emphasized by many linguists and translators. Proper nouns have various functions in a literary text. The translator's task is to choose which of them is the most important and to select an appropriate translation technique. This is especially challenging when the proper name is not only meant to identify an object or a person, but also contains a word play or carries an additional literary allusion.

The translator must therefore comprehend the author's intentions and the message of the writing as well as possible, but also adapt to the limitations of the target language and the potential audience. Hence, it is a complex and multifaceted issue.

Keywords:

proper names, translation

THE COMPARISON OF GRAMMAR IN THE POLISH LANGUAGE TO POLISH SIGN LANGUAGE

Mikołaj Maj

Adam Mickiewicz University in Poznan

mikolaj.maj7001@gmail.com

A few words about the author(s):

Mikołaj Maj – student of Adam Mickiewicz University in Poznań. Interested in the exact sciences (biology and chemistry) and humanities (linguistics), getting the best of both worlds.

Abstract:

The common knowledge of Polish Sign Language (PJM) - despite its 200-year history - remains small among Poles. This lack of knowledge has created many myths about the language. One of them is the idea that "PJM is 'derivative' of the spoken language". According to this thinking, an utterance with a sign is based on the same grammar as a spoken utterance and can be translated as "sign for word". PJM is a natural, independent language that has its own grammar, very different from the spoken language. The aim of the article is to discuss selected aspects of PJM grammar.

Keywords:

Polish Sign Language, PJM, Polish Grammar

CODEPENDENCY – A PSYCHOANALYTIC PERSPECTIVE

Agata Mysona

Jagiellonian University in Kraków

agamysona2@gmail.com

A few words about the author(s):

Psychology student, interested in philosophy and psychoanalysis. Coordinator of Sekcja Psychoanalityczna of the scientific circle Koło Naukowe Studentów Psychologii Uniwersytetu Jagiellońskiego.

Abstract:

The purpose of this talk is to present various theoretizations placing themselves in the conceptual frames of pscyhoanalysis and the inspirations they brought to the understanding of the phenomenon of codependency. These conceptualizations have a common point in the search of the sources of codependency in early childhood, as well as all of them refer to the process of the constitution of subjectivity. Psychoanalytic theoretizations see codependency as a relatively permanent pattern, a transferential matrix shaped in infancy based on the relationship with the first caregivers. Another important aspect of these theories is the emphasis they place upon the interpersonal character of the difficulties occurring in relashionships marked by substance abuse: conflict does not stem from one partner forming the dyad but is enacted in a space between partners. Presented theories see codependency as a system of defences, a disposition predestinating the subject to seek a certian reletional pattern. Psychoanalytic and psychodynamic theories seem to depathologise the codependent subject as they do not see the need to isolate codependency as a separate personality disorder, but rather as a symptom, formed as a reaction to a specific symbolic enviroment the subject is immersed into.

Keywords:

codependency, addiction, psychoanalysis, object relations

UNDERSTAND THE INFPHRASIS. FROM LITERATURE TO PAINTING

Agnieszka Palion-Musioł

University of Bielsko-Biała

apalion@ath.bielsko.pl

A few words about the author(s):

Agnieszka Palion-Musioł, Ph.D. in Linguistics, is Assistant Professor at the University of Bielsko-Biala, Poland. Her research interests are Intersemiotic Translation and Resemiotisation, which she studies from a Multimodal Perspective.

Abstract:

The aim of this presentation is to analyse the correspondence between literature and visual arts, which can constitute an intersemiotic complementarity or equivalent for each other.

Infphrasis is a painting representation of the literary text, comprising a subjective interpretation, which substitutes literary text and is its re-presentation realized by the means of a visible symbol. As a preliminary remark, it should be emphasized that infphrasis is not identical to an illustration of the text, but it is an expression of emotions evoked by the act of reading. The illustration is rather an intersemiotic addition to the text or a complement, which then depicts the chosen excerpt. In contrast, infphrasis is autonomous. It represents the text being its visual substitute which remains equivalent to the reference text in terms of content. Infphrasis is not left in the semantic limbo, because it corresponds directly with the literary text and comprises a new piece of art, a new text of creative nature, which can provide a basis for further intersemiotic transformations and transpositions. This presentation also describes other phenomena and image-text relationships such as ekphrasis, imagery, intertextuality, or transposition, which are essential to understanding the core of infphrasis.

Keywords:

infphrasis, literature, visual arts, re-presentation

PRIMARY SCHOOL TEACHERS' OPINIONS ABOUT DISTANCE EDUCATION DURING A PANDEMIC

Martyna Perzan

University of Warmia and Mazury in Olsztyn

martynaa.perzan@wp.pl

A few words about the author(s):

Martyna Perzan – member of the Psychology Science Club "Faces", student of the 1st year of MA studies in the field of Pedagogy

Abstract:

The COVID-19 pandemic has made remote education a necessity. The aim of the research was to find out the opinions of primary school teachers about distance education during the pandemic. Research questions were:
1. What is the teachers' attitude to remote education?
2. What are the advantages of remote education according to teachers?
3. What are the disadvantages of remote education according to teachers?
The obtained data show that remote education contributed not only to the stress connected with new work tools, the frequent experience of technical problems and many hours spent away from the computer. Due to the fact that remote education became a necessity, the surveyed teachers developed or acquired new technical and digital skills, and many of them showed greater creativity in online classes.

Keywords:

distance education, pandemic, primary school, teachers

FACTORS INFLUENCING THE ABILITY TO EMPATHIZE

Martyna Perzan

University of Warmia and Mazury in Olsztyn

martynaa.perzan@wp.pl

A few words about the author(s):

Martyna Perzan – member of the Psychology Science Club "Faces", student of the 1st year of MA studies in the field of Pedagogy.

Abstract:

The presentation shows a theoretical study on empathy. It contains an explanations of what empathy is, types of empathy and what determines the ability of empathy according to psychologists, researchers, professors and specialists. There are factors influencing the ability to empathize connected with the proper functioning of the brain, upbringing, the child's relationship with parents, socialization and others.

Keywords:

empathy, the ability to empathize

COMPARISON OF YOUNG WOMEN AND YOUNG MEN ATTITUDE TO THEIR OWN BODY

Justyna Perzan

University of Warmia and Mazury in Olsztyn

justyna.perzan@wp.pl

A few words about the author(s):

Justyna Perzan studies Pedagogy at the University of Warmia and Mazury in Olsztyn. She is a member of the "Faces" science club.

Abstract:

The aim of the research was to find out how young adults perceive their bodies.
Research questions:
1. Are young adults satisfied with the appearance of their bodies?
2. Is there a gender differentiation in satisfaction with your body appearance?
3. What figures are desired by young women and young men?
The research tool was proprietary 5-question questionnaires - separate for women and men. The study involved 60 young adults (30 women and 30 men) aged 18-35 years old.

Keywords:

body, young adults, appearance, body perception

EDUCATION IN THE USA

Justyna Perzan

University of Warmia and Mazury in Olsztyn

justyna.perzan@wp.pl

A few words about the author(s):

Justyna Perzan is studying Pedagogy at the University of Warmia and Mazury in Olsztyn. She is a member of the "Faces" science club.

Abstract:

The presentation shows education at various levels in the USA. It presents, inter alia, the stages of education in terms of rank, grading scale and education management. It also compares the education systems in Poland and the USA.

Keywords:

education, USA, educational system

COOPETITION – STRATEGY IN BUSINESS

Karolina Piotrowska

Warsaw University of Life Sciences

pkarolina783@gmail.com

A few words about the author(s):

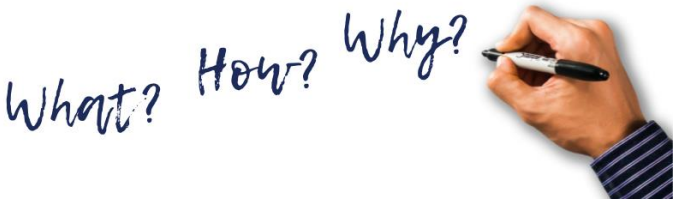
I am interested in economics. The presentation that I created is based on the knowledge of management and business. The topic interested me at the university, because coopetition is a very interesting scientific issue.

Abstract:

The enterprises in different industries compete with each other and, on the other hand, can also cooperate. Coopetition is a relationship between two companies that create a collaboration within the same activity. The coopetition strategy may generate tension between the entities resulting from different goals of the coopetitors. The presentation also describes barriers to coopetition and a cooperative game.

Keywords:

coopetition, competition, cooperation, enterprises



ECONOMIC PERSPECTIVES OF RENEWABLE ENERGY SYSTEMS

Magdalena Sikorska

Cracow University of Economics

magdalena.sikoorska@wp.pl

A few words about the author(s):

PhD student at the College of Economics, Finance and Law at the Cracow University of Economics. Research and teaching assistant in the Department of Economics at Podhale State Higher Vocational School in Nowy Targ.

Abstract:

The energy sector and its future and development directions are among the key issues in the economy of any country. Political and social aspirations are changing the traditional operating system of energy companies and influencing the need to implement innovation processes. New directions of development and changes taking place in the energy sector should ensure energy security in the country on the one hand, and on the other hand they become a prerequisite for the growth of competitiveness of the sector and allow to meet multidimensional challenges at the national, European and global level. The depletion of fossil fuel resources and the need to reduce carbon emissions are driving growing interest in renewable energy sources: solar, wind, hydro, geothermal and biomass energy. EU legislation to promote renewables has also evolved significantly in recent years. Therefore, the purpose of this article is to present conditions for the development of the renewable energy sector in Poland.

Keywords:

renewable energy sources, sustainable development, energy policy, energy economics

ALTRUISM: THE FOUNDATION OF SOCIAL GROUP FUNCTIONING AND ITS NEURONAL CORRELATES

Alicja Terelak

Department of Cognitive Science, Nicolaus Copernicus University; Collegium Minus, Fosa Staromiejska 1A, 87-100 Torun, Poland

alicja.terelak@gmail.com

A few words about the author(s):

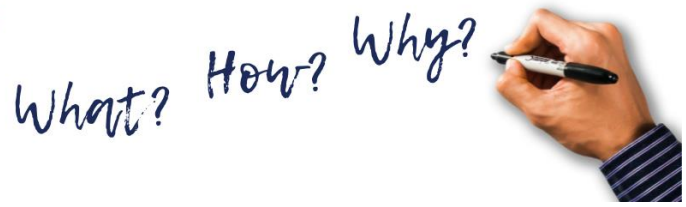
Student of cognitive science at the NCU, scientifically oriented around neuroscience. In her research, she deals with the neurobiological foundations of social bonds, the non-obvious possibilities of neuropeptides, the role of language in cognition.

Abstract:

Homo sapiens is a unique species of creature that stands out on many levels. The great majority of mammals live a solitary lifestyle, or limit their social contacts to very restricted kin groups. Primates are the order of mammals that contains the most numerous group of species able to organise themselves into close groups. Life in any kind of group determines the existence of certain rules of cooperation, which represent a local code, defining the behaviour of members of a group as desired and undesired. This code is called morality. Biology identifies various types of cooperation between members of a group. The most basic are mutualism and reciprocal altruism. Because of the direct effect of mutualism, there is no chance for cheating at all. Reciprocal altruism is a cooperation in which those who take part in this cooperation are not looking for an immediate benefit, but they are looking for a later benefit. This situation is slightly more complicated because, there is the possibility of various forms of cheating. Reciprocal altruism, forms the base for regulating the actions of social groups among species, which are able to gather into stable collectives, often meeting members who punish ungrateful ones. This paper aims to present the mechanisms involved in altruism and various forms of cooperation between people, as well as the neural and neurobiological basis of altruism and to show how it is reflected in the behaviours that regulate human social life.

Keywords:

reciprocal altruism, cooperation, neuronal correlates



VASOPRESSIN: MECHANISMS BEHIND SOCIAL BONDING AND ATTACHMENT

Alicja Terelak

Department of Cognitive Science, Nicolaus Copernicus University; Collegium Minus, Fosa Staromiejska 1A, 87-100 Torun, Poland

alicja.terelak@gmail.com

A few words about the author(s):

Student of cognitive science at the NCU, scientifically oriented around neuroscience. In her research, she deals with the neurobiological foundations of social bonds, the non-obvious possibilities of neuropeptides, the role of language in cognition.

Abstract:

In humans and rodents, arginine vasopressin (AVP) regulates several different physiological functions, for example: blood osmolarity, reproduction, complex behaviour, memory and learning. This paper aims to shed light on the non-obvious functions of vasopressin, including the mechanism of social bonding and attachment.

Neuropeptides secreted by the pituitary gland - particularly vasopressin and oxytocin – have a different function, in relation to higher mental functions. Vasopressin (AVP) has an effect on strengthening romantic bonds and also influences sexual attraction. Prairie voles (Microtus ochrogaster) are a unique type of rodent that exhibit intense monogamous behaviour. There is high expression of c-Fos in their ventral globus pallidus, due to the high number of vasopressin neurons. Studies on prairie voles, mountain voles (Microtus montanus) and meadow voles (Microtus pennsylvanicus) show that promiscuous species exhibit monogamous behaviour after injection of vasopressin.

Keywords:

vasopressin, attachment, social bonding, voles

THE IMPACT OF ORGANIZATIONAL CULTURE ON THE EFFECTIVENESS OF QUALITY MANAGEMENT

Arkadiusz Trela

AWSB University in Dąbrowa Górnicza

arek.trela@op.pl

A few words about the author(s):

Expert, Representative and Auditor for quality management systems. Ph.D. student.

Abstract:

Pro-quality organizational culture obliges organizations to combine socio-cultural and managerial-organizational aspects of management in order to more effective quality management. Appropriate hierarchy of values, attitudes or practices conducted are cultural elements that are increasingly becoming the subject of not only scientific research, but also business practice on te field quality manaagement system, which with the development of corporate social responsibility (CSR) is becoming more and more important in organizations.

The purpose of the presentation is to present how managerial and cultural aspects (determinants) affect on the effectiveness of the quality management. The results of the literature study provide many examples that confirm the thesis that the effectiveness of quality management depends on aspects of organizational culture.

Keywords:

organizational culture, quality management systems, quality culture

CHALLENGES FACED BY AN EARLY CHILDHOOD EDUCATION TEACHER

Julia Ukleja

University of Warmia and Mazury in Olsztyn

juliaukleja@gmail.com

A few words about the author(s):

I am a student of 4th year of the Pedagogy of Early Education at the University of Warmia and Mazury in Olsztyn. In the future, I want to be a teacher in primary school. My passions are travelling and dancing.

Abstract:

The main aim of the research was to find out the opinions of early childhood education teachers about the importance of homework in the education of children in grades 1-3.

The respondents were 100 early childhood education teachers from the from the Warmińsko-Mazurskie voivodeship. A questionnaire was used to conduct the research.

The analysis and interpretation of the collected research material showed that teachers use written work as the most common form of homework. The homework verification is based on revision and evaluation. The respondents indicated mathematical education as the area causing most difficulties for the students. As the objective of homework, the respondents pointed out to developing a habit of revision of the processed material. The results of the research showed that homework is important in the educational process of students in early school age.

Keywords:

education, homework, school, teachers, children

THE USE OF WEBSITES IN EARLY CHILDHOOD EDUCATION

Julia Ukleja

University of Warmia and Mazury in Olsztyn

juliaukleja@gmail.com

A few words about the author(s):

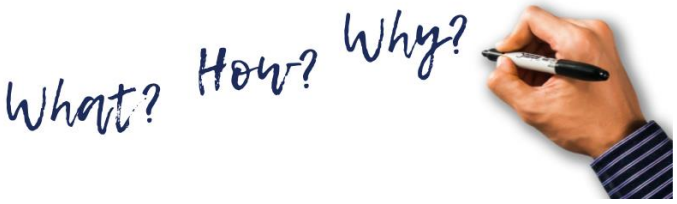
I am a student of 4th year of the Pedagogy of Early Education at the University of Warmia and Mazury in Olsztyn. In the future, I want to be a teacher in primary school. My passions are travelling and dancing.

Abstract:

The main aim of the research was to check which websites are used by early childhood education teachers. At the beginning of the work, the websites that were used during the research were characterized. The respondents were 50 teachers of early childhood education from the Warmińsko-Mazurskie voivodship. A questionnaire was used to conduct the research. Based on the results, the respondents chose Scholaris as the best website useful in their daily work. The teachers declared that they use websites that support the child's development. They use materials from websites mainly for computer, mathematics and science education.

Keywords:

websites, education, school, teachers



LOVE, HOPE, FAITH. IMAGO CHRISTI IN THE POST-CONCILIAR THEOLOGICAL REFLECTION OF THE THREE POPES (JOHN PAUL II, BENEDICT XVI AND FRANCIS)

Maja Wysocka

The Pontifical University of John Paul II in Krakow

wysocka.maja@interia.pl

A few words about the author(s):

Maja Wysocka. She is a PhD student at the Faculty of Theology of the Pontifical University of John Paul II in Krakow.

Abstract:

Analyzing papal teaching, we will look at the Christian aspect of the creation of man in the key of the theological virtues. In reflection, we will start from the Love, thanks to which Christ redeemed the world and restored the original image of God in man, erased by original sin. We will then focus our attention on the hope of eternal life that has been revealed through this Love, and finally we will refer to faith, which is the light that enables man to perceive the hope given to him in God's love. It will be shown how in Christ – the final Word of God's revelation - God "made himself known in the fullest way, told mankind who he is", in order to at the same time "fully reveal man to man himself".

Keywords:

Jesus Christ, Imago Christi, picture, similarity

ABSTRACTS OF
POSTERS

HUMANITIES
SCIENCES

CODING ON THE CARPET – WAYS AND SOLUTIONS FOR CREATIVE MATHEMATICAL EDUCATION

Natalia Jeżewska

University of Silesia

nj805@gmail.com

A few words about the author(s):

My name is Natalia Jeżewska. I am Ph.D. student at the University of Silesia and I am studing Pedagogics. I am a Teacher. I am interested in intersemiotic translation literary text into the language of art and theater in work with children.

Abstract:

Coding on the carpet is a creative method in the math education of young children. Through mathematical activities, we develop logical thinking, abstraction and creative problem solving in children.

Keywords:

coding, logical thinking, maths

SENIOR IN SOCIAL MEDIA

Daria Wrukowska

Nowe Pokolenie MK Agencja Social Media

dariawrukowska@gmail.com

A few words about the author(s):

Daria Wrukowska – The author's research interests are focused on the marketing of seniors, customer behavior and e-customers. She would like to investigate the factors and behaviors of older consumers that influence the choice and ability to use ICT.

Abstract:

Information technologies are conducive to the globalization of consumption habits, trends and other consumer expectations. Elderly generation of baby boomers is among the broad range of mobile technology buyers. Nowadays elderly people are exposed to information technologies to keep them in touch with younger generations. Among various technologies, social network sites (SNSs) are seldom used by the majority of elderly people.

To bridge the digital divide, it is necessary to dig deeply into the minority elderly users of SNSs.

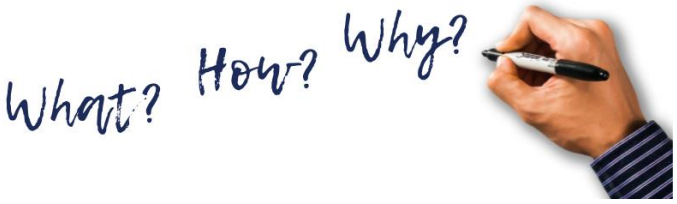
Keywords:

social media, seniors, ICT

ABSTRACTS OF

PRESENTATIONS

MEDICAL SCIENCES



MOTIVATION OF SECONDARY SCHOOL STUDENTS TO TAKE PHYSICAL EDUCATION LESSONS AND PHYSICAL ACTIVITY DURING THE COVID-19 PANDEMIC

Daria Buczkowska

Doctoral School, Institute of Physical Culture Sciences, University of Szczecin

daria.buczkowska@phd.usz.edu.pl

A few words about the author(s):

Daria Buczkowska completed her master's studies in 2020 in the field of Physical Education. Currently, she is studying at the Doctoral School at the University of Szczecin.

Abstract:

Due to the COVID-19 pandemic, teachers and their students were forced to participate in PE lessons remotely. This resulted in enormous difficulties in the implementation of teaching and maintaining the appropriate quality of education, in particular in practical classes, which mainly include physical education lessons. In two secondary schools in Szczecin, a study was conducted on the motivation of students to physical education and physical activity. They were carried out in February 2021. The study was carried out on the basis of the diagnostic survey method, the technique was a questionnaire, and the tool was the HBSC 2018 questionnaire and the own questionnaire. The sample participants included a total of 405 students aged 14-18. The analysis of the results showed that only 46 (26.1%) students from LO III assessed the motivations for physical education as good or very good. In high school 16, the percentage of students who gave the same answer was higher - 99 (43%) people. The study found that more students from LO III - 79 (44.9%) indicated good or very good motivation for any physical activity, similar in LO XVI - 123 (53.7%) people. The developed data allow for a preliminary characterization of the level of motivation for physical education lessons and physical activity of Szczecin youth during the COVID-19 pandemic.

Keywords:

pandemic, motivation, physical education, physical activity

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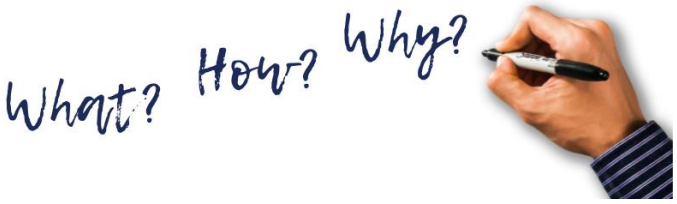


CHARACTERISTICS OF SOCIAL PHOBIA INCLUDING DIAGNOSTIC AND THERAPEUTIC ASPECTS

Jędrzej Dyk

Institute of Psychology, Faculty of Philosophy and Social Sciences,
Nicolaus Copernicus University in Toruń, Poland

jedrzej98@protonmail.com

A few words about the author(s):

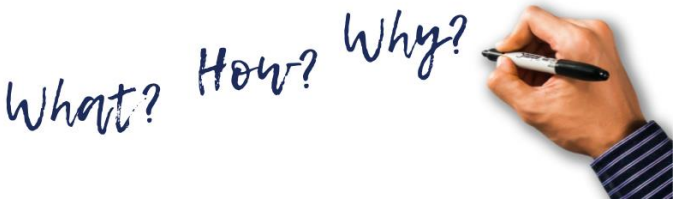
Jedrzej Dyk, a 5th year student of psychology at the University of Nicolaus Copernicus in Toruń. My interests revolve around clinical psychology broadly, particularly substance and behavioral addictions.

Abstract:

Social phobia (F40.1), is an anxiety disorder of the neurosis group (often confused with excessive shyness) in which a person experiences excessive and inadequate fear of all or some social situations. The patient avoids these situations or endures them with fear. The course of the disorder is chronic and persistent, significantly impairing personal and social functioning. By nature, it can be divided into generalized phobia (when fears affect almost all social situations) and non-generalized phobia (when fears affect only certain areas and types of social activity). It is one of the most commonly diagnosed mental disorders, and its prevalence in the child and adolescent population is estimated at 5-10% (there are cross-cultural differences), while it affects 2 to 3% of individuals in the general population. The patient affected by this disorder may resemble a shy person, whereas in social phobia the main difference is the presence of very strong avoidance of social situations and distress accompanied by autonomic arousal. Supportive and screening tools, namely the Social Avoidance and Distress Scale, the Fear of Negative Evaluation Scale, and the Liebowitz Social Anxiety Scale, are used in psychological assessment. A detailed patient history and prolonged observation in various anxiety-generating situations is necessary. Axial treatment is centered around psychotherapy and pharmacotherapy (if necessary).

