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TABLE OF CONTENTS

HUMANITIES SCIENCES PRESENTATIONS

Polycap Mudoh

EUROPEAN UNION AS A MODEL FOR INTEGRATIONAL ARRANGEMENTS IN AFRICA – CENTRAL AFRICAN ECONOMIC AND MONETARY COMMUNITY AS A CASE STUDY	11
--	----

Monika Papiewska

A CLIMATE FOR CREATIVITY AT THE WORK	12
--	----

Kacper Plantowski

THE ANALYSIS OF SOCIAL ATTITUDES TOWARDS MULTIFUNCTIONAL AND SUSTAINABLE FOREST MANAGEMENT	13
---	----

Jacek Rutkowski

THIERRY OF CHARTRES AND BOOK OF NATURE	14
--	----

Gabriela Zadrag

HUNTING – A BLOODY HOBBY OR A WAY TO BALANCE THE ECOSYSTEM? A SOCIOLOGICAL PERSPECTIVE	15
---	----

Joanna Adamczyk

MUSEUM OF STANISŁAW WYSPIAŃSKI IN KRAKÓW - THE PAST, PRESENT AND FUTURE	16
--	----

Daria Borzyszkowska

PRECISE GOAL AS THE KEY TO SUCCESS	17
--	----

Agata Czemerys

DECONSTRUCTING DONNA ANNA. WHAT QUEER STUDIES TELL US ABOUT THE OPERA?	18
---	----

Joanna Gawęda

PROPAGANDA ASPECTS OF THE SUPERHERO CHARACTER ON THE EXAMPLE OF CAPTAIN AMERICA	19
--	----

Michał Mrozek

SOLD PRODUCTION OF INDUSTRY AND CONSTRUCTION IN THE VOIVODESHIPS OF THE EASTERN MACROREGION OF POLAND IN 2016-2018- THE SELECTED PROBLEMS	20
---	----

Przemysław Mirosław Pazder

UNITED STATES OF AMERICA AND THE EUROPEAN UNION- MARSHALL PLAN, EUROPEAN UNION POLICY AND US POLICY, PROBLEMS IN EU-WASHINGTON RELATIONS	21
--	----

Przemysław Mirosław Pazder

OPERATION POLAND IN UKRAINE	22
-----------------------------------	----

Kacper Pelczarski

THE OLDEST MUSICAL INSTRUMENTS	23
--------------------------------------	----



Marcin Rozmarynowski

KNOWLEDGE OR WISDOM AS THE KEY TO SUCCESS? SCHOOL SOCIAL ENGINEERING AND THE INDOCTRINATION OF POLISH TEACHERS DURING THE STALINIST ERA (1948-1956) IN THE LIGHT OF TEACHERS' MEMORIES	24
--	----

HUMANITIES SCIENCES POSTERS

Angelika Lenart

POST-TRAUMATIC STRESS DISORDER IN CHILDREN	26
--	----

Agata Niezabitowska, Ryszard Poprawa

POLISH ADAPTATION AND VALIDATION OF THE MODIFIED REASONS FOR SMOKING SCALE	27
---	----

Marta Rokosz, Ryszard Poprawa

A POLISH ADAPTATION AND VALIDATION OF THE DISTRESS TOLERANCE SCALE	28
---	----

MEDICAL SCIENCES PRESENTATIONS

Gabriela Blat, Natalia Lis

THE IMPACT OF STRESS ON NURSING STUDENTS AND WAYS OF DEALING WITH IT	30
---	----

Damian Dyńska, Katarzyna Kowalcze

TURMERIC AS AN ESSENTIAL ELEMENT OF HUMAN NUTRITION	31
---	----

Alicja Groszek, Agata Kolasa, Zuzanna Gwóźdź, Agnieszka Kwiatkowska

MIGRAINE AS ONE OF THE MAIN CAUSES OF DISABILITY AMONG YOUNG PEOPLE	32
--	----

Edyta Janik, Michał Bijak

IMPACT OF MYCOTOXINS IN FOOD ON HUMAN HEALTH	33
--	----

Katarzyna Kowalcze

PHYTOTHERAPY IN METABOLIC DISEASES	34
--	----

Natalia Krzyżanowska, Kamila Kędzior, Izabela Gura

PATHOGENICITY OF BAYLISASCARIS PROCYONIS IN THE CONTEXT OF RACCOON INTRODUCTION IN POLAND	35
--	----

Filip Lebiedziński, Alan Majeranowski, Aleksandra Janowiak-Majerankowska

EMOTIONS RELATED TO HEMATOPOETIC STEM CELL DONATION - A RETROSPECTIVE SURVEY STUDY ON ACTUAL DONORS	36
--	----

Izabela Malitka

INFLUENCE OF THE TYPE OF MEAT AND FAT QUALITY ON THE DEVELOPMENT OF CARDIOVASCULAR DISEASES	37
--	----

Anna Muzyczka, Patrycja Mściwujewska

DEMOGRAPHIC CHANGES AS A CHALLENGE FOR THE HEALTH CARE SYSTEM ..	38
--	----

**Kacper Niewęglowski, Paweł Oszczędlowski, Martyna Wasyluk, Barbara Madoń,
Piotr Jarosz**

THE IMPACT OF BEE POLLEN SUPPLEMENTATION ON THE ENDOTHELIAL NITRIC OXIDE SYNTHASE (NOS3) RECEPTOR'S EXPRESSION IN THE LIVER IN WISTAR RATS	39
--	----



Barbara Pelc, Aneta Makówka EXAMINING THE LEVEL OF KNOWLEDGE ON DEPRESSION AMONG STUDENTS OF MEDICAL COURSES	40
Bartosz Sobocki MACROPHAGES IN CARCINOGENESIS	41
Monika Sztandera-Tymoczek, Agnieszka Szuster-Ciesielska PHYTOPATHOGENIC FUNGI AS A POTENTIAL HUMAN HEALTH THREAT	42
Tymon Bykowski, Jan Milanowski, Jarosław Nuskiewicz, Karolina Szewczyk-Golec THE ROLE OF PHOSPHO-TAU217 PROTEIN IN DIAGNOSIS OF ALZHEIMER'S DISEASE	43
Filip Dunajewski FEVERFEW (TANACETUM PARTHENIUM) IN MIGRAINE PREVENTION	44
Piotr Dzikowski, Martyna Stefaniak, Zofia Pietrzak, Anna Kolano, Halina Pieciewicz-Szczęśna THE EFFICIENCY OF PATELLOFEMORAL PAIN SYNDROME TREATMENT WITH SYNVISC IN PEDIATRIC PATIENTS – LITERATURE REVIEW	45
Justyna Jandernal, Ewa Ziółkowska TREATMENT OF HER2+ BREAST CANCER - THE CURRENT STATE OF KNOWLEDGE	46
Dorian Jarek, Joanna Kruszka, Jarosław Nuskiewicz, Karolina Szewczyk-Golec ROLE OF MITOCHONDRIAL DYSFUNCTIONS IN DEVELOPMENT AND COURSE OF PARKINSON'S DISEASE	47
Karolina Karaś, Katarzyna Dudzińska, Aleksandra Łoś, Wiktoria Mytych TAKING UP ACTIVE TOURISM AMONG STUDENTS OF RZESZÓW UNIVERSITIES ..	48
Natalia Kazimierczak, Wojciech Kazimierczak, Ewa Ziółkowska COMPLICATIONS OF ONCOLOGICAL TREATMENT IN ORTHODONTIC PRACTICE	49
Anna Kolano, Zofia Pietrzak, Martyna Stefaniak, Piotr Dzikowski, Piotr Olcha ECTOPIC PREGNANCY OF THE RIGHT FALLOPIAN TUBE – CASE STUDY	50
Joanna Kruszka, Dorian Jarek, Jarosław Nuskiewicz, Karolina Szewczyk-Golec VASOVAGAL SYNCOPE – SYMPTOMS, MECHANISM, DIAGNOSIS	51
Szymon Kufel, Ewa Ziółkowska SEXUAL SATISFACTION AND LIFE SATISFACTION IN PEOPLE TREATED WITH ONCOLOGY	52
Marianna Lis, Zuzanna Siwka, Jarosław Nuskiewicz, Karolina Szewczyk-Golec PSILOCYBIN – THE IMPACT ON ADDICTION TO SMOKING	53
Jan Milanowski, Tymon Bykowski, Jarosław Nuskiewicz, Karolina Szewczyk-Golec PRO-INFLAMMATORY CYTOKINES IN THE PATHOGENESIS OF ALZHEIMER'S DISEASE	54
Paweł Myśliborski-Wołowski, Ewa Ziółkowska SIDE EFFECTS OF SELECTED CYTOTOXIC DRUGS	55



Kacper Michał Naumowicz, Miłosz Marek Zbucki, Martyna Słowikowska, Joanna Kotyńska QUERCETIN - AN ALLY IN THE FIGHT AGAINST CORONAVIRUS?	56
Magda Orzolek METABOLIC SYNDROME - CAN KNOWLEDGE PROTECT US FROM IT?	57
Jacek Polechoński, Agnieszka Chruściel PHYSICAL EFFORT WHILE WALKING ON A MULTI-DIRECTIONAL TREADMILL DESIGNED TO MOVE IN VIRTUAL REALITY IN RELATION TO WALKING IN THE FIELD	58
Janina Rzeszot THROUGH THE EYES OF A PHYSIOTHERAPIST ON AN ONCOLOGICAL PATIENT ..	59
Janina Rzeszot CLINICAL PHYSIOTHERAPY – ITS ROLE IN IMPROVING THE PATIENT, IN RETURNING TO EVERY LIFE	60
Ilona Samek, Magdalena Jańczyk, Anna Wójcik, Justyna Bialek, Paulina Krawiec, Joanna Kurzepa IS IT REALLY A STONE? – LIMITED DIAGNOSTIC VALUE OF AN ABDOMINAL X-RAY IN THE DIAGNOSIS OF PATIENTS WITH RENAL COLIC	61
Ilona Samek, Magdalena Jańczyk, Anna Wójcik, Justyna Bialek, Paulina Krawiec, Joanna Milanowska HOW HAS THE ASSESSMENT OF PHYSICIANS' COMPETENCES AND THE FUNCTIONING OF VISITS CHANGED DURING THE COVID-19 PANDEMIC?	62
Zuzanna Siwka, Marianna Lis, Jarosław Nuskiewicz, Karolina Szewczyk-Golec SIDE EFFECTS OF STATINS USED TO TRAT CHOLESTEROL DISORDERS	63
MEDICAL SCIENCES POSTERS	
Kamil Janawa, Anna Baranowska, Jakub Kwiatkowski, Patrycja Kupnicka THE EFFECT OF MORPHINE DEPENDENCE ON THE EXPRESSION OF COX-1 AND COX-2 IN CHOSEN STRUCTURES OF RAT BRAINS EXPOSED TO LOW FLUORIDE CONCENTRATIONS	65
Magdalena Kowalska, Łukasz Fijałkowski, Alicja Nowaczyk CALCULATING CHEMISTRY METHODS AS A SOURCE OF DATA ON TOXICITY OF POTENTIAL DRUGS	66
Malgorzata Król, Marta Skowron, Sandra Piechota, Maria Kopia, Patrycja Kupnicka STRETCHING AS AN ANTI-INFLAMMATORY FACTOR. THE EXPRESSION OF INFLAMMATORY MARKERS IN TISSUES SUBJECTED TO STRETCHING – A REVIEW	67
Anna Ornatowska INNOVATIVE HYDROGEL – THE FUTURE OF ORTHOPEDICS AND TRANSPLANTOLOGY	68
Karolina Żurawska, Weronika Ossowska, Denis Myszak, Michał Tomaszek, Patrycja Kupnicka PRE-EXPOSURE TO FLUORIDE AND THE MRNA EXPRESSION OF GFAP IN THE BRAINS OF MORPHINE-DEPENDENT RATS	69



NATURAL AND TECHNICAL SCIENCES PRESENTATIONS

Wioleta Banaszuk

HYPEROSMOTIC STRESS RESPONSE: THE ROLE OF NEUTRAL AMINO ACID
TRANSPORTER SNAT2 71

Konrad Brzyski, Dariusz Kuc

IMPROVEMENT OF THE MECHANICAL PROPERTIES OF PRESS-HARDENED
22MNB5 STEEL IN INDUSTRIAL CONDITIONS 72

Cassandra Ceccopieri, Joanna Skonieczna-Kurpiel, Jan Madej

HEMATOXYLIN, EOSIN AND NATURAL SAFFRON (HES): A NEW HISTOLOGICAL
STAINING METHOD 73

**Wojciech Gogacz, Maria Dzierżyńska, Sylwia Rodziewicz-Motowidło,
Franciszek Kasprzykowski**

SYNTHETIC ANTIMICROBIAL PEPTIDOMIMETICS BASED ON BINDING SITE
OF CYSTATIN C – OPTIMIZATION OF SCALE-UP SYNTHESIS 74

Justyna Kurcek

CHEMICAL PHOSPHORUS REMOVAL FROM WASTEWATER WITH USING
PRE-HYDROLYZED COAGULANTS 75

Anna Litwin, Sylwia Różalska

COMPARISON OF PESTICIDES EFFECT ON THREE ENTOMOPATHOGENIC
FUNGAL STRAINS OF THE GENUS ISARIA 76

Anna Litwin, Sylwia Różalska

THE INFLUENCE OF HEAVY METALS ON ENTOMOPATHOGENIC FUNGI 77

Amanda Leda, Maria Kuznowicz, Tomasz Rębiś, Teofil Jesionowski

OPTIMIZATION OF WORKING CONDITIONS OF THE SECOND GENERATION
BIOSENSOR DUE TO THE SELECTION OF AN APPROPRIATE MEDIATOR 78

Paulina Machała, Halina Małgorzata Żbikowska

ROLE OF GREEN COFFEE BEAN EXTRACT IN SKIN FIBROBLASTS RESPONSE
TO UVA RADIATION 79

Krzysztof Matuszek

A BRIEF HISTORY OF DEVELOPMENT OF BULK HETEROJUNCTION ORGANIC
SOLAR CELLS (BHJ-OSCS) 80

Jakub Michańków

MODELLING UNIVARIATE TIME SERIES WITH ONE-DIMENSIONAL
CONVOLUTIONAL NETWORKS 81

Oskar Ronda, Bartłomiej Cieślík, Elżbieta Grządka

ACCUMULATION OF RADIOISOTOPES IN SOME SPECIES OF POLISH
MUSHROOMS 82

**Joanna Skonieczna-Kurpiel, Jan P. Madej, Agnieszka Noszczyk-Nowak,
Tomasz Klekiel, Romuald Będziński**

THE STENT IMPLANTATION INTO THE LUMEN OF URETHRA AT NEW ZEALAND
WHITE RABBIT 83



Anna Szymczyk, Robert Ziółkowski, Marcin Drozd, Elżbieta Malinowska MODIFICATIONS OF MAGNETIC NANOPARTICLES SUITABLE FOR NUCLEIC ACIDS EXTRACTION	84
Paweł Błaszczyk MODERN INDUSTRIAL ROBOTS	85
Alicja Bosacka KINETIC STUDIES OF HYBRID POLYMER MATERIALS	86
Gabriela Ciuńczyk, Weronika Dudzińska, Martyna Słowikowska, Joanna Kotyńska, Monika Naumowicz THE EFFECT OF THE ELLAGIC ACID UPON THE ELECTROKINETIC POTENTIAL OF THE PHOSPHATIDYLCHOLINE MEMBRANES	87
Kamil Dędek, Justyna Rosicka-Kaczmarek, Ewa Nebesny, Gabriela Kowalska, Karolina Miśkiewicz INFLUENCE OF THE MICROENCAPSULATION METHOD POTATO STARCH FERULATES ON THEIR PHYSICOCHEMICAL PROPERTIES	88
Milena Kaczmarska, Dorota Żyżelewicz, Joanna Oracz, Katheryna Sheremet ANTIOXIDANT POTENTIAL OF INCLUSION COMPLEXES OF SELECTED POLYPHENOLS WITH 2-HYDROXYPROPYL-B-CYCLODEXTRIN	89
Natalia Kielich, Agata Cieśla POTENTIAL APPLICATION OF CHLOROPLAST UBIQUITIN LIGASES E3 IN ABIOTIC STRESS TOLERANT PLANT BREEDING	90
Paulina Leśniak, Krzysztof Puk, Leszek Guz ICHTHYOFTIRIOSIS IN FISH – SYMPTOMS, DIAGNOSIS AND TREATMENT	91
Paulina Leśniak, Krzysztof Puk, Leszek Guz CANNABIS SATIVA – PROPERTIES AND APPLICATION	92
Julia Mironenka, Przemysław Bernat CHANGES IN TRICHODERMA HARZIANUM CELL MEMBRANE AS RESPONSE TO TOXICITY OF THE HERBICIDE 2,4-D	93
Jakub Osypiuk ASSESSMENT AND COMPARISON OF VARIOUS ASPECTS OF CAT NUTRITION IN POLAND	94
Joanna Pypeć COMPOSITION OF THE RHOPALOCERA BUTTERFLY FAUNA OF THE URSYNOWSKA SLOPE AND THE CHARACTER OF SPECIES CHANGES OVER THE YEARS	95
Julia Sadowska, Patrycja Skowronek MADE-TO-MEASURE POLLINATOR – HOW TO CHOOSE THE PERFECT INSECT FOR YOUR ENVIRONMENT	96
Julia Sadowska, Patrycja Skowronek INSECT FOR SPECIAL TASKS – THE INCREDIBLE BIOLOGY OF BUMBLEBEES	97



Paweł Solarczyk, Piotr Kostusiak, Daniel Radzikowski, Konrad Wiśniewski, Kamila Puppel THE LEVEL OF THE HEALTH-PROMOTING QUALITY OF SEMIMEMBRANOSUS MUSCLE IN PUREBRED AND CROSSBRED BULLS	98
Paweł Solarczyk, Piotr Kostusiak, Daniel Radzikowski, Konrad Wiśniewski, Kamila Puppel BEEF CATTLE BREEDING IN POLAND	99
Julia Wojnicka, Paulina Mertowska, Marta Koziel, Monika Janczarek INFLUENCE OF ENVIRONMENTAL FACTORS ON EXOPOLYSACCHARIDE SYNTHESIS IN RHIZOBIUM LEGUMINOSARUM BV. TRIFOLII	100
NATURAL AND TECHNICAL SCIENCES POSTERS	
Agata Baran MAGNESIUM – BASED HYDRIDES FOR HYDROGEN STORAGE	102
Anna Fenyk, Marek Zieliński, Ewa Miękoś, Ewa Chrzescijańska, Anna Masek, Wojciech Horak CURRENT PROGRESS IN RESEARCH ON MODERN FUNCTIONAL MATERIALS – MAGNETORHEOLOGICAL FLUIDS AND ELASTOMERS	103
Maciej Hałupka, Paweł Janusiak, Krystian Kutnik, Jędrzej Mosiężny PARACHUTE GEOMETRY OPTIMIZATION METHOD WITH REGARD TO STRESS DISTRIBUTION IN THE CANOPY MATERIAL	104
Jakub Józewicz APPLICATIONS OF NANOTECHNOLOGY IN COMPUTER COOLING	105
Wiktoria Kozłowska, Patryk Jedlikowski, Juliusz Saryczew TECHNOLOGY OF OBTAINING HYBRID ROCKET FUELS BASED ON PARAFFIN AND POLYETHYLENE USING A THERMOSTATIC CHAMBER	106
Tomasz Krakowski, Maciej Leszczyk, Łukasz Kozak TELEMETRY SYSTEM FOR SOUNDING ROCKET - DATA PACKAGE FORMULATION AND USAGE OF GSM FOR ENHANCE SYSTEM PERFORMANCE ...	107
Beata Madras-Majewska EX-SITU PROTECTION IN ZOOS	108
Karolina Pietrucha HOW TO LEAD A POLYMER FOR A WALK?	109
Wiktor Tasarek, Wojciech Kubiak, Mateusz Lemański TRACKING SYSTEM FOR RESEARCH ROCKETS USING MODULATION TECHNIQUE WITH CHIRP SPREAD SPECTRUM – LORA	110

HUMANITIES SCIENCES

PRESENTATIONS



EUROPEAN UNION AS A MODEL FOR INTEGRATIONAL ARRANGEMENTS IN AFRICA – CENTRAL AFRICAN ECONOMIC AND MONETARY COMMUNITY AS A CASE STUDY

Polycap Mudoh

University of Szczecin

polycap.mudoh@phd.usz.edu.pl

A few words about the author:

The author is a Cameroonian by nationality, graduated from the Poznan University of Economics and Business - Poland. Is currently a PhD research student from the University of Szczecin in the departments of political science and administration.