Keywords:

social phobia, diagnosis, therapy



GADOLINIUM-BASED CONTRAST AGENTS AS A RISK OF NEPHROGENIC SYSTEMIC FIBROSIS IN PATIENTS WITH ADVANCED CHRONIC KIDNEY DISEASE

Robert Gattner

Nicolaus Copernicus University in Toruń, Ludwik Rydygier Collegium Medicum in Bydgoszcz

ro.gattner@gmail.com

A few words about the author(s):

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

Abstract:

Nephrogenic systemic fibrosis (NSF) is a progressive, potentially lethal, multiorgan fibrosing disorder, which might develop as a serious adverse reaction to gadolinium-based contrast agents used in magnetic resonance studies. It is associated with previous acute or severe chronic renal failure.

The aim of the present elaboration is to sum up current knowlege on the subject.

Keywords:

NSF, CKD, gadolinium contrast agents

SIGNIFICANCE OF SLEEP IN OUR LIVES

Maksymilian Kędzia, Katarzyna Kowalska

Nicolaus Copernicus University Ludwik Rydgier Collegium Medicum in Bydgoszcz

kmaks.kedzia@gmail.com, kat.joan.kowalska@gmail.com

A few words about the author(s):

Maksymilian and Katarzyna are after their first year of medical studies with great passion to medicine.

Abstract:

For thousands of years sleep has been an inseparable part of human nature. However, its function still remains unknown. The main aim of this study is to draw attention of the audience to their sleep quality and increase awareness of its importance. We will try to answer the questions about connections between sleep and wellbeing in on-call work or nursing homes. Beside this, we will discuss the impact of sleep quality on cognitive functions. Mental activity during the night will also be mentioned. Modern world offers many smartphone applications which claim to be useful in monitoring your sleep. Is it really reliable tool to get information about your nocturnal behavior?

Keywords:

sleep, cognitive functions, dream

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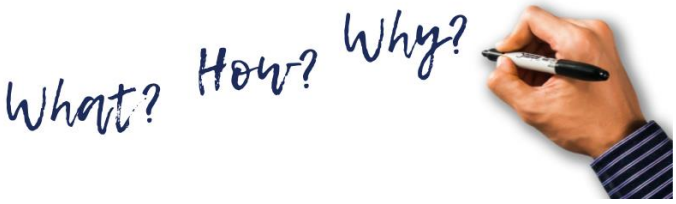

THE IMPACT OF HABITUAL COFFEE CONSUMPTION ON ARTERIAL HYPERTENSION

Bartosz Kulpa

Nicolaus Copernicus University in Toruń, Collegium Medicum in Bydgoszcz

bartosz.kulpaa@gmail.com

A few words about the author(s):

I am a medical student at Ludwik Rydygier Collegium Medicum in Bydgoszcz.

Abstract:

Coffee is one of the most consumed beverages in the world and is the main source of caffeine for adults. There are over 1000 chemical compounds in coffee, in addition to the best-studied caffeine responsible for the addictive nature of this drink, the composition includes, among others also chlorogenic acid, trigonelline or kahweol. Numerous studies indicate that habitual coffee consumption has a beneficial effect on the cardiovascular system and may prevent cardiovascular disease. Due to the prevalence of hypertension in the population, many questions are asked about the safety of habitual coffee consumption in patients with hypertension, and whether coffee consumption increases the risk of hypertension. Recent studies indicate that habitual consumption of coffee does not increase but may even reduce the risk of developing hypertension, and there has been no evidence of a negative effect on blood pressure in people with hypertension.

Keywords:

coffee, blood pressure, hypertension

A NEW LOOK AT ELECTROCONVULSIVE THERAPY IN THE TREATMENT OF DEPRESSIONS

Klaudia Smulewicz

Collegium Medicum UMK

klaudiasmulewicz19@gmail.com

A few words about the author(s):

I am a student at Ludwik Rydygier Collegium Medicum in Bydgoszcz.

Abstract:

Electroconvulsive therapy has been used for years as a method of treating psychic disorders. ECT is well-known and effective in treatment depression. Unfortunately, electroconvulsive therapy (ECT) has historically suffered a damaging stigma that has limited its use. Many people imagine that it is very painful and dangerous but nowadays ECT is very safe and more effective method than using antidepressants in some cases. It is especially recommended in drug resistant depression. ECT can be used in pregnancy and elderly depression. Much research has been done in recent years ,which confirm it is effectiveness. the mechanism of operation is not fully understood, it is supposed to be multi-faceted. This may offer advantages over other therapies, because depression is a disease with many causes. In recent years, by refining the procedure, the side effects have been significantly reduced.

Keywords:

electroconvulsive therapy, drug resistant depression

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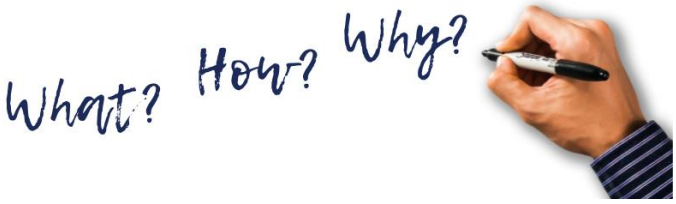


COMPARISON OF EVOLUTIONARY AND INDIVIDUAL DEVELOPMENT AS WELL AS GENETIC REGULATION IN THE FORMATION OF THE GIRDLE OF THE UPPER AND LOWER LIMBS

Kamila Sobczak*, Wioletta Nieścior

Collegium Medicum of Nicolaus Copernicus University

kamila_sobczak2001@wp.pl

A few words about the author(s):

Medical students at Nicholaus Copernicus University in Toruń. We were connected by a passion for anatomy, which we hope to develop further.

Abstract:

When analysing forelimb and hindlimb we can easily notice similarities between them. However while it's easy to recognise homological structures in the free part of the limbs, the girdles are harder to compare. To understand its nature it is crucial to examine the common points as well as differences in evolutionary and embryological development as well as genetic regulation of both limb girdles. From an evolutionary point of view, the pelvic girdle is younger and first developed in jawed fish, while pectoral girdle was present in jawless fish. Embryology points out that girdle development of both limbs start approximately in the same time, but have visible differences. While in pectoral girdle the acromion and coracoid process arise from scapula before the first signs of future clavicle, while all elements of pelvic girdle start in the same place – around the future acetabulum. Genetic pathways controlling development are not identical, however some genes such as Pax family and Emx2 have an important role in development of both girdles. We examined these aspects to answer the question about limb girdles homology.

Keywords:

anatomy, embryology, genetics, evolution, limb girdle

THE ROLE OF HIV – 1 INFECTION IN THE PROGRESSIVE DETERIORATION OF THE NERVOUS SYSTEM

Kamila Sobczak

Collegium Medicum Nicolaus Copernicus University Toruń

kamila_sobczak2001@wp.pl

A few words about the author(s):

Medical student at Nicolaus Copernicus University. Fascinated by human anatomy, neurology and genetics.

Abstract:

Patients with HIV -1 infection can exhibit changes in the CNS, which leads to progressive loss of cognitive abilities. The virus does not directly attack neurons, as the cells do not have CD4 receptors, crucial for infection. However, the CD4 receptors are present in glial cells, the macrophages, and the T- helper lymphocytes. Immunological response to infection in the brain causes neuronal injury, which can cause symptoms such as forgetfulness, headaches, behavioral changes, or mood disorders. It is crucial to examine the mechanism in which astrocytes can be infected by a virus, as these cells make approximately 60% of the brain, and can make a significant HIV - 1 reservoir. It is also proven that the HIV - 1 infection can lead to demyelinating disease. Understanding the viral infection's role in these changes can help diagnose patients and create appropriate prophylaxis for HIV – positive patients, to avoid or minimize neuronal damage.

Keywords:

HIV, brain damage, loss of cognitive abilities

TOTAL HIP ARTHROPLASTY, WHITCH APPROACH IS THE BEST?

Maciej Sokołowski

Nicolaus Copernicus University in Toruń Ludwik Rydygier Collegium Medicum in Bydgoszcz

sokolowskimaciej17@gmail.com

A few words about the author(s):

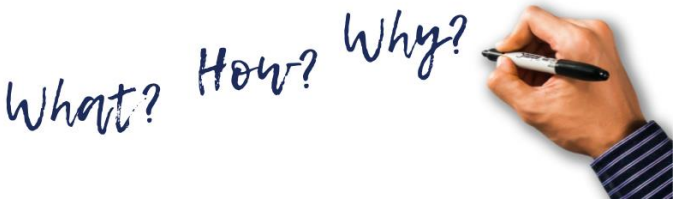
CM UMK student.

Abstract:

Total hip arthroplasty (THA) is an orthopeadic procedure which helps patients with advanced osteoarthritis. Over the years new approaches in THA have been invented and refined by surgeons. In this presentation I would like to present the pros and cons of major approaches and, based on that I will try to select the best one.

Keywords:

hip, arthroplasty, approach, anterior, posterior



PROPRIOCEPTION AND COGNITIVE PROCESSES

Bartosz Bagrowski

Poznan University of Medical Sciences

barbag97@gmail.com

A few words about the author(s):

Pediatric physiotherapist in Orthopaedic and Rehabilitation Clinical Hospital No. 4 of Poznan University of Medical Sciences; Bilateral Integration Therapist; Cognitive trainer; Occupational therapy instructor.

Abstract:

Movement is inseparable from the proprioceptive system - each movement not only requires a deep feeling, but also stimulates it. Thanks to proprioception, it is possible for the physiotherapist to indirectly influence the nervous system and stimulate it to work more effectively. One of the key methods in physiotherapy based on the sense of deep sensation is Proprioceptive Neuromuscular Facilitation (PNF). Neurophysiological studies have shown that appropriate PNF physiotherapy can stimulate the work of the cerebral cortex. In turn, the Feldenkrais method points out that focusing cognitive attention on the movement acts performed not only improves proprioceptive neuromuscular coordination, but can also positively affect mental activity. Proprioception is therefore a means by which not only correct movement patterns can be formed, but also has a beneficial effect on the cognitive apparatus.

Keywords:

cognitive functions, coordination, cortex, movement, proprioception

RELATIONSHIP OF SENSORY INTEGRATION WITH THE PSYCHOMOTOR DEVELOPMENT OF A CHILD

Bartosz Bagrowski

Poznan University of Medical Sciences

barbag97@gmail.com

A few words about the author(s):

Pediatric Physiotherapist in Orthopaedic and Rehabilitation Clinical Hospital No. 4 of Poznan University of Medical Sciences; Bilateral Integration Therapist; Cognitive trainer; Occupational therapy instructor.

Abstract:

Psychomotorics is an approach in which attention is paid to the relationship between the body and the psyche – deals with the relationships between movement and learning, executive functions and perception. Psychomotor development is the basis on which the other elements are built, i.e. the development of coordination and shaping the mental sphere in terms of cognitive and emotional - the child gets to know himself and other people and discovers the world, developing at the same time such skills as: concentration of attention, spatial orientation, sense of the body schema or psychomotor coordination. In the context of psychomotor development, an important role is played by sensory integration, i.e. the process of proper organization and ordering of information received by the senses. Sensory integration is the foundation of proper functioning because it plays an important role in shaping the percept and schema of one's own body, which is particularly important at every stage of psychomotor development.

Keywords:

body schema, cognitive functions, emotional development, psychomotorics, sensory integration

MONOCYTOSIS AS A POTENTIAL PROGNOSTIC MARKER OF CHRONIC LYMPHOCYTIC LEUKEMIA

Adrian Bakiera (1)*, Marcin Szum (1), Adam Michalski (1), Aleksandra Tomczak (1), Michał Zarobkiewicz (2), Waldemar Tomczak (3), Jacek Roliński (2), Agnieszka Bojarska-Junak (2), Wioleta Kowalska (2)

Medical University of Lublin:
(1) Student Scientific Group at the Chair and Department of Clinical Immunology
(2) Chair and Department of Clinical Immunology
(3) Department of Haematooncology and Bone Marrow Transplantation

*abakiera98@gmail.com

A few words about the author(s):

The authors are students, young and experienced scientifics at the Medical University of Lublin who, as a research team, carry out projects on the number and function of immune cell subpopulations in the pathogenesis of many diseases, including CLL.

Abstract:

INTRODUCTION: Leukocytosis with lymphocytosis, as well as confirmed presence of clonal CD5+/CD19+ B-cell are among diagnostic criteria of chronic lymphocytic leukemia (CLL). Currently it is suspected that level of peripheral blood monocytes in CLL patients can also serve as a prognostic factor. Interestingly, it was proven that monocyte count in addition to the other prognostic factors can help us to identify patients with high progression risk CLL.

AIM: The aim of the study was to assess the value of monocyte count as a prognostic factor in CLL patients at the different stages of the disease.

MATERIALS AND METHODS: During the study an absolute monocyte count (103/μl) was assessed in blood smear performed at the moment of diagnosis in 70 CLL patients and 21 healthy volunteers (HV).

RESULTS: Among patients diagnosed with CLL a statistically higher ($p<0.01$) level of monocytes was discovered, as compared to the HV. Furthermore, a statistically lower level ($p<0.05$) of monocytes was discovered in Rai 0 stage patients diagnosed with CLL, as compared to the patients in other stages of Rai classification.

CONCLUSIONS: Patients diagnosed with CLL have higher levels of monocytes than healthy population. Furthermore, it is speculated that monocytes may be involved in the process of progression of the disease, as suggested by the higher values of monocyte count in patients with high progression risk CLL compared to the intermediate and low progression risk CLL.

Keywords:

monocytosis, chronic lymphocytic leukemia

BODY COMPOSITION OF WOMEN NOT TAKING UP PHYSICAL ACTIVITY

Agata Malczyk (1), Zuzanna Całyniuk (2)*, Martyna Frątczak (3), Paweł Jurczak (3)

(1) University of Applied Sciences in Nysa
(2) University of Life Sciences in Lublin
(3) Student Scientific Association "Animal Sciences and Bioeconomy"
University of Life Sciences in Lublin

*zcalyniuk@gmail.com

A few words about the author(s):

Students and Ph.D. Student.

Abstract:

Inadequate nutrition and lack of physical activity are conducive to the development of diseases, which may not be clinically manifested at first, therefore regular monitoring of the health condition is essential for its preservation.

Material and research methods.

548 women aged 19-26 participated in the study. Body composition was assessed using the InBody model MC-780 analyzer by electrical bioimpedance and anthropometric BMI. The study provided information on body fat and lean tissue [%], muscle mass [kg], bone mineral mass [kg], total water [kg] including intracellular and extracellular water [kg] and the proportion of extracellular water to total [%] as well as BMI [kg/m^2], visceral tissue index, metabolic age [years] and basal metabolism [kcal]. The obtained results were analyzed statistically. The significance level was adopted for $p = 0.05$. The statistical analysis was performed using the statistical program Statistica 13.3.

Over 75% of the surveyed women aged 19-26 had a normal body weight, and almost 90% had a normal body water content. However, the ratio of extracellular water to total body water increased in 86.7% of the women tested. The ratio of extracellular water to total body water increased statistically with age. Almost 45% of the respondents had too high (high and high level) adipose tissue content in the body. Better nutritional status assessed on the basis of BMI and body composition analysis was characteristic of women at the age of 21.

Keywords:

woman, electrical bioimpedance, body composition

DOWNREGULATION OF MMP9 REGULATES THE METASTATIC POTENTIAL OF BREAST CANCER CELLS

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

Department of Histology and Embryology, Faculty of Medicine, Nicolaus Copernicus University in Toruń, Collegium Medicum in Bydgoszcz, Karłowicza 24, 85-092 Bydgoszcz, Poland

*mizdebska@cm.umk.pl

A few words about the author(s):

I am a biology graduate at the Nicolaus Copernicus University and I work at the Department of Histology and Embryology at CM UMK.

Abstract:

Despite numerous scientific studies, the greatest clinical problem of cancer patients is the invasiveness and metastasis of cancer cells. This is especially true of breast cancer, especially as 81% of this type of cancer is invasive. Cancer cells acquire migratory capacity by changing their phenotype from epithelial to mesenchymal, which is related to the widely understood reorganization of the cytoskeleton. Recent literature indicates that not only the actin cytoskeleton is involved in the movement, but also the remodeling of the extracellular matrix (ECM), with particular emphasis on the role of metalloproteinases (MMPs). In the case of cancer cells, they "pave" the way for growing filopodia, and thus allow their movement. With regard to breast cancer, MMP-9 is of the greatest importance and is additionally considered a marker of this cancer. The research material consisted of two breast cancer cell lines: MCF-7 and MDA-MB-231, in which the level of MMP9 was reduced and additionally treated with cyclophosphamide, a drug standardly used in cancer therapy. The results of the obtained studies based on the analysis of MTT, Western blot, immunofluorescence, migration, and invasion of cells indicate that downregulation of MMP9 reduces the metastatic potential of breast cancer cells, and cyclophosphamide intensifies this process.

Keywords:

brest cancer, MMP9, metastasis

COVID-19 – LOTS OF DIVERGENT INFORMATION IN THE MEDIA WORLD & FEW FACTS

Magdalena Jańczyk (1)*, Ilona Samek (1), Krystian Cholewa (1), Dominika Psiuk (1), Joanna Milanowska (2)

(1) SKN at the Department of Applied Psychology of the Medical University of Lublin
(2) Department of Applied Psychology, Medical University of Lublin

*magdajanczyk7@gmail.com

A few words about the author(s):

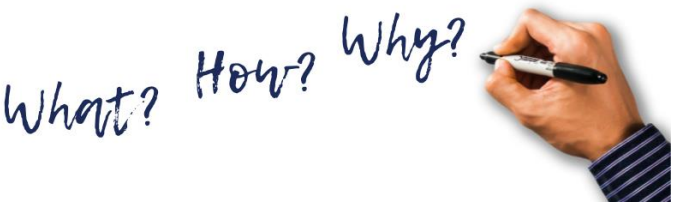
Magdalena Jańczyk – a radiographer, a student of Master's degree studies in electroradiology at the Medical University.

Abstract:

The SARS-CoV-2 has been a highly publicized topic from the beginning by all types of publications. The content released covered the emergence of the virus and global incidence statistics. Currently, it is also a major media theme, but with a groundswell of conflicting and controversial information correlating to the prevailing pandemic. To highlight the confusion regarding published content related to the COVID 19. The study was conducted by means of the author's questionnaire. Men (38%) and women (62%) participated in the survey. Nearly 97% of the respondents received at least 3 messages about the origin and transmission of the virus. The respondents specified as the route of transmission of the virus mainly "leakage" from the laboratory, consumption of frozen food from China and infection by bats. On the issue of vaccination, as many as 70% of respondents pointed to discrepant messages (compulsory acceptance of vaccination under the pretext of "sending" working people on unpaid leave & voluntary opportunity to accept vaccination). About 60% of the respondents received conflicting messages about the efficacy of COVID-19 vaccination (efficacy about 90% & 50%). There was also controversy among the respondents regarding rumors about the so-called covid supplement. Data suggest that people are lost in the plethora of conflicting information reaching them. The public does not know which data shared is true and this translates into disregard for pandemic control principles.

Keywords:

COVID 19, media, information



FASHION FOR HEALTHY EATING – VEGETARIANISM WITH HEAD

Magdalena Jańczyk (1)*, Ilona Samek (1), Krystian Cholewa (1), Dominika Psiuk (1), Joanna Milanowska (2)

(1) SKN at the Department of Applied Psychology of the Medical University of Lublin
(2) Department of Applied Psychology, Medical University of Lublin

*magdajanczyk7@gmail.com

A few words about the author(s):

Magdalena Jańczyk – a radiographer, a student of Master's degree studies in electroradiology at the Medical University.

Abstract:

INTRODUCTION: Vegetarianism is one of the popular diets followed by Poles. It is estimated that the number of such people in the country reaches 2 million (about 7%). According to published data vegetarianism is declared by the majority of people under 25 years of age as well as by seniors. It is worth emphasizing different forms of vegetarianism such as lacto-vegetarianism, semi-vegetarianism.

AIM: To present the opinion regarding vegetarian diet by people following it.

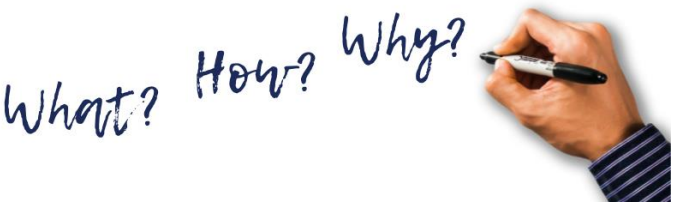
MATERIAL AND METHODS: The study was conducted with the help of the author's questionnaire, and the results were analysed.

RESULTS: Men (35%) and women (65%) participated in the study. Analysis showed that the majority of the respondents (72%) give up eating meat but do not reject other animal products (e. g. milk). Nearly 20% follow a restrictive diet and the rest prefer other forms of vegetarianism. Some respondents (24%) observe hair weakness and vitamin deficiencies, of which only 6% follow the principles of substitution according to their level of needs. The survey also shows that one in three respondents takes help from a nutritionist. According to the opinion leaders, the overall impact of the diet is positive or rather positive (59%), while an average impact is advocated by 31%.

CONCLUSIONS: The data suggest that a vegetarian diet does not necessarily carry negatives effects if followed rationally.

Keywords:

vegetarianism, fashion, nutrition



ALPHA-SYNUCLEIN AND ITS ROLE IN NEURODEGENERATIVE DISEASES

Dorian Jarek *(1), Jarosław Nuszkiewicz (2), Karolina Szewczyk-Golec (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*Number-four@wp.pl

A few words about the author(s):

Dorian Julian Jarek is a first-year student of medicine at Collegium Medicum, Nicolaus Copernicus University, since October working at the Students Research Club of Medical Biology.

Abstract:

Alpha-synuclein (α-syn) is a peptide, a product of SNCA gene, which locus is 4q21. There are several mutations that can cause the production of malformed α-syn, which then accumulates in the form of Lewy Bodies (LB). Synucleinopathies (SCPs) is a cumulative term for α-syn related diseases and is divided in four different neuropathologies, of which Parkinson's disease (PD) is the most common, affecting about 2% of population over the age of 60. The other are dementia with Lewy Bodies (DLB), multiple systems atrophy (MSA) and pure autonomic failure (PAF). All of these are thought to be caused by neurodegeneration and accumulation of α-syn in LB. Characteristic symptoms of PD are rigidity, bradykinesia and non-motor symptoms, including depression, dysosmia, and pain. Many of PD's symptoms are also present in other SCPs, but they differ in various matters. DLB is similar in terms of pathology to PD but when it comes to symptoms it is alike to Alzheimer's disease. It's thought to be caused by different distribution of pathological changes, in PD, the substantia nigra is damaged, while DLB patients exhibits malformations in the cerebral cortex. MSA occurs in two variants: Parkinsonian, in which patients suffer to the symptoms similar to PD, and cerebral, which includes impaired coordination and ataxia. PAF causes urinary and sexual dysfunction and hypoperfusion in the neck area. It is also thought to be an intermediate state to central neurodegenerative disorders.