Abstract:

Regional integration is proceeded at different levels across the globe. Today's examples include the European Union (EU) and the African Union (AU). Within the AU, Sub-regional organizations employ different strategies to foster regional integration. Examples of such sub regional organizations are; the Central African Economic and Monetary Community (CEMAC), The Economic Community of West African States (ECOWAS), and the South African Development Community (SADC). From its conception, the raison d'être of the AU has been to foster integration in the continent and see into it that it's practiced effectively. To assess EU as model of integrational arrangements, consideration has to be taken on the influence it has to other organizations seeking integrational arrangements. So far, the EU is the only organization that is regarded as a model for other integrational arrangements. In the same line it stands out today as one of the most influential institutions on the African continent. The ongoing debate today is about the EU is whether it can serve as model for integrational arrangements in other communities. The purpose here therefore, is to examine whether the EU can serve as model for integrational arrangements in Africa, while taking the CEMAC as a case. Though the CEMAC organization has some defined objectives that are like the EU, for example the creation of an economic Union and a regional parliament. Yet, it appears this region might be far from its expectation.

Keywords:

model, integrational arrangements



A CLIMATE FOR CREATIVITY AT THE WORK

Monika Papiewska

Radom Academy of Economics

monika.papiewska@vp.pl

A few words about the author:

Management student, Radom Academy of Economics, manager with 20 years of experience.

Abstract:

The aim of the work is to study the climate for creativity in terms of innovative ideas that are useful. The right climate is conducive to work efficiency, self-fulfillment and building the desired relationships.

To measure the perception of the workplace by employees, the KEYS questionnaire by prof. T. Amabile. The measurement covers three areas: the organizational motivation, resources and management practices. It also provides detailed information on how people perceive the work environment and its impact on creativity. The tool used indicates a strong differentiation of the surveyed companies, which gives comparative possibilities.

The practical effects of the study are to help managers of two separate organizations to define the image of the climate in the team and its impact on the employee to demonstrate creativity.

The analysis of the research results shows that the corporate work environment generates innovative results through a coherent management and organization policy, a common vision, providing rewards, or freedom and autonomy.

Keywords:

climate for innovation, relationship building, working environment



THE ANALYSIS OF SOCIAL ATTITUDES TOWARDS MULTIFUNCTIONAL AND SUSTAINABLE FOREST MANAGEMENT

Kacper Plantowski

University of Lodz, Branch in Tomaszów Mazowiecki

k.plantowski@gmail.com

A few words about the author:

Student of forestry at the University of Lodz, Branch in Tomaszów Mazowiecki. Interested in oenology and foreign cuisines (especially Italian and Japanese). Trying to filter specialist forestry knowledge through sociological lens.

Abstract:

Over the decades, the meaning of the notion of ‘forest’ has changed. Formerly, forests used to be complex ecosystems, whose biocenosis was created by nature. They constituted a diverse environment that was subject to the law of natural processes. However, with the passing of time human beings have begun to interfere with forests and subjugate them to their own use. The ecological function of forests has been pushed to the background. Today, however, forests are no longer treated as merely a source of wood raw material; ecological and social functions have also gained importance.

The new system of forest management has attracted both followers and opponents. The interference of humans with forests and logging provoke extreme emotions. The Polish society has developed different attitudes. Forests have gained advocates and the blame for forests’ bad sanitary conditions often falls on foresters. On the other hand, the elimination of logging is not possible, because this area requires a rational and neutral analysis. To this end, the author of this presentation conducted survey research among people who do not possess specialist forestry knowledge. The aim was to illustrate social attitudes to multifunctional and sustainable forest management in Poland. The results form grounds for the analysis of the social moods in this regard as well as establishing their reasons. The presentation will combine sociological considerations with theoretical knowledge in the field of forestry.

Keywords:

survey research, multifunctional forest, sustainable forest management, social attitudes



THIERRY OF CHARTRES AND BOOK OF NATURE

Jacek Rutkowski

University of Warsaw

j.rutkowski2@student.uw.edu.pl

A few words about the author:

I finished Mathematics at the University of Warsaw and now I study Philosophy at the same University. I am interested in mediaeval philosophy, allegorical exegesis of Scripture, Saint Thomas Aquinas, mediaeval mathematics.

Abstract:

The metaphor of the „Book of Nature” invented by Maximus the Confessor has been repeated by numerous mediaeval authors. It was a predominant tendency in twelfth century to treat this „book” in the same way as the Holy Scripture, second book written by the finger of God. Namely, mediaeval authors distinguished four senses of Scripture: literal, moral, tropological and analogical, as they are enumerated in the famous verse of Augustin of Dacia. Similarly, the „Book of Nature” was supposed to have allegorical senses, which might be uncovered by a mystical insight. Thierry of Chartres, however, in his work *De sex dierum operibus* sought to read the aforementioned book by means of the natural sciences.

Keywords:

Thierry of Chartres, School of Chartres, Book of Nature



HUNTING – A BLOODY HOBBY OR A WAY TO BALANCE THE ECOSYSTEM? A SOCIOLOGICAL PERSPECTIVE

Gabriela Zadrag

University of Lodz, Branch in Tomaszów Mazowiecki

zadragabi@gmail.com

A few words about the author:

Studying forestry at the University of Lodz, Branch in Tomaszów Mazowiecki. Interested in biology. Wishes to investigate the subject of hunting from an interdisciplinary perspective. Believing in sociology as a means of understanding various problems.

Abstract:

The aim of the presentation is a sociological and nature-related reflection on the practise of hunting and its implications. Due to small body of scientific research on social attitudes towards hunting, it is worthwhile to explore this problem from an interdisciplinary perspective. For example, examining the connection and differences between the attitudes of ecological movements and the assumptions of the State Forests' management might reveal some dependency and facilitate the understanding of the complexity of this problem. In this context, the question of hunting combines social and biological aspects. I will consider them all and present both scientific and ethical arguments. Could the ecosystem function without hunting? Do hunters balance it out by negative selection and killing weak animals? What are the benefits of hunting? Could it be ethical to kill other species? Are there other ways to balancing the ecosystem? I am interested in capturing ways in which different social groups perceive the practise of hunting in Poland. The threads to be considered in this context include the benefits of hunting, the ethics of hunting or attitudes towards other forms of ecosystem balancing and towards the reintroduction of endangered species. Taking all this into account, I will propose an interdisciplinary approach to the topic, as well as present gaps in research and make my own recommendations in this area.

Keywords:

interdisciplinarity, hunting, ecosystem, ethics



MUSEUM OF STANISŁAW WYSPIAŃSKI IN KRAKÓW - THE PAST, PRESENT AND FUTURE

Joanna Adamczyk

Pontifical University of John Paul II in Kraków

joanna.adamczyk@doktorant.upjp2.edu.pl

A few words about the author:

The author is a Ph.D. student in the second year of the Doctoral School in the discipline of history at the Pontifical University of John Paul II in Kraków. Her research interests are culture in Kraków during the Galician autonomy (1866-1914).

Abstract:

Stanisław Wyspiański is one of the most important Polish artists at the turn of the 19th century. No wonder then that in Kraków, the city where he lived and worked, they wanted to commemorate his life and work. One way was a museum. The purpose of this paper is to briefly investigate the history of this institution and determine whether we can talk about its continuity or whether they were separate initiatives - through the past, present state and plans for the future.

By analyzing the history of the museum available in historical sources, literature on the subject, up to websites in the case of the latest initiatives, a scheme of events related to this issue will be established.

As well as historical and recent undertakings and plans for the future will be presented. An attempt will also be made to diagnose why the artist's legacy was not exhibited for a long time and what factors influenced the revival of the idea of creating the Museum of Stanisław Wyspiański.

Keywords:

history, culture, museum, Wyspiański, Kraków



PRECISE GOAL AS THE KEY TO SUCCESS

Daria Borzyszkowska

University of Warmia and Mazury in Olsztyn

daria.jadwiga.borzyszkowska@gmail.com

A few words about the author:

Fourth year law student with the passion for self-development, self-help, spirituality and home gardening.

Abstract:

The definition of success may be different for everyone. The term is defined by dictionary as “the achieving of the results wanted or hoped for”. Therefore if every person’s dreams and desires vary, the natural consequence is that their definition of success is different as well. In my report I would like to present how despite of variety in understanding the previously mentioned concept, the key to achieve the purpose is always the same. Napoleon Hill once said “Set your mind on a definite goal and observe how quickly the world stands aside to let you pass”. The only way to become successful is to know what you want to achieve. Without this knowledge, one cannot start their journey towards success.

Keywords:

precise goal essentialism



DECONSTRUCTING DONNA ANNA. WHAT QUEER STUDIES TELL US ABOUT THE OPERA?

Agata Czemerys

Fryderyk Chopin University of Music; University of Warsaw

agataczemerys@gmail.com

A few words about the author:

Agata Czemerys is a music theorist, singer and choral conductor. Her research interests are focused on operatic theatre and social contexts of its works.

Abstract:

Queer studies is the study of deconstruction of binary discourse on the identity of a subject. As a relatively new field of academic research it has not got settled in the area of opera studies yet. However, there is no doubt that queer studies can strongly challenge the modern humanities as well as confront the opera with completely new questions and problems.

The aim of this paper is to present the theoretical basis of queer theory and translate it into the field of operatic works. In her research the author refers to the classic authors of queer theory: Michael Foucault and Judith Butler, as well as Louis Althusser and his approach to the concept of ideology. Their considerations will help to present several directions in the study of gender performativity in opera, and will be applied to the dramatic trajectory as well as musical language of Wolfgang Amadeus Mozart's Don Giovanni, with a focus on the one of opera's protagonists Donna Anna.

Keywords:

Queer studies, queer theory, gender performativity, opera, Mozart



PROPAGANDA ASPECTS OF THE SUPERHERO CHARACTER ON THE EXAMPLE OF CAPTAIN AMERICA

Joanna Gawęda

University of Nicolaus Copernicus in Toruń

joannagaweda1910@gmail.com

A few words about the author:

Master of Cultural Studies.

Abstract:

Propaganda aspects of the superhero character on the example of Captain America. Captain America is a perfect example of American propaganda. Over the years, we can observe how his form is changing in mass culture. From comic books to modern movies, Captain America will always be the symbol of America.

Keywords:

propaganda, Captain America, superhero, movie, comic book



SOLD PRODUCTION OF INDUSTRY AND CONSTRUCTION IN THE VOIVODESHIPS OF THE EASTERN MACROREGION OF POLAND IN 2016-2018- THE SELECTED PROBLEMS

Michał Mrozek

*Department of Economics, Institute of Economics and Finance,
Faculty of Economics, Finance and Management, University of Szczecin*

michaladrianmrozek@gmail.com

A few words about the author:

My scientific area of interests are: labour market, labour market policies, socio-economic development, socio-economic policies, sustainable development.

Abstract:

The paper regards the assessment of the sold production of industry and construction in the voivodeships of the eastern macroregion of Poland in 2016-2018 within the selected problems. The aims of the paper are the assessment of the sold production of industry and construction in the voivodeships of the eastern macroregion of Poland in 2016-2018.; determination of the level of the sold production of industry by enterprises size class in the voivodeships of the eastern macroregion of Poland in 2016-2018. The following research problems were put forward: how does the diversification of the voivodeships of the eastern microregion of Poland in terms of the level of the sold production of industry and construction look?; which of the researched voivodeships of the eastern microregion of Poland has the lowest, middle, the highest level within the sold production of industry and construction? In the theoretical part was presented the characteristic of the production of industry and construction. In the empirical part were presented the results of the carried out researches. In the paper was carried out the documentation, statistical, dynamic, comparative analysis. The results showed that the researched voivodeships are diversified between themselves depending on the particular variables. The inference process took place in the deductive way.

Keywords:

sold production, industry and construction, eastern macroregion of Poland



UNITED STATES OF AMERICA AND THE EUROPEAN UNION- MARSHALL PLAN, EUROPEAN UNION POLICY AND US POLICY, PROBLEMS IN EU-WASHINGTON RELATIONS

Przemysław Mirosław Pazder

Pomeranian University in Słupsk

mm527@o2.pl

A few words about the author:

Przemysław Mirosław Pazder – graduate of the Pomeranian University in Słupsk. Research interests: Holodomor victims among Poles in Ukraine.

Abstract:

Undoubtedly, the United States and the European Union should be qualified as one of the most important actors in international relations who significantly affect various processes and phenomena taking place in the modern world. Both the USA and the EU affect virtually all spheres of social and economic life (the EU and the US account for a total of 2/3 of the world's GDP), as well as foreign policy, social affairs, security and culture. Due to current relations on the Brussels-Washington line and prospects for the development of mutual relations between these players are an extremely important factor determining the state of international relations. The assessments of EU-US relations made by analysts and politicians vary widely.

Keywords:

European Union, United States of America, economy, Marshall Plan



OPERATION POLAND IN UKRAINE

Przemysław Mirosław Pazder

Pomeranian University in Słupsk

mm527@o2.pl

A few words about the author:

Przemysław Mirosław Pazder – graduate of the Pomeranian University in Słupsk. Research interests: Holodomor victims among Poles in Ukraine.

Abstract:

It is believed that the Great Terror is inextricably linked with the promotion to the head of the NKVD, Nikolai Yezhov, who held this function from September 26, 1936 to November 25, 1938. The new head of the NKVD was needed by Joseph Stalin to carry out a radical purging both in the power and the party apparatus and among social strata which Stalin described as "uncertain elements". The Polish minority living in the territory of the USSR also fell victim to these repressions.

Keywords:

Polish operation, Stalin, Polish minority



THE OLDEST MUSICAL INSTRUMENTS

Kacper Pelczarski

kpelczarski93@gmail.com

A few words about the author:

Polish archaeologist. In 2017, he defended his master's thesis entitled Musical instruments in the Paleolithic at the University of Wrocław and since then he has been dealing with archaeomusicological issues.

Abstract:

The purpose of the presentation is to discuss the oldest Palaeolithic artifacts considered musical instruments: the bones of the cave bear from Divje Babe I, which may have been the oldest flute associated with the Neanderthals; flutes from Hohle Fels, Geissenklösterle, Vogelherd, La Roque and Les Roches; middle paleolithic phalanges whistles and bulroarer from Tata. For this purpose, archaeological data, microtraces researches and musicological studies were analyzed and interpreted. On their basis, it can be concluded that the production of musical instruments most likely appeared in the Middle Paleolithic and was associated with *Homo neanderthalensis* (Divje Babe I flute), but their dissemination took place in the beginning of the Upper Palaeolithic in Europe, as well as other manifestations of symbolic culture. The first instruments related to *Homo sapiens* come from the Swabia (Hohle Fels, Geissenklösterle and Vogelherd sites) and southern France (Isturitz sites).

Keywords:

palaeolith, Neanderthals, oldest musical instruments



KNOWLEDGE OR WISDOM AS THE KEY TO SUCCESS? SCHOOL SOCIAL ENGINEERING AND THE INDOCTRINATION OF POLISH TEACHERS DURING THE STALINIST ERA (1948-1956) IN THE LIGHT OF TEACHERS' MEMORIES

Marcin Rozmarynowski

University of Gdansk

marcin.rozmarynowski@phdstud.ug.edu.pl

A few words about the author:

PhD student in social sciences (pedagogical discipline) at the Doctoral School of Humanities and Social Sciences at the University of Gdansk.

Abstract:

The indoctrination of Polish teachers during the so-called "ideological offensive" (1948-1956) was one of the basic tasks of the ruling communists in Poland. The Polish Workers' Party (later: the Polish United Workers' Party), which at that time had full power in Poland, tried to change the mentality of the society by, among other things, "ideological formatting" of teachers, who were then to transfer the Leninist-Stalinist vision of the world to their students. For this purpose, the Polish authorities used such tools as, for example, forcing teachers to participate in ideological training, ideological conferences and propaganda in the press and scientific literature. The aim of this presentation will be to present a historical outline of the above activities in the context of teachers' personal memories and to attempt to answer the following questions: Did teachers - according to their own memories - change their worldview during the Stalinist times? How do they view the times of the "ideological offensive"? Did the social knowledge of that time allow the communist authorities to achieve their specific goals?

Keywords:

indoctrination, history of education, teachers, communism

HUMANITIES SCIENCES

POSTERS



POST-TRAUMATIC STRESS DISORDER IN CHILDREN

Angelika Lenart

The John Paul II Catholic University of Lublin

angelikalenart@vp.pl

A few words about the author:

Master, doctoral student at the Department of General Pedagogy on the social science faculty of the Catholic University John Paul II in Lublin.

Abstract:

Children who have experienced traumatic events in their lives and grew up in an environment that neglected their needs and in which abuse occurred will feel the long-term and varied impact of these events on their lives. That is why, working with children who have experienced trauma is so important but also difficult. Caregivers and educators should first learn about their history and understand the impact of traumatic events they have experienced before focusing on their behaviour. They ought to build appropriate relationships that will allow to gain confidence and a sense of security.

Keywords:

trauma, trauma experience, PTSD, posttraumatic development, relationship disorders



POLISH ADAPTATION AND VALIDATION OF THE MODIFIED REASONS FOR SMOKING SCALE

Agata Niezabitowska*, Ryszard Poprawa

Institute of Psychology, University of Wrocław, Dawida 1, 50-529 Wrocław

*agata.niezabitowska@gmail.com

A few words about the author:

Agata Niezabitowska, Master of Psychology at the University of Wrocław (Poland), is interested in social media and its impact on psychological well-being. Her research focuses on the topic of problematic internet use and the psychology of addictions.

Abstract:

The aim of the study was adaptation and validation of the Modified Reasons for Smoking Scale (MRSS). After obtaining an equivalent Polish translation of the original version, validation studies were conducted on a sample of 477 smokers (51% women) aged 18-60 years. Construct validity was examined with confirmatory factor analysis (CFA). Reliability was determined by analysing internal consistency, time stability and item-total correlation coefficients. The indicators for criterion validity were: Fagerström Test for Nicotine Dependence - Revised (FTND-R) and Self-Control Scale (SCS). CFA of 7-factor MRSS showed a sufficient fit to the data and weak loadings of 4 items. Two factors were very highly correlated. Subsequent CFA proved that the 5-factor version has better fit parameters and high all factor loadings. It obtained high reliability indicators. Smoking motives, according to hypotheses, significantly positively correlate with FTND-R and negatively with SCS.

Although the original 7-factor Polish MRSS has relatively acceptable psychometric properties, the 5-factor version is more theoretically consistent and has better reliability and criterion validity rates. It measures the following motives: 1) addictive/automatism, 2) pleasure/handling, 3) tension reduction/relaxation, 4) social, 5) stimulation. The shortened Polish MRSS has high psychometric properties and can be successfully used in scientific research as well as in psycho-preventive and clinical practice.

Keywords:

cigarette smoking, validation, smoking motives, Polish adaptation of MRSS



A POLISH ADAPTATION AND VALIDATION OF THE DISTRESS TOLERANCE SCALE

Marta Rokosz*, Ryszard Poprawa

Institute of Psychology, University of Wrocław, Wrocław, ul. Dawida 1, 50-527

*marta.rokosz@uwr.edu.pl

A few words about the author:

Marta Rokosz is a PhD student at the University of Wrocław, and Ryszard Poprawa is her PhD advisor. Their scientific interests include, among other, stress and coping, basic psychological needs, and problematic Internet use.

Abstract:

Distress Tolerance Scale (DTS; Simons & Gaher, 2005) measures individual differences in experiencing and enduring negative emotional states. It consists of four dimensions: tolerance of perceived distress, assessment and acceptance of emotions, absorption of attention, and emotion regulation. The study aimed to evaluate the psychometric properties of the Polish adaptation of the Distress Tolerance Scale (DTS). A total of 1,210 individuals aged between 18 and 69 participated in the study (45% men, 51% women). EFA revealed a two-factor structure of the DTS, with Regulation as a separate factor. The original model's CFA showed an unsatisfactory fit to the data. Better CFA parameters were obtained through the reduced, three-factor version of the DTS. Both versions show good internal consistency, temporal stability, convergent, and discriminant validity, with an exception of the Regulation subscale. As expected, distress tolerance is positively associated with positive affectivity, satisfaction with life, and self-control ability, but negatively with negative affectivity, perceived stress, and difficulties in emotion regulation. Men declared higher levels of distress tolerance than women. The Regulation subscale showed the weakest validity results, and in terms of content, it seems to deviate from the concept of distress tolerance. With all those findings in mind, we recommend the valid and reliable three-factor version to be used in further studies.

Keywords:

distress, distress tolerance, Polish adaptation, questionnaire validity

MEDICAL SCIENCES

PRESENTATIONS



THE IMPACT OF STRESS ON NURSING STUDENTS AND WAYS OF DEALING WITH IT

Gabriela Blat*, Natalia Lis**

State Higher School of Technology and Economics in Jarosław

*blatgabriela053@gmail.com, **natalia22322@interia.pl

A few words about the author:

The students of the second year of nursing in PWSTE Jarosław, actively participate in the academic circle called "Promotorzy zdrowia". The supervisor of science club is dr Anna Muzyczka.

Abstract:

Main goal of conducted research was to check the level of knowledge and youth awareness about functioning of nursing students under stress and ways to deal with it.

RESEARCH PROBLEMS:

1. What is the biggest source of stress in nursing students?
2. Does stress affect student decisions?
3. Do students know how to deal with stress in difficult situations?

GENERAL HYPOTHESES:

1. The biggest source of stress among students is the session.
2. Stress makes it difficult to make rational decisions.
3. Students know how to deal with stress and most often use natural methods.

RESEARCH METHODS: The only method that was used to carry research was a survey on youth awareness about the impact of stress on nursing students. Research were carried by online form, posted on social media websites in the region of Podkarpacie. Moreover survey had questions, for example, about methods methods of coping with stress and impact on daily functioning. Examined person usually could choose one answer out of several, in case of some questions examined person was asked to write answer by themselves or to choose more than just one answer.

RESEARCH RESULTS: Survey has been filled by about 86 teenagers and it was addressed to youth in age range between 18 and 40. Our research shows that: the biggest source of stress among students is the session. Stress is destructive for them and use natural methods dealing with it, such as listening to music and/or talking to a close friend.

Keywords:

nursing students, stress



TURMERIC AS AN ESSENTIAL ELEMENT OF HUMAN NUTRITION

Damian Dyńka*, Katarzyna Kowalcze

Siedlce University of Natural Sciences and Humanities, Student's science Club of dieteticians

*damian19@opoczta.pl

A few words about the author:

I am a student of dietetics at the Faculty of Medical Sciences and Health Sciences at the University of Natural Sciences and Humanities in Siedlce. My research supervisor is dr Katarzyna Kowalcze.

Abstract:

Spices are an indispensable part of our diet. In addition to their typical taste, they can bring us a number of health benefits. Among them, turmeric deserves special attention- which is obtained from turmeric root. It is perfect for seasoning meat, fish and vegetables. Despite the number of culinary applications, the subject of this study will be its remarkable health-promoting properties. It turns out that this spice can reduce the risk of cancer development, metabolic disorders, disorders of the central nervous system or diseases of the cardiovascular system. It has a strong antioxidant, anti-inflammatory and antibacterial effect, thanks to the presence of curcuminoids, among which curcumin deserves special attention. It is an extremely well-studied spice, but undoubtedly, further research will help to discover possible further beneficial properties.

Keywords:

turmeric, diet



MIGRAINE AS ONE OF THE MAIN CAUSES OF DISABILITY AMONG YOUNG PEOPLE

Alicja Groszek*, Agata Kolasa, Zuzanna Gwóźdź, Agnieszka Kwiatkowska

Student Research Group at the Department of Applied Psychology, Medical University of Lublin

*alicja.groszek@gmail.com

A few words about the authors:

We are medical students at the Medical University of Lublin. We are particularly interested in the psychological aspects of disease entities and their influence on the course of the disease and treatment.

Abstract:

Migraine is a common chronic neurological disease. It occurs in about 6% of men and 15-18% of women. The disease manifests itself as paroxysmal, severe headaches with symptoms such as nausea, vomiting and photophobia. There may also be focal neurological symptoms such as visual, speech, and sensory disturbances. Migraine remains second among the world's causes of disability, and first among young women. It causes a significant reduction in the quality of life, ability to work and daily activity. The disability burden associated with migraine is concentrated among people of working age, which makes it a huge social and economic problem. Furthermore, migraine predisposes to mental disorders such as depression, anxiety, and sleep disorders. Coexistent psychiatric diseases increase migraine-related disability and reduce quality of life. Hence, evaluation of migraine headache must be comprehensive and include an assessment of the patient's psychiatric condition, thus ensuring effective treatment. Despite the high prevalence rates it continues to be underdiagnosed and undertreated. Clinicians often focus on therapeutic aspects and neglect to acknowledge the functional disabilities and psychological impact of the disease, leading to a limitation in a multifaceted approach to the migraine. This overview helps to identify the size of the public-health problem that migraine is and shows the need to diagnose and treat mental disorders among people affected by this disease.

Keywords:

migraine, disability, mental disorders



IMPACT OF MYCOTOXINS IN FOOD ON HUMAN HEALTH

Edyta Janik*, Michał Bijak

Biohazard Prevention Centre, Faculty of Biology and Environment, University of Lodz

*edyta.janik@unilodz.eu

A few words about the author:

The author is a PhD student whose doctoral thesis concerns the cytotoxic and genotoxic properties of mycotoxins.

Abstract:

Mycotoxins are secondary metabolites produced by a variety of filamentous fungi on different agricultural commodities under specific environmental conditions. Mycotoxins are mainly produced by fungi of the genus *Aspergillus*, *Penicillium* and *Fusarium* in different climate zones. This process is particularly intense in the tropical region due to the warm and humid conditions. Mycotoxins contaminate plant-based products such as grains, grain-based products, vegetables, fruits, dried fruits and nuts. Mycotoxins can occur at any stage of food production, from field cultivation to harvesting, as well as during processing, storage and transport of the finished product. As they are temperature resistant, their presence in food and fodder can be hazardous to human and animal health. Meat, milk (and dairy products) and eggs from infected animals can also pose a serious risk to human health. The most dangerous mycotoxins include ochratoxins, aflatoxins, patulin, zearalenone and trichothecenes. The adverse effects of mycotoxins on human health can be both acute and chronic. They can affect a single organ or target multiple organs, leading to cytogenic, mutagenic, carcinogenic, teratogenic or immunosuppressive activity. Therefore, it is important that mycotoxin control measures are implemented and followed.

Keywords:

mycotoxins, fungi, grains, health



PHYTOTHERAPY IN METABOLIC DISEASES

Katarzyna Kowalcze

Siedlce University of Natural Sciences and Humanities

kkowalcze@dietoterapia.waw.pl

A few words about the author:

Dietitian, passionate about a healthy lifestyle, specializing in diet therapy of metabolic disorders. Lecturer, academic teacher.

Abstract:

Disorders of carbohydrate, lipid and insulin metabolism in type 2 diabetes require various methods of therapeutic management.

One of them may be phytotherapeutic support and using the potential of plants.

Many scientific studies show the effect of various active substances contained in plants on the modification of disorders characteristic of the metabolic syndrome, related to disorders of carbohydrate, protein and fat metabolism.

The current state of knowledge allows the use of over two hundred substances of plant origin and various mechanisms of action on the body of a diabetic patient in a multi-directional way. The likely mechanisms of the effects of herbs and their plant compounds on the organism described in the literature include:

- effect on increasing insulin secretion from β cells of Langerhans islets (people with hyperinsulinemia - white mulberry),
- improvement of glucose tolerance,
- slowing down the absorption of sugars in the digestive tract,
- increasing glycogen synthesis.

The plants that have been best studied in these aspects include:

Cinnamomum cassia, *Morus alba*, *Urtica dioica*, *Ginkgo biloba*, *Phaseolus vulgaris*, *Galega officinalis*, *Agropyron repens*, *Trigonella foenum-graecum*, *Vaccinium myrtillus*.

Keywords:

phytotherapy, metabolic disorders, obesity, diabetes, insulin resistance



PATHOGENICITY OF BAYLISASCARIS PROCYONIS IN THE CONTEXT OF RACCOON INTRODUCTION IN POLAND

Natalia Krzyżanowska*, Kamila Kędzior, Izabela Gura

*Student Research Group at the Chair and Department of Biology and Genetics,
Medical University of Lublin*

*natalia.krzyzanowska97@gmail.com

A few words about the authors:

We study medical analytics and pharmacy at the Medical University of Lublin. We are interested in parasitology and molecular biology, which we believe to be prospective and very important branches of science.

Abstract:

Baylisascaris procyonis is a roundworm infecting North American raccoon (*Procyon lotor*) as a specific, definitive host. Unembryonated eggs are shed in the environment with faeces. After 2–4 weeks the eggs reach an invasive stage. Raccoons can be infected by ingesting embryonated eggs from the environment. This parasite causes an intestinal infection in raccoons, dogs and rabbits. Many different species of birds and mammals, including humans, may be infected with *B. procyonis* larvae as a paratenic hosts, after accidentally ingesting infective nematode eggs. In that event, the larvae migrates through the tissues of the infected organism. Visceral, ocular, and neural larva migrans and encephalitis in humans have been documented. Most diagnosed cases have been in children and were severe or fatal. The raccoon is native to North America, but it was introduced into Europe and Asia in the 20th century. The first wild population in Poland was recorded around 1990. Currently, the highest prevalence of this species is observed in the Warta Mouth National Park situated in western Poland, but the raccoon spreads over the whole country. Since there is no dedicated treatment or a vaccine, baylisascariasis should be taken into consideration as a public health problem.

Keywords:

raccoon, *Baylisascaris procyonis*, baylisascariasis



EMOTIONS RELATED TO HEMATOPOETIC STEM CELL DONATION - A RETROSPECTIVE SURVEY STUDY ON ACTUAL DONORS

**Filip Lebieński (1)*, Alan Majeranowski (2),
Aleksandra Janowiak-Majerankowska (3)**

(1) Student Scientific Society of Medical University of Gdańsk

*(2) Department of Hematology and Transplantology, Medical University of Gdańsk, Smoluchowskiego
17 Street, 80-214 Gdańsk; Department of Medical Biotechnology, Intercollegiate Faculty of
Biotechnology, University of Gdańsk and Medical University of Gdańsk, Dębinki 1 Street, 80-211*

(3) Department of Otolaryngology, Medical University of Gdańsk, Smoluchowskiego 17, 80-214 Gdańsk

*flebiezinski@gmail.com

A few words about the authors:

Filip Lebieński is a 5th year medical student at Medical University of Gdańsk. Alan Majeranowski and Aleksandra Janowiak-Majerankowska are resident physicians at University Clinical Centre in Gdańsk.

Abstract:

The collection of hematopoietic stem cells is a unique experience for the donors, which often appears to have some emotional impact on them. The aim of the study was to assess the emotions that accompanied the actual unrelated bone marrow cell donors and to compare these emotions between the cohort subjected to the harvest from the iliac crest (cohort 1) and the cohort that underwent the peripheral blood apheresis (cohort 2). In addition, satisfaction with donation-related medical care was assessed.

METHODS: The method of the study was an anonymous survey conducted in 2018 on a group of 102 actual unrelated bone marrow donors who underwent the procedure of hematopoietic stem cell collection at the Department of Hematology and Transplantology of the University Clinical Centre in Gdańsk. The questionnaire was based on single and multiple choice closed questions and one open question.

RESULTS AND CONCLUSIONS: It was possible to compare the results from both cohorts. Significant differences occurred primarily in the frequency of feeling anxiety, restlessness, pride and satisfaction during the procedure - the above-mentioned emotions were present in a greater percentage in cohort 1. The results of the study should, firstly, draw the attention of the scientific community to the scale of negative emotions in donors and, secondly, encourage further research on the conditions that influence donors' way of experiencing the procedure of bone marrow donation.

Keywords:

allogenic unrelated bone marrow transplantation, donation, emotions, bone marrow donors



INFLUENCE OF THE TYPE OF MEAT AND FAT QUALITY ON THE DEVELOPMENT OF CARDIOVASCULAR DISEASES

Izabela Malitka

Siedlce University of Natural Sciences and Humanities, Student's Science Club of Dieticians

izamalitka6@wp.pl

A few words about the author:

Student of dietetics at the University of Natural Sciences and Humanities in Siedlce, Faculty of Medical Sciences and Health Sciences.

Abstract:

In the modern world, much attention is paid to consumed food products. Their composition and the content of individual components are assessed. Such products include meat and various types of fats. Meat is the source of many important, essential ingredients in the diet of every human being. In its composition, it contains not only wholesome protein, but also many minerals and vitamins. The same applies to fats, which are an essential component of any diet. They perform many important functions in the body, including providing plenty of energy and essential vitamins. The excess of these products in the diet can cause many diseases, including cardiovascular disease. However, not all meat and not all fat adversely affect the functioning of the body. Both the right type and the right amount are important. Balancing all nutrients, limiting the amount of saturated fatty acids and cholesterol is an important element in the prevention of cardiovascular diseases.

Keywords:

meat, fats, cardiovascular diseases



DEMOGRAPHIC CHANGES AS A CHALLENGE FOR THE HEALTH CARE SYSTEM

Anna Muzyczka*, Patrycja Mściwujewska**

State Higher School of Technology and Economics Fr. Bronisław Malinowski in Jarosław, Poland

*anna.muzyczka@pwste.edu.pl, **patrycja.msciwujewska@wp.pl

A few words about the author:

The author is an assistant professor at PWSTE in Jarosław, she is interested in public health and holistic medicine. She is responsible for international cooperation at PWSTE (contacts Villanova University in Pennsylvania).

Abstract:

An aging population and low birth rate cause demographic changes, which are the challenge of the 20th and 21st centuries.

Elderly dependency ratio in Europe estimated at 2050 increases by over 30% compared to 2020.

The population of Poland has also grown the stage of demographic old age and it is the country that is aging the fastest in Europe and the number of economically active elderly people in Poland is still one of the lowest between OECD countries, which results in a heavy load in health care system.

No fully developed system of institutional care for seniors, no support for informal caregivers in the form of the so-called "respite care", shaping a negative image of old age, reducing the phenomenon of old age to the economic problem is not conducive building generation solidarity.

Keywords:

demography, senior health, economy



THE IMPACT OF BEE POLLEN SUPPLEMENTATION ON THE ENDOTHELIAL NITRIC OXIDE SYNTHASE (NOS3) RECEPTOR'S EXPRESSION IN THE LIVER IN WISTAR RATS

**Kacper Niewęłowski*, Paweł Oszczędlowski, Martyna Wasyluk,
Barbara Madoń, Piotr Jarosz**

*Student Research Group at Department of Histology and Embryology with Experimental
Cytology Unit, Medical University of Lublin*

*kniew99@gmail.com

A few words about the authors:

Medical students at the Medical University of Lublin. We love broadening our knowledge and gaining new experiences, especially in good company. And that's why we are here!

Abstract:

INTRODUCTION: It is known that diet affects human health. Bee pollen contains vitamins, minerals, carbohydrates, lipids and proteins. Small amounts of NO, constantly produced by NOS3 enzyme in liver sinusoidal endothelial cells (LSECs), are essential for controlling intrahepatic sinusoidal vascular tone and blood flow.

AIM OF THE STUDY: Assessment of the impact of bee pollen and whey proteins on alterations in Wistar rats' livers.

MATERIAL AND METHODS: 30 male Wistar rats were divided into 6 groups: 3 running and 3 not-running. In both levels of activity there was one control, one supplemented with bee pollen and one receiving whey proteins. After 8 weeks of laboratory phase all animals were decapitated and their livers were collected, formalin-fixed, paraffin-embedded and prepared into 5 µm thick slides. Immunostaining against NOS3 receptors was performed on the slides and they were viewed under the light microscope.

RESULTS: The evaluation of immunostaining against NOS3 revealed an enhanced expression of NOS3 in running groups supplemented with bee pollen. Non running groups showed decreased NOS3 expression which wasn't improved by bee pollen alone.

CONCLUSIONS: The outcome suggests that bee pollen consumption may increase protective role of physical effort in hepatic fibrosis and portal hypertension development. Further studies should aim at discovering the possible mechanism.

Keywords:

bee pollen, proteins, liver, rats, NOS3



EXAMINING THE LEVEL OF KNOWLEDGE ON DEPRESSION AMONG STUDENTS OF MEDICAL COURSES

Barbara Pelc*, Aneta Makówka**

State Higher School of Technology and Economics in Jarosław

*pelcbarbara99@gmail.com, **aneta.mak0917@wp.pl

A few words about the authors:

The students of the third year of nursing in PWSTE Jarosław, actively participate in the academic circle called "Promotorzy zdrowia".

Abstract:

Main aim and research purposes: the main aim of the studies conducted was to examine the level of knowledge on depression among students of medical courses.

GENERAL HYPOTHESES:

1. Students have knowledge concerning the diagnosis of depression.
2. Students know the types of depression and the options of treatment.
3. Students know and can recognize the symptoms suggesting depression.

RESEARCH METHOD: the only research method applied to develop the topic was an online survey concerning the level of knowledge students of medical courses have on depression. The survey was introduced by social media in the territory of Poland. The respondent could indicate one answer from a few available. There were also multiple choice and open text questions.

RESULTS: about 100 respondents participated in the survey. According to the students, women suffer from depression more often than men, and the most depressive occupations are respectively: doctors, gravediggers and carers of the elderly. Among the most effective forms of treatment, the respondents indicated pharmacotherapy and psychotherapy. The students can recognize symptoms suggesting depression and its clinical picture. They are acquainted with the features the inpatient has, and what consultant they need to see. What is worth noting, the respondents want to attend additional training, and a half from them mark their knowledge as moderate.

Keywords:

depression, awareness, treatment, symptoms



MACROPHAGES IN CARCINOGENESIS

Bartosz Sobocki

International Research Agenda 3P: Medicine Laboratory

b.sobocki@gumed.edu.pl

A few words about the author:

Student of 4th year of medicine in Medical University of Gdańsk, affiliated with International Research Agenda: 3P Medicine Laboratory, focused on researching breast cancer microenvironment, especially tumor associated macrophages and fibroblasts.

Abstract:

The aim of this study is to present the most important, selected by author facts about role of macrophages in the cancerogenesis process and their potential in treatment. The 36 manuscripts were evaluated and selected to analysis, including 12 reviews, 21 original papers and 3 clinical trials. The phagocytes are a diverse group of cells. Monocytes are released from the bone marrow and then circulate in blood vessels. If monocytes reach target tissue, they convert into macrophages. The phagocytes play a role in inflammation, remodeling and immunity. Whether they will differentiate into specific, functional phenotypes (M1, M2a, M2b, M2c, M2d), depends on microenvironment. It is proved that tumor associated macrophages have prognostic role in the breast cancer, head and neck squamous cell carcinoma and others. High density of TAMs is correlated with overall survival and disease-free survival in many cancers. Levels of TAMs's biomarkers like CD68+, CD80+ CD163+, CD206+ and its ratios are emphasized as a prognostic factor in development of the cancer, but this factors should be considered specifically to the type of cancer. Because of all findings, TAMs are proposed as a novel biomarker of cancers. Macrophages are also considered as a promising target in cancer therapy. Clinical trials associated with targeting TAMs with CCR2 inhibition or Blocking Il-1 β and others were conducted.

Keywords:

tumour associated macrophages, cancer, microenvironment



PHYTOPATHOGENIC FUNGI AS A POTENTIAL HUMAN HEALTH THREAT

Monika Sztandera-Tymoczek*, Agnieszka Szuster-Ciesielska

*Department of Virology and Immunology, Institute of Biological Sciences,
Faculty of Biology and Biotechnology, Maria Curie-Skłodowska University of Lublin*

*monika.sztandera@poczta.umcs.lublin.pl

A few words about the author:

Monika Sztandera-Tymoczek – a PhD student at the Doctoral School of Exact and Natural Sciences at UMCS. Her research focuses on the microscopic phytopathogenic fungi and their potential impact on development of allergies in humans.

Abstract:

Allergic diseases are defined as excessive and abnormal reactions of the immune system to harmless substances commonly found in the environment. A significant proportion of these substances are inhaled allergens, including fungal spores. Furthermore, their small size allows the spores to penetrate the lower respiratory tract, damaging the respiratory epithelium, which can lead to the development of an inflammatory response in the form of asthma. The increased incidence of asthma is the reason for searching for new possible causes of appearance of the condition.

The available diagnostic tests do not always allow determination of the cause of allergy, which may be related to the body's sensitization to allergens of other fungi. An example is the parasites of plants commonly found in the environment, i.e. microscopic phytopathogenic fungi with yet uncharacterized allergenic properties. They are responsible for reduction of yields, as well as deterioration of the quality of plant products and the decorative value of ornamental plants. During the vegetative season, microscopic phytopathogenic fungi cause massive infections of plants, and the high air-borne concentrations of their spores are a significant source of molecules with potential allergenic properties. Additionally, the distribution of plants and fungi and the production of spores depend on the meteorological conditions, human activity, and geographical location.