Keywords:

alpha-synuclein, neurodegeneration, Parkinson's disease, synucleinopathy

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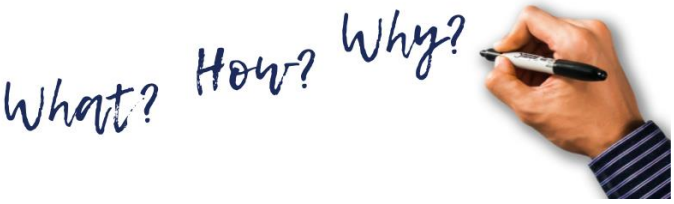

MITOCHONDRIAL DISORDERS IN HUNTINGTON'S DISEASE

Dorian Jarek *(1), Jarosław Nuszkiewicz (2), Karolina Szewczyk-Golec (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*Number-four@wp.pl

A few words about the author(s):

Dorian Julian Jarek is a first-year student of medicine at Collegium Medicum, Nicolaus Copernicus University, since October working at the Students Research Club of Medical Biology.

Abstract:

Huntington's disease (HD) is an incurable, hereditary neurodegenerative disease, also known as Huntington's chorea. Symptoms begin to show up around the age of 30, including involuntary choreiform movements, mental disorders, dementia and cognitive deficits. All of these are thought to be caused by mutations in HTT gene (locus 4p16.3), which causes an abnormal number of glutamine residues in the structure of huntingtin protein. It leads to the cerebral cortex atrophy, enlargement of lateral ventricles and accumulation of mutated huntingtin (mHtt) in the striatum, especially in the caudate nucleus. Mitochondrial dysfunctions are often associated with the pathogenesis of HD. mHtt alters many mitochondrial functions, such as trafficking and Ca2+ homeostasis. It is caused by a mHtt's direct interaction with the mitochondrial outer membrane. Moreover, N-terminal fragments of mHtt affect translocase of the inner membrane 23 (TIM23), which results in impairing a protein import mechanism and leads to neurodegeneration. According to studies, mitochondria with protein import defect are present in presymptomatic HD brain, but they are absent in other organs, which leads to the conclusion that it is an early and tissue-specific symptom of the disease. All mentioned defects have an impact on the development of HD.

Keywords:

Huntingtin, Huntington's disease, mitochondrial dysfunction

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ROLE OF MITOCHONDRIAL DYSFUNCTIONS IN THE DEVELOPMENT AND COURSE OF MULTIPLE SCLEROSIS

Dorian Jarek *(1), Jarosław Nuszkiewicz (2), Karolina Szewczyk-Golec (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*Number-four@wp.pl

A few words about the author(s):

Dorian Julian Jarek is a first-year student of medicine at Collegium Medicum, Nicolaus Copernicus University, since October working at the Students Research Club of Medical Biology.

Abstract:

Multiple sclerosis (MS) is one of the most common neurodegenerative diseases, causing chronic inflammatory demyelination, affecting more than 2 million people worldwide. Many characteristic symptoms appear in the course of MS. Most common are motor disorders, such as fatigue, problems with vision, muscle weakness, rigidity and spasms, severe pain, and several non-motor symptoms, including depression, anxiety, impaired learning, thinking and planning. All of these are thought to be caused by two processes: autoimmune neuroinflammation, which causes an atrophy of myelin sheath components, and neurodegeneration, a main factor responsible for the progression of the disease. Mitochondrial dysfunctions are often associated with the pathogenesis of many neurodegenerative diseases, including MS. Mitochondria are one of the most important organelles in the development of MS because of a high energy demand of demyelinatised neurons, which use a lot of adenosine triphosphate (ATP). In myelinated neurons, an impulse goes through saltatory conduction, which allows cells to depolarize only a small part of their membrane. In the cause of MS neurons, they use more ATP because of a larger surface without myelin sheaths. In addition, defective mitochondria cause further neurodegeneration by the excessive production of reactive oxygen and nitrogen species. All of these defects have an impact on the development of MS.

Keywords:

mitochondria dysfunction, multiple sclerosis, reactive oxygen species, reactive nitrogen species

ONCOLOGICAL COMPLICATIONS IN DENTAL PRACTICE

Natalia Kazimierczak (1)*, Wojciech Kazimierczak (2), Ewa Ziółkowska (3)

(1) Kuyavian-Pomeranian University in Bydgoszcz
(2) Department of Radiology and Diagnostic Imaging, Dr. A. Jurasz University Hospital No. 1
(3) President Stanisław Wojciechowski Kalisz Academy

*natnowicka@gmail.com

A few words about the author(s):

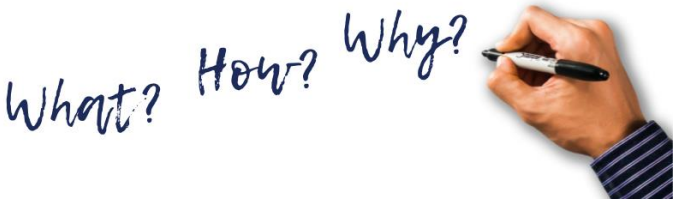
Dentist, Master of Science in Orthodontics. Since 2014 she has been a lecturer at KPSW in Bydgoszcz. She is constantly expanding her knowledge, participating in specialized courses in Poland and around the world.

Abstract:

Chemotherapy and radiotherapy are one of the basic types of therapies used in oncology. The high survival rate obliges the world of medicine to develop algorithms and protocols for dental diagnostics and treatment. Dental treatment should be based on the knowledge consulted with doctors of other specialties.

Keywords:

radiation therapy, chemotherapy, dental care, treatment, dental complications



THE ROLE OF VITAMIN D IN THE DEVELOPMENT OF PSORIASIS

Oliwia Kotowska (1)*, Paulina Mucha (1), Jarosław Nuszkiewicz (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*olikot10@wp.pl

A few words about the author(s):

Oliwia Kotowska is a first-year student of medicine at Ludwik Rydgier Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Toruń, a member of the Student Research Club of Medical Biology.

Abstract:

Psoriasis develops based on the malfunction of the immune system. In its course, an excessive proliferation occurs, including the division and growth of epidermal cells. The epidermis is the natural source of vitamin D synthesis by sunlight action. Cholecalciferol (vitamin D3) is formed from 7-dehydrocholesterol in skin exposed to UV rays. It then undergoes 25-hydroxylation in the liver and 1α-hydroxylation in the kidney giving the active form of vitamin D3 - calcitriol. Studies have shown that vitamin D and its derivatives have the ability to inhibit abnormal cell division of the epidermis, which has found application in the treatment of diseases such as psoriasis. Vitamin D is responsible for the regulation of calcium-phosphate homeostasis and bone metabolism, has anti-inflammatory effects and inhibits immune reactions involving certain types of cells. In addition, studies have shown a link between vitamin D deficiency and the risk of developing psoriasis. The properties of vitamin D and its derivatives may help patients with psoriasis and vitamin D supplementation may be an auxiliary element of the therapy.

Keywords:

autoimmune disorders, psoriasis, vitamin D

THE RELATIONSHIP BETWEEN BREASTFEEDING AND POSTPARTUM DEPRESSION

Oliwia Kotowska (1)*, Jarosław Nuszkiewicz (2), Karolina Szewczyk-Golec (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*olikot10@wp.pl

A few words about the author(s):

Oliwia Kotowska is a first-year student of medicine at Ludwik Rydgier Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Toruń, a member of the Student Research Club of Medical Biology.

Abstract:

Breastfeeding brings many benefits for both the infant and the mother. It provides the child with a lower risk of infection and obesity, lower cholesterol level, improved cognitive and motor function and more. Breast milk contains numerous and well-balanced components, including water, proteins, lipids, carbohydrates, mineral salts, vitamins, trace elements, hormones, enzymes, growth factors and immune anti-infective and anti-inflammatory factors. Unproblematic breastfeeding can relieve stress, reduce the risk of breast and ovarian cancer and maternal depression. During breastfeeding, two hormones are secreted in the woman's body, namely prolactin and oxytocin. Prolactin is responsible for the production of milk, while oxytocin facilitates milk ejection from the breast. Lower levels of oxytocin have been shown to be associated with higher levels of postpartum depression. However, the relationship between breastfeeding and postpartum depression is two-way. Breastfeeding problems can increase the risk of postpartum depression, but postpartum depression can also lead to frequency disorder and early cessation of breastfeeding. An overview of the relationship between breastfeeding and postpartum depression in both aspects is discussed in the present paper.

Keywords:

breastfeeding, postpartum depression

HONEY AND ITS ANTIOXIDANT EFFECT

Joanna Kruszka (1)*, Jarosław Nuszkiewicz (2), Karolina Szewczyk-Golec (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*joannakruszka99@gmail.com

A few words about the author(s):

Joanna Eugenia Kruszka is a first-year student of medicine at Collegium Medicum, Nicolaus Copernicus University; since this year working at the Students Research Club of Medical Biology.

Abstract:

Honey is a natural food product known for its pro-health properties for centuries. It is produced by bees from nectar or plant secretions, which are then processed and enriched with specific substances. It is used all over the world in gastronomy, medicine and cosmetics. Honey is known for its antibacterial, antiviral, antifungal and antioxidant properties. Honey is a natural source of many biologically active substances, such as flavonoids, phenolic acids, riboflavin, niacin, folic acid, pantothenic acid, pyridoxine, ascorbic acid, glucose oxidase, catalase, organic acids and many others. The mentioned compounds help to restore the balance in the amount of reactive oxygen species (ROS), including superoxide anion ($O^{2\bullet-}$), hydroxyl radical (•OH) and hydrogen peroxide (H_2O_2), produced in the body in biochemical processes. The exact mechanism of action is unknown, but mechanisms such as free radical sequestration, hydrogen donation and metal ion chelation are proposed. By reducing oxidative stress, defined as an imbalance between free radicals generated in the organism and ROS-neutralizing mechanisms, honey may protect the organism against many diseases such as Alzheimer's, cancer, diabetes mellitus, metabolic diseases and premature aging.

Numerous methods are used to measure the antioxidant properties of honey, including oxygen radical absorbance capacity (ORAC) assay, 1,1-diphenyl-2-picrylhydrazyl (DPPH) scavenging assay and ferric reducing antioxidant power (FRAP) assay.

Keywords:

antioxidants honey, oxidative stress

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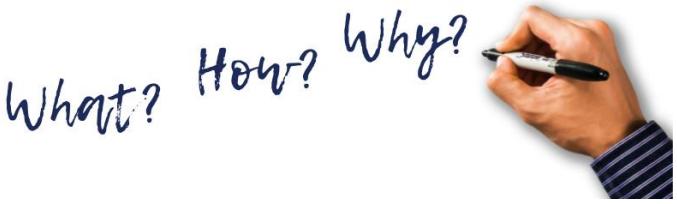

THE USE OF HYALURONIC ACID IN TISSUE REGENERATION

Joanna Kruszka (1)*, Jarosław Nuszkiewicz (2), Karolina Szewczyk-Golec (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*joannakruszka99@gmail.com

A few words about the author(s):

Joanna Eugenia Kruszka is a first-year student of medicine at Collegium Medicum, Nicolaus Copernicus University; since this year working at the Students Research Club of Medical Biology.

Abstract:

Hyaluronic acid (HA) is an organic compound, a polysaccharide from the group of glycosaminoglycans that consists of the disaccharide units of D-glucuronic acid and N-acetylglucosamine. It is found in many bacteria and in all vertebrates, mainly in the extracellular matrix where it stabilizes its structure and provides a gel state. HA is synthesized on the inner side of the cell membrane by transmembrane enzymes, namely HA 1 synthetase (HAS1), HA 2 synthetase (HAS2), and HA 3 synthetase (HAS3). Due to the presence of a hydroxyl group, HA can bind water, which provides moisturizing properties. Depending on the molecular weight (MW), hyaluronic acid molecules may exhibit different properties. High MW molecules play a large role in the joints as a lubricant and also have anti-inflammatory effects, in contrast to lower MW particles with pro-inflammatory effects. HA can also appear outside of cells as a signalling molecule. Due to its numerous properties, HA and its derivatives have found wide therapeutic application, among others, in skin regeneration, cartilage and bone regeneration, and ophthalmology. In tissue engineering, HA derivatives are used to create hydrogels and tissue scaffolds as biocompatible and biodegradable materials.

Keywords:

biomaterials, hyalouronic acid

TUMOR RESISTANCE MECHANISMS AND THE BREAST CANCER STEM CELL HYPOTHESIS

Joanna Kruszka (1)*, Jarosław Nuszkiewicz (2), Karolina Szewczyk-Golec (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*joannakruszka99@gmail.com

A few words about the author(s):

Joanna Eugenia Kruszka is a first-year student of medicine at Collegium Medicum, Nicolaus Copernicus University; since this year working at the Students Research Club of Medical Biology.

Abstract:

Breast cancer is one of the most common cancer in females in terms of morbidity and mortality in the world. In 2018, 18.1 million patients were diagnosed with this type of cancer, and around 2 million died from it. Its occurrence is conditioned by a mixture of genetic and environmental factors. It is characterized by high heterogeneity both between tumors from different patients and within one tumor.

Stem cells play an important role in the organism, especially in embryonic development. The cancer stem cell hypothesis assumes that cancer cells, like normal cells, arise from a minority subpopulation of cancer stem cells (CSC). These cells are resistant to radio- and chemotherapy, hide from the immune system and can acquire epithelial or mesenchymal features. The self-renewal and properties of breast CSC (BCSC) are regulated by the activation and interaction of pathways important for embryonic development, such as the Wingless-related integration site (WNT)/β-catenin and Hedgehog pathways. BCSCs induce drug resistance in a number of ways, including the overexpression of ATP-binding cassette (ABC) transporters, increased aldehyde dehydrogenase (ALDH) activity, enhanced DNA repair mechanisms, enhanced capture of reactive oxygen species, escape from cell death, autophagy and more. They are also capable of falling into a state of sleep, and keeping them that state, waking them up, or destroy them are all potential treatments.

Keywords:

breast cancer, cancer steam cells

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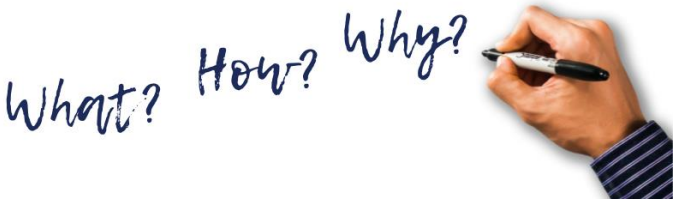


THE ROLE OF THE KYNURENINE PATHWAY OF TRYPTOPHAN METABOLISM IN TYPE 2 DIABETES

Justyna Kubacka*, Anna Stefańska

Department of Laboratory Medicine, Collegium Medicum, Nicolaus Copernicus University, Sklodowskiej-Curie 9, 85-094 Bydgoszcz

*justynkakubacka@wp.pl

A few words about the author(s):

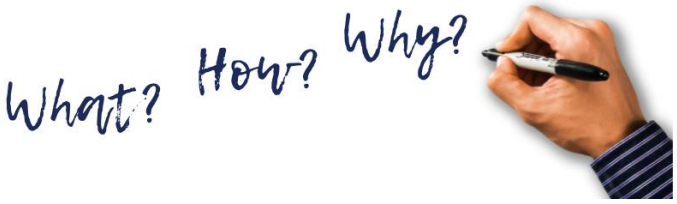
Justyna Kubacka – Ph.D. student; Anna Stefańska – dr. hab. prof. UMK.

Abstract:

Tryptophan (TRP) is an aromatic essential amino acid that plays an important role in the metabolic processes of the human body. A small proportion of dietary TRP is used for protein synthesis; a very small fraction (1%) produces serotonin and subsequently, a pineal hormone called melatonin. However, the main alternative route of tryptophan catabolism is the kynurenine (KP) pathway, responsible for nearly 95% of tryptophan degradation. The kynurenine pathway is a source of biologically active metabolites called kynurenines that can be able to influence or be under the influence of various body systems including the endocrine, immune and nervous systems with the final product of KP, nicotinamide adenine dinucleotide (NAD+), essential for important cellular processes. Until now, the role of this pathway and the effects of individual kynurenines have been studied mainly in the context of mental and neurological diseases, but over the past decade the interest of the kynurenine pathway has also increased in metabolic disorders, i.e. type 2 diabetes.

Keywords:

tryptophan, kynurenine pathway, diabetes mellitus



THE ROLE OF PERIOPERATIVE CONCENTRATIONS OF VITAMIN D IN THYROID SURGERY

Jan Milanowski (1)*, Jarosław Nuszkiewicz (2), Karolina Szewczyk-Golec (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*janek.milanowski@wp.pl

A few words about the author(s):

Jan Skarbimir Milanowski is a second-year student of medicine at Collegium Medicum, Nicolaus Copernicus University, working at the Students Research Club of Medical Biology for last three years. Interested in neurodegenerative diseases.

Abstract:

The thyroid gland is an endocrine gland producing triiodothyronine (T3), thyroxine (T4) and calcitonin. Near to the thyroid gland, parathyroid glands can be found. They secrete a parathyroid hormone which is antagonistic to calcitonin. All these hormones regulate cell metabolism and the calcium-phosphate balance. Thyroid diseases, such as goiter caused by iodine deficiency, Graves' disease, Hashimoto's disease or a number of neoplasms, necessitate surgical intervention (thyroidectomy). The parathyroid glands are often damaged during thyroidectomy, so the metabolism of calcium and phosphate suffers. Vitamin D, namely ergocalciferol (D2) and cholecalciferol (D3), and their biologically active form, calcitriol, are responsible for calcium homeostasis. It is done by regulating the interaction of the kidneys and parathyroid glands, promoting the absorption of calcium by the intestines, and enhancing the resorption of calcium and phosphate from the bones. Moreover, it has an immunomodulatory and antiproliferative effect in cancer and is supposed to have a positive effect on hypertension and inflammation in the course of heart failure. Vitamin D concentration measurements before and after thyroidectomy can be used as a predictor of the patient's condition during postoperative treatment. Routine vitamin D and calcium supplementation after thyroid surgery should also be considered, but this issue requires further clinical research.

Keywords:

cancer, surgery, thyroidectomy, vitamin D

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ROLE OF SELECTED ADIPOKINES AND MELATONIN IN HUNTINGTON'S DISEASE

Jan Milanowski (1)*, Jarosław Nuszkiewicz (2), Karolina Szewczyk-Golec (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*janek.milanowski@wp.pl

A few words about the author(s):

Jan Skarbimir Milanowski is a second-year student of medicine at Collegium Medicum, Nicolaus Copernicus University, working at the Students Research Club of Medical Biology for last three years. Interested in neurodegenerative diseases.

Abstract:

Huntington's disease (HD) is an autosomal dominantly inherited neurodegenerative disorder caused by mutations in HTT gene encoding huntingtin protein. Loss of neurons in the cerebral cortex and striatum, dysfunction of movement, cognitive and behavioral disturbances are observed in HD patients. HD is incurable and constantly progressing. Adipokines are substances produced by adipose tissue with various regulatory functions. Changes in the concentrations of some adipokines may be related to the pathogenesis of HD. Leptin is a protein involved in the regulation of hunger and satiety. Its level in HD is related to the number of CAG codon repeats in the mutated HTT gene. Increase in the leptin secretion is associated with worse prognosis. Adiponectin is an adipokine that modulates insulin sensitivity and the metabolism of the liver. In HD patients, a reduced concentration of adiponectin is observed, despite the lack of an increase in the amount of adipose tissue. This most likely reflects an impairment of adipocyte metabolism in HD. Melatonin, a pineal gland hormone that regulates biological rhythms, has neuroprotective properties. Low levels of melatonin in HD are believed to contribute to the progression of neurodegeneration. Understanding the role of adipokines and melatonin in the pathogenesis of HD course may allow us to better understand this disease, enable faster diagnosis and implementation of solutions that improve the quality of patients life.

Keywords:

adipokines, adiponectin, Huntington’s disease, leptin, melatonin

RECURRENT MYXOMA OF THE LEFT ATRIUM WITH AN EPISODE OF STROKE IN THE FORM OF RIGHT PARESIS, MIXED APHASIA, AND VASCULITIS OF THE LOWER LIMBS. A CASE RAPORT

Marina Milona*, Hubert Rola

Pomeranian Medical University

*marina.milona97@gmail.com

A few words about the author(s):

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

Abstract:

Cardiac Myxomas (CM) are noncancerous primary cardiac tumor with comprise about 50% of all benign cardiac tumors in adults a 15% of such tumors in children. Most of them arise from the left atrium (up to 75%), 20% of them from the right atrium, and rarely could arise from both atria and the ventricle. The clinical manifestation is related to the location, mobility, size of the tumor, and also relation to surrounding cardiac structures. Around 10% of CM cases are related (/inherited) to family syndrome such as Carney syndrome. This is an autosomal dominant mutation of the PRKAR1A gene. The symptoms that the patient presents include obstruction, preoperative embolism, and constitutional symptoms. The most common complications in patients with cardiac myxomas are neurological complications. The treatment choice is radical resection of the tumor with surrounding tissue and structures, which helps to protect the patient from recurrence.

It is a rare case of recurrent myxoma of the left atrium with an episode of stroke in the form of right paresis, mixed aphasia, and vasculitis of the lower limbs.

Keywords:

cardiac myxomas, cardiac tumor, symptoms

SURGICAL SITE INFECTIONS AFTER CARDIAC SURGERY: RISK FACTORS I PREVENTION STRATEGIES

Marina Milona*, Hubert Rola

Pomeranian Medical University

*marina.milona97@gmail.com

A few words about the author(s):

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

Abstract:

Surgical site infection (SSI) is the most common form of infection in health care institutions and accounts for 18.3% of all infections found in hospitals in Europe. Patients undergoing procedures surgery are particularly vulnerable to surgical site infections due to the very invasive nature of these treatments. Due to the serious clinical and economic reasons consequences of SWI, it is recommended to take preventive actions in the period before, during, and postoperative to reduce the morbidity and mortality rates associated with its complication. The identified SSI risk factors in procedures in cardiac surgery related to the patient include: age, obesity, diabetes, level blood glucose ≥ 200 mg/dL, smoking, having an infection elsewhere. The risk factors associated with the procedure are: the value of the surgical site risk index, length of preoperative stay, skin preparation, mechanical ventilation, non-observance of aseptic techniques, inadequate hygiene of the hands, the number of opened ones the door in the operating room during the procedure. Preventive measures used in treatments surgical procedures that effectively reduce the number of infections: prophylaxis antibiotic treatment within 1 hour before incision, stop using antibiotics within 48 hours after the operation, depilation in the immediate preoperative period, maintenance of intraoperative normothermia at 35.5 °C or more and control glycemia in the postoperative period, extended to 48 hours after surgery.

Keywords:

surgical site infection, sternal wound infection, risk factors

THE ROLE OF GUT MICROBIOTA IN THE DEVELOPMENT AND TREATMENT OF OBESITY

Paulina Mucha (1)*, Oliwia Kotowska (1), Karolina Szewczyk-Golec (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*paulinamucha99@gmail.com

A few words about the author(s):

Paulina Mucha is a third-year student of Pharmacy at Collegium Medicum, Nicolaus Copernicus University, working at the Student Research Club of Medical Biology.

Abstract:

Obesity is a complex disease involving an excessive amount of adipose tissue. Obesity is a serious problem because it is associated with poorer health outcomes and reduced quality of life. Most often, obesity develops from a prolonged imbalance of energy intake and energy expenditure. Obesity has individual, socioeconomic and environmental causes, including improper diet and low physical activity. Recent evidence, primarily from animal model studies, suggests that the composition and function of the gut microbiota has also an important role in the pathogenesis of obesity. In humans, the microbiota composition is usually different in lean and obese people. Currently, new research methods allow the identification of many bacteria that are a part of the intestinal microflora. It has been shown that some bacteria, particularly Firmicutes phylum are more efficient in obtaining energy from food than other species of bacteria, thus contributing to weight gain. Interestingly, obese people have less microbial diversity in comparison with lean subjects. Proper diet may improve the microbial richness and clinical phenotypes. The existing evidence supports further investigation of the gut microbiota and points to the use of modifying the gut microbiota in the treatment of overweight or obese people.