Keywords:

allergy, microscopic phytopathogenic fungi, asthma



THE ROLE OF PHOSPHO-TAU217 PROTEIN IN DIAGNOSIS OF ALZHEIMER'S DISEASE

**Tymon Bykowski (1)*, Jan Milanowski (1), Jarosław Nuskiewicz (2),
Karolina Szewczyk-Golec (2)**

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

*(2) Department of Medical Biology and Biochemistry, Faculty of Medicine, Ludwik Rydygier
Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Toruń*

*tymon.bykowski@gmail.com

A few words about the author:

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

Abstract:

Alzheimer's disease (AD) is the most common cause of dementia in the human population nowadays. In the following years, scientists expect major increase in the number of AD cases. Early diagnosis can significantly improve patient quality of life. Current diagnostic methods make it possible to detect AD before the onset of clinical symptoms. Early diagnosis is important because it offers more options for treating the disease, Pathological changes increase over time and become irreversible. One of the most accurate and efficient biomarkers used in preclinical diagnostics of AD is protein p-tau217 which allows to distinguish AD from other neurodegenerative disorders. Currently, most of diagnosed cases of Alzheimer's disease are established in the clinical stage of the disease, when the degree of neurodegradation does not allow for an effective slowdown the disease progression. Considering the inevitable increase in the number of patients, it is important to start diagnostics at a stage well ahead of the occurrence of symptoms typical for neurodegradation. Early diagnostics seem to be possible thanks to the use of the p-tau217 biomarker. Protein p-tau217 is a new marker and further research is needed before it becomes widely used in AD diagnosis.

Keywords:

Alzheimer's disease, neurodegenerative diseases, p-tau217



FEVERFEW (TANACETUM PARTHENIUM) IN MIGRAINE PREVENTION

Filip Dunajewski

Poznan University of Life Sciences, Wojska Polskiego 28, 60-624 Poznan

filip.dunajewski@gmail.com

A few words about the author:

Neurosciences and nutrition are amongst his go-to everyday reads.

Abstract:

Migraine is a common neurological disorder. Global Burden of Disease Study found that migraine is the second highest cause of years lost due to disability and after the stroke the second-highest contributor to neurological disease burden. It is estimated that about 15% of the worldwide population suffer from migraines, with the prevalence higher in women than men. Although there are medications that can prevent migraine headaches, they often cause side effects and are mainly intended for severe migraines. Adding to this an increasing trend to use nature-derived treatments, there is a need to develop a safer medication.

Feverfew (*Tanacetum parthenium*) is a perennial plant traditionally used for the treatment of migraine. Although the mechanism of action is still to be discovered, its anti-migraine properties most likely owe to a sesquiterpene lactone, the parthenolide. It is easily accessible in form of dried plants or standardized capsules. Dosages, effectiveness, and safety of feverfew have been assessed, either in standalone formula or combined with other substances.

Keywords:

feverfew, migraine, prevention



THE EFFICIENCY OF PATELLOFEMORAL PAIN SYNDROME TREATMENT WITH SYNVISC IN PEDIATRIC PATIENTS – LITERATURE REVIEW

**Piotr Dzikowski (1)*, Martyna Stefaniak (1), Zofia Pietrzak (1), Anna Kolano (1),
Halina Piecewicz-Szczęsna (2)**

*(1) Students' Scientific Association at the Chair and Department of Epidemiology,
Medical University of Lublin*

(2) Chair and Department of Epidemiology, Medical University of Lublin

*piotrek-dzikowski@wp.pl

A few words about the authors:

Piotr Dzikowski, Martyna Stefaniak, Zofia Pietrzak, Anna Kolano - medicine students, Medical University of Lublin.

Halina Piecewicz-Szczęsna - tutor of the work.

Abstract:

INTRODUCTION: Patellofemoral pain in the knee is a common ailment affecting adults and pediatric patients. Pain in the knee joint may be caused by degenerative joint disease, chondromalacia, patellofemoral pain syndrome or discoid meniscus. Patellofemoral pain syndrome is one of the most common causes of pain in the front knee.

AIM OF THE STUDY: The aim of the study is to evaluate efficacy of patellofemoral pain syndrome treatment with Hylan G-F 20 for patients that were unaffected by physical therapy and analysis of possible adverse drug reactions.

METHODS: Authors searched PubMed and Google Scholar for articles from the last 10 years.

RESULTS: The major treatment of PFPS is physical therapy, which is successful for approximately 80% of participants. An alternative to operation when physical therapy failed is the application of Hylan G-F 20 into joint. Hylan G-F 20 is available as an elastic, viscous liquid containing Hylan polymers A and B, administered to periodically replace and refill synovial fluid in joints. Applied to joints, Hylan G-F 20 reduces discomfort and pain and improves joint mobility.

CONCLUSIONS: The use of the Synvisc in the case of the patellofemoral pain syndrome gives good results, with a low percentage of complications. However, there is a need for more studies to determine the place of viscosupplementation in the management of the disease.

Keywords:

patellofemoral pain syndrome, PFPS, Synvisc



TREATMENT OF HER2+ BREAST CANCER - THE CURRENT STATE OF KNOWLEDGE

Justyna Jandernal (1)*, Ewa Ziółkowska (2)

*(1) Department of Clinical Oncology, Regional Specialist Hospital
Dr. Władysław Biegański in Grudziądz*

(2) Department of Electroradiology, Medical Faculty, Academy of Kalisz

*j.jan@interia.eu

A few words about the authors:

Justyna Jandernal – specialist in clinical oncology, dealing in the diagnosis and treatment of cancer patients for several years. Dr hab. Ewa Ziółkowska – specialist in oncological radiotherapy, professor at the Academy of Kalisz at the Medical Faculty.

Abstract:

Breast cancer is the most common cancer in women. Among the biological subtypes of breast cancer, we can distinguish the following cancers: luminal Her2+ and non-luminal Her2+. Until the introduction of Her2 receptor-targeting therapies, they were the cause of many premature deaths. The introduction of new therapies has improved the prognosis in this group of patients. It has lowered the risk of recurrence in cases of early stages of disease, and in palliative patients it has prolonged the time to disease progression and overall survival. In our presentation, we will present the current guidelines for the treatment of patients with Her2+ breast cancer at various stages.

Keywords:

Her2+ breast cancer, radiotherapy, chemotherapy, anti-HER2 therapy



ROLE OF MITOCHONDRIAL DYSFUNCTIONS IN DEVELOPMENT AND COURSE OF PARKINSON'S DISEASE

**Dorian Jarek (1)*, Joanna Kruszka (1), Jarosław Nuskiewicz (2),
Karolina Szewczyk-Golec (2)**

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

*(2) Department of Medical Biology and Biochemistry, Faculty of Medicine, Ludwik Rydygier
Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Toruń*

*Number-four@wp.pl

A few words about the author:

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:

Parkinson's disease (PD) is one of the most common neurodegenerative diseases, affecting about 2% of population above the age of 60. Characteristic symptoms are motor disorders, such as rigidity, bradykinesia and several non-motor symptoms, including depression, dysosmia, and pain. All of these are thought to be caused by reduction in the number of dopaminergic neurons in the substantia nigra and accumulation of α -synuclein (α -syn) in Lewy bodies. Mitochondrial dysfunctions are often associated with the pathogenesis of PD. Several genetic familial PD loci are directly linked to mitochondria, with their pathogenic mutations causing mitochondrial dysfunctions. Many proteins associated with PD affect mitochondrial functioning, impairing trafficking, making mitophagy defective and altering many functions of these organelles. PTEN-induced kinase 1 (PINK-1) affects mitochondria in several ways, weakening trafficking, altering mitochondrial fusion and fission, unbalancing Ca^{2+} homeostasis, increasing oxidative stress and disallowing electron transport chain and mitophagy to work properly. Proteins such as α -syn, Parkin, leucine rich repeat kinase 2 (LRRK2), ATPase 13A2 (ATP13A2) and many more have similar effect on functioning of mitochondria. All of these defects has an impact on the development of PD, for example, defective mitophagy leads to the accumulation of defective mitochondria, which causes death of neuronal cells and neurodegeneration.

Keywords:

mitochondria dysfunction, mitophagy, Parkinson's disease



TAKING UP ACTIVE TOURISM AMONG STUDENTS OF RZESZÓW UNIVERSITIES

Karolina Karaś*, Katarzyna Dudzińska, Aleksandra Łoś, Wiktoria Mytych

*Student Research Club of Travelers, Institute of Physical Culture Science,
University of Rzeszow, Rzeszow*

*karolina.karas@adres.pl

A few words about the authors:

We are students from University of Rzeszów and we belongs to Student Scientific Organisation of Travelers.

Abstract:

Active tourism is intended mainly for people who want to face new challenges, satisfy their ambitions or overcome weaknesses, but also for people who benefit from the pleasure of spending time outdoors. Such people are undoubtedly students who willingly undertake this type of tourism.

The aim of the research was to learn about active tourism among students of the University of Rzeszów and the Rzeszów University of Technology. The results will show whether students are aware of the importance of active tourism in their free time.

The method used was a diagnostic survey, while the technique used was a questionnaire. The study was conducted on 100 students of the University of Rzeszów (URz) and 100 students of the Rzeszów University of Technology (PRz).

The results obtained after the survey show that in the group of student youth there is a huge demand and demand for active tourism. Students decide to engage in active tourism to spend time with friends and maintain physical and spiritual health.

Keywords:

tourism, active tourism, recreation



COMPLICATIONS OF ONCOLOGICAL TREATMENT IN ORTHODONTIC PRACTICE

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

*(1) Department of Electroradiology, Kaliska Academy named
after President Stanisław Wojciechowski, Kalisz*

(2) Department of Radiology, Collegium Medicum, Nicolaus Copernicus University in Toruń

*natnowicka@gmail.com

A few words about the authors:

DDS, Master of Science in Orthodontics Natalia Kazimierczak, Lek. Wojciech Kazimierczak, PhD, Associate Professor Ewa Ziółkowska.

Abstract:

Chemotherapy and radiotherapy are one of the basic treatment methods used in oncology. Previous neoplastic disease and treatment are associated with potential numerous complications, including orthodontic complications.

The effects of cancer therapy influence the choice of orthodontic therapy. Correct diagnosis allows for a satisfactory orthodontic treatment effect.

It has the functionality and aesthetics of a smile and healthy periodontium.

AIM: The aim of the study was to conduct a systematic review of the literature on orthodontic complications following oncological therapy.

MATERIALS AND METHODS: Quarterly PubMed, Scopus and GUS databases up to 2020 were conducted to search for studies covering the frequency of occurrence of orthodontic disorders after previous chemotherapy and / or radiotherapy. The inclusion criteria were the literature in English and Polish.

Keywords:

chemotherapy, radiotherapy, dental disorders, orthodontic therapy



ECTOPIC PREGNANCY OF THE RIGHT FALLOPIAN TUBE- CASE STUDY

**Anna Kolano (1)*, Zofia Pietrzak (1), Martyna Stefaniak (1), Piotr Dzikowski (1),
Piotr Olcha (2)**

(1) Students of Medical University of Lublin

*(2) Head of the gynecology department of the first military clinical hospital
with a polyclinic of SPZOZ in Lublin*

*anusiak1313@gmail.com

A few words about the authors:

Students of Medical university of Lublin, members of many science clubs, active participants of many national and international conferences.

Abstract:

An ectopic pregnancy, is defined as the implantation of fetal egg in a place other than uterine cavity. For several years, the frequency of ectopic pregnancies is 11.1 per 1000.

Patient came to the emergency room with acute pain in lower abdomen at 20th of May 2020. Due to pandemia, she called the general practitioner twice but prescribed medications did not work. She was admitted to the Gynecological guard with severe abdominal pain, spotting and soiling from genital tract. In anemnesis: last menstrual period 6th of April 2020. In examination: pain, tenderness of the right appendages, perceptible resistance. Hb level decreased to 11.0 g/dl, erythrocyte mass 3,5 mln, progesterone 8 ng/ml, other parameters were normal. hCG 6000 mIU/ml.

In ultrasound pregnancy was not found, but widening of the fallopian tube in the right appendages, presence of a right tubal ectopic pregnancy and fluid in the Douglas sinus. The patient was reffered for surgery due to high hCG level and advanced pregnancy. Pregnancy and raptured fallopian tube were removed.

An ectopic pregnancy is one of the life-threatening conditions of a woman. Early and accurate diagnosis allows to choose the treatment: pharmacological- methotrexate therapy, sparing the fallopian tube/s, which does not limit the fertility in the future, surgical treatment - although effective, causes intra- and postoperative complications, and in the case of removal of the fallopian tube, it limits the woman's fertility.

Keywords:

Fallopian tube, ectopic pregnancy, pregnancy



VASOVAGAL SYNCOPE - SYMPTOMS, MECHANISM, DIAGNOSIS

**Joanna Kruszka (1)*, Dorian Jarek (1), Jarosław Nuskiewicz (2),
Karolina Szewczyk-Golec (2)**

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

*(2) Department of Medical Biology and Biochemistry, Faculty of Medicine, Ludwik Rydygier
Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Toruń*

*joannakruszka99@gmail.com

A few words about the author:

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:

Vasovagal syncope (VVS) is a neurocardiogenic syndrome that manifests itself in syncope during upright standing. This is characterized by a sudden onset, a short course, and spontaneous recovery without medical intervention. Three types can be distinguished, including reflex syncope, syncope due to orthostatic hypotension and cardiac syncope. This phenomenon is based on the fact that in upright position, about a liter of blood moves from the upper body to the lower limbs and splanchnic area. This is the reason for the decrease in venous return, ventricular preload and cardiac output. These factors stimulate the sympathetic nervous system leading to an acceleration of the heartbeat. However, after standing for a while, the patient develops bradycardia and faints as a consequence.

Syncope may be preceded by prodromal symptoms such as sweating, pallor or a fast heart rate. Emotional stress, temperature or prolonged standing are among many factors that can cause this problem. This type of episode usually occurs in young people, but it can even occur in people in their eighties. Many studies suggest that a tendency to faint may be genetically determined. To diagnose this most common cause of syncope, the patient must show a positive response to head-up tilt test which is hypotension and/or bradycardia. It is also necessary to prove the absence of other diseases that may cause fainting.

Keywords:

cardiovascular system, syncope, vasovagal syncope



SEXUAL SATISFACTION AND LIFE SATISFACTION IN PEOPLE TREATED WITH ONCOLOGY

Szymon Kufel (1)*, Ewa Ziółkowska (2)

*(1) Department of Clinical Oncology, Regional Specialist Hospital
Dr. Władysław Biegański in Grudziądz*

(2) Kaliska Academy Stanisław Wojciechowski, Faculty of Health Sciences

*kufel.szymon@gmail.com

A few words about the authors:

Szymon Kufel, MA – psychologist, psychotherapist dealing with diagnostics and therapy of cancer patients.

Dr hab. Ewa Ziółkowska - specialist in oncological radiotherapy, professor at the Academy of Kalisz at the Faculty of Medicine.

Abstract:

INTRODUCTION: Studies The subject of the presented research is the quality of life considered in the context of satisfaction with sex life and life satisfaction.

OBJECTIVE: Research on the level of sexual satisfaction in people suffering from oncological diseases. Research on the influence of Sexual Satisfaction on Life Satisfaction.

METHOD: The research group consists of people aged 41 to 65 years old. (women: 22, men: 8) with oncological disease treated in the departments of: 1) Clinical Oncology, 2) Oncological Surgery, 3) Urology of the Regional Specialist Hospital in Grudziądz and people working in the Grudziądz Amazon Club. The control group consists of people aged 37 to 61 years old. (women: 26, men: 4) not treated oncologically.

THE FOLLOWING RESEARCH TOOLS: The study used questionnaires: Personal questionnaire, SWLS The Satisfaction with Life Scale by Drenner, Emmons, Larson, Griffin. Polish adaptation Z. Juczyński (1985), KSS Sexual Satisfaction Questionnaire, by Nomejko, Dolińska-Zygmunt (2011).

CONCLUSIONS: The results revealed significant associations between sexual satisfaction and quality of life. Oncologically ill women achieve a significantly lower level of satisfaction with life and a lower level of sexual satisfaction compared to women from the control group. The prolonged duration of oncological treatment has an impact on life and sexual satisfaction. Oncologically ill persons undergoing surgery obtain statistically significantly lower sexual satisfaction.

Keywords:

quality of life, sexual satisfaction, cancer, oncological treatment



PSILOCYBIN - THE IMPACT ON ADDICTION TO SMOKING

**Marianna Lis (1)*, Zuzanna Siwka (1) Jarosław Nuszkievicz (2),
Karolina Szewczyk-Golec (2)**

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

*(2) Department of Medical Biology and Biochemistry, Faculty of Medicine, Ludwik Rydygier
Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Toruń*

*marianna-lis@o2.pl

A few words about the author:

Marianna Lis is a third-year student of pharmacy at Collegium Medicum, Nicolaus Copernicus University; member of Students Research Club of Medical Biology.

Abstract:

Psilocybin is a psychoactive alkaloid found in hallucinogenic mushrooms. The compound is a serotonin 5-HT_{2A} receptor agonist. Recently, the use of psilocybin has been found to be helpful in quitting smoking addiction. Smoking is considered to be one of the most common addictions. Nicotine, the main chemical compound found in tobacco, increases the level of dopamine in brain which makes it highly addictive. Recent studies suggest that using moderate to high doses of psilocybin during cognitive behavioural therapy for smoking addiction helps to achieve better results in smoking abstinence. Fifteen participants took part in a study of Matthew W. Johnson et al. 2017, in which the addition of psilocybin to quit-smoking therapy was analysed. After 12 months follow-up, ten of the participants were confirmed as smoking abstinent. Other study suggests that mystical subjective effects rather than the pharmaceutical impact of chemical compounds found in psilocybin were more significant in obtaining results. The effects of psilocybin are still being examined, besides treating addictions this substance has found its usage in the treatment of depression and anxiety. The use of 5-HT_{2A} receptor agonists can cause serotonin syndrome which is responsible for hallucinations. Unfortunately psilocybin, as well as other tryptamines, can also be very dangerous for humans. The medical properties of psilocybin are still a controversial topic and more research is needed.

Keywords:

psilocybin, serotonin, smoking addiction



PRO-INFLAMMATORY CYTOKINES IN THE PATHOGENESIS OF ALZHEIMER'S DISEASE

**Jan Milanowski (1)*, Tymon Bykowski (1), Jarosław Nuskiewicz (2),
Karolina Szewczyk-Golec (2)**

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

*(2) Department of Medical Biology and Biochemistry, Faculty of Medicine, Ludwik Rydygier
Collegium Medicum in Bydgoszcz Nicolaus Copernicus University in Toruń*

*janek.milanowski@wp.pl

A few words about the author:

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

Abstract:

Alzheimer's disease (AD) is the most common neurodegenerative disease, most often manifested after the age of 60. AD is incurable, constantly progressive disease and leads to the patient's death. The disease significantly reduces cognitive abilities and does not allow patients to perform the simplest activities. AD is associated with the formation of extracellular β -amyloid plaques (A β), intracellular neurofibrillary tangles and axonal lesions. Oxidative stress, hyperphosphorylation of tau proteins and microglia activation and consequently neuroinflammation are also recognized as causes of AD pathogenesis. Activated by aggregated A β , microglial cells secrete cytokines, including interleukin 1 (IL-1), interleukin 2 (IL-2), interleukin 6 (IL-6), interleukin 8 (IL-8), and tumor necrosis factor α (TNF- α). Thus microglia contributes to the build-up of neuroinflammation and the progression of neurodegeneration in the central nervous system (CNS). Moreover, it causes damage to the functioning of the blood-brain barrier, which additionally exposes the neurons to harmful factors. Understanding the correlation between interleukin-induced inflammation and AD progression will help to prevent the progression of neurodegeneration and improve the standard of living of the patients.

Keywords:

Alzheimer's disease, cytokines, neuroinflammation



SIDE EFFECTS OF SELECTED CYTOTOXIC DRUGS

Paweł Myśliborski-Wołowski (1)*, Ewa Ziółkowska (2)

(1) Regional Specialist Hospital in Grudziądz

(2) The Academy of Kalisz

*pamys@o2.pl

A few words about the authors:

Paweł Myśliborski-Wołowski is an internal medicine specialist currently working in the department of clinical oncology in Grudziądz. Ewa Ziółkowska is a specialist in oncological radiotherapy and a professor at the The Academy of Kalisz.