Keywords:

gut, microbiota, obesity

BUMETANIDE FOR AUTISM SPECTRUM DISORDER

Paulina Mucha (1)*, Jarosław Nuszkiewicz (2), Karolina Szewczyk-Golec (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*paulinamucha99@gmail.com

A few words about the author(s):

Paulina Mucha is a third-year student of Pharmacy at Collegium Medicum, Nicolaus Copernicus University, working at the Student Research Club of Medical Biology.

Abstract:

Autism is an early-onset pervasive developmental disorder. Autism spectrum disorders (ASDs) are a group of developmental disabilities that can cause significant behavioural and social challenges. The causes of autism are not fully understood. There are no medications for this disease. The treatment is only symptomatic. Recent studies suggest that bumetanide therapy may improve the core symptoms of ASDs. Bumetanide is a diuretic agent, a chloride importer antagonist and a GABAergic inhibition enhancer. Gamma aminobutyric acid (GABA) mediated synapses are altered in autism. It appears that bumetanide can restore the GABAergic inhibition in patients with neurodevelopmental disorders by decreasing neuronal chloride concentration. The intracellular level of chloride is primarily controlled by two chloride cotransporters, namely the Na-K-Cl cotransporter 1 (NKCC1), which is a chloride importer, and the potassium-chloride cotransporter 2 (KCC2), which is a chloride exporter. The diuretic bumetanide is a specific NKCC1 antagonist that reduces intracellular chloride levels. An exquisite selectivity of bumetanide to the NKCC1 chloride importer and the converging experimental data suggest that the therapeutic action of bumetanide is related to the alterations of Cl^- levels in amygdala neurons in patients with autism. In an open-label trial, bumetanide improved visual communication and recognition of emotive figures in adolescents with ASD.

Keywords:

autism, bumetanide, chloride, GABA

INTERVENTIONAL RADIOLOGY IN THE TREATMENT OF LIVER CANCERS

Magda Orzołek

Nicolaus Copernicus University in Toruń Ludwik Rydygier Collegium Medicum in Bydgoszcz

orz.magda@gmail.com

A few words about the author(s):

I am B.Sc. in Nursing, my main interests are bedsores treatment and palliative care.

Abstract:

The introduction of the presentation introduces the topic of cancer treatment, explaining the types of cancerous changes and risk factors. Then, after explaining the role of interventional radiology, combining imaging diagnostics and X-ray treatment, the presentation shows the techniques and procedures for the treatment for liver cancers by means of embolization, chemoembolization, radioembolization, thermal ablation and cryoablation. Effectiveness of the various procedures are compared at the end of the presentation.

Keywords:

X-ray treatment, cancer, liver cancer

RELATIONSHIP OF ABO BLOOD GROUPS WITH THE OCCURRENCE OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)- RESULTS OF A PRELIMINARY SYSTEMATIC REVIEW

Alicja Rewera-Burlikowska*, Bożena Mroczek

Department of Humanities in Medicine, PUM

*alicja.rewera@gmail.com

A few words about the author(s):

Bożena Mroczek, Ph.D., Assoc. Prof. Pomeranian Medical University in Szczecin, Poland. Head of the Department of Humanities in Medicine; Alicja Rewera-Burlikowska, medicine doctor, Ph.D. student at the Department of Humanities in Medicine.

Abstract:

COPD is a progressive disease of the lower airways with irreversible narrowing, resulting in respiratory failure. The reasons are passive and active smoking, environmental pollution, occupational exposure to dust and chemical compounds, genetic conditions and low socioeconomic status. The 1.57 times higher odds ratio of the occurrence of this disease in people with a positive family history of this disease prompts the search for the genetic basis of COPD. Belonging to blood group A or the lack of B antigen on the surface of erythrocytes may also be a possible risk factor for this disease.

The aim of the study was to present the relationship between ABO blood groups and the occurrence of COPD.

The study was based on a systematic review of the literature with key words: chronic obstructive pulmonary disease, blood groups, blood types, Rh blood groups, risk factors and PRISMA 2009 checklist guidelines. Seven out of 401 articles found in the SCOPUS, PUB MED, EBSCO, and EMBASE databases were qualified.

Six of the seven presented studies showed a correlation between having group A, B, AB or 0 and the occurrence of COPD. Ultimately, the association with ABO blood group was not considered a prognostic factor for COPD. The small number of studies conducted on the relationship between the blood group and the occurrence of COPD does not allow for drawing unequivocal conclusions regarding the studied correlation and indicates the need for wider population studies.

Keywords:

chronic obstructive pulmonary disease, blood groups, blood types, Rh blood groups, risk factors

PERSONALISED TREATMENT IN ORTHOPEDIC

Hubert Rola*, Marina Milona

Pomeranian Medical University

huberter@ymail.com

A few words about the author(s):

Medicine student at Pomeranian Medical University. Future orthopaedic surgeon, strongly interested in genetic, epigenetic and stem cells research.

Abstract:

The history of medicine shows that curing people was not an easy task – mortality was high. Everyone, more or less, was treated with the same strategy. If there was a patient with an infected leg, the leg was cut off whoever it was poor or rich. Ever since then situation has hanged diametrically. In the 21st century, we have new methods, so new possibilities. nowadays the main direction of treatment, especially in orthopedic, is to suit it for a specific patient. Especially in oncology - bone neoplasms, where diagnose is usually made too late and standard chemo- or/and radiotherapy does not work. Quite a lot of patients in orthopedic wards are also hematology patients with myeloma or other hematologic neoplasms. A new approach could not only cure the main illness, but it could help prevent complications such as compression fractures of the vertebra. The use of CRISP-R in near future could help cure genetic diseases, which back in the days were incurable, for example, Paget's disease or rheumatoid diseases like rheumatoid arthritis. Old strategy in medicine - treating everyone with the same approach will be limited only to emergency cases. the rest will be suited for patients to improve curability and to restrain the side effects of drugs.

Keywords:

orthopedic, epigenetic, CRISP-R, personalised treatment

NEW STRATEGIES IN OSTEOSARCOMA TREATMENT

Hubert Rola*, Marina Milona

Pomeranian Medical University

*huberter@ymail.com

A few words about the author(s):

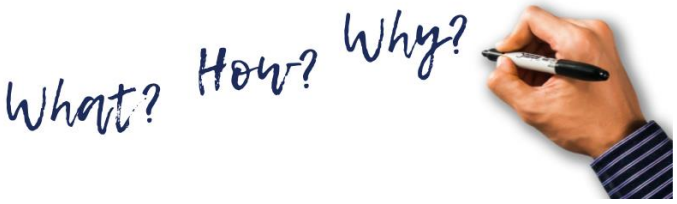
Medicine student at Pomeranian Medical University. Future orthopaedic surgeon, strongly interested in genetic, epigenetic and stem cells research.

Abstract:

Osteosarcoma (OS) is a sarcoma that affects bone, especially the lower femur or area of the knee. There are two peaks of patients at age 10-15 and around 50-60. In both groups progression of disease and symptoms can be different, but they accrue the same problems - diagnostics hence treatment is very difficult. Patients are usually diagnosed in a late stage of os and it is often drug-resistant. In the case of multi-drug resistance (MDR), there were no other options besides surgery or radiotherapy. With the ongoing progress of medicine and science field, doctors and scientists acquire new methods which could help not only treat but more important even prevent primarily progression of os. One of the hardest tasks in patients with os is to diagnose in the early stage - new methods could help with this problem. The main scientists' direction is immunotherapy, biologic treatment, and genetic modification such as crisp-r and epigenetic modifications. Some of them are in the clinical trial phase, but early results indicate decent efficiency even in MDR os. These are relatively new approaches in medicine overall, but it is necessary to connect old methods of diagnostic like MRI or CT and treatment like surgery with new ways of genome engineering to improve survivorship and curability.

Keywords:

orthopedic, CRISP-R, osteosarcoma, immunotherapy



INFLUENCE OF THE PHYSICAL ACTIVITY AND SELECTED FOOD PRODUCTS ON THE FACTORS OF THE CARDIOVASCULAR RISK OF THE PEOPLE WITH OVERWEIGHT AND OBESITY

Julia Ruszkiewicz

Ludwik Rydygier Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Toruń

juliaruszkiewicz6@gmail.com

A few words about the author(s):

Julia Ruszkiewicz – 4th-year student of medicine at Ludwik Rydygier Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Toruń.

Abstract:

Overweight and obesity deal more and more people and become huge problem for the health and social politics. According to data of the Polish main statistical office in 2014 overweight and obesity dealt 62% of men and 46% of women. Accumulation of excess body fat leads to many complications, including disturbance of lipid metabolism, hypertension and type 2 diabetes. Many of those issues can be prevented by modifying daily diet and introducing physical activity. Conducted researches shows that 30 minutes of the aerobic resistance training, 5 days a week, can improve lipid profile and reduce body weight and increase maximal oxygen uptake. An important fact is that people with higher physical efficiency are less exposed to cardiovascular diseases. By changing eating habits and introducing portion of the nuts or whole-grain foods to daily diet we can profitably influence on the carbohydrate management, improve lipid profile, reduce body weight and blood pressure, therefore apart from treatment of the effects of obesity it is important to introduce prevention to decrease risk of the complications caused by excessive accumulation of the adipose tissue and encourage patients to make changes in their daily diet and everyday physical activity.

Keywords:

overweight, obesity, physical activity, cardiovascular risk factors, diet

REVIEW OF ADVANCED THERAPIES IN PARKINSON'S DISEASE

Renata Seroka

Poznan University of Medical Sciences

seroka.renata@gmail.com

A few words about the author(s):

I am a graduate of Poznan University of Medical Sciene, where I studied nursing and continue to do so. I am president of a student science club on research methodology. I currently work as a nurse on a neurology unit.

Abstract:

Parkinson's disease (PD) is a neurodegenerative disorder that affects 0.15-0.3% of the population. From 1990 to 2016, the number of PD's patients increased from 2.5 million to 6.1 million worldwide, while the number of patients in Poland reaches about 90,000. The pathomechanism of PD's involves degeneration and graduate loss of dopaminergic neurons in the substantia nigra pars compacta along with destruction of its terminals in the striatum. This long-term process leads to the development of extrapyramidal symptoms, initially the typical motor ones and later the non-motor too. As the disease progresses, the response to treatment worsens and new motor, neurological and neuropsychiatric complications appear (e.g. dyskinesia, dystonia, postural instability, rigidity and dementia). When optimal oral or transdermal therapies have been exhausted or therapy leads to dangerous side effects, advanced forms of treatment are used, such as: Deep Brain Stimulation (DBS), Subcutaneous Apomorphine Infusion or Duodopa pump treatment.

Every year the number of PD's patients increases, therefore awareness of advanced therapies is essential to alleviate the symptoms of the late stage of the disease and prolong the autonomy of patients.

The aim of this presentation is to introduce advanced therapies in Parkinson's and analyze their mechanisms of action and effectiveness.

Keywords:

Parkinson's disease, advanced therapies

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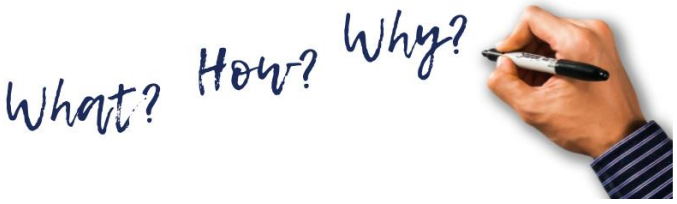

THE IMPACT OF THE DIET INTERVENTIONS ON MENTAL DISORDERS

Agata Grabowska (1, 2)*, Szymon Siatkowski (1), Ewelina Mularczyk (1, 2), Magdalena Dębiec (2, 3), Natalia Białoń (2)

(1) Department of Physiotherapy, The Jerzy Kukuczka Academy of Physical Education in Katowice
(2) Faculty of Medical Sciences in Katowice, The Medical University of Silesia
(3) Laboratory of Molecular Biology, Institute of Physiotherapy and Health Science, The Jerzy Kukuczka Academy of Physical Education

*agata.g141@gmail.com

A few words about the author(s):

We are students of two universities The Jerzy Kukuczka Academy of Physical Education in Katowice and Medical University of Silesia. We do like science and in the future we want to be good scientists.

Abstract:

The aim of the study was to review the literature on the impact of the diet interventions and dietary components on the symptoms of mental disorders. First, an outline of the modern therapy of mental disorders is presented, and then nutritional psychiatry is characterized. The new field of nutritional psychiatry provides evidence that dietary quality is a modifiable risk factor for mental illness. Recent systematic reviews that investigate the relationship between diet and common mental disorders have found that healthy eating patterns are inversely related to the likelihood of developing depression or the risk of developing depression. The evidence that describes the effect of the nature of the diet on the symptoms of mental disorders is listed below. Afterwards, probable biological processes that may influence the development of the disorders are described. The role of the intestinal microbiome has been taken into account in biological processes. Research on potential biological processes related to diet and mental health was mainly related to: inflammation, oxidative stress and neuroplasticity. The gut microbiome is a key mediating pathway in each of these processes. There are certain neurobiological mechanisms that can be modulated by diet. The use of dietary and nutraceutical interventions in mental disorders can influence their course and the onset of symptoms.

Keywords:

mental disorders, mental illness, diet, psychiatry, nutrition

EFFECT OF IRON DEFICIENCY ON HEART FAILURE

Jagoda Skrzeszewska (1)*, Jarosław Nuszkiewicz (2), Karolina Szewczyk-Golec (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*skrzeszewskajagoda@gmail.com

A few words about the author(s):

Jagoda Maria Skrzeszewska is a first-year student of medicine at Ludwik Rydygier Collegium Medicum in Bydgoszcz, Nicolaus Copernicus in Toruń; a member of the Students Research Club of Medical Biology.

Abstract:

Heart failure (HF) is a disease of various etiology that is the most common cause of morbidity and mortality in adults worldwide. The results of the European Society of Cardiology (ESC) registry show that the annual mortality of hospitalized patients is 11% and the risk of death due to HF is as high as 55%. Iron is an essential micronutrient for the proper functioning organism. It participates in the transport of oxygen, is involved in the metabolism of the heart and skeletal muscle. Iron deficiency is one of the most common comorbidities in patients with HF. Chronic iron deficiency and chronic anemia lead to a decrease in peripheral vascular resistance and blood pressure. The sympathetic nervous system and the renin-angiotensin-aldosterone system are then activated, resulting in an increase in water and sodium accumulation in the tissues. This leads to an increase in plasma volume, which exacerbates HF. In addition, a decrease in hemoglobin caused by iron deficiency reduces the amount of oxygen delivered to the cells. All of the mentioned factors cause adverse changes in the structure of the heart, leading to inflammation, hypertrophy and even the enlargement of heart cavities. Adverse remodeling of the heart causes its overload and the development of HF. Iron supplementation and avoidance of deficiency may protect against HF and are important in the prevention and treatment of heart disease.

Keywords:

anemia, heart failure, iron, iron deficiency

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EFFECT OF SUPPLEMENTATION WITH WITHANIA SOMNIFERA PREPARATIONS ON THE SYSTEMIC HOMEOSTASIS

Jagoda Skrzeszewska (1)*, Alicja Ziętara (1), Karolina Szewczyk-Golec (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*skrzeszewskajagoda@gmail.com

A few words about the author(s):

Jagoda Maria Skrzeszewska is a first-year student of medicine at Ludwik Rydygier Collegium Medicum in Bydgoszcz, Nicolaus Copernicus in Toruń; a member of the Students Research Club of Medical Biology.

Abstract:

Withania somnifera, commonly known as Indian ginseng or Ashwagandha. Among others, it seems to have a positive impact on the functioning of the nervous system. Ashwagandha leaves and roots are used for medicinal purposes, because numerous active phytonutrients, mainly vitanolides, alkaloids and sitoindosides, can be found in their chemical composition. The mentioned compounds have anti-stress and sedative effect. The anti-stress effect might take place due to the influence of the active substances on the hypothalamic-pituitary-adrenal axis. Withania somnifera plays an important role in weight control in obese adults who are under constant stress. It decreases serum cortisol and stress markers, that regulate eating behavior. The extract of the plant's root causes lowering of cholesterol, triglycerides, LDL and VLDL in diseases such as mild insulin-dependent diabetes and mild hypercholesterolemia. Moreover, Ashwagandha shows positive effects on sleep. Non-regenerative sleep (NRS) is one of the main symptoms of insomnia. NRS is associated with stress, anxiety or depression and increased levels of inflammatory markers such as C-reactive protein (CRP). By the fact that Withania somnifera has anxiety-reducing effects and causes a reduction in CRP levels, it allows the organism to prepare better for sleep. Therefore, it can be used in the treatment of NRS. Ashwagandha increases mental concentration and may be helpful in treating depression and other nervous system disorders.

Keywords:

Ashwagandha, cortisol, nervous system, phytonutrients, sleep, stress, Withania somnifera

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T FOLLICULAR HELPER CELL SUBSETS IN PATIENTS WITH CHRONIC LYMPHOCYTIC LEUKEMIA

Marcin Szum (1)*, Adrian Bakiera (1), Justyna Woś (2), Waldemar Tomczak (3), Jacek Roliński (2), Agnieszka Bojarska-Junak (2)

Medical University of Lublin:
(1) Student Scientific Group at the Chair and Department of Clinical Immunology
(2) Chair and Department of Clinical Immunology
(3) Department of Haematooncology and Bone Marrow Transplantation

*szummarcin@gmail.com

A few words about the author(s):

The authors are students and scientists of the Medical University of Lublin. They conduct research on the number and function of immune cell subpopulations in the pathogenesis of many diseases, including chronic lymphocytic leukemia.

Abstract:

INTRODUCTION: Chronic lymphocytic leukemia (CLL) is a neoplastic disease of the haematopoietic system. It is characterized by the accumulation of morphologically mature but functionally defective B lymphocytes in the peripheral blood, bone marrow, lymph nodes and spleen. CLL is characterized by impaired immune functions largely due to profound T-cell defects. The imbalance of Th1/Th2 was confirmed. Moreover, in the T-cell population, abnormalities have also been observed among follicular T-lymphocytes (THF), which have specialized properties in promoting normal B cell activation, but their role in CLL is unknown.

AIM: The aim of the study was to assess the THF cell subpopulation in the peripheral blood and their correlation with the clinical picture in patients with CLL.

MATERIALS AND METHODS: The research group consisted of: 40 untreated CLL patients and 20 healthy volunteers. The percentage of THF cells was tested in them by flow cytometry.

RESULTS: Among patients diagnosed with CLL, a statistically higher percentage of THF cells was discovered than in healthy volunteers. Moreover, in the group of patients as compared to healthy volunteers, a statistically higher percentage of THF1 lymphocytes and a lower percentage of the TFH2 subpopulation were observed.

CONCLUSIONS: A statistically significant higher percentage of T Follicular Helper Cells (TFH) in CLL patients compared to healthy controls suggests a significant role of these cells in the pathogenesis of CLL.

Keywords:

CLL, T lymphocytes, TFH

KEY NEGATIVE IMMUNE CHECKPOINTS MOLECULES ON THE MONOCYTES– SHORT REVIEW

Aleksandra Tomczak(1)*, Bartosz Twarowski (1), Adrian Bakiera (1), Michał Zarobkiewicz (2), Waldemar Tomczak (3), Agnieszka Bojarska-Junak (2), Wioleta Kowalska (2)

Medical University of Lublin:
(1) Student Scientific Group at the Chair and Department of Clinical Immunology
(2) Chair and Department of Clinical Immunology
(3) Department of Haematooncology and Bone Marrow Transplantation

*ola.m.tomczak@gmail.com

A few words about the author(s):

The authors are students, young and experienced researchers at the Medical University of Lublin who, as a research team, carry out projects on the number and function of immune cell sub-populations in the pathogenesis of many diseases.

Abstract:

INTRODUCTION: Monocytes are the cells of the innate immune response, which migrate to tissue and differentiate into macrophages or dendritic cells. Monocytes are divided into 3 subpopulations: classical, intermediate and nonclassical. Recent literature's data presents that monocytes can regulate the immune response through a mechanism dependent on the expression of negative immune checkpoints.
AIM: The aim of the study was to analyze the data from literature about the expression of PD-1, PD-L1 and TIM-3 on the monocytes in various diseases.
MATERIALS AND METHODS: Review of scientific articles (according to papers available in PubMed and Scopus) from the period 2018 – 2021.
RESULTS: Currently published items specify that the monocytes PD-L1+ are observed in patients with solid tumors (e.x. breast cancer, lung cancer) and hematological cancer (e.x Hodgkin lymphoma). The scientifics indicated that the percentage of PD-L1+ monocytes increased with disease progression. In addition to PD-L1 and PD-1, the immunomodulatory molecule of the cellular immune response is TIM-3. It has been reported that the monocytes TIM-3+ may be involved in the pathogenesis of many diseases, including chronic viral diseases [e.x. hepatitis B].
CONCLUSIONS: Based on the analyzed articles, it can be concluded that PD-L1/PD-1 and TIM-3 on monocytes affect the regulation of the immune response in various diseases. Probably blocking these cells can be an important therapeutic strategy in the future.

Keywords:

immune checkpoints, monocytes

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INFLUENCE OF GUT MICROFLORA ON THE DEVELOPMENT AND COURSE OF ALZHEIMER'S DISEASE

Alicja Ziętara (1)*, Jarosław Nuszkiewicz (2), Karolina Szewczyk-Golec (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*a.zietara@yahoo.pl

A few words about the author(s):

Alicja Ziętara is a first-year student of medicine at Ludwik Rydgier Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Toruń, a member of the Students Research Club of Medical Biology.

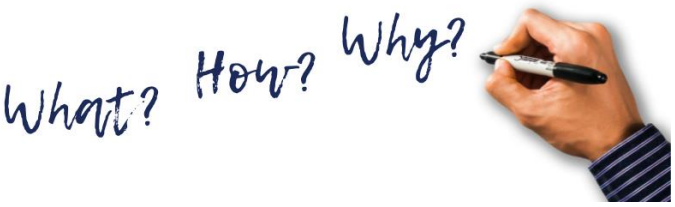
Abstract:

Microbiota intestinal disorders are supposed to be related to many human diseases. Disturbances along the brain-gut-microbiota axis may significantly contribute to the pathogenesis of neurodegenerative disorders. Alzheimer's disease (AD) is the most frequent cause of dementia characterized by a progressive decline in cognitive function associated with the formation of amyloid beta (Aβ) plaques and neurofibrillary tangles. The increased permeability of the gut and blood-brain barrier induced by microbiota dysbiosis may mediate or affect AD pathogenesis and other neurodegenerative disorders, especially those associated with aging. Moreover, bacteria populating the gut microbiota can secrete significant amounts of amyloids and lipopolysaccharides, which might contribute to the modulation of signaling pathways and the production of pro-inflammatory cytokines associated with the pathogenesis of AD.

In addition, stress can notably impact the microbiota-gut-brain axis at all stages of life. Modulation of the composition of gut microbiota may decrease the risk of AD and be able to slow down the progression of AD. Modification of the gut microbiota composition by probiotic supplementation or by food-based therapy may create new preventive and therapeutic options in AD. Understanding the mechanisms underlying the influence of the gut microbiota on the development of AD could provide new insights into novel treatments.

Keywords:

Alzheimer's disease, blood-brain barrier, gut microbiota



THE RELATION BETWEEN ENDOMETRIOSIS AND OVARIAN CANCER

Alicja Ziętara (1)*, Jagoda Skrzeszewska (1), Karolina Szewczyk-Golec (2)

Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University in Toruń:
(1) Students Research Club of Medical Biology
(2) Department of Medical Biology and Biochemistry

*a.zietara@yahoo.pl

A few words about the author(s):

Alicja Ziętara is a first-year student of medicine at Ludwik Rydgier Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Toruń, a member of the Students Research Club of Medical Biology.

Abstract:

Endometriosis is characterized by ectopic implantation of endometrial cells with elevated proliferation and migration. Recent molecular and pathological studies indicate that endometriosis may serve as a precursor of ovarian cancer (endometriosis-associated ovarian cancer, EAOC). Based on the current knowledge, histological and genetic alterations in endometriosis might explain why and how endometriosis can change into several types of cancer. There is sufficient evidence to conclude that there is an increased risk of developing clear-cell and endometrioid epithelial ovarian cancer for women with histologically verified endometriosis. According to clinical studies, EAOC patients present the symptoms at a younger age with a lower stage and grade of tumor and are more likely to be premenopausal than women with other types of ovarian cancer. Moreover, current molecular research aims to link endometriosis to EAOC through pathways related to oxidative stress, inflammation and hyperestrogenism. Numerous epidemiologic studies have shown an increased risk of EAOC among women with endometriosis.

Keywords:

endometriosis, endometriosis-associated ovarian cancer, ovarian cancer

ABSTRACTS OF

POSTERS

MEDICAL SCIENCES

ARSENIC EXPOSURE AND NEUROINFLAMMATION – A REVIEW

Anna Baranowska*, Jakub Kwiatkowski, Kamil Janawa, Michał Tomaszek, Patrycja Kupnicka

Department of Biochemistry and Medical Chemistry, Pomeranian Medical University in Szczecin, ul. Powstańców Wielkopolskich 72, 70-111 Szczecin, Poland

*a.baranowska96@wp.pl

A few words about the author(s):

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

Abstract:

INTRODUCTION: Arsenic is a toxic, carcinogenic element found in the form of inorganic and organic compounds. Due to the negative health effects observed after As exposure, the mechanism of its neurotoxicity, including neuroinflammation, is currently the subject of research.

AIM: The review of the latest research on the neurotoxicity of As in the context of neuroinflammation.

METHODS: The literature review was prepared by searching for scientific reports in the PubMed database. 10 papers were analyzed.

RESULTS: The pro-inflammatory effect of As organic compounds is related to the damage of the blood-brain barrier and an increase in its permeability to IFNγ. Increased concentration of IFNγ leads to the activation of microglia, an increase in the expression of the inflammatory cytokines IL-6 and TNF-α, and a decrease in the expression of CD200, a protein regulating neuroinflammation. As increases the expression of IL-1β, IFNγ, and TNF-α through the increased formation of ROS, which activate protein kinase C and MAPK. Also, in vitro studies showed an increase in gene expression of IL-1β, IL-6, TNF-α, COX-2, and MIF-1 in cortical astrocytes after As exposure. Regarding inorganic arsenic trioxide opinions are divided. Some studies indicate that arsenic trioxide limits microglia activation and alleviates inflammation, others that it increases inflammation in the nervous system.

CONCLUSIONS: Exposure to As leads to the activation of microglia and the development of neuroinflammation.

Keywords:

arsenic, neuroinflammation, neurotoxicity

HELICOBACTER PYLORI AND EPSTEIN-BARR VIRUS IN PATIENTS WITH GASTRIC CANCER

Magdalena Dzikowiec (1)*, Dorota Pastuszak-Lewandoska (2)

Chair of Biology and Medical Microbiology, Medical University of Lodz, Poland:
(1) Department of Biomedicine and Genetics
(2) Department of Microbiology and Laboratory Medical Immunology

*magdalena.dzikowiec@umed.lodz.pl

A few words about the author(s):

M. Dzikowiec: Assistant at the Department of Biomedicine and Genetics. The aim of doctorate research is to look for diagnostic and prognostic non-invasive biomarkers in patients with gastric cancer, focusing on altered expression of genes and miRNAs.

Abstract:

Despite the remarkable advances in science and medicine in recent years, cancer is the second leading cause of death after cardiovascular disease. It is estimated that infectious agents may be the etiological factor of up to 15-20% of cancers. Gastric cancer is one of the most common types of cancer, and due to the fact that the symptoms of the disease appear at an advanced stage, it is diagnosed very late. According to the data of WHO, in 2020 about 10 million people were diagnosed with new cases of cancer, and stomach cancer was in the 6th place. Helicobacter pylori and Epstein-Barr virus are mentioned as important risk factors for gastric cancer development. The aim of the research was to determine the prevalence of H. pylori and EBV in patients with gastric cancer. Helicobacter pylori has been recognized by the International Agency for Research on Cancer as a class 1 carcinogen. Prevalence of bacteria depends on the region of the world and the country, and in Poland is estimated at 66.6%. Epstein-Barr virus is very widespread in the world, affecting over 90% of people. Epstein-Barr virus-associated gastric carcinoma (EBVaGC) is a distinct subtype in terms of oncogenesis and molecular features and accounts for approximately 10% of cases. The co-infection with H. pylori causes chronic gastritis, and the inflammatory process is significantly increased. It has been proven that chronic inflammatory infection increases the risk of stomach cancer.

Keywords:

Helicobacter pylori infection, H. pylori prevalence, EBV infection, gastric cancer

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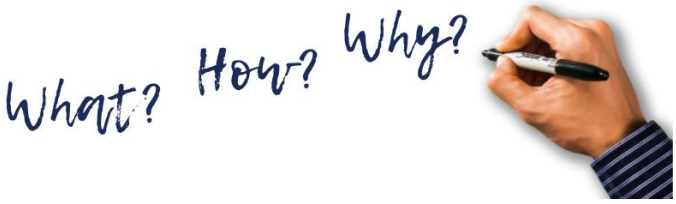

ADHD/ADD STIMULANT MEDICATIONS AND THEIR COGNITIVE-ENHANCING EFFECTS ON A HEALTHY ORGANISM: AN OVERVIEW OF ADDERALL AND ITS MEMORY AND ATTENTION-ENHANCING PROPERTIES

Konrad Hołowaty

Department of Chemistry, Jagiellonian University

K.holowaty@student.uj.edu.pl

A few words about the author(s):

Medicinal Chemistry student, halfway through master's degree, interested in neurochemistry.

Abstract:

The cognitive-enhancers are the most common drugs used in ADD and ADHD therapies. It is scientifically confirmed that their properties improve abilities such as memory and focus in individuals suffering from attention-deficit disorders. However, there is a recent trend of taking such drugs by healthy individuals, in order to improve their cognitive skills even further. This overview focuses on Adderall: one of the most popular ADHD-stimulant medications, and its memory and focus-improving effects on a healthy organism.

Keywords:

cognitive-enhancers, attention-deficit-disorder

EVALUATION OF THE RELIABILITY OF THE RULER DROP TEST PERFORMED BY MIXED MARTIAL ARTS FIGHTERS

Alan Langer (1)*, Jacek Polechoński (2)

(1) Student Scientific Circle of Physical Activity and Tourism in Virtual Reality "ACTIVE VR", The Jerzy Kukuczka Academy of Physical Education in Katowice
(2) Institute of Sport Sciences, The Jerzy Kukuczka Academy of Physical Education in Katowice

*langermma@gmail.com

A few words about the author(s):

Alan Langer – MMA fighter, S&C coach, Ph.D. student. Jacek Polechoński – physical education teacher, physiotherapist, Ph.D.

Abstract:

INTRODUCTION: The Ruler Drop Method (RDM) is one of the simple tests to evaluate reaction speed. Martial arts are among the sports in which the speed of reaction is of great importance. Therefore, it is worth considering the use of RDM in this type of discipline. However, the usefulness of the test depends on whether the measurements performed with it are sufficiently reliable.

AIM: The main aim of the research was to assess the reliability of RDM in the group of mixed martial arts (MMA) fighters. In addition, the reaction speed of the right and left hands was compared.

METHODS: 34 MMA fighters were tested. The test consisted in grasping the ruler dropped by the examiner. The intraclass correlation procedure was used to assess the reliability of the measurements.

RESULTS: Intraclass correlation coefficient (ICC) for the right hand was ICC=0.753, while for the left hand it was ICC=0.845, which in both cases indicates an excellent reliability test. MMA fighters obtained significantly better results ($p<0.05$) when performing the test with the left hand than with the right hand.

CONCLUSIONS: RDM can be considered a reliable test in a group of MMA fighters. It is difficult to unequivocally explain why MMA fighters reacted faster with their left hand, the more so as the group of competitors included the vast majority of right-handers. Perhaps this is due to the fact that the left hand is put forward during the fight and it plays the main role in the fight from a distance.

Keywords:

catch the ruler test, ruler drop method, MMA fighters, reliability, reaction speed

ANTIMICROBIAL ACTIVITY OF C10(6)-RR-NH2 LIPOPEPTIDE AGAINST MULTIDRUG-RESISTANT PSEUDOMONAS AERUGINOSA

Tomasz Pietrucha (1)*, Aleksandra Śmietańska (2), Róża Czerwińska (1), Olga Bortkiewicz (3), Damian Neubauer (4), Małgorzata Fleischer (3), Joanna Nowicka (3)

(1) Medical student, Students Scientific Society of Microbiologists association at the Department of Microbiology, Faculty of Medicine, Wroclaw Medical University
(2) Pharmacy student, Students Scientific Society of Microbiologists association at the Department of Microbiology, Faculty of Medicine, Wroclaw Medical University
(3) Department of Microbiology, Faculty of Medicine, Wroclaw Medical University (4) Department of Inorganic Chemistry, Faculty of Pharmacy, Medical University of Gdansk

*tomek.pietrucha97@gmail.com

A few words about the author(s):

We are a group of students working together with university employees. We are passionate about both laboratory and scientific work and we are really glad to combine it in the Microbiologists' Scientific Group at Wrocław Medical University.

Abstract:

Antimicrobial resistance is a problem of modern medicine. Antibiotics become less and less active and effective. Non-fermenting Gram-negative bacilli, such as multi-resistant Pseudomonas aeruginosa pose a big challenge. ß-lactams, especially carbapenems, are affected to a concerning and alarming degree. Short cationic lipopeptides are a promising group of compounds to fight MDR pathogens. They consist of a few basic amino acid residues and N-terminal fatty acid chain. Their modifications can lead to compounds with improved antimicrobial activity. The aim of our study was to determine the activity of C10(6)-RR-NH2 against carba-, imi-, meropenem-resistant strains of P. aeruginosa. Eleven clinical strains, isolated from the respiratory tract secretion of ICU patients and a model strain (ATTC 27853) were used. Lipopeptide C10(6)-RR-NH2 was used in the study. Strain sensitivity was measured quantitatively by determining the MIC value (minimum inhibitory concentration) and MBC (minimum bactericidal concentration). The activity of the peptide against mature biofilm was assessed by determining the MBEC (minimum biofilm eradication concentration). MIC, MBC and MBEC ranges were respectively 4-16 µg/mL, 32-128 µg/mL and 16-128 µg/mL. The MBEC values were 2-16x higher than the MIC values. The lipopeptide exhibited antimicrobial activity against the analised strains. Higher MBEC values could result from the difficulties in lipopeptide penetration into the mature biofilm's structure.

Keywords:

lipopeptide, antimicrobial activity, P. aeruginosa, biofilm

CAN VIRTUAL REALITY BOXING BE AN INTENSIVE FORM OF TRAINING FOR MIXED MARTIAL ARTS FIGHTERS?

Jacek Polechoński (1)*, Alan Langer (2)

(1) Institute of Sport Sciences, The Jerzy Kukuczka Academy of Physical Education in Katowice
(2) Student Scientific Circle of Physical Activity and Tourism in Virtual Reality "ACTIVE VR", The Jerzy Kukuczka Academy of Physical Education in Katowice

*j.polechonski@awf.katowice.pl

A few words about the author(s):

Jacek Polechoński – physical education teacher, physiotherapist, Ph.D. Alan Langer – MMA fighter, S&C coach, Ph.D. student.

Abstract:

Active video games in immersive virtual reality (IVR) are an emerging and dynamically developing form of physical activity (PA). Previous studies indicate that the intensity of this kind of physical exertion may be moderate or even high. It is interesting if PA in IVR can be intense enough for well-trained athletes? The aim of the study was to assess the intensity of PA mixed martial arts (MMA) fighters while practicing an active video game "Box VR" against the background of the control group. 23 MMA fighters were tested: 20 men and 3 women. The control group was 11 people: 6 men and 5 women not practicing martial arts. The subjects played the Box VR game for 10 minutes. A training program for beginners was used. The intensity of exercise was assessed using a heart rate monitor. The research also used the Rate of Perceived Exertion Scale. The studies showed that the intensity of PA in both groups was moderate and almost identical. However, the studied groups made significantly different ($p<0.05$) subjective assessment of physical effort. On a 10-point scale, MMA fighters rated the PA intensity during the Box VR game at 5.8±2.0 points, while people not training in martial arts at 4.5±1.6 points. Greater subjective fatigue of MMA fighters indicate their greater involvement in virtual training than non-athletes from the control group. A beginner training program was used during the research, so it seems that the PA intensity level could be increased by using the advanced version.

Keywords:

immersive virtual reality, physical activity, box, MMA fighters

ASSESSMENT OF OBESITY IN THE TIMES OF THE SARS-COV-2 VIRUS EPIDEMIC

Alicja Rewera-Burlikowska (1)*, Natalie Grzesch (2)

(1) Department of Humanities in Medicine, Pomeranian Medical University in Szczecin
(2) Department of Clinical and Molecular Biochemistry, Pomeranian Medical University in Szczecin

*alicja.rewera@gmail.com

A few words about the author(s):

Grzesch Natalie, laboratory diagnostician, Ph.D. student at the Department of Clinical and Molecular Biochemistry, PUM. Alicja Rewera-Burlikowska, medicine doctor, Ph.D. student at the Department of Humanities in Medicine, PUM.

Abstract:

2 billion people worldwide suffer from obesity and overweight. In Poland, it affects 8 million citizens, and 19 million are overweight (WHO). Counteracting them is included in the assumptions of the 2030 Agenda for Sustainable Development, which talk about sustainable consumption and production patterns as well as ensuring a healthy life and promoting prosperity.

The aim of the study was to present the problem of obesity in the COVID-19 era in Poland, in the context of the 3rd and 12th goals of sustainable development.

The publications in the Web of Science, Google Scholar and PubMed databases were analyzed, using the keywords "obesity", "COVID-19", "sustainable development Agenda 2030".

During the COVID-19 epidemic and related isolation, the risk of being overweight has increased and obesity. The reason was the compensation of negative emotions, fears and boredom by eating and limiting activity in the opinion of the Polish Society for the Study of Obesity. Being overweight in patients with SARS-COV-2 infection increased the risk of developing severe pneumonia by 86%, and obesity by 142%.

The gains and losses from COVID-19 prevention should be assessed against the increase in the number of overweight and obese people and their complications. Raising awareness about obesity, its causes and prevention in the COVID-19 era is important to achieving the goals of sustainable development.

Keywords:

obesity, COVID-19, sustainable development Agenda 2030

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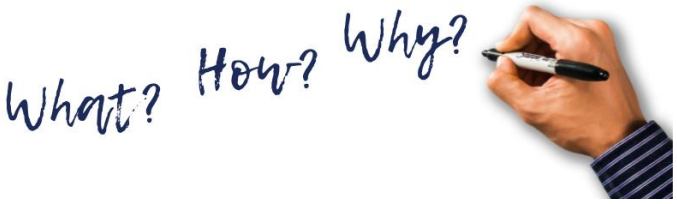

GERIATRIC PATIENT IN A PALIATIVE WARD UNDER THE CARE OF A PHYSIOTERAPIST IN THE FIELD OF MEDICAL REHABILITATION

Janina Danuta Rzeszot

University of Vocational Education

danuta.rz@op.pl

A few words about the author(s):

Physiotherapist.

Abstract:

General rehabilitation with a geriatric patient is a very developing area of health activity and a sector that strongly supports many governmental and UE instytutions, offering subsidies for the development of treatment facilities for the eldery, in geriatric, the most important thing is an indiwidual approach to the patient. Medical rehabilitation- comprehensive and team action for the benefit of a physically disablet person, aimed ay restoring that person to full physical or mental fitness, as well as the ability to work and actively participate in social life. In this paper, I present the application of rehabilitation of an elderly patient in a palliative department in a descriptive form. Physiotherapy is based on the use of movment and other physical factors that are found in nature for healing purposes . While rehabilitation involves activities to restore a patient's physical and mental helth, physical therapy is mainly about pain relief and restoring fitness. Cognitive rehabilitation aims to rebuild a disturdbed function or introduce compensation strategies to replace the lost ones. Neuropsychological rehabilitation is based on the assumption that controlled behavioral stimulation will intensify the proces of creating new connections in the domaged neural network, which in turn improves psychomotor functioning. The problems of geriatric rehabilitation are mainly based on physical activation. the main task is to prevent falls and maintain or improve functional status.

Keywords:

general rehabilitation, physiotherapy, while rehabilitation, cognitive, neuropsyhological rehabilitation

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ENVIRONMENTAL EXPOSURE TO CADMIUM AND THE DEVELOPMENT OF NEUROINFLAMMATION - A LITERATURE REVIEW

Michał Tomaszek*, Kamil Janawa, Anna Baranowska, Jakub Kwiatkowski, Patrycja Kupnicka

Department of Biochemistry and Medical Chemistry, Pomeranian Medical University, Powstańców Wlkp. 72, 70-111 Szczecin

*michaltomaszek97@gmail.com

A few words about the author(s):

Students at Pomeranian Medical University in Szczecin – Faculty of Medicine. Members of Biochemical Scientific Club.

Abstract:

INTRODUCTION: Cadmium crosses the blood-brain barrier and induces the activation of various signaling pathways involved in inflammation, oxidative stress and neuronal apoptosis. These disorders also affect microglia, which is the main regulator of the immune response in the central nervous system (CNS).

AIM: The review of the literature on the relationship between cadmium exposure and neuroinflammation.

METHODS: The review was prepared by searching for scientific reports in Medline and Scopus databases. 10 scientific articles were analyzed.

RESULTS: Exposure to Cd causes the formation of hydrogen peroxide, which contributes to the development of oxidative stress. Cadmium causes the activation of M1 microglia phenotype (responsible for inflammation and cytotoxic reactions), which results in the release of pro-inflammatory cytokines such as IL-6, IL-1β and TNF-α. Also, astrocytes, the largest glial cells, under the influence of Cd, release IL-6 and IL-8 by activating the MAPK cascade and regulating the NF-κB, leading to the development of inflammation and neuronal apoptosis. Also, increased activation of the NLRP3 inflammasome indicate cadmium-induced brain pyroptosis. In addition, cadmium inhibition of the AMPK-PGC-1α-NRF1/2 signaling pathway reduces the expression of mitochondrial-related regulatory factors OPA1 and TFAM, resulting in inflammasome growth.

CONCLUSIONS: Aforementioned studies indicate that cadmium exposure contributes to the development of neuroinflammation.

Keywords:

cadmium, neuroinflammation

ABSTRACTS OF

PRESENTATIONS

TECHNICAL AND NATURAL SCIENCES

MANAGEMENT OF INNOVATIONS IN THE ENERGY SECTOR

Czesław Fliśnik

University WSB

jasiek@pampam.pl

A few words about the author(s):

Engineer by education, has knowledge and experience in such areas as: electronics, IT, telecommunications and electronic media. Theoretician and practitioner in the processes of media digitization. He is also working on clean innovative energy.

Abstract:

Innovative projects in energy organizations have a positive impact on the company's development through the application of the principles of continuous improvement of the staff, development of computerization and automation of technological systems control, which, as a result of modification, allow the introduction of new sources of clean energy in the form of heat energy and additionally electricity, which is also a new product enterprise, obtained from natural gas or biogas. Obtaining heat and electricity from one primary source is called cogeneration in the energy sector.

In the above-mentioned issue, it is "gas cogeneration" which, using the source of gas as primary energy, introduces a new quality in innovative energy technology. Gas cogeneration has a positive effect on the quality of the environment, working conditions and, above all, gives the possibility of producing electricity for own use and for the public grid. Installation of a new additional source of clean energy on the basis of highly qualified and experienced staff and the existing technical infrastructure such as: buildings, technical facilities, heating network, and above all computerized modern devices controlling the operation of the entire heating plant and heat distribution, with proportionally low expenditure, allows you to transform into a professional heat and power plant. Commissioning a cogeneration unit should definitely improve the environmental performance of the heating plant.

Keywords:

innovations, management, energy, biogas, cogeneration

A NEW MWCNTS-BASED MATERIALS FOR BIOPOTENTIAL MEASUREMENTS

Dominik Grochala (1)*, Paweł Smoleń (2)

(1) Institute of Electronics, Faculty of Computer Science, Electronics and Telecommunications, AGH University of Science and Technology, Al. Mickiewicza 30, 30-059 Kraków, Poland
(2) Smart Nanotechnologies S.A., Karola Olszewskiego Str. 25, 32-566 Alwern

*grochala@agh.edu.pl

A few words about the author(s):

Ph.D. student in the field of Biomedical Engineering and Biocybernetics. His current interests are associate with dedicated measurement systems for biomedical applications.

Abstract:

An aging population and the continuous improvement of human living standards create a growing demand for personalized wearable health devices, including bio-potential monitoring systems. Long-term observation of ECG, EEG, EOG, and EMG signals delivers valuable information about a health condition, detecting any changes in vital signs. In our research, we proposed nanocomposite material with the preparation procedure of samples as electrodes. The main component of the developed mixture is a silicone resin as a matrix with Multi-Walled Carbon Nanotube (MWCNTs) as a conductive filler. Improvement of material homogenization process causing the decrease of heterogeneity has a positive effect on the electrical conductivity and mechanical strength. The introduction of various methods of final forming samples, including hot and cold pressing, was utilized to check the influence on final material properties. The fact of CNTs uses also increases the significance of the study since nanomaterials as a filler usually feature properties that are often difficult to predict based only on theoretical models. That is the reason why we proposed empirical investigation based on advanced material testing in application conditions. The collected results show good conductivity of the material with its easy to obtain integrity with textiles and good mechanical strength. The above makes it a promising electrode material for biopotential measurements during the patients' activities of daily living.

Keywords:

MWCNTs, e-textiles, dry ECG electrodes, nanocomposite

MYCOLOGICAL CONTAMINATION OF USED AIR CONDITIONING FILTERS CAR

Monika Huse-Kutowska

Bydgoszcz University of Science and Technology, Department of Plant Biology and Protection, Laboratory of Molecular Mycology, Phytopathology and Entomology

monhus001@utp.edu.pl

A few words about the author(s):

Monika Huse-Kutowska is a graduate of Environmental Protection at the University of Technology and Life Sciences in Bydgoszcz. She actively participated in national and international scientific conferences.