Abstract:

A side effect is any adverse effect that has a causal relationship with the treatment administered. The individual stages of antitumor treatment, both local and systemic, are characterized by a specific type and severity of toxicity. There are two main types of side effects of oncology drugs: predictable - related to the mechanism of action (e.g. neutropenia, hepatocellular damage, cardiotoxicity) and unrelated to the properties of therapy (e.g. allergic reactions). They concern basically all organs and systems. They can pose a threat to the health and life of the patient, therefore the assessment of their severity is determined using a 5-point scale, describing both the patient's condition and the medical procedures undertaken. The knowledge of the above issue is important both for oncologists and for general practitioner caring for oncological patients.

Keywords:

adverse events, cytotoxic drugs, chemotherapy



QUERCETIN - AN ALLY IN THE FIGHT AGAINST CORONAVIRUS?

**Kacper Michał Naumowicz (1)*, Miłosz Marek Zbucki (1), Martyna Słowikowska (1),
Joanna Kotyńska (2)**

(1) VI High School – King Sigismund Augustus in Białystok, Warszawska 8 Street, Białystok, Poland

*(2) Department of Bioelectrochemistry, Faculty of Chemistry, University of Białystok,
K. Ciołkowskiego 1K Street, Białystok, Poland*

*kacpern132@gmail.com

A few words about the authors:

K.M. Naumowicz, M.M. Zbucki – students of High School, M. Słowikowska - teacher of High School,

J. Kotyńska – PhD from University of Białystok.

Abstract:

As the COVID-19 pandemic caused by the new coronavirus is spreading all over the world, scientists frantically search for effective treatment methods. Currently, several dozens of trials concerning COVID-19 are being conducted, ranging from intravenous vitamin C and menstrual blood-derived stem cells insertion to malaria and HIV pharmaceuticals. There are also some research into the serum obtained from patients, who have recovered from a laboratory-confirmed COVID-19 infection. The main idea is that serum contains antibodies, highly needed for newly diagnosed patients in order to effectively treat a disease. Two of the other potential remedies struggling for attention are quercetin and vitamin D.

Quercetin, being a main representative of flavonoids, is known not only for its immune system strengthening and antiviral properties, but also for being inexpensive and widely available. The presentation shows the structure of quercetin's molecule and its derivatives. Physicochemical characteristics of this compound and origins of its occurrence in one's diet have been mentioned as well as its bioactivity, absorption and metabolism. It was primarily focused on the pro-health influence of quercetin, its usage in anti-cancer therapy and fighting cardiovascular diseases. It has also been shown that quercetin can be useful in both the prevention and treatment of COVID-19 infection.

Keywords:

quercetin, covid-19, flavonoid, daily diet



METABOLIC SYNDROME - CAN KNOWLEDGE PROTECT US FROM IT?

Magda Orzolek

Ludwik Rydygier Collegium Medicum in Bydgoszcz Nicolaus Copernicus University in Toruń

orz.magda@gmail.com

A few words about the author:

My name is Magda Orzolek, I finished bachelor studies in nursing. I am trying to broaden my knowledge about a healthy lifestyle. I am also interested in the influence of diet on human health.

Abstract:

The presentation concerns the subject of the metabolic syndrome - a set of factors which, due to the broadly understood sedentary lifestyle, occur increasingly often in the society and predispose to diseases of the cardiovascular system. The structure of the work includes the presentation of an appropriate definition, clinical criteria of diagnosis and epidemiology. The information contained in the medical facts concerning the metabolic syndrome allows us to formulate a question - can knowledge protect us from it? The main purpose of this presentation will be an attempt to assess the influence of human beings and their pro-health behavior on the occurrence of this phenomenon. In order to broaden the knowledge, the issue of therapeutic measures allowing to reduce the risk of atherosclerotic diseases and type 2 diabetes will also be discussed.

Keywords:

metabolic syndrome, sedentary lifestyle, diseases of the cardiovascular system



PHYSICAL EFFORT WHILE WALKING ON A MULTI-DIRECTIONAL TREADMILL DESIGNED TO MOVE IN VIRTUAL REALITY IN RELATION TO WALKING IN THE FIELD

Jacek Polechoński*, Agnieszka Chruściel

Institute of Sport Science, Jerzy Kukuczka Academy of Physical Education, Katowice, Poland

*j.polechonski@awf.katowice.pl

A few words about the authors:

Jacek Polechoński – physical education teacher, physiotherapist, PhD.

Agnieszka Chruściel – student.

Abstract:

The aim of the study was to compare the intensity of physical exertion during a 10-minute walk in flat terrain and on a multi-directional treadmill (OMNI) designed to move in the virtual reality. 20 female students of AWF Katowice (age 24 ± 0.65) were examined. During both forms of walking, the participants moved at the same pace of 128 steps/min., which was generated by the metronome. The research showed that the tested female students increased their cardiovascular effort while walking on an OMNI treadmill compared to walking in the field. Statistically significant differences were observed for the average and maximum heart rate (HRave and HRmax) as well as the percentage of maximum heart rate (%HRmax). The intensity of the first of the analyzed physical efforts was moderate and the second - low.

Keywords:

exercise intensity, virtual reality, percentage of maximum heart rate, physical activity, multidirectional treadmill



THROUGH THE EYES OF A PHYSIOTHERAPIST ON AN ONCOLOGICAL PATIENT

Janina Rzeszot

danuta.rz@op.pl

Abstract:

Cancer is a chronic disease that disrupts the proper functioning of the patient's/human body in the anatomical, functional, psychological, social, professional, and spiritual spheres. After falling ill, the patient needs a specialized approach and long-term treatment, which can have a negative effect on the body, physiology and psychology. As a result of rehabilitation by 50%, it is possible to increase the fitness and physical capacity of an oncological patient. Systematic physical activity reduces the risk of disease recurrence by 30-40%. Currently, oncological patients can finance oncological rehabilitation from several sources from the National Health Fund, The Health Insurance, Institution of the State Fund for Rehabilitation of Disabled People and from the funds of such organization as the Amazons Club or the Polish Laryngectomic Society. The National Health Fund finances the rehabilitation of cancer patients in inpatient and outpatient departments, home rehabilitation and sanatorium treatment. ZUS finances the rehabilitation of breast cancer patients, and PERON co-finances rehabilitation stays for disabled people. Preventing the effects of malignant tumors is the basic task of oncological rehabilitation, the implementation of which may lead to a significant reduction in medical, social and economic costs associated with this group of diseases. Physiotherapy is one of the most commonly prescribed treatment support methods.

Keywords:

cancer, rehabilitation, physical activity, oncological patients



CLINICAL PHYSIOTHERAPY- ITS ROLE IN IMPROVING THE PATIENT, IN RETURNING TO EVERY LIFE

Janina Rzeszot

danuta.rz@op.pl

Abstract:

Clinical physiotherapy is the first from of rehabilitation after surgery or illness. The combination of treatment and rehabilitation departments significantly shortened the period of stay in the hospital. The aim of the study was to present descriptive methods of physiotherapy on the examples of disease entities in the selected literature. Scheuermann's disease, or deformity of the thoracic or lumbar spine, is caused by abnormal growth and wedging of the vertebral bodies. Water therapy has a positive effect on children and has an attractive exercise. By improving stroke survivors, the effects of teamwork using specialized methods improve the quality of life of patients. Clinical trials are leading to the development of effective and safe methods of immunotherapy of Alzheimer's disease and other neurodegenerative diseases. The prospects for the development of rehabilitation are related to the current, anticipated directions and problems of the development of sciences. The perspectives indicate already developed directions, determined on the one hand by cognition, and on the other by research possibilities. Rehabilitation measures shorten the treatment period, improve its outcomes, alleviate disability and increase the possibility of returning to society.

Keywords:

clinical physiotherapy, physiotherapist, clinical trials



IS IT REALLY A STONE? - LIMITED DIAGNOSTIC VALUE OF AN ABDOMINAL X-RAY IN THE DIAGNOSIS OF PATIENTS WITH RENAL COLIC

**Ilona Samek (1)*, Magdalena Jańczyk (1), Anna Wójcik (1), Justyna Bialek (1),
Paulina Krawiec (1), Joanna Kurzepa (2)**

*(1) Scientific Students Association at the 1st Department of Medical Radiology,
Medical University of Lublin*

(2) 1st Department of Medical Radiology, Medical University of Lublin

*samekilona@gmail.com

A few words about the authors:

Students of Master's degree studies in electroradiology and students of medicine at the Medical University of Lublin.

Abstract:

Renal colic resulting from urolithiasis is quite a common problem that patients report in the emergency departments. The first-to-go examination is ultrasound (US) of an abdomen with estimation of the deposit size and evaluation of urinary tract obstruction. A complementary study is an abdominal x-ray (XR) where radiopaque deposits can be shown. Aim of the study is to determine the usefulness of XR in diagnosing renal colic. The study was conducted on the basis of the analysis of scientific articles from Pub Med database and clinical cases from the 1st Department of Medical Radiology, Medical University of Lublin. US has poor sensitivity (24%–60%) but high specificity (79%–100%) for detection of urinary tract stones. XR shows most of the deposits in the urinary system (85-90%) and their visibility depends on the chemical composition. Shading stones should be differentiated from e.g. phlebolites, lying barite, calcifications in the organs, lymph nodes and vascular. The much greater sensitivity to tissue attenuation and better tissue resolution of low-dose CT results in a better sensitivity and specificity in the diagnosis of kidney stones (respectively 99.6% and 94.9%). The data suggest that XR and US have limited diagnostic value in differentiating the cause of renal colic. CT scan is more accurate examination. At most institutions that offer this examination, CT scanning has replaced USG and XR, the historic diagnostic standard, for the assessment of acute renal colic.

Keywords:

Kidney stone, CT, XR, USG



HOW HAS THE ASSESSMENT OF PHYSICIANS' COMPETENCES AND THE FUNCTIONING OF VISITS CHANGED DURING THE COVID-19 PANDEMIC?

**Ilona Samek (1)*, Magdalena Jańczyk (1), Anna Wójcik (1), Justyna Bialek (1),
Paulina Krawiec (1), Joanna Milanowska (2)**

*(1) Student Scientific Circle at the Department of Applied Psychology of the Medical
University of Lublin*

(2) Department of Applied Psychology, Medical University of Lublin

*samekilona@gmail.com

A few words about the authors:

Students of Master's degree studies in electroradiology and students of medicine at the Medical University of Lublin.

Abstract:

Physicians are one of the the most frequently assessed professions in terms of competence, i.e. the combination of knowledge, skills and attitudes. Telephone medical advice, as the main form of doctor's visit, is currently causing controversies all along the subject of this study. The aim of the study is to compare the assessment of physicians' competences and the functioning of visits according to patients before and during the COVID-19 pandemic. The study was carried out using the author's questionnaire at the turn of 2019/2020. 210 questionnaires were collected and analysed. Then they were compared to the current research results from Google Scholar database. The analysis of the survey conducted before the pandemic showed that according to ¼ of respondents, physicians are not competent, and only 45.72% of people indicated positive feelings during the examination. Currently, the tele-advice is assessed positively by 42.7% of patients, and 41.7% consider its quality to be comparable to a face-to-face visit. A survey conducted before the pandemic showed that 21.9% of patients rated the treatment information provided by the doctor as incomprehensible, and currently 41% of people indicated such problems. The data suggest that physicians still does not pay as much attention as they should to the quality of health services and that tele-advice may cause some confusion. It is important to provide doctors with appropriate psychological care to improve the quality of examinations.

Keywords:

Physician, competence, survey, tele-advice, COVID-19



SIDE EFFECTS OF STATINS USED TO TRAT CHOLESTEROL DISORDERS

**Zuzanna Siwka (1)*, Marianna Lis (1) Jarosław Nuskiewicz (2),
Karolina Szewczyk-Golec (2)**

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

*(2) Department of Medical Biology and Biochemistry, Faculty of Medicine, Ludwik Rydygier
Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Toruń*

*zuzanna.siwka@gmail.com

A few words about the author:

Zuzanna Alicja Siwka is a third-year student of biotechnology at Collegium Medicum, Nicolaus Copernicus University; since October 2020 working at the Students Research Club of Medical Biology.

Abstract:

Cholesterol is a lipid which optimal amount is determined by the proper course of biosynthesis and accordingly balanced delivering with food. Most of the exogenous cholesterol which goes into the veins subjects to a negative feedback mechanism. Changes in cholesterol concentration can cause many diseases. Statin therapy besides positive influence of lowering cholesterol causes side effects. Main tasks of statins is to suppress platelets aggregation and anti-clogging effect. Statin therapy involves with side effects such as hepatotoxicity, myopathy, rhabdomyolysis ora new onset diabetes. It can also cause arterial muscle necrosis or lead to microanurysmia. It's known that tratment with high doses of statins leads to exposure of patients with cardiovascular diseases to intracerebral haemorrhage (ICH). The main reason of therapy termination by patients are muscle symptoms that may indicate statin intolerance, which in turn leads to poorer control of LDL cholesterol levels. Withdrawal of statins is associated with an increased risk of cardiovascular collisions.

Keywords:

cholesterol, side effects of statins therapy, statins

MEDICAL SCIENCES

POSTERS



THE EFFECT OF MORPHINE DEPENDENCE ON THE EXPRESSION OF COX-1 AND COX-2 IN CHOSEN STRUCTURES OF RAT BRAINS EXPOSED TO LOW FLUORIDE CONCENTRATIONS

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

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

*kjanawka@interia.pl

A few words about the authors:

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

Abstract:

INTRODUCTION: Exposure to fluoride leads to neurodegeneration. Fluoride crosses the blood-brain barrier, initiating inflammation, which may be especially harmful in the pre- and neonatal period when this barrier is not fully mature. Cyclooxygenases (COX1 and COX2) are responsible for the synthesis of prostanoids - inflammation mediators. Fluoride exposure results in an increase of COX2 activity and prostaglandin E2 concentration, disturbing the balance in the central nervous system. Morphine, a substance with an analgesic effect, and high addictive potential, also has pro-inflammatory properties. Under the influence of neuroinflammation, morphine tolerance increases. Moreover, the morphine-induced increase in COX2 expression is involved in the development of withdrawal syndrome.

AIM: The assessment of the mRNA expression of COX1 and COX2.

MATERIALS AND METHODS: The studies were conducted in chosen structures of rat brains exposed to fluoride and/or to morphine using qRT-PCR.

RESULTS: Morphine dependence in rats pre-exposed to fluoride decreased the mRNA expression of COX1 in the prefrontal cortex, hippocampus and striatum vs fluoride group (F). Fluoride exposure decreased the expression of COX2 in the striatum, hippocampus and cerebellum. In the striatum and cerebellum, COX2 expression was increased in the fluoride-morphine group vs F. **Conclusions:** Changes in the expression of inflammatory mediators, caused by fluoride neurotoxicity, may influence the development of dependence.

Keywords:

inflammation, morphine dependence, fluoride



CALCULATING CHEMISTRY METHODS AS A SOURCE OF DATA ON TOXICITY OF POTENTIAL DRUGS

Magdalena Kowalska*, Łukasz Fijałkowski, Alicja Nowaczyk

*Department of Organic Chemistry, Faculty of Pharmacy, Collegium Medicum in Bydgoszcz,
Nicolaus Copernicus University, 2 dr. A. Jurasza St., 85-094 Bydgoszcz, Poland*

*magda.kowalska9@gmail.com

A few words about the authors:

The authors of the research are employees and a doctoral student at the Faculty of Pharmacy at CM UMK in Bydgoszcz.

Abstract:

One of the most important components in the process of discovering new drugs is testing the toxic effects of the analyzed substances in the human body. Over the years we have observed an increase in the safety assessment requirements for medicines. One of the most tested parameters is cardiotoxicity. According to the latest guidelines, the estimation of the toxic effects of the substance on the heart muscle is focused on checking the strength of the compound's action on a group of three types of ionic channels: potassium, sodium and calcium. Researchers based on the Comprehensive in vitro Proarrhythmia Assay (CiPA) group have proposed a group of six ion channels of significance for both myocardial depolarization and repolarization: KV11.1, sodium NaV1.5 and calcium CaV1.2.

In this study, the toxicity profile of tiagabine was evaluated. In silico tests were carried out using computational chemistry methods. For this purpose, the ProTox II software was used to determine the most important parameters in drug safety research. The results obtained were compared with the values for substances whose safety in usage is known. The process of docking tiagabine with models of the above mentioned ion channels was also conducted. The tests were carried out using AutoDock software.

Based on the analyses carried out, it was concluded that it is a safe pharmaceutical. Nevertheless, it is recommended to perform additional tests to confirm low toxicity of tiagabine.

Keywords:

in silico tests, ion channels, cardiotoxicity



STRETCHING AS AN ANTI-INFLAMMATORY FACTOR. THE EXPRESSION OF INFLAMMATORY MARKERS IN TISSUES SUBJECTED TO STRETCHING – A REVIEW

**Malgorzata Król (1)*, Marta Skowron (2), Sandra Piechota (3),
Maria Kopia (4), Patrycja Kupnicka (5)**

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

*malgorzatakrol246@gmail.com

A few words about the authors:

Students of the Faculty of Medicine and Medical Diagnostics, members of the Scientific Club at the Department of Biochemistry at the Pomeranian Medical University in Szczecin.

Abstract:

Inflammation is the body's universal, defensive response to harmful stimuli. However, under certain circumstances, it can lead to the development of chronic diseases and irreversible tissue damage. Apart from pharmacological treatment, physical therapy and stretching exercises are very important in controlling the development of chronic diseases.

In in vitro studies conducted on fibroblast cultures, repetitive or high amplitude cyclic stretching resulted in increased synthesis of pro-inflammatory cytokines and apoptosis, while brief, static stretching caused a decrease in IL-6 and TGF-beta 1. Studies using both chondrocytes and fibroblasts have also demonstrated anti-inflammatory effects of low amplitude mechanical inputs. Recent reports also suggest that low amplitude static (non-cyclical) stretching may be an anti-fibrotic and anti-inflammatory factor.

Studies in animal models using carrageenan, an inflammation-causing factor, have shown that exercises with a prominent stretching component reduce the thickness of the inflammatory infiltrate and the number and activity of macrophages in connective tissue.

The positive effects of stretching are also visible in the treatment of autoimmune disease, systemic sclerosis, where researchers observed a delay in the progress of the disease based on the evaluation of animals' skin condition.

Despite many scientific reports, the mechanisms underlying the effects of stretching in reducing inflammation are still not fully understood.

Keywords:

stretching, inflammation



INNOVATIVE HYDROGEL - THE FUTURE OF ORTHOPEDICS AND TRANSPLANTOLOGY

Anna Ornatowska

Lodz University of Technology, Żeromskiego 116, 90-924, Lodz

225398@edu.p.lodz.pl

A few words about the author:

I am a third-year student of Nanotechnology at the Lodz University of Technology. I am interested in the use of polymers in medicine.

Abstract:

A hydrogel is a water-insoluble system which, thanks to the presence of hydrophilic groups, is characterized by high water absorption. In the case of the hydrogel I am talking about - the proportion of water is 60%.

Scientists from Duke University have developed a gel that has the same strength and flexibility as human cartilage tissue.

It owes its unique properties to a special structure - two connected polymer networks. The first is a flexible fiber, while the second, more rigid, is a basket-like system. The surface of the second layer is negatively charged, and both of the layers are reinforced with a net of cellulose fibers.

These fibers, when stretched, provide resistance and keep the material together.

The negative charges, mentioned before, also play a significant role. When the gel is subjected to pressure, they push each other and combine with water molecules. This allows the hydrogel to return to its original shape after the force is removed.

Researches show that this hydrogel exhibits a similar strength to the porous titanium system used for bone implants.

The question is, will it be a breakthrough project in the field of orthopedics and transplantation?

Keywords:

hydrogel, cartilage, polymer, cellulose



PRE-EXPOSURE TO FLUORIDE AND THE MRNA EXPRESSION OF GFAP IN THE BRAINS OF MORPHINE-DEPENDENT RATS

Karolina Żurawska*, Weronika Ossowska, Denis Myszak, Michał Tomaszek, Patrycja Kupnicka

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

*karolina19970714@gmail.com

A few words about the authors:

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

Abstract:

INTRODUCTION: GFAP is an intermediate fibril protein produced by astrocytes. This protein is necessary for the maintenance of proper white matter architecture and the integrity of the blood-brain barrier. GFAP is produced in increased amounts in response to damage to the central nervous system, it has a neurotoxic effect and contributes to the degeneration of neurons. However, some studies showed a decreased GFAP expression after fluoride exposure accompanied by an increase in BDNF expression, indicating impaired maturation of nerve cells and the implementation of adaptive processes. GFAP expression may also be altered by morphine administration, which chronic use leads to inflammation of the central nervous system.

AIM: The assessment of the mRNA expression of GFAP.

MATERIALS AND METHODS: The studies were conducted using qRT-PCR in chosen structures of rat brains exposed to fluoride and/or to morphine.

RESULTS: Morphine dependence was associated with a significant decrease in GFAP expression in the prefrontal cortex. Fluoride exposure and subsequent morphine dependence decreased the mRNA expression of GFAP in all analyzed structures except the striatum vs control group. The fluoride-morphine group showed lower mRNA expression of GFAP vs fluoride group in the prefrontal cortex and higher expression in the hippocampus.

CONCLUSIONS: Fluoride changes the expression of glial fibrillary acidic protein. Observed changes are structure-dependent and may influence morphine dependence.

Keywords:

GFAP, fluoride, morphine dependence

NATURAL AND TECHNICAL SCIENCES

PRESENTATIONS



HYPEROSMOTIC STRESS RESPONSE: THE ROLE OF NEUTRAL AMINO ACID TRANSPORTER SNAT2

Wioleta Banaszuk

*Department of Molecular Biology, Institute of Biological Sciences,
Faculty of Biology and Biotechnology, Maria-Curie Skłodowska University of Lublin*

wioleta.banaszuk@poczta.umcs.lublin.pl

A few words about the author:

I am a PhD at the Doctoral School of Exact and Natural Sciences at UMCS. My research focus on the regulation of plasma membrane amino acid transporters activity via posttranslational modifications in Golgi compartment.

Abstract:

Cellular responses induced by stress are essential for the survival of cells. Adaptation to hyperosmotic stress includes induction of expression of SNAT2 on the plasma membrane. This helps to reverse loss of cell volume induced by increased extracellular osmolarity and promote homeostasis through amino acid uptake. SNAT2 is a member of system A transporters that displays a preference for transport of neutral amino acids across the membranes, such as alanine, serine, proline and glutamine. The cellular pathways involved in the regulation of SNAT2 in response to hyperosmotic stress are less understood. The integrated stress response (ISR) is a mechanism activated in the response to a diverse stresses, which leads to a phosphorylation of eukaryotic translation initiation factor 2 alpha (eIF2 α) and decrease in global protein synthesis. The cellular response to hyperosmotic stress also involves regulation of the phosphorylation of eIF2 by increased levels of GADD34, a regulatory subunit of the protein phosphatase PP1. Moreover, activity of GADD34 reverses fragmentation of Golgi apparatus caused by hyperosmotic stress and is important for cis- to trans-Golgi trafficking of SNAT2, hence promoting maturation, membrane localization and function of this transporter.

Keywords:

hyperosmotic stress, amino acid transporter SNAT2, Golgi apparatus



IMPROVEMENT OF THE MECHANICAL PROPERTIES OF PRESS-HARDENED 22MnB5 STEEL IN INDUSTRIAL CONDITIONS

Konrad Brzyski*, Dariusz Kuc

*Faculty of Materials Engineering, Silesian University of Technology,
Krasinskiego 8, 40-019 Katowice*

*Konrad.B@e-mail.net.pl

A few words about the authors:

Dariusz Kuc is an associate professor in Faculty of Materials Engineering of Silesian University of Technology. He is also a thesis supervisor of Konrad Brzyski, who is simultaneously a technologist in a company Gruppo CLN and a PhD student.

Abstract:

Industrial implementation of steel is always a compromise between tensile strength and possible elongation. Application of modern hot forming technology is known as a possibility of an enhancement both of these parameters. In this study has been examined 22MnB5 press-hardened steel with Al-Si coating processed in non-laboratory conditions. The tests were carried out at the plant of one of the largest car manufacturers in southern Poland. The results of the conducted research confirmed successful setting of technological proces parameters. High tensile strength and high hardness of tested samples indicate, that stable and fine martensitic structure was obtained in serial production. Moreover, mechanical properties achieved in trials has already exceed properties of 1st generation martensitic steel. Continuation of research is a perspective of a further progress, which will result in increased strength of the car's body parts responsible for safety.

Keywords:

Press-Hardened Steel, hot forming, automotive industry



HEMATOXYLIN, EOSIN AND NATURAL SAFFRON (HES): A NEW HISTOLOGICAL STAINING METHOD

Cassandra Ceccopieri*, Joanna Skonieczna-Kurpiel, Jan Madej

Wrocław University of Environmental and Life Sciences

*cassandra.ceccopieri@upwr.edu.pl

A few words about the authors:

Mgr. Cassandra Ceccopieri and DVM Joanna Skonieczna-Kurpiel are Ph.D. students at the Division of Histology and Embryology of Veterinary Science. Dr hab. Jan Madej, Assoc. Prof. scientifically deals with the morphology of the immune system of birds.

Abstract:

Hematoxylin and eosin (H&E) is one of the most widely used histological stainings in medical diagnosis. However, one of the main limitations of the method is the inefficiency in effectively differentiating muscle from connective tissue. Several modifications of the protocol have been already proposed giving satisfactory results only in specific tissues.

Our team took up the challenge of refining an existing variation of the procedure employing saffron as a specific dye for connective tissue.

We, therefore, introduce hematoxylin-eosin saffron (HES), a new trichromatic staining for the effective identification of collagen fibers in a wide range of animal tissues.

Keywords:

saffron, collagen fibers, multichromatic staining, connective tissue



SYNTHETIC ANTIMICROBIAL PEPTIDOMIMETICS BASED ON BINDING SITE OF CYSTATIN C – OPTIMIZATION OF SCALE-UP SYNTHESIS

Wojciech Gogacz*, Maria Dzierżyńska, Sylwia Rodziewicz-Motowidło,
Franciszek Kasprzykowski

University of Gdansk, Faculty of Chemistry, Wita Stwosza 63, 80-308 Gdańsk, Poland

*w.gogacz4@gmail.com

A few words about the author:

All authors of this study are experienced scientists from the Department of Biomedical Chemistry involved in broadly understood proteins and peptides research, except Wojciech Gogacz who is a graduate student at this research unit.

Abstract:

In the era of constantly mutating bacterial strains resistant towards more and more antimicrobial chemotherapeutic agents, including antibiotics, it is necessary to search for and synthesize new biologically active compounds. They should be effective against bacterial diseases, and therefore have a different mechanism of action compared to the compounds known so far. The structure of the presented peptidomimetics is based on the *N*-terminal binding fragment of human cystatin C (Arg⁸-Leu⁹-Val¹⁰-Gly¹¹) – a protein responsible, inter alia, for inhibiting bacterial growth by suppressing their cysteine protease as well as inhibiting the replication of some viruses. Despite the fact that these compounds do not show modulation of cysteine proteases, the conducted studies confirmed their effectiveness in the struggle against Gram-positive bacterial strains such as MRSA, GAS or CNS, and in addition, antiviral activity directed, in particular, against HSV-1, shown especially by the derivative called Cystapep 1.

Due to the very high potential of the above-mentioned human cystatin C derivatives in the treatment of many bacterial and viral diseases, preliminary studies were carried out to optimize their synthesis on a larger scale. They were based on the implementation of the steps leading to the production of Cystapep 1 on a pilot scale.

Keywords:

Cystapep 1, cystatin C, antimicrobial peptidomimetics, scale-up synthesis, Gram-positive bacteria



CHEMICAL PHOSPHORUS REMOVAL FROM WASTEWATER WITH USING PRE-HYDROLYZED COAGULANTS

Justyna Kurcek

*The Faculty of Civil and Environmental Engineering and Architecture,
Rzeszow University of Technology, Powstancow Warszawy 12, 35-959 Rzeszow, Poland*

justyna.kurcek@wp.pl

A few words about the author:

I am a student of the second-degree studies in Environmental Engineering at Rzeszow University of Technology. My general fields are modern methods of sewage and water treatment.

Abstract:

Phosphorus is a biogenic element, which has a significant impact on plant growth and the development of living organisms in the water. High phosphorus concentration causes eutrophication of water and increased growth of algae, which, when blooming, reduce the transparency of water and contribute to a reduction oxygen content. It has negative effects in the form of dying mainly of fish, but also of other living organisms.

The main source of phosphorus in the waters is domestic sewage. Effective wastewater treatment is very important, because it is a highly reduce the concentration of biogenic elements. Therefore, wastewater treatment from phosphorus compounds is very important in environmental protection.

Chemical removal of phosphorus from sewage depending on the type of sewage and the amounts contained in them, different forms of phosphorus, as well as the choice and place of adding the reagent, differ in the reduction efficiency of this element. The advantage of chemical phosphorus removal with the use of pre-hydrolyzed coagulants is that this method has been repeatedly tested in technological lines and it is possible to achieve a very high level of wastewater treatment.

Keywords:

chemical phosphorus removal, pre-hydrolyzed coagulants, phosphorus, wastewater



COMPARISON OF PESTICIDES EFFECT ON THREE ENTOMOPATHOGENIC FUNGAL STRAINS OF THE GENUS ISARIA

Anna Litwin*, Sylwia Różalska

University of Lodz, Faculty of Biology and Environmental Protection, Department of Industrial Microbiology and Biotechnology, Banacha 12/16, 90-237 Lodz, Poland

*anna.litwin@biol.uni.lodz.pl

A few words about the author:

My name is Anna Litwin. I am a PhD student at the Department of Industrial Microbiology and Biotechnology of the University of Lodz. My main research topic is entomopathogenic fungi and their relationships with synthetic insecticides.

Abstract:

Fungi of the genus *Isaria* are entomopathogenic - they have insecticidal activity. They occur naturally in the environment and have many interesting properties: produce secondary metabolites and silver nanoparticles.

The aim of the study was to compare the effect of pesticides on three strains of entomopathogenic fungi of the genus *Isaria*: *I. fumosorosea*, *I. farinosa* and *I. tenuipes*.

On the basis of the results concerning the influence of insecticides on the growth of selected strains, pyrethroids were selected for further studies. Subsequently, studies were carried out to determine the optimal growth culture medium for these strains.

The influence of both the active substance deltamethrin and the commercial preparation Deltam on the strains was also determined. Deltam, containing the active substance deltamethrin, caused very high growth inhibition of the strains (by 80 and 94% at a concentration of 25 and 50 mg/L, respectively).

Due to the best growth of *I. fumosorosea*, it was selected for further studies. Among others, it was investigated whether insecticides cause oxidative stress in this strain.

We concluded that it would be worth extending the research on the effect of Deltam on *Isaria* fungi. It is very interesting that the commercial preparation exerts a much stronger influence on the growth of the fungus than the active substance itself.

The research was financed from the grant of the National Science Center of Poland under the number 2016/23/B/NZ9/00840.

Keywords:

entomopathogenic fungi, pyrethroids, *Isaria*



THE INFLUENCE OF HEAVY METALS ON ENTOMOPATHOGENIC FUNGI

Anna Litwin*, Sylwia Różalska

University of Lodz, Faculty of Biology and Environmental Protection, Department of Industrial Microbiology and Biotechnology, Banacha 12/16, 90-237 Lodz, Poland

*anna.litwin@biol.uni.lodz.pl

A few words about the author:

My name is Anna Litwin. I am a PhD student at the Department of Industrial Microbiology and Biotechnology of the University of Lodz. My main research topic is entomopathogenic fungi and their relationships with synthetic insecticides.

Abstract:

Entomopathogenic fungi – mycoinsecticides, are capable of infecting, causing diseases and killing arthropods. Due to their properties, they act as a natural factor controlling the populations of arthropods and act as endophytes - they support plant growth, provide plants with available nitrogen and contribute to the control of fungal plant pathogens (Jaber and Enkerli 2017, Ramakuwela et al. 2020). In addition, they have many other important properties - they are able to convert flavonoids and steroids as well as biosynthesize silver nanoparticles, they also produce numerous secondary metabolites that can be used as antibacterial agents (Dou et al. 2019, Wang et al. 2019).

Entomopathogenic fungi can also help in the removal of heavy metals - directly through the accumulation of metals in the biomass and indirectly through their influence on plant phytoremediation properties (Farias et al. 2019). This is a very important function because even trace amounts of metals have a negative impact on the environment and living organisms. Heavy metals were found to have a detrimental effect also on entomopathogenic fungi (Wang et al. 2018). It has been shown, inter alia, that lead accumulates in *B. bassiana* cells and influences morphological changes of hyphae. Chromium causes oxidative stress and lipid peroxidation in entomopathogenic fungi.

It is very important to understand as much as possible the effects of metals on entomopathogenic fungi and the mechanisms of fungal sensitivity.

Keywords:

heavy metals, entomopathogenic fungi



OPTIMIZATION OF WORKING CONDITIONS OF THE SECOND GENERATION BIOSENSOR DUE TO THE SELECTION OF AN APPROPRIATE MEDIATOR

Amanda Leda (1)*, Maria Kuznowicz (2), Tomasz Rębiś (1), Teofil Jesionowski (2)

(1) Poznań University of Technology, Faculty of Chemical Technology, Institute of Chemistry and Technical Electrochemistry, Department of General and Analytical Chemistry,

4 Berdychowo Street, 60-965 Poznań

(2) Poznań University of Technology, Faculty of Chemical Technology, Institute of Chemical Technology and Engineering, Department of Chemical Technology,

4 Berdychowo Street, 60-965 Poznań

*amanda.leda@student.put.poznan.pl

A few words about the authors:

Amanda Leda, Maria Kuznowicz, Tomasz Rębiś and Teofil Jesionowski are scientifically associated with the Faculty of Chemical Technology at the Poznań University of Technology.

Abstract:

The aim of this study was to compare external mediators (i.e. (hydroxymethyl)ferrocene, 1,4-benzoquinone and an equal mixture of potassium hexacyanoferrate(II) and potassium hexacyanoferrate(III) based on a hybrid nanomaterial: magnetite/polydopamine/glucose oxidase ($\text{Fe}_3\text{O}_4/\text{PDA}/\text{GO}_x$), and then to carry out optimization for working conditions.

The scope of conducted study consisted of the synthesis of $\text{Fe}_3\text{O}_4/\text{PDA}$ hybrid material. Then the process of adsorption immobilization of glucose oxidase with *Aspergillus niger* was carried out. A biosensor system based on a glassy carbon (GC) electrode was constructed. Each of the systems was subjected to electrochemical tests, using cyclic voltammetry (CV) and chronoamperometry (CA). Finally, a number of physicochemical analyses were performed in order to characterize the obtained systems (TEM, Bradford, PdI, zeta potential, NIBS).

Thanks to the electrochemical tests carried out, it was shown that a properly selected mediator for the analyzed hybrid system is (hydroxymethyl)ferrocene.

The paper was financed and prepared as a part of project no. 2017/27/B/ST8/01506 funded by the National Science Centre.

Keywords:

second generation biosensor, mediator, hybrid system



ROLE OF GREEN COFFEE BEAN EXTRACT IN SKIN FIBROBLASTS RESPONSE TO UVA RADIATION

Paulina Machała*, Halina Małgorzata Żbikowska

*Department of General Biochemistry, Faculty of Biology and Environmental Protection,
University of Lodz*

*paulina.machala@edu.uni.lodz.pl

A few words about the authors:

Halina Małgorzata Żbikowska – Associate professor at the Department of General Biochemistry, University of Lodz. Researcher and university lecturer.

Paulina Machała – PhD student at the Department of General Biochemistry, University of Lodz.

Abstract:

Excessive exposure to UVA radiation from sunlight causes sunburn, but also damages DNA, gene mutations, immunosuppression, oxidative stress and inflammatory reactions. These factors are crucial in the development of photoaging and skin cancers. Currently used sunscreens are increasingly enriched with plant compounds containing numerous bioactive substances, including antioxidants.

Coffee bean contains over 700 compounds, including numerous polyphenols (including chlorogenic acid), phenolic acids (caffeic, caffeoylquinic - strongly absorbing radiation at 325 nm), alkaloids (caffeine), polysaccharides, lipids, volatile and heterocyclic compounds.

The aim of the research was to evaluate the effect of coffee bean extract on the level of reactive oxygen species (spectrofluorimetric method) and DNA damage (comet test) and the survival (CCK8 test) of human skin fibroblasts Hs68 line after exposure of UVA radiation (8 J/cm²).

Preliminary studies indicate that the extract significantly inhibits the formation of reactive oxygen species and DNA damage in fibroblasts Hs68, affecting the increased survival of Hs68 cells exposed to UV (by 20% in a concentration of 25 µg/ml, compared to the control). Extracts with such properties can be used as ingredients in sunscreens.

Keywords:

green coffee bean extract, photoaging, antioxidants



A BRIEF HISTORY OF DEVELOPMENT OF BULK HETEROJUNCTION ORGANIC SOLAR CELLS (BHJ-OSCS)

Krzysztof Matuszek

Lodz University of Technology, Zeromskiego 116, 90-924 Lodz, Poland

krzysztof.matuszek@hotmail.com

A few words about the author:

Wanted to become a scientist from the age of 6, probably. Cannot stand inactivity. Demands a lot from others and balances it with demanding even more from himself. A LEGO Technic hobbyist and a huge fan of Agatha Christie's crime stories.

Abstract:

An organic solar cell (OSC) is a type of a photovoltaic thin film device that utilizes organic compounds. The first OSC was fabricated by Calvin in 1958. Since then, little development had been done in the field until 1986 when a breakthrough approach of manufacturing a two-layer device was first applied. In 1991, blended small molecule organic heterojunction was introduced by prof. Hiramoto. By blending the electron donor and acceptor materials together into a nearly homogenous film, maximization of phase contact area between the two was achieved which resulted in much higher power conversion efficiency (PCE). A year later, prof. Sariciftci first reported an OSC with bulk heterojunction (BHJ) composed of a polymer donor and fullerene C-60 acceptor. While prof. Sariciftci's first cells offered around 1% PCE, by 2010 efficiencies of up to 11% were reported for OSCs with a fullerene-based small molecule acceptor PC71BM (phenyl fullerene C71 butyric acid methyl ester). In the second decade of the 21st century, no significant rise in PCE was reported for a few years. Such a stall did not last long, though, and in 2015 the first non-fullerene acceptor, ITIC, was introduced. Its use together with already known high performance donor polymers instantly allowed PCEs of 15% and higher. Since then, at least a few new acceptor families are being reported each year. Nowadays, special emphasis is put on maximizing the PCE while maintaining high environmental stability of OSCs.

Keywords:

solar cells, polymers, organic materials, molecular optoelectronics, photovoltaics



MODELLING UNIVARIATE TIME SERIES WITH ONE-DIMENSIONAL CONVOLUTIONAL NETWORKS

Jakub Michańków

Cracow University of Economics

newsme23@gmail.com

A few words about the author:

PhD Candidate, researching deep learning models in time series forecasting.

Abstract:

The goal of this article is to present theoretical concepts and applications of one-dimensional convolutional neural networks in univariate time series data modeling and prediction. While highly popular, CNNs are mostly used for working with two-dimensional image data. This work shows that they can also be successfully applied for modeling time series data.

The methodology used in this research is computer simulation. A model based on one-dimensional convolutional network is programmed to train on two different time series data sets - daily temperature data and Tesla stock prices. Root-mean-square error (RMSE) and Mean absolute percentage error (MAPE) measures were used to evaluate model performance.

In both cases, the model performs quite well, although the results obtained on the stock prices data are slightly better. The work also indicates the possibilities of improving and streamlining the models based on the described methods.

Keywords:

deep learning, forecasting, convolutional networks, time series



ACCUMULATION OF RADIOISOTOPES IN SOME SPECIES OF POLISH MUSHROOMS

Oskar Ronda (1)*, Bartłomiej Cieřlik (2), Elżbieta Grządka (3)

(1) *Students' Chemical Society at Gdansk University of Technology, Faculty of Chemistry,
Gdańsk University of Technology*

(2) *Department of Analytical Chemistry, Faculty of Chemistry, Gdańsk University of Technology*

(3) *Department of Radiochemistry and Environmental Chemistry, Faculty of Chemistry,
Maria Curie-Skłodowska University*

*s171310@student.pg.edu.pl

A few words about the author:

Oskar Ronda – I am a student of Faculty of Chemistry of Gdańsk University of Technology. My scientific interests concern environmental analytics, in particular environmental radiochemistry.

Abstract:

Mushrooms are very popular in polish cuisine. Therefore, it is justified to care for the safety of their consumption, especially in the context of their proven ability to accumulate some dangerous radioisotopes, such as cesium-137 (Cs-137). Main sources of radioactive pollutions in environment are nuclear tests and nuclear reactors disasters. The Chernobyl Disaster (1986) has the greatest impact on the environment in Poland. Effects of this disaster are detectable until now. Seven popular species of polish wild mushrooms (including four edible and three inedible) are the subject of research. Samples were collected from six areas in Poland, which differed in the level of soil contamination by Cs-137 from Chernobyl fallout. In this study, we also examined activity of natural radioisotopes such as potassium-40 (K-40), lead-210 (Pb-210) and, the first time on a large scale in Europe, bismuth-214 (Bi-214). For analysis we used gamma-ray spectrometer with HPGe detector. Research results confirms significant accumulation of Cs-137 in wild mushrooms. Moreover, activity of Cs-137 exceeds values allowed in foodstuffs in some samples from Opole Voivodeship.