Abstract:

Studies on air quality within automotive vehicles are a developing research area. Indoor air quality is an indicator of environmental health. The cabin dust filter is one of the most important components of the air conditioning system, which each air-conditioned car is equipped with. Long-term exposure to mould spores can develop a cough, chronic sneezing and allergic diseases (allergic rhinitis, allergic conjunctivitis, bronchial asthma, allergic alveolitis). The objective of the present study there was a literature review – research articles from international science databases. 20 articles were analyzed, where the types of fungi occurring in filters and air were analyzed. The most common species of the genus Aspergillus were also determined. The results are presented in a tabular form. The analysis has shown the occurrence of such types of fungi as Cladosporium, Alternaria, Acremonium and including toxigenic fungi such as Penicillium, Fusarium, and Aspergillus. Among the Aspergillus genus, the results showed the presence of the A. flavus, A. niger, A. fumigatus, A. ochraceus and A. clavatus species, which cause severe allergic and pulmonary respiratory diseases. Air in artificially heated environments should provide comfort to its occupants but it may pose a risk to human health if the car filtration system is contaminated by pathogenic fungi.

Keywords:

Aspergillus, environmental, health, filters

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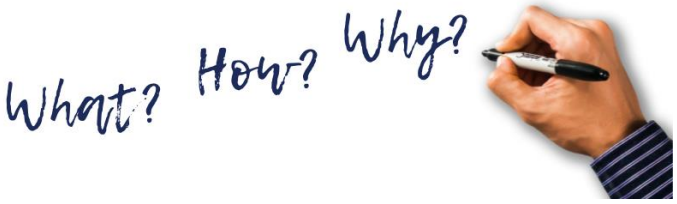

MICROBIOLOGICAL AND TOXICOLOGICAL THREATS IN WORKPLACES

Monika Huse-Kutowska

Bydgoszcz University of Science and Technology, Department of Plant Biology and Protection, Laboratory of Molecular Mycology, Phytopathology and Entomology

monhus001@utp.edu.pl

A few words about the author(s):

Monika Huse-Kutowska is a graduate of Environmental Protection at the University of Technology and Life Sciences in Bydgoszcz. After completing her MA studies, her scientific and professional interests focused on the issues of molecular biology.

Abstract:

Studies on mould contamination and the secondary metabolites of moulds in workplaces are a developing research area. The association of moulds and their metabolites to different negative health conditions in humans and animals, has contributed to the importance of investigating different health risks induced by this family of heterotrophs. The aim of this study was a literature review – research articles from international science databases. Research articles were analyzed types of fungi and their secondary metabolites that occur in workplaces and cytotoxicity of the moulds using the MTT test. The results were presented in a tabular form. The analysis has shown the occurrence of the most common types of fungi as Alternaria, Penicillium, Aspergillus. The following moulds were most often described as cytotoxic: Alternaria alternata, A. limoniasperae, Aspergillus flavus, A. fumigatus, A. ochraceus Penicillium biourgeianum. Moulds isolated from the working environments produced the following mycotoxins: chanoclavines, cyclopiazonic acid, fumigaclavines, meleagrin, roquefortins, viridicatin, viridicatol which may have a negative impact on human health.

Keywords:

mould, Aspegillus, MTT test

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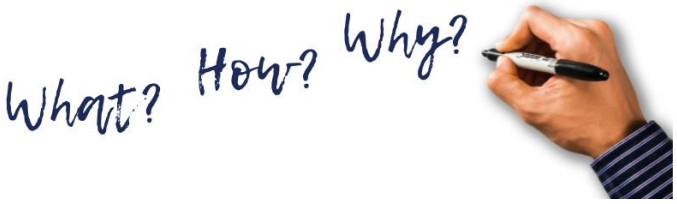

THE EFFECT OF SELECTED CYTOKININS ON MICROPROPAGATION OF ALTERNANTHERA FICOIDEA (L.) SM.

Monika Grzelak, Eryk Mizerakowski, Adam Nawrocki*

Warsaw University of Life Sciences, Nowoursynowska 166, 02-787 Warsaw, Poland

*adamnawrocki1996@gmail.com

A few words about the author(s):

Adam Nawrocki & Eryk Mizerakowski 2nd year master's students in the field of horticulture, Monika Grzelak Ph.D. student of Doctoral School in Warsaw University of Life Sciences. Our field of interests are micropropagation of woody and perennial plants.

Abstract:

Micropropagation allows to quickly obtain high numbers of good quality and healthy plants. Growth regulators accelerates life processes in plants. The aim of the experiment was to investigate the effect of selected growth regulators (cytokinins with addiction of auxines) on micropropagation Alternanthera ficoidea (L.) Sm. in laboratory conditions. Microcuttings (approximately 1 cm) were put in glass jars with Murashige i Skoog medium. The following growth regulators were used: Thidiazuron (1 ml/l TDZ), 6-Benzylaminopurine (1 ml/l BA) and 6-(γ,γ-Dimethylallylamino)purine (1 ml/l 2iP). Additionally to each treatment were added 0.1 ml/l 1-naphthylacetic acid (NAA). There were 4 treatments, each in triplicate, each containing 5 microcuttings. After 4 weeks the effect of the treatments on micropropagation rate, mass and lenght of microcuttings, width and lenght of leaves, SPAD and the chlorophyll and carotenoids content were evaluated. The results were processed and analyzed statistically.

Keywords:

micropropagation, growth regulators, cytokinins, Alternanthera ficoidea

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OPTIMIZATION OF THE METHOD FOR THE DETERMINATION OF ZEARALENONE BIOTRANSFORMATION PRODUCTS BASED ON LIQUID CHROMATOGRAPHY COUPLED WITH MASS SPECTROMETRY

Monika Nowak*, Sylwia Różalska

Department of Industrial Microbiology and Biotechnology, University of Lodz

*monika.nowak@biol.uni.lodz.pl

A few words about the author(s):

We are the team from Department of Industrial Microbiology and Biotechnology, University of Lodz.

Abstract:

Zearalenone (ZEN) is a mycotoxin secreted by several species of Fusarium. ZEN is a serious threat because it pollutes cereal crops worldwide. The fungus infects corn, barley, oats, rice, wheat and sorghum. As a non-steroidal oestrogenic mycotoxin, it has the ability to bind to estrogen receptors, disrupting the natural hormonal balance, and therefore posing a risk to the human and animal populations. ZEN can cause e.g. reproductive disorders in cattle and chickens, hyperestrogenic syndromes, diseases of the liver and the immune system in humans. Equally toxic to the environment are the products of its biotransformation, i.e. α- and β-zearalenol (α- and β-ZOL), where the α-ZOL is 10 times more toxic than the original compound.

The aim of this study was to optimize the method for the determination of ZEN biotransformation metabolites by liquid chromatography coupled with mass spectrometry (LC-MS / MS) using the LightSight software. The IDA (Information Dependent Acquisition) screening method in the pMRM (predictive Multiple Reaction Monitoring) scanning mode to search for metabolites of ZEN transformations was developed with the use of LightSight software. The final method contained 55 MRM pairs corresponding to the individual transformations of ZEN, including hydroxylation to α- and β-ZOL forms, sulfonation and glucuronidation.

This work was supported by Polish Nacional Science Centre, grant no. UMO-2016/23/B/NZ9/00840.

Keywords:

Zearalenone, mycotoxins, Fusarium, liquid chromatography, mass spectrometry

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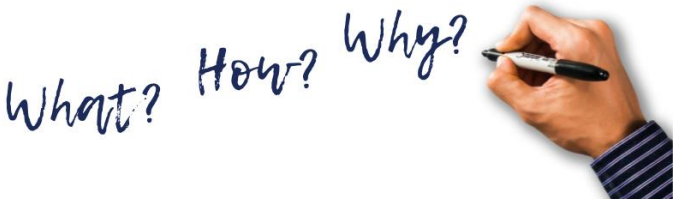

DETERMINATION OF CYCLIC HEXADEPSIPEPTIDES (DESTRUXINS) BY LIQUID CHROMATOGRAPHY COUPLED WITH MASS SPECTROMETRY

Monika Nowak*, Sylwia Różalska

Department of Industrial Microbiology and Biotechnology, University of Lodz

*monika.nowak@biol.uni.lodz.pl

A few words about the author(s):

We are the team from Department of Industrial Microbiology and Biotechnology, University of Lodz.

Abstract:

Destruxins (dtxs) are secondary metabolites belonging to the group of cyclic hexadepsipeptides. They are produced mainly by entomopathogenic fungi of the genus Metarhizium and are involved in the pathogenesis of insects. So far, about 40 types of dtxs have been described. Dtxs A, B and E have the most important role in the pathogenesis. These secondary metabolites are determined by molecular biology techniques and by liquid chromatography coupled with mass spectrometry (LC-MS/MS).

The aim of this study was to develop a LC-MS/MS method for the determination of dtxs in the post-cultured extracts of fungal strains of the genus Metarhizium.

The method was developed on an Agilent 1200 liquid chromatograph coupled with an AB Sciex QTRAP 4500 mass spectrometer. A C18 Kinetex column was used for the chromatographic separation. The mobile phases were water and methanol (both with 5 mM ammonium formate) at a flow rate of 0.5 ml/min. The MS/MS conditions were optimized based on commercial standards of dtxs A and B. The final LC-MS/MS method in the MRM scanning mode allowed the determination of 19 types of dtxs in post-cultured extracts.

The developed LC-MS/MS method allowed the identification of the dtxs profile in five Metarhizium strains. A quantitative method was developed for dtxs A and B, while the remaining compounds were determined using a pseudo-quantitative method.

This work was supported by Polish Nacional Science Centre, grant no. UMO-2016/23/B/NZ9/00840

Keywords:

Destruxins, secondary metabolites, Metarhizium, liquid chromatography, mass spectrometry

BEAUTY AND HARMONY IN PHYSICS

Michał Palczewski

michalsmile@tlen.pl

Abstract:

One of the driving forces of the development of science, including physics, was the search for beauty. The mentioned beauty, harmony, and symmetry evident in the issues being discovered allowed us to learn about the truth, goodness, and beauty of the created world. These transcendentals, about which Aristotle wrote and about which science was later developed by St. Thomas Aquinas, delighted and still delight physics researchers; not infrequently they also helped to formulate physical theories correctly. In this paper I discuss some of them, such as: general theory of relativity, the quark model, and the description of the energies of excited states in nuclear alpha decays.

Bibliography:
- „Summa theologiae", św. Tomasz z Akwinu
- „Jak scena stała się dramatem", ks. W. Grygiel FSSP
- „Die Grundlage der allgemeinen Relativitatstheorie", A. Einstein
- „High-Energy Inelastic e-p Scattering at 6° and 10°", E. D. Bloom; et al.
- „Phenomenological formula for α-decay half-lives of heaviest nuclei", A. Sobiczewski, A. Parkhomenko
- „Historia fizyki", A. K. Wróblewski
- „Zagubione w matematyce. Fizyka w pułapce piękna", Sabine Hossenfelder

Keywords:

physics, beauty, General relativity, St. Thomas Aquinas

THE ISSUE OF MASS

Michał Palczewski

michalsmile@tlen.pl

Abstract:

One of the fundamental quantities in physics is mass. Related issues (such as the second law of dynamics, equality of inertial and gravitational mass, the equivalence of energy and mass, or role of the Higgs boson in giving mass to particles) show how great role it plays and how much scientific effort was needed to study its properties. In this presentation I would like to discuss some of the aspects of this concept.

Bibliography:
- "Philosophiae Naturalis Principia Mathematica", I. Newton
- „Zur Elektrodynamik bewegter Körper", A. Einstein
- „Die Grundlage der allgemeinen Relativitatstheorie", A. Einstein
- „One hundred years of Eotvos experiment", L. Bod, E. Fischbach, G. Marx, M. Naray-Ziegler
- „Broken Symmetry and the Mass of Gauge Vector Mesons", F. Englert, R. Brout
- „Broken Symmetries and the Masses of Gauge Bosons", P. W. Higgs
- „Global Conservation Laws and Massless Particles", G.S. Guralnik, C.R. Hagen, T.W.B. Kibble

Keywords:

mass, special relativity, general relativity, Eotvos experiment, Higgs boson

BIRCH TAR IN TERMS OF INNOVATIVE POLIMERIC ECOLOGICAL APPLICATIONS

Agnieszka Richert

Nicolaus Copernicus University in Toruń, Faculty of Biology and Veterinary Science, Department of Genetics, Lwowska 1, 87-100 Toruń, Poland

a.richert@umk.pl

A few words about the author(s):

Ph.D. Agnieszka Richert conducts scientific research in the field of biodegradable polymeric materials and biocides. She deals with the determination of biological properties, degradation of materials by microorganisms isolated from the environment.

Abstract:

Tar is a product of dry distillation of wood. It has antiseptic and bactericidal properties. In the past, it was used in skin diseases, e.g. in the treatment of psoriasis and in veterinary medicine, for dressing and in the care of hooves. It was also used to impregnate canvas and leather, seal boats and barrels, stick arrowheads to arrows and for many other purposes. In this paper, I present a completely new approach to tar as a substance that has been used as an "eco" additive to biodegradable polymer films, giving a product with completely new properties and application possibilities.

Funding: The project "Innovation Incubator UMK_4.0" is implemented under the program of the Ministry of Education and Science entitled "Incubator of Innovation 4.0"(contract number MNISW/2020/331/DIR) as part of the non-competitive project entitled "Support for the management of scientific research and commercialization of the results of R&D works in research units and enterprises", Intelligent Development Operational Program 2014-2020, Measure 4.4, co-financed by the European Regional Development Fund.

Keywords:

birch tar, biopolymers, PLA, eco-, biocide, useful properties

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APPLICATION OF IMAGE ANALYSIS FOR CULTIVAR DISCRIMINATION OF APRICOT SEEDS

Ewa Ropelewska (1)*, Kadir Sabanci (2), Muhammet Fatih Aslan (2)

(1) Fruit and Vegetable Storage and Processing Department, The National Institute of Horticultural Research, Konstytucji 3 Maja 1/3, 96-100 Skierniewice, Poland
(2) Electrical and Electronics Engineering, Karamanoglu Mehmetbey University, Karaman, Turkey

*ewa.ropelewska@inhort.pl

A few words about the author(s):

Ewa Ropelewska – Prof. IO-PIB, Associate Professor; Kadir Sabanci – Associate Professor; Muhammet Fatih Aslan - Research Assistant. Interests: image processing; machine vision; deep learning; horticulture; electronic engineering.

Abstract:

The apricots belonging to four cultivars were sampled from the orchard located in central Poland. The seeds were extracted manually from apricot stones. The digital color images of fifty seeds for each cultivar were acquired using a flatbed scanner. Image processing was performed using the MaZda application (Łódź University of Technology, Institute of Electronics, Poland). The seed images were converted to color channels R, G, B, L, a, b, X, Y, Z. In the case of each image, about 2000 textures were calculated. The discriminative models based on textures selected for individual color channels, color spaces Lab, RGB and XYZ, and a set including textures from all color channels were built using the WEKA machine learning software (University of Waikato, New Zealand). The cultivar discrimination accuracy reached 99% for model developed based on textures selected from the color space Lab and the Multilayer Perceptron classifier. Also, very high correctness equal to 96% was obtained for model built based on a set including the textures selected from all color channels. The accuracies were the lowest for models built for individual color channels. The accuracy reached 91% for color channel b. The results proved the usefulness of image analysis based on textures of the outer surface of images for cultivar discrimination of apricot seeds. The developed discriminative models can be used to discriminate the apricot seeds belonging to different cultivars with a probability close to 100%.

Keywords:

apricot seeds, digital color images, textures, discriminative classifiers

ELECTRONIC IDENTIFICATION

Agata Burska

University of Warmia and Mazury in Olsztyn, Faculty of Veterinary Medicine

burska.agata@wp.pl

A few words about the author(s):

Second year student of the Faculty of Veterinary Medicine at the University of Warmia and Mazury in Olsztyn.

Abstract:

Electronic identification of animals is the process of marking an animal with a unique number in order to verification of the individual. Both farm animals and domestic animals are identified. This work focuses on the process of identifying domestic animals.

The aim of the presentation is to raise awareness among owners about the essence of electronic identification of domestic animals by presenting its characteristics. This identification has, in addition to the overarching goal of helping to find a missing animal, also a significant impact on reducing the scale of the problem of animal homelessness.

An indispensable element in the identification process is the observance of all its stages, which are the identification of the animal in the veterinary facility and then registration of the number in the electronic database.

Keywords:

animal marking, domestic animal

ELECTROMAGNETIC RADIATION

Agata Burska

University of Warmia and Mazury in Olsztyn, Faculty of Veterinary Medicine

burska.agata@wp.pl

A few words about the author(s):

Second year student of the Faculty of Veterinary Medicine at the University of Warmia and Mazury in Olsztyn.

Abstract:

Electromagnetic radiation is a method of energy transfer that occurs as the emission of electromagnetic waves. Due to the development of technology, more and more devices that facilitate daily activities and communication are produced and used. It is associated with an increase in the number of electromagnetic radiation sources, and hence exposure to them. In cities, the accumulation of radiation sources leads to the phenomenon known as electrosmog.

This work presents the exact definition of electromagnetic radiation divided into its types, sources and properties. The aim of the work is to make people aware of the impact of electromagnetic radiation on living organisms and to characterize protection against radiation on the basis of articles from the Law and Environmental Protection Act.

A disturbing phenomenon is the increased exposure to the effects of mobile telephony. The presentation included suggestions on how to use cell phones to reduce the impact of radiation on health.

Keywords:

energy transfer, electromagnetic waves, health

BIFUNCTIONAL CONDUCTING POLYMER MATRICES WITH ANTIBACTERIAL AND NEUROPROTECTIVE EFFECTS

Dominika Czerwińska-Główka*, Magdalena Skonieczna, Sebastian Student, Wioletta Przystaś, Ewa Zabłocka-Godlewska, Beata Cwalina, Katarzyna Krukiewicz

Silesian University of Technology, Akademicka 2A, 44-100 Gliwice, Poland

*Dominika.Czerwinska-Glowka@polsl.pl

A few words about the author(s):

Ph.D. student at the Silesian University of Technology.

Abstract:

Conducting polymers due to their unique properties are regarded as interesting materials for bioengineering. Moreover, combining antibacterial and neuroprotective functions together with electrochemical parameters makes them extremely desirable especially as neural implant materials.

In this work, electrically-responsive polymers based on poly(3,4-ethylenedioxypyrrole) (PEDOP) and PEDOP/Tc containing common antibiotic (tetracycline) within the polymer structure were obtained through electrochemical oxidative polymerization process. Both matrices simultaneously with a sputtered Pt-layer as control were carefully examined by a wide variety of techniques (electrochemical, spectroscopic and microscopic).

Biological activity against Gram-negative Escherichia coli was assessed using LIVE/DEAD assay simultaneously with morphometric analysis. Cytocompatibility and neuroprotective effects were evaluated using rat neuroblastoma B35 cell line and were analyzed by means of MTT, cell cycle, Annexin V apoptosis assay and SEM micrographs).

Obtained results confirmed both antibacterial and neuroprotective character of PEDOP/Tc, which makes it an extremely potential neural interface materials.

This research was supported by the National Science Centre, Poland (SONATA 2016/23/D/ST5/01306 and OPUS 2019/35/B/ST5/00995).

Keywords:

antibacterial effect, conducting polymers, neural interfaces, poly(3,4-ethylenedioxypyrrole), tetracycline

DEVICES FOR MONITORING THE TECHNICAL CONDITION OF ENGINE OILS

Tomasz Filipiuk

Faculty of Mechanical Engineering, Military University of Technology, Warsaw, Poland

tomasz.filipiuk@wat.edu.pl

A few words about the author(s):

The author is a young scientist from the Military University of Technology in Warsaw. He is a Ph.D. student in the discipline of mechanical engineering, he works at the university as an academic teacher. He is interested in liquid fuels.

Abstract:

Monitoring the technical condition of engine oils is a very important issue in the aspect of car diagnostics. Based on the quality parameters of fresh and aged engine oil, the condition of the internal combustion engine can be determined. The development of the economy and technical progress in the field of motorization constantly forces changes in the production of engine oils. Currently, very high demands are placed on engine oils. There are many methods that allow you to determine the technical condition of the engine oil. Laboratory methods allow you to carry out very precise tests, however, they are laborious and time-consuming. In the case of on line methods, it is possible to control the technical condition of the oil on an ongoing basis, however, these methods do not provide precise results.

Keywords:

engine oil, viscosity, aging, monitoring

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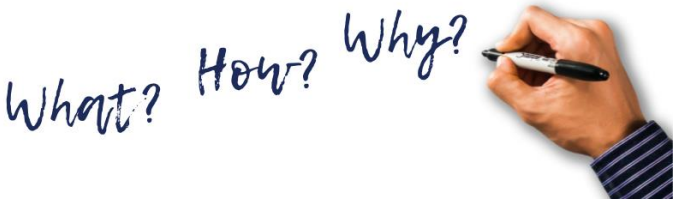

MICRORHEOLOGICAL AND DESTABILIZATION BEHAVIORS OF PROTEIN AND POLYSACCHARIDE COLLOIDAL DISPERSIONS

Adonis Hilal*, Anna Florowska, Małgorzata Wroniak

Institute of Food Science, Department of Food Technology and Assessment, Warsaw University of Life Sciences (WULS-SGGW), 159c Nowoursynowska Street, 02-787 Warsaw, Poland

*adonis_hilal@sggw.edu.pl

A few words about the author(s):

Adonis Hilal M.Sc. (Ph.D. student), Anna Florowska Ph.D., Małgorzata Wroniak Ph.D., work at the Institute of Food Sciences, Division of Fat and Oils and Food Concentrates Technology, of the Warsaw University of Life Sciences.

Abstract:

The purpose of this study was to assess the microrheological and destabilization behavior of aqueous colloidal dispersions prepared from selected plant-based proteins (pea and wheat protein, concentration levels – 10, 15, and 20 g/100 g) and polysaccharides (gellan and konjac gum) using the dynamic multi-speckle diffusing-wave spectroscopy technique (MS-DWS) and the centrifugal stability analysis method (CSA). Gellan gum dispersions were prepared in three concentration levels: 0.2, 0.4, and 0.6 g/100 g, while konjac were prepared in 0.5, 1, and 1.5 g/100 g. It was demonstrated that the dispersion obtained using the lowest concentration (10 g/100 g) of wheat protein was the most unstable. Gellan and konjac gum, in contrary, exhibited the best stability (regardless of concentration level) based on the instability index. The elasticity index (EI) of the 1.5 g/100 g konjac gum dispersion was the highest (0.369 nm^{-2}), meaning that it had the highest polymeric mesh size. The examined samples had a low solid-liquid balance factor (SLB), indicating that they had more solid-like characteristics. A significant correlation was found between the solid-liquid factor and the instability index of the studied dispersions. Furthermore, the macroscopic viscosity index (MVI) was significantly comparable in all the tested samples. It is feasible to influence the physical properties of protein and polysaccharide colloidal dispersions by controlling the conditions under which they are produced.

Keywords:

MS-DWS method, CSA method, food ingredients, physical properties

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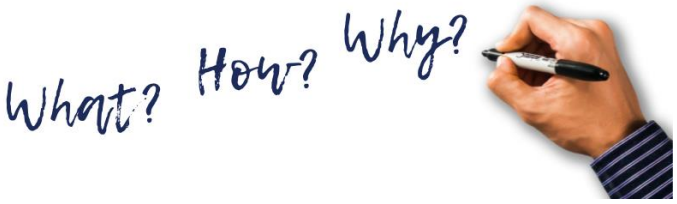

A STATISTICAL STUDY OF VARIOUS FACTORS' EFFECTS ON HUMAN WELL-BEING

Alicja Hołowiecka

Lublin University of Technology, Faculty of Technology Fundamentals,
Student's Association of Mathematicians "KWATERNION"

alicja.holowiecka@pollub.edu.pl

A few words about the author(s):

I am fifth-year student of Mathematics. My scientific interests include applications of mathematics to everyday problems. In my studies I focus mostly on statistics, machine learning, and connections between Mathematics and Computer Science.