Keywords:

Chernobyl, radioisotopes, cesium-137, mushrooms, accumulation



THE STENT IMPLANTATION INTO THE LUMEN OF URETHRA AT NEW ZEALAND WHITE RABBIT

**Joanna Skonieczna-Kurpiel (1)*, Jan P. Madej (1), Agnieszka Noszczyk-Nowak (1),
Tomasz Klekiel (2), Romuald Będziński (2)**

*(1) Faculty of Veterinary Medicine, Wrocław University of Environmental and Life Sciences,
Norwida 25, 50-375 Wrocław, Poland*

*(2) Faculty of Mechanical Engineering, University of Zielona Góra,
Szafrana St. 4, 65-516 Zielona Góra, Poland*

*sko.joanna1@gmail.com

A few words about the authors:

J. Skonieczna-Kurpiel is a PhD student.

Dr hab. J. Madej, Assoc. Prof. is a specialist in immune system of birds.

Prof. A. Noszczyk-Nowak is a specialist in cardiology.

Prof. R. Będziński, Dr hab. inż. T. Klekiel do the experimental mechanics.

Abstract:

Urethral stricture is a common disease around the world, that causes symptoms as slow and progressive deterioration of the urinary and pain during urination. The most popular ways of treatment are dilating or stretching, urethrotomy and urethroplasty. Those procedures do not always solve the problem. The scientists work on creating a new solution like a stent, which would be easy to implant, cheap and effective.

The experiment was performed on one male New Zealand White rabbit weighing 2.5 kg. The implantation of the stent was made under the USG control. The whole urethra with the stent was taken, cut into slices and stained with haematoxylin-eosin (H&E). The process of implantation was successful but during the week the stent has migrated, collapsed and curled up. The microscopic examination of the urethra revealed widening of its lumen and inflammation. In the mucosa hyperaemia, haemorrhages, oedema and vascular dilatation were observed. The epithelium was locally thinned and damaged. Moreover, in some places complete lack of epithelium was noted. The results of this experiment indicate that stent designing process should take into account not only the mechanical properties of the organ wall, but also the participation of contractile elements such as smooth muscles that are under the control of the nervous system. The surface of the implant should keep it in place and not cause extensive inflammation of the surrounding tissues.

Keywords:

rabbit, urethra, stent, morphology



MODIFICATIONS OF MAGNETIC NANOPARTICLES SUITABLE FOR NUCLEIC ACIDS EXTRACTION

**Anna Szymczyk (1)*, Robert Ziolkowski (1), Marcin Drozd (1, 2),
Elżbieta Malinowska (1, 2)**

(1) Faculty of Chemistry, Warsaw University of Technology, Warsaw, Poland

(2) CEZAMAT PW, Warsaw, Poland

*anna.szymczyk.dokt@pw.edu.pl

A few words about the authors:

M.Eng. Anna Szymczyk, nanomaterials in biosensors.

PhD Robert Ziolkowski, electrochemical biosensors.

PhD Marcin Drozd, nanomaterials synthesis and functionalization.

Prof. Elżbieta Malinowska, specialist in electrochemical (bio-)sensors.

Abstract:

Nanomaterials are becoming more and more popular nowadays. Due to their small size and large surface to volume ratio they are characterized by physicochemical properties substantially different than respective bulk materials. Application of such in medical diagnostic is becoming inevitable. One of such examples can be magnetic nanoparticles. As was already proved they can overcome limitations in traditional method of e.g. nucleic acids isolation from physiological samples (blood, saliva, plasma). This is because of their good dispersion, low cost, ease of modification suitable for specific adsorption of nucleic acids, and most important also ease of its separation from the whole sample.

In the presented study we used as magnetic cores Fe_3O_4 prepared by coprecipitation and controlled oxidation of iron(II) precursor. Both types were coated with versatile surface modifiers e.g. gold, polyethyleneimine and silica shell or graphene oxide also additionally modified with carboxylic or thiolate-groups. All of them were purified by means of a magnet. For future analysis dedicated to nucleic acids adsorption were selected nanoparticles, which showed long- term stability in solution and very good magnetism. The magnetic nanoparticles were characterized by measuring the zeta potential, size distribution profile and UV-Vis absorption.

Keywords:

iron (II, III) oxide, modified magnetic nanoparticles, graphene, polymers, gold



MODERN INDUSTRIAL ROBOTS

Paweł Błaszczyk

Lodz University of Technology

228374@edu.p.lodz.pl

A few words about the author:

My name is Paweł Błaszczyk, I am 21 years old and I am the student of Łódź University of Technology. I like basketball, video games and electronics. My field of study is automatics and robotics.

Abstract:

The presentation includes the most important things about the industrial robots, that are being used nowadays. Viewer will be able to get some basic knowledge of robotics and its role in contemporary manufacturing. The main goal of this presentation is to increase people's interest in robotics, which is going to be one of the most key field of science in the future.

Keywords:

robotics, industrial robots, modern manufacturing



KINETIC STUDIES OF HYBRID POLYMER MATERIALS

Alicja Bosacka

*Maria Curie-Skłodowska University, Institute of Chemical Sciences,
Maria Curie-Skłodowska Sq. 3, 20-031 Lublin, Poland*

alicja.bosacka@poczta.umcs.lublin.pl

A few words about the author:

I am PhD student at Maria Curie-Skłodowska University in Lublin (Poland). I am interested in physical chemistry, material synthesis, their functionalization and investigation.

Abstract:

Materials can be divided into porous and non-porous. Porous media are commonly used as the adsorbents because of the much larger specific surface area than non-porous and therefore exhibit better sorption properties. Material porosity is a property of solids that determines the size and number of voids inside the material. The empty spaces are areas where there is no solid material, possibly only fluid (most often water or air). Adsorbent is a medium with a highly developed surface on which a process takes place that involves the surface bonding of fluid (liquid or gas) molecules by liquid or solid particles, called adsorption. The substance that is adsorbed is an adsorbate. The valuable tool to assess the adsorbent-adsorbate interactions is kinetic study. Generally, kinetic is a branch of physical chemistry that studies the velocity and mechanisms of chemical reactions. Kinetic study could be used to evaluate sorption properties of the materials. On the basis UV-Vis spectra is possible to evaluate sorption properties of the selected material in the presence of the given adsorbate. In this work, the sorption behaviour of the three hybrid polymeric samples with different compositions (the disparate content of the organic and inorganic phases) and in the presence of three various adsorbates were examined.

Keywords:

kinetic studies, hybrid materials, polymers



THE EFFECT OF THE ELLAGIC ACID UPON THE ELECTROKINETIC POTENTIAL OF THE PHOSPHATIDYLCHOLINE MEMBRANES

**Gabriela Ciuńczyk (1)*, Weronika Dudzińska (1), Martyna Słowikowska (1),
Joanna Kotyńska (2), Monika Naumowicz (2)**

(1) VI High School – King Sigismund Augustus in Białystok, Warszawska 8 Street, Białystok, Poland

*(2) Department of Bioelectrochemistry, Faculty of Chemistry, University of Białystok,
K. Ciołkowskiego 1K Street, Białystok, Poland*

*lo6@um.bialystok.pl

A few words about the authors:

G. Ciuńczyk and W. Dudzińska – students of High School, M. Słowikowska – teacher of High School, J. Kotyńska – PhD from University of Białystok, M. Naumowicz – PhD, Associate Professor at University of Białystok.

Abstract:

The ellagic acid is a natural compound, belonging to the polyphenols group. It is well known for its antibacterial, anti-inflammatory and antiviral properties as well as high antioxidant ones. Several studies have shown that ellagic acid has the anti-cancer effect. This compound arouses great interest among scientists, due to its ability to prevent and treat cancer. The biological membranes play important functions in living organisms. An understanding how the biologically active compounds interact with cell membranes, allows to broaden the knowledge about the course of the physicochemical and biochemical processes, in which they participate. Therefore, by conducting research on the electrokinetic potential of membranes, we can obtain valuable information about their condition.

The influence of the ellagic acid on the electrokinetic (zeta) potential of the liposomal phosphatidylcholine membranes was analyzed. The liposomes were obtained by sonication technique. Measurements were performed by Zetasizer Nano ZS using the microelectrophoretic technique. The liposomes suspended in 0.9% NaCl were titrated to the desired pH (range 2–10, every ± 0.3 units) using NaOH or HCl. The obtained results indicated the values of the electrokinetic potential change as a result of the modification of the lipid membranes with ellagic acid. These changes may be related to interactions both between the membrane components and the environment, and between the membrane-forming components.

Keywords:

ellagic acid, polyphenols, membranes, electrokinetic potential, liposomes



INFLUENCE OF THE MICROENCAPSULATION METHOD POTATO STARCH FERULATES ON THEIR PHYSICOCHEMICAL PROPERTIES

Kamil Dędek*, Justyna Rosicka-Kaczmarek, Ewa Nebesny, Gabriela Kowalska, Karolina Miśkiewicz

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

*kamil.dedek@dokt.p.lodz.pl

A few words about the author:

PhD candidate at the Institute of Food Technology and Analysis at the Lodz University of Technology. His primary interests focus on issues related to the study of carbohydrates, hydroxy acids and healthy properties of food ingredients.

Abstract:

Bioactive compounds, including ferulic acid, are a valuable component of food due to their pro-health properties. Nevertheless, due to their low stability to environmental conditions during processing and storage, introducing those compounds into foods is challenging. Microencapsulation may be an effective panacea to introduce such compounds into those products. Microencapsulation is a technique whereby liquid droplets or solid particles are packed into continuous individual walls. The walls are designed to protect the encapsulated material from factors that may cause its deterioration. Spray drying is one of the processes contributing to successful microencapsulation. During this process, the evaporation of solvent, that is most often water, is rapid and the entrapment of the interest compound occurs quasi-instantaneously.

In this study was investigated the possibility of obtaining stable potato starch ferulates microcapsules using spray drying and deep freezing. Then their selected physicochemical properties were analyzed.

The results of the conducted analyzes showed that the use of both spray drying and deep freezing contributed to obtaining stable potato starch ferulates. When spray drying was used, spherical particles were obtained which contained a lower amount of fiber than compared to their freeze-dried counterparts.

Keywords:

microencapsulation, spray drying, freeze drying, potato starch



ANTIOXIDANT POTENTIAL OF INCLUSION COMPLEXES OF SELECTED POLYPHENOLS WITH 2-HYDROXYPROPYL-B-CYCLODEXTRIN

Milena Kaczmarska*, Dorota Żyżelewicz, Joanna Oracz, Katheryna Sheremet

Lodz University of Technology, Faculty of Biotechnology and Food Sciences, Institute of Food Technology and Analysis, B. Stefanowskiego 4/10 St., 90-924 Lodz, Poland

*milena.kaczmarska@dokt.p.lodz.pl

A few words about the author:

I am PhD student at the Lodz University of Technology. My research interests is associated with encapsulation of polyphenols using different methods and the application of the resulting preparations to food products.

Abstract:

2-Hydroxypropyl- β -cyclodextrin (HP- β -CD) is a cyclic oligosaccharide, which, thanks to its structure, is able to form stable inclusion complexes with many compounds. The formation of inclusion complexes with polyphenols may contribute to the improvement of functional properties of the preparations obtained from them.

The aim of the study was to evaluate the antioxidant potential of inclusion complexes of selected polyphenols, (+)-catechin, quercetin and gallic acid with HP- β -CD. The total polyphenolic content and the antioxidant activity of inclusion complexes were determined using the Folin-Ciocalteu method and in vitro tests (DPPH, FRAP, ABTS, iron ions chelating activity).

The inclusion complexes were characterized by a high content of polyphenolic compounds. The highest amount of these substances was observed in the complex with quercetin (1155.06 mg of catechin/g), while preparation with (+)-catechin showed the lowest one (909.63 mg of catechin/g). The inclusion complex with quercetin had the greatest reducing ability and the activity of chelating iron ions. On the other hand, it was characterized by the lowest DPPH scavenging capacity. The complex with gallic acid showed the highest antioxidant activity in the DPPH and the lowest in the ABTS tests. However, it does not have the ability to chelate iron ions. The complex with (+)-catechin showed the highest ABTS scavenging ability and the lowest ability to reduce iron ions in FRAP test.

Keywords:

encapsulation, inclusion complex, polyphenols, antioxidant activity, 2-Hydroxypropyl- β -cyclodextrin



POTENTIAL APPLICATION OF CHLOROPLAST UBIQUITIN LIGASES E3 IN ABIOTIC STRESS TOLERANT PLANT BREEDING

Natalia Kielich (1)*, Agata Cieřła (2)

(1) Faculty of Biology, Institute of Molecular Biology and Biotechnology, Adam Mickiewicz University in Poznań, Poznań, Poland

(2) PhD, Laboratory of Biotechnology, Faculty of Biology, Institute of Molecular Biology and Biotechnology, Adam Mickiewicz University in Poznań, Poznań, Poland

*nataliakielich1@gmail.com

A few words about the author:

I am a conscientious student and I am pursuing a Master's degree in Biotechnology. I am interested in both genetic manipulation and protein post-translational modifications.

Abstract:

In the wake of growing population and climate changes, the food production system is under pressure.

It is believed that plant biotechnology could be the solution. That is why, we have started working on chloroplast-localized E3 ubiquitin ligase called SP1 ligase family. The activity of SP1 promotes both chloroplasts proteome changes during plant development and abiotic stress tolerance, which is one of the factors of increasing agriculture yields losses globally. Under stress condition for example salt or osmotic stress, the TOC complex is targeted for the proteasomal degradation by SP1 ligase. During this study, genetic constructs have been generated with Gateway® cloning. The prepared DNA constructs will be used for the overexpression SP1 types ligases in bacteria system. Future experiments are being based on these overproduced proteins. It is necessary to identify the substrates of such ligases in chloroplasts. More work is needed to clarify the role of SP1 ligases family and its possible application in modern agriculture.

Keywords:

agriculture, chloroplast-localized E3 ubiquitin ligase SP1, plant biotechnology, ubiquitination



ICHTHYOPHTHIRIOSIS IN FISH - SYMPTOMS, DIAGNOSIS AND TREATMENT

Paulina Leśniak*, Krzysztof Puk, Leszek Guz

*Sub-Department of Fish Disease and Biology, Institute of Biological Bases of Animal Diseases,
University of Life Sciences in Lublin*

*paulina.lesniak@up.lublin.pl

A few words about the author:

I am a veterinarian and p.H.D student at the Sub-Department of Fish Diseases and Biology at the University of Life Sciences in Lublin.

Abstract:

Ichthyophthirius multifiliis (Ich) is a protozoan parasite, causing white spot disease and is a major burden for fish farmers and aquarists worldwide. The adult form of I. multifiliis is uniformly ciliated, and this allows the parasite to move vigorously (rotating), it has a pear-shaped or spherical shape. Two extracellular protozoa mainly induce white spot disease in fish Ichthyophthirius multifiliis (Ich) in freshwater fish, and Cryptocaryon irritans in marine fish. Ich, usually results high morbidity, and high mortality, soon after infection, unlike to other parasites.

Factors accelerating the development of the disease in fish are their high density, excessive stress, low water exchange and poor hygiene of the joints. Through the years, the primary treatment against I. multifiliis has changed according to efficacy, toxicity or carcinogenicity of the substances. Some treatments are safe e.g. salt, pH and temperature regulations and may be more or less effective. The use of chemicals for treatment of white spot disease is common practice for aquaculturists and aquarists. Aquarists use, primarily, formulations that include malachite green, methylene blue, copper sulfate and formaldehyde.

Keywords:

Ichthyophthiriosis, fish, disease



CANNABIS SATIVA - PROPERTIES AND APPLICATION

Paulina Leśniak*, Krzysztof Puk, Leszek Guz

*Sub-Department of Fish Disease and Biology, Institute of Biological Bases of Animal Diseases,
University of Life Sciences in Lublin*

*paulina.lesniak@up.lublin.pl

A few words about the author:

I am a veterinarian and PhD student at the Department of Fish Diseases at the University of Life Sciences in Lublin.

Abstract:

Cannabis sativa L. is a dioicous plant of the Cannabaceae family and it is widely distributed all over the world. It has been used as a psychoactive drug, as a folk medicine ingredient and as a source of textile fibre since ancient times. In fact, the modern botanical varieties of *C. sativa* mainly used for the manufacturing of fish nets, strings, ropes, textiles and even paper have a low amount of psychoactive D9-THC. *C. sativa* is characterized by a complex chemical composition, including terpenes, carbohydrates, fatty acids and their esters, amides, amines, phytosterols, phenolic compounds, and the specific compounds of this plant, namely the cannabinoids. The most common uses for medical cannabis include for severe or long-term pain, nausea and vomiting due to chemotherapy (cancer treatments), and painful muscle spasms. When usual treatments are ineffective, cannabinoids have also been recommended for anorexia, arthritis, glaucoma and migraine.

Keywords:

Cannabis sativa, treatment, properties, disease



CHANGES IN TRICHODERMA HARZIANUM CELL MEMBRANE AS RESPONSE TO TOXICITY OF THE HERBICIDE 2,4-D

Julia Mironenka*, Przemysław Bernat

*Department of Industrial Microbiology and Biotechnology,
Faculty of Biology and Environmental Protection, University of Lodz*

*julia.mironenka@edu.uni.lodz.pl

A few words about the author:

PhD student from the University of Lodz. Interested in proteomic and metabolomic analysis.

Abstract:

Trichoderma fungi are well known biocontrol agents (BCAs), which have been reported to be effective in inhibition root rot disease of plants. The mechanisms of action of Trichoderma against fungal pathogens include secretion of antibiotics, competition for space and nutrients, production of lytic enzymes, and induction of host resistance. To the crop protection, not only BCAs are used, the strong chemicals include herbicides, which suppress plant growth. The question is, what impact they (pesticides) have on the physiology of Trichoderma sp.

One of the important element of the transfer of metabolites outside the fungal cell is condition of membrane. The proper functioning of this structure determines the effectiveness of using fungi as biocontrol agents.

Therefore, the aim of the study was to check the effect of the herbicide – a very popular in Europe 2,4-D (2,4-Dichlorophenoxyacetic acid), on the composition and permeability of T. harzianum cell membrane.

Liquid cultures were carried out under controlled conditions, and measurements were made in two phases of growth – exponential growth phase and stationary.

It was shown that the presence of the herbicide causes oxidative stress and influences the permeability of the cell membrane of the tested fungus. Thus the presence of the herbicide can be regarded as a chemical stress.

Keywords:

Trichoderma harzianum, 2,4-D, cell membrane, chemical stress



ASSESSMENT AND COMPARISON OF VARIOUS ASPECTS OF CAT NUTRITION IN POLAND

Jakub Osypiuk

Department of Veterinary Medicine, University of Warmia and Mazury, Olsztyn

osypiuk.jakub@gmail.com

A few words about the author:

Jakub Osypiuk is a veterinary student involved in research and development in the field of animal nutrition.

Abstract:

Proper nutrition of a domestic cat depends on many factors. In addition to the special nutritional requirements specific to this species, there are often individual characteristics such as age, sex, physical activity, sterilization / castration, current or accompanying state im chronic diseases.

The aim of the research was to check the way cats are fed by their owners in Poland in relation to generally accepted standards of proper nutrition of these animals and to analyze the influence of the respondent's socio-demographic characteristics on the way of nutrition.

The research was carried out using a survey questionnaire disseminated on social media. The questionnaire was voluntary and anonymous. 2,398 respondents took part in the survey.

The results of the study showed the presence of abnormalities in popular way of feeding cats. The data obtained also show that the age and place of residence of the owner determine the diet of the cat.

Keywords:

cat, nutrition, veterinary



COMPOSITION OF THE RHOPALOCERA BUTTERFLY FAUNA OF THE URSYNOWSKA SLOPE AND THE CHARACTER OF SPECIES CHANGES OVER THE YEARS

Joanna Pypec

University of Life Sciences in Lublin

joannapypec@wp.pl

A few words about the author:

Joanna Pypec is currently studying at University of Life Sciences in Lublin and dealing with broadly understood plant protection. She is planning to start a PhD.

Abstract:

In the face of intensive urbanization and strong anthropopressure, it is important to protect natural, unchanged habitats of flora and fauna. Butterflies are particularly sensitive to landscape transformations.

The aim of the study was to learn the current species and quantitative composition of Rhopalocera in the Skarpa Ursynowska nature reserve in Warsaw and to compare the results with data from 20 years ago. For this purpose, the most commonly used method of linear transect was used, which consisted in setting out an observation trail and making regular counts of butterflies in a given area. The monitoring lasted 26 weeks.

A number of observed species decreased - from 39 observed in 1996-1999 to 27 today. Also, the number of noted butterflies reduced - from 46% to 94%, depending on the taxon.

Impact on the lepidopterofauna was mainly the transformation of the landscape of the reserve. It is necessary to continue monitoring in the coming years.

Keywords:

biodiversity, butterfly conservation, habitat loss



MADE-TO-MEASURE POLLINATOR - HOW TO CHOOSE THE PERFECT INSECT FOR YOUR ENVIRONMENT

Julia Sadowska*, Patrycja Skowronek

*University of Life Science in Lublin, Faculty of Animal Sciences and Bioeconomy,
Institute of Biological Basis of Animal Production
Research tutor: Professor Aneta Strachecka*

*sadowska_julia@onet.pl

A few words about the authors:

The authors of the article conduct scientific cooperation within the Environmental Protection Science Club in the Environmental Biology Section. The works mainly concern biochemistry, entomology, immunology and supplementation of pollinating insects.

Abstract:

To obtain the crops of our planet, including fruit, vegetables and flowers, we need the help of pollinators. Many species of these useful insects live in our environment, but many people are not aware of their important role in the natural environment. As it turns out, the Hymenoptera insects responsible for pollination are the most popular: honey bees, bumblebees and wild pollinators (e.g. *Osmia*). Each of these insects has different biological/anatomical features, which allows for their various uses. Despite performing the same work, we can notice some differences between them, for example in their lifestyle, living places, life cycle, pollinator working time, their anatomy and, consequently, differences in the choice of pollinated plants. Despite these differences, not everyone knows that depending on their needs (plants), they can choose the right pollinating insect. Every gardener, orchardist, florist should determine what plants he has in his gardens, orchards, greenhouses and choose the perfect little helper for them. The correct selection of pollinators in terms of the needs of the flora we grow can help in obtaining a sufficiently high yield and prevent economic losses.

Keywords:

insects, honey bee, bumblebee, wild pollinators



INSECT FOR SPECIAL TASKS - THE INCREDIBLE BIOLOGY OF BUMBLEBEES

Julia Sadowska*, Patrycja Skowronek

*University of Life Science in Lublin, Faculty of Animal Sciences and Bioeconomy,
Institute of Biological Basis of Animal Production
Research tutor: Professor Aneta Strachecka*

*sadowska_julia@onet.pl

A few words about the authors:

The authors of the article conduct scientific cooperation within the Environmental Protection Science Club in the Environmental Biology Section. The works mainly concern biochemistry, entomology, immunology and supplementation of pollinating insects.

Abstract:

Nowadays, there is a strong tendency to reduce the population of all insects, including useful pollinators. Therefore, recent scientific research focuses on insects that, along with bees, will perform the same functions, or will complement their activities. One of such pollinators is the bumblebee, which despite a different biology from the bees, works just as well in pollination, with simpler living conditions. Their specific biology allows them to help where other pollinators fail. They have a short life cycle, but it is sufficient for them to play an important role in our environment. Bumblebees are distinguished by an exceptionally long tongue which helps them pollinate plants. This is unique in that they can pollinate other plants than those pollinated by bees. This is due to the bumblebee's tongue reaching the inside of flowers with a deeper pollination organs (e.g. tomatoes). They are also very productive workers in our meadows and gardens. They work very intensively from the very morning. They are not afraid of temperatures that are too low for bees. Their specific biology makes them great pollinators alongside honeybees, complementing each other in the environment.

Keywords:

insects, bumblebees, biology, pollinators



THE LEVEL OF THE HEALTH-PROMOTING QUALITY OF SEMIMEMBRANOSUS MUSCLE IN PUREBRED AND CROSSBRED BULLS

**Paweł Solarczyk*, Piotr Kostusiak, Daniel Radzikowski,
Konrad Wiśniewski, Kamila Puppel**

Warsaw University of Life Sciences, Institute of Animal Sciences, Department of Animal Breeding

*pawel_solarczyk@sggw.edu.pl

A few words about the author:

I am a PhD student at the Institute of Animal Sciences.

Abstract:

Beef is an important source of bioactive ingredients that improve our health. It is an excellent source of anserine, carnosine, alanine, creatine, and polyunsaturated fatty acid (PUFA), which plays an important preventative role in carcinogenic processes. The strategy for rearing and feeding cattle for slaughter should be directed at reducing saturated fatty acid (SFA) in beef fat and/or increasing PUFA, especially n-3. Therefore, the aim of the study was to determine the influence of breed types on the nutritional and prohealth quality of beef. The experiment was conducted in Poland, on 62 bulls from three breeds: Limousin, Polish Holstein-Friesian, and Polish Holstein-Friesian × Limousin. Bulls were slaughtered at 21–23 months of age, and samples of semimembranosus muscle (300 g) were cut parallel to the muscle axis at 24 h postmortem. It can be concluded that commodity crossbreeding significantly improved the quality of beef, resulting in similar or even better results than purebred cattle.

Keywords:

beef, bioactive ingredients, prohealth quality, crossbreeding



BEEF CATTLE BREEDING IN POLAND

**Paweł Solarczyk*, Piotr Kostusiak, Daniel Radzikowski,
Konrad Wiśniewski, Kamila Puppel**

Warsaw University of Life Sciences, Institute of Animal Sciences, Department of Animal Breeding

*pawel_solarczyk@sggw.ed.pl

A few words about the author:

I am a PhD student at the Institute of Animal Sciences.

Abstract:

Cattle are one of the three most important species of animals used in agriculture. Poland as a country has very good conditions for livestock production, especially for the use of cattle for this purpose, due to the quality of the soil but also the topography. The main direction of cattle production in Poland, milk is obtained, hence the dairy animals that are missing from farms are used for beef production. However, in addition to the dairy breeds, there are also meat breeds from which you can get better quality beef. The aim of the study is to review the condition of beef cattle farming in Poland.

Keywords:

beef, breeds, cattle production



INFLUENCE OF ENVIRONMENTAL FACTORS ON EXOPOLYSACCHARIDE SYNTHESIS IN RHIZOBIUM LEGUMINOSARUM BV. TRIFOLII

Julia Wojnicka*, Paulina Mertowska, Marta Koziel, Monika Janczarek

*Department of Industrial and Environmental Microbiology Maria Curie-Skłodowska
University, Lublin*

*j_wojnicka@onet.eu

A few words about the authors:

Employees of the Maria Curie-Skłodowska University who want to learn and study soil bacteria as closely as possible.

Abstract:

Bacteria *Rhizobium* are characterized by high metabolic plasticity, enabling them to adapt to changing soil conditions. By establishing symbiosis they are involved in the process of biological nitrogen fixation, which limiting the need for the use of artificial fertilizers by plants. The process of establishing symbiosis is a multi-stage process. and requires the exchange of many molecular signals, both from plant and bacteria. One of the secondary signals involved in this process is exopolysaccharide (EPS), which is responsible for a wide variety of functions. During symbiotic interactions, it is responsible for the adhesion of bacteria to the plant root, it is a structural component of the infection thread and suppresses the plant's defense response. This polymer in *R.leguminosarum* bv. *trifolii* consists of the repeating subunits of an octasaccharide that contains D-glucose, D-glucuronic acid, and D-galactose in a 5:2:1 molar ratio. The region on the chromosome-Pss-I is responsible for the synthesis, modification and transport of the EPS molecule. The production of EPS is regulated not only by genetic factors derived from bacteria (including PsiA, PsrA, ExoR and RosR), but also by environmental factors: deficiency of phosphorus and nitrogen source, type of carbon source, plant root secretions, temperature, soil pH or salinity.

Keywords:

nitrogen-fixing bacteria, symbiosis, exopolysaccharide, synthesis, *Rhizobium leguminosarum* bv. *trifolii*

NATURAL AND TECHNICAL SCIENCES

POSTERS



MAGNESIUM - BASED HYDRIDES FOR HYDROGEN STORAGE

Agata Baran

*Department of Functional Materials and Hydrogen Technology,
Military University of Technology, Kaliskiego 2 Street, 00-908 Warsaw, Poland.*

agata.baran@wat.edu.pl

A few words about the author:

An author is a researcher working at Military University of Technology in Warsaw. During the PhD studies she is working mainly on the hydrogen storage materials, including synthesis and characterisation in context of the functional parameters.

Abstract:

Hydrogen is an almost ideal energy carrier that is considered to be a clean fuel and has the largest gravimetric density of all known chemical substances (~3 times higher than that of gasoline). It is also the most abundant element (~15 mol%) on the surface of the Earth, which makes it perfect as an alternative source of energy. One of the hydrogen storage option is based on a solid-state hydrides, which is a promising option when considering some of its unique features (such as heat evolution during loading and low-pressure filling). This solution is characterized by having the highest volumetric density (higher than that of liquid hydrogen) and, when properly used, is relatively safe. Solid-state vessels usually do not need to work under high pressure and hydrogen is released in an endothermic reaction, which, depending on the conditions, material and vessel size, may take from minutes to days due to the extremely low heat conductivity of hydrides, which in real systems remains in the effective range of insulators ($<1 \text{ W/m/K}$), even those that are metallic alloys. One of the most investigated types of materials (mainly due to their relatively high gravimetric capacity) is a group of magnesium-based hydrides, including pure magnesium. The poster presents main advantages but also main problems of magnesium – based hydrides, their synthesis and applications.

Keywords:

hydrogen storage, mechanochemical synthesis, ball milling; magnesium hydride, magnesium-based hydrides



CURRENT PROGRESS IN RESEARCH ON MODERN FUNCTIONAL MATERIALS - MAGNETORHEOLOGICAL FLUIDS AND ELASTOMERS

**Anna Fenyk (1)*, Marek Zieliński (1), Ewa Miękoś (1), Ewa Chrzęścijańska (2),
Anna Masek (3), Wojciech Horak (4)**

(1) University of Lodz, Department of Inorganic and Analytical Chemistry

(2) Lodz University of Technology, Institute of General and Ecological Chemistry

(3) Lodz University of Technology, Institute of Polymer and Dye Technology

(4) AGH University of Science and Technology in Kraków, Department of Machine Design and Technology

*anna.fenyk@chemia.uni.lodz.pl

A few words about the author:

Anna Fenyk is PhD student at the Department of Inorganic and Analytical Chemistry of the University of Lodz. Scientific interests: inorganic chemistry, magnetochemistry, ecology.

Abstract:

Nowadays, continuous technological development is mainly based on the creation of new materials. Often, these materials affect innovation and the subsequent use of a given product in more and more innovative and advanced applications. In recent decades, much attention has been given to the area of intelligent or multifunctional materials, and the specific properties which enable them to fulfill specific functions. Functional materials are characterized by a unique feature. Under the influence of certain external factors, they can change their physical properties to a large extent. Functional materials can be divided according to their specific characteristics: physical (superconductors, conductive polymers, magnetostrictive materials), chemical (new generation catalysts, selective sensors, effective luminescent and electroluminescent materials) and biological (biosensors, intelligent drug transporters, etc.). The group of intelligent materials includes liquids, elastomers, gels, magnetorheological foams among many other examples. Over the course of several decades, they have become objects of interest not only in terms of application, but also fundamental cognition. This work presents techniques used for the rheological characterization of selected magnetorheological materials, describes the rheological properties of these materials, and discusses the theoretical basis explaining their properties.

Keywords:

intelligent materials, rheological characteristics, elastomers



PARACHUTE GEOMETRY OPTIMIZATION METHOD WITH REGARD TO STRESS DISTRIBUTION IN THE CANOPY MATERIAL

Maciej Hałupka(1)*, Paweł Janusiak(1), Krystian Kutnik(1), Jędrzej Mosiężny(2)

(1) PUT RocketLab student research group, Poznan University of Technology

(2) Institute of Thermal Energy, Poznan University of Technology

*maciej.halupka@student.put.poznan.pl

A few words about the authors:

Maciej Hałupka B.Eng, Paweł Janusiak B.Eng and Krystian Kutnik B.Eng are Aerospace Engineering students and members of PUT RocketLab student research group at Poznan University of Technology. The research was supervised by Jędrzej Mosiężny PhD.

Abstract:

The goal of this study was to create a design tool which streamlines the process of parachute design and provides the user with an optimized parachute canopy. The tool incorporates gradient and genetic optimization methods. A series of exemplary canopy geometries was generated for different coefficients of pressure. To validate the design tool these geometries were analyzed using CFD for flow conditions which represent the conditions upon which the main and drogue parachutes of the sounding rocket designed by scientific club PUT RocketLab will work.

Keywords:

parachute design, optimization, CFD, sounding rocket



APPLICATIONS OF NANOTECHNOLOGY IN COMPUTER COOLING

Jakub Józewicz

Lodz University of Technology, Zeromskiego 116, 90-924 Lodz

j.jozewicz@gmail.com

A few words about the author:

Student of 3rd year of nanotechnology at Lodz University of Technology.

Abstract:

Heat dissipation is a major challenge in constructing electronics nowadays, thus there is a need for better and better cooling solutions. Designs based on nanotechnology offer very promising results and are currently considered to be introduced.

Keywords:

cooling, nanotechnology, graphene



TECHNOLOGY OF OBTAINING HYBRID ROCKET FUELS BASED ON PARAFFIN AND POLYETHYLENE USING A THERMOSTATIC CHAMBER

Wiktoria Kozłowska (1)*, Patryk Jedlikowski (2), Juliusz Saryczew (3)

Poznan University of Technology:

(1) Faculty of Chemical Technology

(2) Faculty of Computer Science

(3) Faculty of Aerospace Engineering

*wiktoria.kozłowska@student.put.poznan.pl

A few words about the authors:

Wiktoria Kozłowska – senior year student of Chemical Technology.

Patryk Jedlikowski – senior year student of Computer Science.

Juliusz Saryczew – senior year student of Aerospace Engineering.

Poznań University of Technology

Abstract:

Features such as safety, low cost and low barriers to entry make hybrid rocket engines an attractive alternative to suborbital flights and space exploration missions.

The hybrid nature of rocket propulsion is achieved through the use of propellants stored in different phases. Choosing the right solid fuel is the subject of much research.

This problem is dealt with by the PUT RocketLab Science Club at the Poznań University of Technology in the project of the Hexa 2 sounding rocket for the SpacePort AmericaCup 2021 competition.

Our hybrid rocket fuel is a mixture of high melting paraffin wax and high MFI, LDPE, which we acquire in the form of a cylinder with a cylindrical port. Fuel grain casted at ambient temperature causes breaking.

We suggest pouring fuel into a preheated mold and cooling it in a thermostatic chamber. Our research shows that this approach prevents hybrid rocket fuel from cracking. After casting we perform a CT scan to check the fuel grains condition.

Keywords:

hybrid rocket fuels, fuel casting, thermostatic chamber



TELEMETRY SYSTEM FOR SOUNDING ROCKET - DATA PACKAGE FORMULATION AND USAGE OF GSM FOR ENHANCE SYSTEM PERFORMANCE

Tomasz Krakowski*, Maciej Leszczyk, Łukasz Kozak

*PUT Rocket Lab – The student rocketry team of PUT, Chair of Thermal Engineering,
Poznan University of Technology*

*tomasz.j.krakowski@student.put.poznan.pl

A few words about the authors:

Members of electronic and IT section of student rocketry team PUT Rocket Lab. Main focus of their studies are affordable and high performance electronic solutions for sounding rockets.

Abstract:

Telemetry systems are used to measure physical data of dynamic system and send results to control facility. Sounding rocket is instrument-carrying (scientific payload) flying vehicle operating in lower part of atmosphere. In case of sounding rocket telemetry system should provide information such as altitude, position and direction of movement. Moreover because of high acceleration (10G) and velocity (450 m/s) of rocket, system have to deliver operation status in real time to ensure safety of ground control unit. Successful operation should end with fast and efficient rescue of rocket from touchdown localization. To achieve that we used system based on custom sensor board that measure and calculate localization of rocket and telemetry board, which main object is to transmit information over wireless 868 MHz LoRa based telemetry link. The second unit is also responsible for data package formulation and sending GPS localization through GSM during parachute descent part of operation. To bond these tasks together, we developed whole necessary software, based on open-source solutions as well as own, previously prepared libraries. Entire code has been written with C++ programming language.

Keywords:

wireless telemetry, rocket, GSM, C++



EX-SITU PROTECTION IN ZOOS

Beata Madras-Majewska

Apiculture Division, Institute of Animal Sciences, Warsaw University of Life Sciences

beata_madras_majewska@sggw.edu.pl

A few words about the author:

Abstract:

The perception of zoos only as entertainment venues is already very outdated today. The vision of a modern zoo is a reflection of its actual role in activities undertaken to protect wild species, promote the idea of nature conservation, conduct scientific research and broadly educate the public on the protection of wild species and their role in ecosystems. Contemporary zoos are institutions that actively participate in efforts to save endangered species. Today, zoological gardens and parks are becoming centers of wildlife conservation. The main goal is to maintain in artificial (ex-situ) natural genetic variation, characteristic of a population in the natural environment (in-situ). The aim of the study is to analyze the operation and cooperation strategies of zoos seeking to implement their primary mission - nature conservation.

Keywords:

ex-situ conservation, in-situ conservation, legislation, biodiversity, nature conservation plans



HOW TO LEAD A POLYMER FOR A WALK?

Karolina Pietrucha

Lodz University of Technology, Zeromskiego 116, 90-924 Lodz, Poland

225400@edu.p.lodz.pl

A few words about the author:

I am a third year student of Nanotechnology at Lodz University of Technology. I am an active member of scientific club SKN "NANO".

Abstract:

Polymer science is a rapidly-expanding research field. Although much has been done to understand the nature of polymers, there are still unanswered questions. For example, when a new copolymer is invented it is crucial to know what physical properties it has. We would like to know how far the chain will extend in space or how the chain will behave in different solvents. But how answers for such questions can be found?

This is the moment when a chemist can reach for mathematical methods. Polymers can be modelled as Self-Avoiding Walks (SAW) on a d -dimensional lattice. A Self-Avoiding Walk is a sequence of moves on a lattice and each step is of the same length. The main requirement is that the path cannot intersect itself.

There is still little known about SAWs from a mathematical perspective. However, there are methods of approximation, which helps to estimate, for example, the average end-to-end distance of the chain when the number of steps is fixed. Monte Carlo simulations can be involved into solving the SAW problem.

Monte Carlo Simulation is a mathematical technique that generates random variables for modelling risk or uncertainty of a system. If it is impossible to follow all the possible paths on a lattice, the best way to do is to simulate a representative group of sample walks. One randomly simulated walk is not valuable, but if many sample walks are generated, then we can obtain an accurate result - as the law of large numbers says.

Keywords:

polymers, Self-Avoiding Walk, Random Walk, Monte Carlo Simulation



TRACKING SYSTEM FOR RESEARCH ROCKETS USING MODULATION TECHNIQUE WITH CHIRP SPREAD SPECTRUM - LORA

Wiktor Tasarek*, Wojciech Kubiak, Mateusz Lemański

Science Club of Aviation and Cosmic Technology - PUT Rocket Lab

*wtasarek@gmail.com

A few words about the authors:

We are the group of students from Poland, which are passionate about rocket science and space industry. Our main goal is to occupy planet Mars.

Abstract:

This paper presents a project of a research rocket localization system created for the PUT Rocket Lab science club. One of the biggest problems for engineers who build rockets is their recovery. Most teams decide on very expensive commercial solutions, which are not free of limitations anyway. Our proposed system is a cheap alternative to the products available on the market, and thanks to the use of the chirp spread spectrum modulation technique, it offers more possibilities. The whole system consists of a tracker, a receiver, and a mobile application that acts as a graphical user interface. The tracker and the receiver are equipped with a LoRa radio module from Semtech, which is considered to be the first low-cost implementation of CSS modulation. To operate the radio module, our team decided to implement a library, which allowed us to use all of LoRa features. Microcontroller STM32F411 is used as a central processing unit, while the receiver is equipped with a microcontroller with integrated Bluetooth and Wi-Fi modules - ESP32. In order to display the location of the object we implemented a mobile application. The application offers real-time capture of location data and displays them on the map, which significantly speeds up and facilitates the process of finding the rocket.

Keywords:

rocket, lora, tracking, GPS, CSS



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