Abstract:

The World Health Organization (WHO) defines mental health as "a state of well-being in which a person uses his or her abilities, can cope with the stresses of daily life, can work productively and fruitfully, and is able to contribute to the community". It is estimated that mental health disorders account for as much as 12% of the global burden of disease, and unfortunately this problem is still often marginalized. For this reason, it is very important to draw attention to it and ensure public awareness. In this paper we will mainly focus on the first part of the WHO definition of mental health, "a state of well-being".

The question pondered in this study is: which factors influence human well-being and how? The study material consists of 240 responses to a survey, which was partly based on the one by Wojciszke and Baryła in "Skale do Pomiaru Nastroju i Sześciu Emocji". The proposed factors which influence well-being, are: sex, age, sleeping habits, physical activity, diet, usage of electronic devices and social contacts. The last five factors are considered for the whole study group and also in division for men and women. The resulting linear models were also used to create an application (in Python programming language) which estimates one's well-being based on his/her responses to 15 questions about the given factors that influence well-being. Another outcome of this study was an infographic which shows what can affect our well-being.

Keywords:

well-being, mood, statistics, psychology

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THE USE OF MACHINE LEARNING METHODS TO PREDICT STROKE AMONG PATIENTS

Alicja Hołowiecka

Lublin University of Technology, Faculty of Technology Fundamentals,
Student's Association of Mathematicians "KWATERNION"

alicja.holowiecka@pollub.edu.pl

A few words about the author(s):

I am fifth-year student of Mathematics. My scientific interests include applications of mathematics to everyday problems. In my studies I focus mostly on statistics, machine learning, and connections between Mathematics and Computer Science.

Abstract:

The aim of this paper is to apply various machine learning methods to predict stroke in a patient. Several models will be presented and finally the most optimal one will be selected. Considerations will also include determining which patient characteristics were most important in the stroke prediction process. The study material was the "Stroke Prediction Dataset" from the Kaggle website, containing stroke information among 5109 patients. Due to strong imbalance, the SMOTE oversampling technique was applied. The dataset was then split into training and test datasets. The following machine learning methods were presented: logistic regression, decision tree, random forest, k nearest neighbours method, naive Bayes classifier and discriminant analysis. The study found that the model achieving the best accuracy on the test set was the random forest. Furthermore, the most significant variables in this model were the patient's age, average blood glucose level, and BMI.

Keywords:

machine learning, stroke, random forest, classification, prediction

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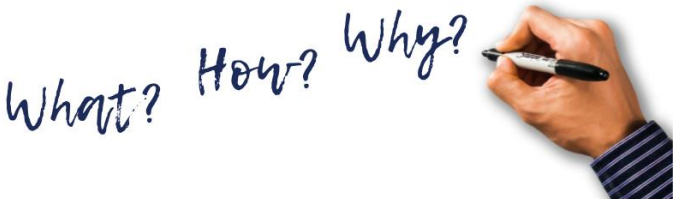

ALTERNATIVE FUELS IN THE SCOPE OF THE IED DIRECTIVE

Krzysztof Knaś

Department of Thermal Machinery, Faculty of Mechanical Engineering and Computer Science, Czestochowa University of Technology, al. Armii Krajowej 21, 42-201 Czestochowa, Poland

kknas@itm.pcz.pl

A few words about the author(s):

I am a Ph.D. student at the Department of Thermal Machines at the Częstochowa University of Technology. I am interested in issues related to: anthropogenic materials, the possibilities of using waste materials and mechanical activation

Abstract:

The article presents the possibilities of using blends of alternative fuels within the limits imposed by the IED Directive. The materials tested and analyzed were alternative solid fuels based on waste plastics from disassembly of passenger cars. The paper contains the results of analyzes of the fractional, morphological and chemical composition of mixtures of waste groups constituting a potential alternative fuel. The content of the main components of the exhaust gas was obtained on the basis of stoichiometric calculations, assuming that: the exhaust gas is dry, the excess air coefficient was $\lambda = 1$. Then, for the purposes of reference to the emission limit values in the directive, the results were recalculated for the three oxygen contents in the exhaust gas, respectively 6%, 10%, 11%. The analysis of the obtained results made it possible to state that the emissions of pollutants meet the limits imposed by Directive 2010/75/EU of the European Parliament and of the Council of November 24, 2010 on industrial emissions.

Keywords:

alternative fuels, thermal energy recovery, directive IED

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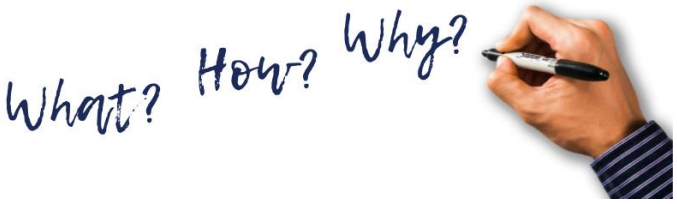

ANIMAL COGNITIVE ABILITIES: FROM USING TOOLS BY CHIMPANZEES TO FMRI EXPERIMENTS ON DOGS

Julia Korczyk

Faculty of Biology, Jagiellonian Univeristy

julia.korczyk@gmail.com

A few words about the author(s):

I am biology student at Jagiellonian Univeristy.

Abstract:

The first observation of animal cognitive abilities was made in the 1960s by Jane Godall. Since then, significant development of research has occurred and magnetic resonance has been applied to scan animal brains, eg. brains of dogs. The issue of cognitive abilities in various animals is discussed between researchers. One group of researchers conducts experiments on animal intelligence, whereas the other group discusses anthropomorphization.

During the presentation, I will focus on research based on group of animals such as: dolphins, dogs, and primates. I will present behavioral and neurobiological research supporting arguments for animal intelligence. Octopi have 500 million nerve cells and they have the largest nervous system among invertebrates (Albertin et al., 2015; Hochner, 2012). Octopi remember the designs presented visually (Well, 1987) and they can distinguish individual people (Anderson et al., 2010). Then I will focus on communication capabilities and MRI research conducted on dogs (Polgárd et al., 2000), and dolphins (Janik, 2013). In the end, I will present research on memory in chimpanzees (Inuue and Matsuzawa, 2007) and differences between neuroplasticity in chimpanzees and humans. In addition, I will also discuss anthropomorphization.

In summary, in my presentation, I will present research on new discoveries regarding animal intelligence and how modern science interprets them.

Keywords:

fMRI, inteligence, aniamal intelligence, cognition

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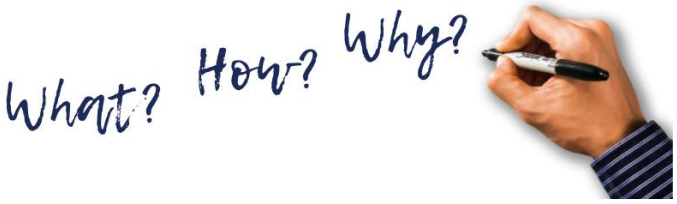

8-AMINOQUINOLINE GLYCOCONJUGATES - SYNTHESIS AND PRELIMINARY EVALUATION OF THEIR CYTOTOXICITY

Monika Krawczyk*, Gabriela Pastuch-Gawołek

Silesian University of Technology: Department of Organic Chemistry, Bioorganic Chemistry and Biotechnology, , 44-100 Gliwice, B. Krzywoustego 4, Poland; Biotechnology Centre, 44-100 Gliwice, B. Krzywoustego 8, Poland

*monika.krawczyk@polsl.pl

A few words about the author(s):

I am a PhD student at the Silesian University of Technology. My research is related to the synthesis of glycoconjugates of biologically active compounds and the assessment of their anti-cancer activity.

Abstract:

Our studies focus on the use of small quinoline molecules as metal ion chelators and potential anti-cancer agents. The 8-aminoquinoline (8-AQ) scaffold shows a broad spectrum of biological activity, above all, their antimalarial activity has been broadly described. This molecule contains two nitrogen atoms that are situated to form complexes with metal ions. Small molecule nitrogen heterocycles are important structures, widely used in the design of potential pharmaceuticals. Metal complexing compounds have also found application in anti-cancer therapy. With their use, divalent metal ions such as Cu(II) or Zn(II), which are important factors for cancer growth, can be eliminated from the body. However, most known anti-cancer drugs show serious side effects on healthy tissues. The biggest challenge associated with effective cancer therapy is selective drug targeting to tumor tissue.

This prompted us to design 8-AQ derivatives that would show better selectivity, solubility, and cell membrane permeability. For this purpose, we attached a glucose or galactose fragment to the 8-AQ molecule using various linkers. The sugar unit should facilitate the transport of such a compound through GLUT transporters directly to cancer cells, which are characterized by increased demand for glucose and overexpression of its transporters.

The synthesis as well as the results of the preliminary evaluation of the anticancer activity of 8-aminoquinoline glycoconjugates will be presented.

Keywords:

quinoline, glycoconjugates, cytotoxicity, anti-cancer agents

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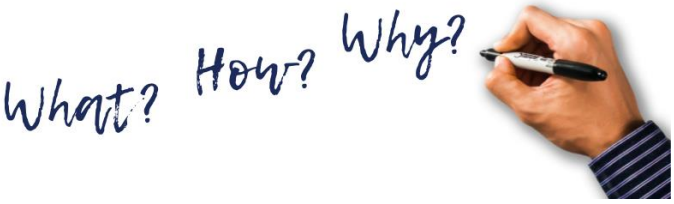

POSSIBILITIES OF USING ORGANIC ACIDS AS LEACHING AGENTS FOR METAL RECOVERY

Magdalena Lisińska

Silesian University of Technology

magdalena.lisinska@polsl.pl

A few words about the author(s):

Young scientist at the Silesian University of Technology in Katowice. Performs hydrometallurgical research of metals recovery from printed circuit boards (PCBs) from used mobile phones. Interests: Hydrometallurgy, Recycling, Environmental Protection.

Abstract:

The ever-increasing amount of waste, including waste lithium-ion batteries (LIBs) and electrical and electronic equipment, is forcing scientists to find an appropriate method of recycling this waste. Metal recovery mainly includes pyrometallurgical and hydrometallurgical processes. Hydrometallurgical machining is of great interest due to its higher efficiency and better economy. Organic acids are also gaining popularity among the leaching agents used in hydrometallurgy. Organic acids are environmentally friendly, unlike other leaching agents. An overview of possible ways of recovering metals from spent lithium-ion batteries (LIB) and electrical and electronic equipment using various organic acids, including citric acid, oxalic acid, formic acid, acetic acid, lactic acid, and malic acid, is presented.

Keywords:

hydrometallurgy, organic acids, waste, recovery, metals

THE CHLOROPLAST GENOME AS A 'SUPER-BARCODE' IN PLANT DNA BARCODING

Mikołaj Maj

Adam Mickiewicz University in Poznan

mikolaj.maj7001@gmail.com

A few words about the author(s):

Mikołaj Maj – student of Adam Mickiewicz University in Poznań. Interested in the exact sciences (biology and chemistry) and humanities (linguistics), getting the best of both worlds.

Abstract:

DNA barcoding is an effective tool that enables quick and accurate identification of plant species. However, none of the loci available affects all species. Since single locus DNA barcodes do not have the appropriate variability in closely related taxa, recent barcode research has placed great emphasis on the use of whole genome chloroplast sequences as a super-barcode, which is now more readily available as a result of improvements in sequencing technology. Specific barcodes can increase our ability to distinguish closely related plants at the species and population level.

Keywords:

plant DNA barcoding, super-barcode, barcodes, chloroplast genome

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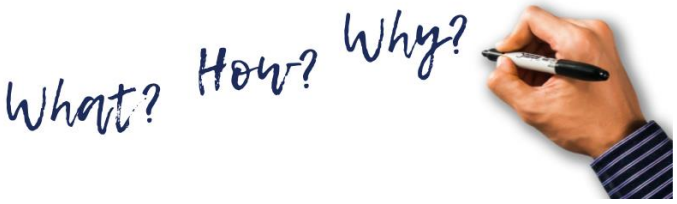

KALE AND APPLE POMACE AS RAW MATERIALS FOR MULTI-GRAIN SNACKS IN THE FORM OF BARS

Ewelina Masiarz*, Hanna Kowalska

Warsaw University of Life Sciences

*ewelina_masiarz@sggw.edu.pl

A few words about the author(s):

Third year PhD student at the SGGW, Dep. of Food Engineering and Process Management. In addition to risk/hazard analyses, and simulations/optimizations of food production I also have experience in developing a multi-grain bars production technology.

Abstract:

The aim of the study was to investigate the effect of the addition of kale and fresh apple pomace on the properties of multigrain bars. For this purpose, tests were carried out on the content of carbohydrates, total polyphenols, antioxidant activity and chlorophyll content in the bars. Selected scientific articles were also analyzed.

Keywords:

kale, bars, chlorophyll

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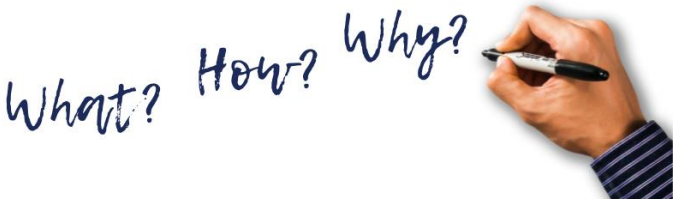


THE IMPORTANCE OF BIOMASS AS A RENEWABLE ENERGY SOURCE

Marzena Mazurek (1)*, Aleksandra Siekierzyńska (1), Jan Buczek (2)

(1) University of Rzeszow, College of Natural Sciences, Institute of Agriculture, Environmental Protection and Management, Departament of Plant Physiology and Biotechnology, Poland
(2) University of Rzeszow, College of Natural Sciences, Institute of Agriculture, Environmental Protection and Management, Departament of Plant Production

*marzena.guty@poczta.onet.pl

A few words about the author(s):

I graduated biotechnology at the University of Silesia in Katowice. My doctoral thesis is concentrated in the field of the somaclonal variability of highbush blueberry plants.

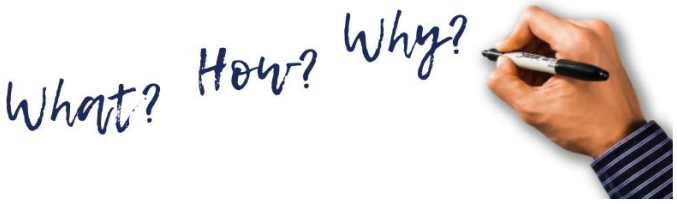
Abstract:

Biomass is biodegradable plant and animal substances and residues derived from products and waste from agricultural and forestry production, as well as from the industry processing products. In our country, the basic source of renewable energy from the type of biofuels is agricultural and forest biomass. In the geographic and climatic conditions of Poland, biomass is practically the most accessible and abundant renewable energy resource.

As biomass can be used the products from agricultural crops, such as straw from cereals and rapeseed, which do not affect the level of food production. And for this purpose, a mass of annual and perennial plants from purposeful energy crops is used. An additional source of biomass can be wood obtained from forestry or wood processing, including bark and sawdust. The natural conditions of the Podkarpackie voivodeship determine that there are potential opportunities for obtaining wood and agricultural biomass in this region. The theoretical resources of wood waste from forests and forest land in the Podkarpacie amount to 259.8 thousand tons per year gives the possibility of obtaining energy in the amount of over 2 million GJ/year. Additional resources of wood biomass that can be used for energy purposes are waste wood from orchards and gardens and roadsides. The estimated amount of waste wood from cleanings, sanitary cuts, and orchard renewals in the Podkarpacie voivodship is 1,880.5 tons per year.

Keywords:

biomass, agriculture



THE USE POPLAR (POPULUS SP.) IN AGROFORESTRY SYSTEMS

Marzena Mazurek

University of Rzeszow, College of Natural Sciences, Institute of Agriculture, Environmental Protection and Management, Departament of Plant physiology and biotechnology, Poland

marzena.guty@poczta.onet.pl

A few words about the author(s):

I graduated biotechnology at the University of Silesia in Katowice. My doctoral thesis is concentrated in the field of the somaclonal variability of highbush blueberry plants.

Abstract:

Agroforestry is defined as an agricultural system that is developed to involve the interaction of shrubs, trees, and crops, and/or animals on the same land. Agroforestry systems can provide a range of environmental benefits. For example, they can improve soil fertility, protect crops and livestock from wind, restore degraded lands, improve water conservation, limit pests and prevent soil erosion. Additionally, the development of agroforestry systems in agrarian lands increases the overall quantity of microbial biomass and the amount of organic carbon in soils and thus helps to combat climate change.

Poplar is one of the fast-growing trees, the use of which in agroforestry systems can bring many environmental benefits. Poplar (Populus sp.) Is a widely known tree in Poland. Poplar is commonly considered a good choice for agroforestry systems due to adds to soil fertility. A wide variety of commonly planted crops e.g. wheat, oat, sorghum, maize, etc. can be grown as inter-crops in poplar agroforestry. The creation of agroforestry systems with poplar leads to the improvement of soil properties. Total soil humus and stable humic acids content are higher in poplar ecosystems with agroforestry in comparison with standard agriculture. Along with increased biomass accumulation in the soil, soil quality and fertility improvement are observed. At the same time, biodiversity in agroforestry systems increases.

Keywords:

poplar, agroforestry

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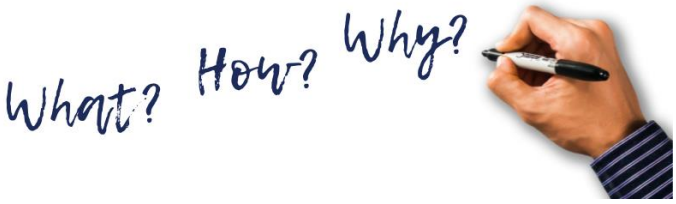

CHARACTERISTICS OF FELINE HYPERTHYROIDISM AS THE MOST COMMON CHRONIC DISEASE OF THE ENDOCRINE SYSTEM

Jakub Osypiuk

Faculty of Veterinary Medicine at the University of Warmia and Mazury

osypiuk.jakub@gmail.com

A few words about the author(s):

Fourth-year student of veterinary medicine. Author of scientific works in the field of feeding dogs and cats.

Abstract:

Feline hyperthyroidism is the most common hormonal disorder in this species. The diagnosis of hyperthyroidism is based on clinical symptoms such as polydipsia, polyuria, weight loss, increased excitability, vomiting and laboratory tests. In older cats, it is a direct threat to life, requiring quick and properly selected therapy. Treatment methods include pharmacological treatment, dietary treatment, surgical removal of the thyroid gland or radioiodine therapy. An overactive thyroid can have a big impact on the proper functioning of other systems in the body.

Keywords:

thyroid, cat, endocrine system

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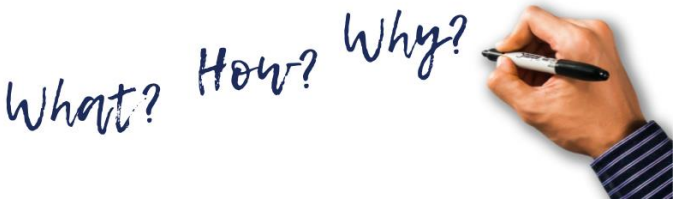

CHARACTERISTICS OF CANINE HYPOTHYROIDISM AS A CHRONIC DISEASE OF THE ENDOCRINE SYSTEM

Jakub Osypiuk

Faculty of veterinary medicine at the University of Warmia and Mazury in Olsztyn

osypiuk.jakub@gmail.com

A few words about the author(s):

Fourth-year student of veterinary medicine. Author of scientific works in the field of feeding dogs and cats.

Abstract:

Hypothyroidism in dogs is a common endocrine disease of this species. Diagnostics is based on symptoms such as weight gain, hair loss, lack of energy, skin discoloration, fungal infections, and laboratory tests. Heart disease is also associated with hypothyroidism. Treatment is based on pharmacological treatment and an appropriate diet, sometimes supported by iodine supplementation. Appropriate treatment can provide the dog a long and comfortable life.

Keywords:

thyroid, dog, endocrine system

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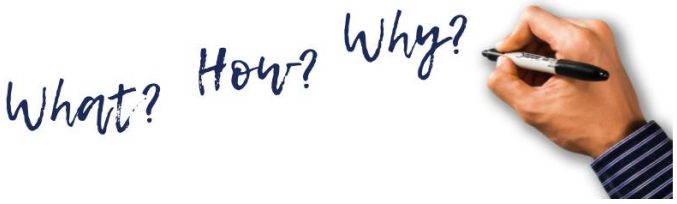

INTERACTIONS OF RECOMBINANT PROTEINS RESEARCH WITH DEDICATED BIOSENSORS USING BLITZ TECHNOLOGY

Maciej Prusinowski*, Joanna Żebrowska, Daria Krefft, Małgorzata Ponikowska, Marta Prusinowska Marta, Klaudia Jędryś, Natalia Górecka, Piotr Skowron

University of Gdansk, Faculty of Chemistry, Department of Molecular Biotechnology

*maciej.prusinowski0009@gmail.com

A few words about the author(s):

Chemists, biotechnologists and molecular biologists from Department of Molecular Biotechnology, Faculty of Chemistry, University of Gdansk. Specialized in DNA recombination, Gene cloning and expression, Protein isolation and engineering.

Abstract:

Proteins perform very important and diverse functions. They are major compounds in most of cellular processes. Whereas their functions often depend on interactions with other proteins or different molecules. Therefore, the development of accurate methods of studying these interactions in cells is extremely important. We present results series of the kinetic mesurements of recombinant proteins interactions with selected molecules and biomolecules. Kinetic measurements of protein-ligand interactions have made by using the Label-free Assays in a Drop technique using the Blitz® apparatus from ForteBio. Main advantage this metod is possibility of analysing various interactions, including protein-protein, protein-antibody guaranteed by using specialized biosensors.

For the measurements were used recombinant proteins, which were overexpressed in Escherichia coli expression system after designed, codon-optimized and expressed synthetic genes. The proteins were purified by affinity chromatography methods. Obtained proteins showing the selective properties of interactions with different biomolecules. Because all of obtained proteins had a His tag, for interaction measurement was used His1k biosensors which are selected to immobilize the proteins on the sensors. The ability of the obtained, recombinant proteins to bind selectively to a specific molecules for example telomeric DNA was confirmed. The rate and affinity constants for binding interactions (ka, kd, KD) were determined.

Keywords:

protein interactions, kinetic, biolayer interferometry, binding affinities

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COOPERATION BETWEEN NON-RELATED INDIVIDUALS IN ANIMAL SOCIETIES

Anita Rzadkiewicz

Adam Mickiewicz University in Poznań

anirza@op.pl

A few words about the author(s):

My name is Anita. I am a student of environmental protection. I like observing nature and learning about relationships between species. I am also interested in environmental impact assessments. In my spare time I draw landscapes – this is my passion.

Abstract:

Animals, like humans, work together and they exchange their resources or services.

It has often been suggested that the evolutionary explanation for cooperation between related individuals in animal communities is reciprocity. This explanation comes from reciprocal altruism, in which one animal shares its resources and the other reciprocates at a later stage. But does this type of cooperation occur between unrelated individuals? Are the animals able to help and then wait for compensation if they are not related to each other? Some examples of cooperation between non-kin animals likely represents a reciprocity that can be tied to the 'Prisoner's Dilemma' game theory, but firm evidence of reciprocity in animal societies is rare. This is due to the fact that the most common type of animal cooperation is mutualism or manipulation, which reduces the risk of fraud.

The aim of the presentation is to explain the cooperation between unrelated individuals in animal communities, taking into account the principles of reciprocity, mutualism and manipulation. The presentation also introduces the concept of reciprocal altruism and the way of thinking known as the "Prisoner's Dilemma". The presented examples allow us to consider whether, as a result of co-evolution, animals are able to show altruistic behavior towards unrelated individuals.

Keywords:

cooperation, reciprocal altruism, Prisoner's Dilemma, mutualism, manipulation

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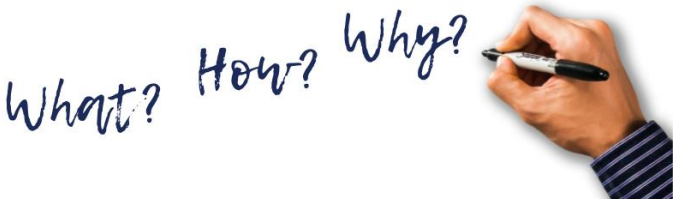


INFLUENCE OF THE ADDITION OF LEAD GLASS FROM THE $PbO-B_2O_3-SiO_2-ZnO-Al_2O_3$ SYSTEM ON THE STRUCTURE OF THE COMPOSITE ON THE 5083 ALUMINUM MATRIX

Adam Zwoliński

AGH University of Science and Technology

adam.zwolinski@agh.edu.pl

A few words about the author(s):

Ph.D. student from the Faculty of Non-Ferrous Metals.

Abstract:

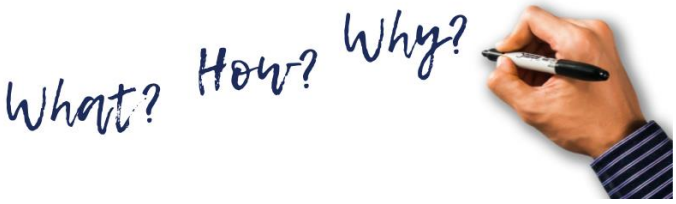
The work contains research on the plastic consolidation of fast crystallized 5083 aluminum alloy and lead glass powder.

The presentation touched on issues related to composite materials, characteristics of aluminum series 5xxx, methods of rapid crystallization, plastic consolidation and methods of producing composites on the example of hot extrusion and the characteristics of the glass phase.

As part of own research, two rods were produced in the process of plastic consolidation. One of them was a rod made of quick-crystallized 5083 aluminum alloy and the other was a metal-glass composite with the addition of 10% lead glass powder from the $PbO-B_2O_3-SiO_2-ZnO-Al_2O_3$ system. Then, light and scanning electron microscopy tests were carried out to confirm the integrity of the components being connected and the glass phase distribution.

Keywords:

aluminum 5083, lead glass, plastic consolidation



PARACETAMOL POISONING IN DOGS AND CATS

Konrad Zwoliński

University of Warmia and Mazury in Olsztyn, Faculty of Veterinary Medicine

143130@student.uwm.edu.pl

A few words about the author(s):

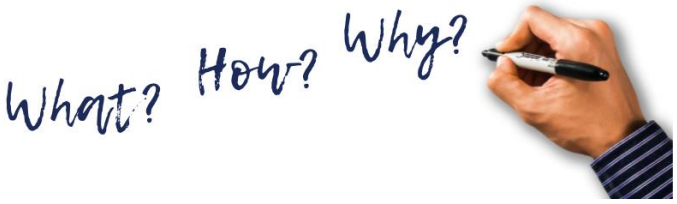
5th year student of the Faculty of Veterinary Medicine at the University of Warmia and Mazury in Olsztyn.

Abstract:

Paracetamol is known as a non-narcotic pain reliever. Used as an analgesic and antipyretic drug. The main causes of poisoning are the administration or leaving in an easily accessible place for animals preparations with paracetamol - clinical symptoms at a dose greater than 10 mg/kg in susceptible cats, young and old, other 50 mg / kg, in dogs 100 mg/kg b.w. The main symptoms a few hours after ingestion are: vomiting, diarrhea,salivation, abdominal soreness, brown oral mucosa then yellowing, lowering body temperature, dyspnoea.

Keywords:

drug, vomiting, non-narcotic pain reliever



ORTHOPEDIC EXAMINATION OF HORSES

Konrad Zwoliński

University of Warmia and Mazury in Olsztyn, Faculty of Veterinary Medicine

143130@student.uwm.edu.pl

A few words about the author(s):

5th year student of the Faculty of Veterinary Medicine at the University of Warmia and Mazury in Olsztyn.

Abstract:

Orthopedic examination in horses is aimed at determining which limb is affected, the closer location of the disease process and the type of lesions. The indications for the examination are lameness, bone spavin, chronic/acute arthritis, periarticular inflammation, inflamation of: articular sheaths, tendons, ligaments, injuries of: muscles, bones, tendons, ligaments, purchase/nsale examination, genetic defects.The examination plan includes an interview, observation of the animal at rest and movement, skin temperature examination, arterial pulsation examination, examination of the hoof, joints and limb sections, special tests and specialist examination.

Keywords:

lameness, arthritis, injuries

ABSTRACTS OF

POSTERS

TECHNICAL & NATURAL SCIENCES

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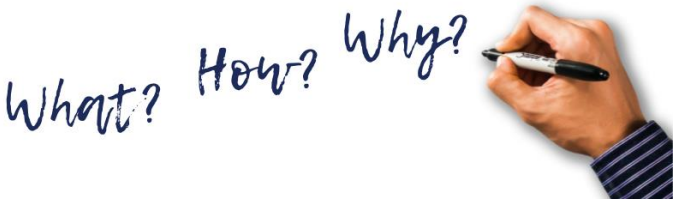

SYNTHESIS OF LITHIUM AMIDE FROM METALLIC LITHIUM BY PLANETARY BALL MILLING

Agata Baran

Military University of Technology

agata.baran@wat.edu.pl

A few words about the author(s):

Agata Baran is a researcher, lecturer and Ph.D. Student at Military University of Technology in Warsaw. Her main field of study is focused on hydrogen storage materials, including synthesis and characterization of the functional parameters.

Abstract:

Lithium amide is a material capable of storing hydrogen in its solid-state. It guarantees safety and relatively high energy rates. That group of materials has gained much attention lately due to the need of finding alternative energy sources. It is all connected with the climate changes followed by the climate crisis.

The aim purpose of this work is based on the lithium amide synthesis via ball milling technique. Ball milling (BM) and reactive ball milling (RBM) is the most promising method of synthesis of materials for Energy storage. Mechanical alloying allows obtaining homogeneous materials by milling the metallic materials. The experiment involved using the home-made vial for ball milling with attached systems constantly monitoring pressure and temperature values. Products of synthesis were pure metallic lit and commercial lithium hydride (LiH). Different milling balls were used: steel, ceramic, and sintered carbides. Working gas was a mixture of hydrogen and nitrogen (N_2:H_2) equal to 1:2 with the pressure in a range of 90–98 bar.

Keywords:

lithium amide, metal hydrides, hydrogen storage, ball milling, mechanochemical synthesis

GAS CHROMATOGRAPHIC METHODS FOR THE DETERMINATION OF OXYGENATES COMPOUNDS IN AUTOMOTIVE-MOTOR GASOLINE

Marta Bielicka (1, 2)*, Wojciech Cudnowski (1), Grzegorz Boczkaj (2)

(1) LOTOS Lab Sp. z o.o., Elbląska 135, 80-718 Gdańsk
(2) Gdańsk University of Technology, Faculty of Chemistry, Department of Process Engineering and Chemical Technology, G. Narutowicza 11/12, 80-233 Gdańsk

*Marta.Bielicka@lotoslab.pl

A few words about the author(s):

Prof. Grzegorz Boczkaj does research in Chemical Engineering, Analytical Chemistry and Environmental Chemistry. Wojciech Cudnowski is a manager of the laboratory for instrumental analysis. M. Bielicka is a Ph.D. student and coordinator in LOTOS Lab.

Abstract:

Gasolines, according to the Polish standard PN-EN 228, are fuels for spark ignition engines. Motor gasolines may contain oxygenate containing compounds (oxygenates)- alcohols and ethers. These compounds have a high resistance to detonation combustion (high octane number), therefore they are intentionally added to gasolines in order to increase their research octane number. This study presents three standard test methods for the determination of oxygen compounds long with discussion of their advantages and disadvantages. All of them are based on a gas chromatography with the flame ionization detector (GC-FID). The main difference between these methods relates to alternative way of separating the oxygenates from the rest of the sample components. Next, the isolated fraction of oxygenates in all methods is separated to individual oxygen compounds using a column with non-polar stationary phase.

Keywords:

gasoline, gas chromatography, oxygenates compounds, GC-FID

ELECTROCHEMICAL BIOSENSOR FOR EQUINE VIRAL ARTERITIS PROTEIN DETECTION USING ANTIBODY MODIFIED GOLD ELECTRODES

Ewelina Bięga (1)*, Marcin Kowalski (1), Mateusz Brodowski (1), Wioleta Białobrzeska (1), Sabina Żołędowska (1, 2), Dawid Nidzworski (1, 2)

(1) Institute of Biotechnology and Molecular Medicine, 3 Trzy Lipy St., 80-172 Gdansk, Poland
(2) SensDx S.A., 14b Postepu St., 02-676 Warsaw, Poland

*e.biega@ibmm.pl

A few words about the author(s):

Ewelina Bięga received the M.Sc.Eng. degree from the Gdansk University of Technology in 2015 and subsequently in 2017 from the University of Gdansk. Since 2020 she has been working as a chemist. Her main research area is development of biosensors.

Abstract:

Equine viral arteritis (EVA) is a disease caused by equine arteritis virus (EAV) of the species Alphaarterivirus equid, an RNA virus. Equine arteritis virus often affects the upper respiratory tract, affecting horses' performance, which is particularly problematic in the case of racehorses. It was also observed that EAV is a frequent cause of miscarriages in mares, which poses a great risk to breeding. The recent surge in the development of rapid diagnostics was due to the fact that EAV is often asymptomatic. For this reason, the virus spreads very quickly and is a major epidemiological threat.

Electrochemical impedance spectroscopy was used as the research method. To perform electrochemical detection of the biomarker for EVA protein, the surface of the gold electrodes was functionalized with used: 4-aminothiophenol, glutaraldehyde, monoclonal antibodies (receptor), and bovine serum albumin. Negative and positive samples of comparable concentrations were applied to the surface of the electrodes prepared as described above.

In the case of the tested monoclonal antibodies, it was observed that the responses obtained after applying the negative sample are comparable to the sensor responses to the blank and that the negative sample is easily distinguishable from the positive sample, which demonstrates the good selectivity of the sensor and the absence of cross-reactions.

Project funded by The National Centre of Research and Development Contract No POIR. 04.01.04-00-0013/18-00

Keywords:

electrochemical impedance spectroscopy, equine viral arteritis, biosensor, antibodies, gold electrodes

JANUS DIMER – WHAT IS IT AND WHERE IS IT USED?

Karolina Dąbrowska

Maria Curie-Sklodowska University, Faculty of Chemistry

karolinadab6@gmail.com

A few words about the author(s):

I am a student of master's studies at the Maria Curie-Sklodowska University at Lublin (Faculty of Chemistry).

Abstract:

Name of Janus dimers come from Roman god with two faces. Janus particles has dual nature which is related to the different properties of the part of particles. It can be physical, optical, electrical or magnetic properties. Currently, scientists are working on both Janus particles in the form of spheres and capsules.

Keywords:

Janus dimers

RESEARCH ON THE RECOVERY OF PGMS USING COMMERCIAL ION EXCHANGE RESINS

Karolina Goc (1)*, Grzegorz Benke (1), Joanna Kluczka (2)

(1) Centre of Hydroelectrometallurgy, Łukasiewicz Research Network-Institute of Non-Ferrous Metals, Sowińskiego 5, 44-100, Gliwice, Poland
(2) Department of Inorganic Chemistry, Analytical Chemistry and Electrochemistry, Faculty of Chemistry, Silesian University of Technology, B. Krzywoustego 6, 44-100, Gliwice, Poland

*karolinag@imn.gliwice.pl

A few words about the author(s):

Karolina Goc – Specialist in the Hydrometallurgy Research Group. Grzegorz Benke – Head of the Hydrometallurgy Research Group. Joanna Kluczka – Professor at the Faculty of Chemistry of the Silesian University of Technology.

Abstract:

The main aim of this research was to check the possibility of using commercial ion exchange resins, obtained from different manufacturers, for the recovery of platinum group metals, such as platinum, palladium and rhodium. The solution used in the experiments was obtained during the leaching of wastes produced in the refining process of noble metals.

The research consisted of the following steps: selection of the resins in the preliminary sorption tests; comparison of the chosen resins using a static method; elution and regeneration experiments of PGMs using a set of different eluents.

It was observed that the resins such as Puromet MTS98500 and Lewatit MonoPlus MP600 are the most efficient sorbents of PGMs. The ratio of solid to liquid phase 1:10 and the solution contact time with the resin from 15 to 30 minutes could be used in further dynamic research. Thiourea solution with the addition of hydrochloric acid could be used as the eluting agent for the recovery of platinum group metals.

Keywords:

pgm, ion exchange, sorption, resins, recovery of noble metals

DEEP EUTECTIC SOLVENTS AS INHIBITORS OF COPPER ELECTRODEPOSTION

Patrycja Kowalik (1)*, Wojciech Simka (2), Dorota Kopyto (1)

(1) Łukasiewicz Research Network - Institute of Non-Ferrous Metals, Center of Hydroelectrometallurgy, Sowinskiego 5, 44-100 Gliwice, Poland
(2) Department of Inorganic, Analytical Chemistry and Electrochemistry, Faculty of Chemistry, Silesian University of Technology, B. Krzywoustego 6, 44-100 Gliwice, Poland

*patrycjak@imn.gliwice.pl

A few words about the author(s):

2017-present – Specialist, Center of Hydroelectrometallurgy in ŁUKASIEWICZ–Institute of Non-Ferrous Metals, 2020-present – Implementation Doctorate Programme, "Use of additives containing ionic liquids in electrorefining and electrowinning of copper".

Abstract:

Electrodeposition of copper is important for a variety of industrial and decorative purposes including large-scale use in the electronics industry for production of printed circuit boards, selective case hardening of steel for engineering components, and production of electrotypes in the printing industry. Copper may be easily deposited and electroplated with other metals and it is therefore particularly useful as a pre-coating for soft soldered work or for zinc alloy die-castings used by the automotive industry. In these cases the copper deposit provides a protective layer to the metal to allow further coatings to be applied.

Ionic liquids (ILs) based on eutectic mixtures of choline chloride and hydrogen bond donors such as urea, glycerol, citric acid, malonic acid, oxalic acid or ethylene glycol are named deep eutectic solvents (DESs). These class of ionic liquids can be used as electrochemical solvents or inhibitors for the electrodeposition of copper. DESs differ from ILs due to their impressive properties such as low cost, easy preparation techniques, low volatility, biodegradability and non-toxicity.

Keywords:

deep eutectic solvents, ionic liquids, copper, copper electrodeposition, inhibitors

SPORTBAND – PHYSICAL ACTIVITY MONITORING DEVICE

Przemysław Łukasiewicz

WDTECH Sp. z o.o. Kampinoska 25, 80-180 Gdansk

lukasiewicz@wd-tech.eu

A few words about the author(s):

M.Sc. in Mechatronic. Embedded developer and mechanical engineer. Assistant manager of electronics Research and Development team.

Abstract:

An increasing part of society is becoming aware of the positive impact of exercise not only on our physical, but also mental health. Sport improves the physical condition and functioning of the immune system and internal organs. It helps calm down negative emotions and relieve stress. Therefore, the number of people who try to exercise regularly, increases year by year.

The SportBand was created to meet the expectations of people who want to consciously practice physical activity and for whom ordinary sports bands do not provide enough information. The chest strap developed by us is distinguished primarily by its ability to measure chemical substances in sweat. Such information, enables better planning of the training program, hydration and administer proper supplementation. In addition to measuring the components of sweat, the Sportband also measures heart rate, blood oxygenation and body temperature. To provide environmental information, the band is equipped with a temperature and atmospheric pressure sensor and an accelerometer.

Keywords:

wearable electronics, health, measurement of the chemical components of sweat

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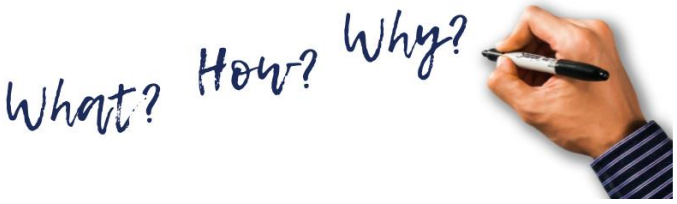

THERMOPHILES – WHY ARE THEY ABLE TO LIVE IN EXTREMELY HIGH TEMPERATURES?

Natalia Maciejczyk

Maria Curie-Skłodowska University, Institute of Biological Sciences,
ul. Akademicka 19, 20-033 Lublin

Natalia.Maciejczyk@Live.umcs.edu.pl

A few words about the author(s):

Student of Biotechnology at Maria Curie-Skłodowska University.

Abstract:

Extremophiles are microorganisms that inhabit extreme environmental conditions in which ambient temperature, air pressure, pH, radiation or salinity can reach extremely high or low values. They can be grouped depending on environmental parameters. Considering ambient temperature there are thermophiles (hyperthermophiles – extreme thermophiles) and psychrophiles. The present thesis is a review article about thermophiles, that is extremophiles which are able to live in high temperatures. It is enabled by their unique structure and a variety of specific defense mechanisms: production of heat shock proteins, thermostable enzymes and nucleic acides; different construction of cytoplasmic membrane; ability to quick resynthesis the thermally denatured macromolecules; occurence of trehalose and supercoiled DNA; increasing the thermal stability of ribosomes; etcetera. Enzymes produced by thermophilic microorganisms are used in industrial biotechnology. Most frequently these include extremophilic proteases and lipases.

Keywords:

thermophiles, extremophiles, ambient temperature, high temperature, biotechnology

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AUTOMOTIVE INDUSTRY AND METHODS OF HYDROGEN STORAGE

Magda Pęska*, Magdalena Rzeszotarska

Institute of Advanced Materials and Technologies, Military University of Technology, Kaliskiego 2 St., 00-908 Warsaw, Poland

*magda.peska@wat.edu.pl

A few words about the author(s):

I am PhD Student of material engineering at Military University of Technology. My research are focused on hydrogen storage materials and previously my master and engineer work consist of 3D printing technology.

Abstract:

The shortage of energy resources creates the need to search for new and alternative sources of energy. There are hopes associated with hydrogen, since a significant amount of energy is released during combustion in oxygen and only water vapor is a by-product. However, an important problem that must be faced in order to commercially use hydrogen in the automotive industry is how it is stored.

One solution is to store hydrogen in the gaseous state, but in such tanks, despite large volumes, a very small mass of hydrogen is stored, in order to reduce the ratio of the mass of the tank to the mass of hydrogen it contains, high pressures are required.

Another approach is to store hydrogen in the liquid state, liquefying hydrogen from the gaseous state allows to increase the density, but it is a more expensive process than its compression, and it is necessary to use low temperatures.

An increasingly interesting approach is to store hydrogen in the solid state, as it is the most effective and safe method. Storage in metal hydrides allows for the best ratio of the weight of the tank to the weight of the hydrogen stored in it.

There are a number of possibilities for storing hydrogen for use in the automotive industry, but each method presents certain difficulties. This work was financially supported by The National Centre (NCN) in Poland, No. 2018/29/N/ST8/01417

Keywords:

hydrogen storage, solid state hydrogen storage, hydrogen energy, hydrogen economy

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ANALYSIS OF IMPACT OF ZNO NANOPARTICLES ON REDOX HOMEOSTASIS OF A HUMAN BLOOD CELLS

Szymon Porębski*, Agnieszka Grzelak

Department of Molecular Biophysics, Faculty of Biology and Environmental Protection, The University of Lodz

*szymon.porebski@edu.uni.lodz.pl

A few words about the author(s):

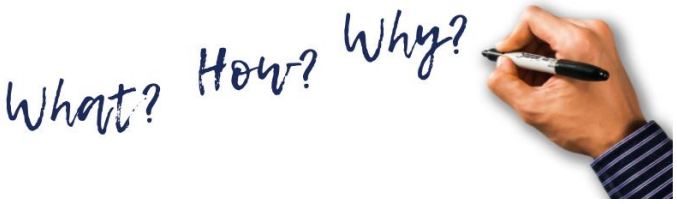
A. Grzelak is Ph.D. In her study concentrates on impact of nanomaterials and metabolism of ROS on health of cells. Sz. Porębski is a master degree student. He received degree of Bachelor of Sciences from biotechnology under supervison of A. Grzelak.

Abstract:

Zinc ions play crucial role in maintaining an antioxidant homeostasis and defence against reactive oxygen species. Zinc is an element, which plays vital role in a structure of many proteins such as transcription factors and most common antioxidant enzymes. A redox homeostasis is maintained in eukaryotic cells by the Plasma Membrane Redox System (PMRS), which regulates a level of reduced nicotinamide dinucleotides and protects membranes from damage caused by an oxidative stress. Moreover, principal components of PMRS play crucial role in a defence and a progress of a cancer disease. Current state of science suggest in contrast to many inorganic nanomaterials, Zinc Oxide Nanoparticles (ZnONP's) affects the cell mostly by excessive zinc ions release and disruption of a intracellular metabolism of this metal. Many studys present, that a biological release of free zinc from cellular compartments is a crucial element of response to the oxidative stress. According to these facts, we performed experiments to estimate a level of disruption of eukaryotic redox homeostasis, especially on activity of PMRS after incubation with bare and PEGylated ZnONP's suspension.

Keywords:

Plasma Membrane Redox System, redox homeostasis, ZnONP's, human blood cells



PAINKILLERS AND ENVIRONMENTAL IMPACT

Anna Wasilewska

Maria Curie-Skłodowska University in Lublin

aniajessica.wasilewska@gmail.com

A few words about the author(s):

I am a student of Department of Radiochemistry and Environmental Chemistry, Faculty of Chemistry, University of Maria Curie-Skłodowska in Lublin.

Abstract:

Nowadays, there is an increasing consumption of drugs from the group of nonsteroidal anti-inflammatory drugs. This causes an increase the presence of these drugs in the environment. Because of this, toxicity studies of ibuprofen, ketoprofen, naproxen and paracetamol have been conducted on garden cress (Phytotoxkit) and on Vibrio fischeri bacteria (Microtox®). It appears that naproxen has shown the most detrimental effects on the growth of garden cress roots. In the case of the Vibrio fischeri test, ibuprofen, ketoprofen and naproxen at high concentrations show a very harmful effect by inhibiting the bioluminescence of the bacteria. Paracetamol is one of the drugs with moderate harmfulness against bacteria. In addition, paracetamol, ketoprofen, and ibuprofen stimulate the root growth of garden cress. Such diverse results can be explained by the physical and chemical properties of the compounds studied, as well as from the diversity of life processes of the organisms studied.

Keywords:

ibuprofen, ketoprofen, paracetamol, naproxen, Vibrio fischeri, garden cress

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