

## **Summary**

This study was conducted to determine the role and place of sentinel lymphoscintigraphy in sentinel lymph biopsy (SLB), a procedure used to identify, extract and examine a sentinel lymph node for metastases. It also helps to determine the spread of a tumour, stage the disease, make a prognosis and decide on additional treatment. Our study included 17 patients diagnosed with malignant melanoma at a high risk of developing lymph metastases without clinical manifestation. The lymphoscintigraphy was conducted on Dual Head SPECT gamma camera Toshiba CGA 7200 UI. The visualized lymph nodes were projected and marked on the skin via a radioactive point source under monitoring control. Also, the nodes were verified intraoperatively through patent blue colouring, extracted and examined histopathologically. In all the 17 patients, Lymphoscintigraphy visualized the sentinel lymph nodes (SLN), which were intraoperatively located directly under the skin markers and extracted. In SLNs of five patients, diffuse metastases were identified with clinically negative lymph nodes. There were no metastases in the sentinel lymph nodes of twelve patients. The technique for marking of SLN is a minimally invasive method and reliable for detecting metastases in the lymph nodes in high-risk patients with malignant melanoma. The SLB, including lymphoscintigraphy, should be applied as a standard for staging, prognosis and determining the behaviour of the clinician in malignant melanoma.

**Key words:** malignant melanoma; sentinel lymphoscintigraphy; sentinel lymph biopsy

## **VARIA**

### **ORAL PRESENTATIONS**

#### **THE ACADEMIC LECTURER AS A CREATOR OF CREATIVE THOUGHT**

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#### **Summary**

The mission of the modern academic teacher is to create a new generation of professionals who are not just narrow specialists, but creative personalities with innovative creative thinking. Creativity in medicine is the key to its sustainable development. Creative thinking is based on a critical appraisal of existing ideas and stereotypes and the justification of new original ideas, methods and technologies. The student is not a storage device for a given volume of information, but a thinking person with an active perception and individual attitude to the learning material. In this respect, the academic lecturer is faced with the serious challenge of mastering and using the art of problematic lectures, learning dialogues, brainstorming and other effective approaches of modern interactive style in the learning process.

**Key words:** creativity, innovation, original ideas, interactive learning, problem lecture.

#### **MARINE ALGAE: BENEFITS AND POTENTIAL HEALTH HAZARDS**

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#### **Summary**

Algae are a valuable marine resource which has been used for thousands of years. Traditionally

they have been used in medicine and pharmacology for their anti-microbial, anti-inflammatory qualities and as anti-oxidants. They are also used as food supplements in veterinary medicine, as biofertilizer in agriculture and also as biofuel. Marine algae also contain BAS (bio-active substances) /polyunsaturated fatty acids – omega-3 and omega-6 / as well as phospholipids, vitamins, to mention a few. Just as herbs, which are most effective when gathered from the region in which we live, marine algae from the Black Sea should be used as a resource in the future. However, there are also some hazards in the use of marine algae. The microalgae from a genus *Pseudonitzschia*, *Dinophysis*, *Prorocentrum*, *Alexandrium*, *Prymnesium*, and *Mycrocystis* in the Black Sea are always present in the blooms concentration at the BBS coast. They are described as “potentially toxic” species, and their monitoring is vital for the ecosystem. Therefore, before we start cultivating and using marine algae, we should carefully investigate and eliminate the health hazard factors such as the presence of toxins, especially cyanotoxins, any nuclear pollution in the region, heavy metal pollution and biogenes from the anthropogenic pressure on the waters. The biotoxins found in the mussels and other marine species can cause gastrointestinal problems, skin rash and allergies. This paper describes the benefits and health hazards in the cultivation of marine algae. The results are based on continuous research and monitoring of the Black Sea ecosystem.

**Key words:** marine algae, Black Sea, toxic species

## **ANATOMY TRAINING IN STUDENTS’ PERSPECTIVE**

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### **Summary**

Anatomy training is fundamental in medical education. It is well-known for its magnitude, many facts and serious psychological burden when meeting a cadaver. During a routine dissection practice demonstrators are usually included – pronounced students with excellent marks in anatomy exam and specific interests in the field of surgical disciplines. We aimed to investigate students’ opinion on anatomy training and demonstrator role in it. We interviewed 150 medical students with a survey about their view on anatomy teaching and the demonstrators’ role in it. All students reported that anatomy is one of the hardest discipline, which change the general view for medical education. Students reported increase level of stress and general change in point of view for medicine during the anatomy classes. More than 90% of students consider demonstrators not only a part of dissection practice, but also an active part of their education. All of the medical students are consentient that demonstrators are mediators, combining their assistants’ role together with a friendly mood. Anatomy education is one of the hardest and needs a lot of time and forces. Demonstrator has a leading role in direct dissection work as well as in education. Pedagogical demonstrator skills are essential for university teachers.

**Key words:** anatomy, demonstrators, education

## THE ENGLISH LANGUAGE AS A MEDIATOR IN THE COMMUNICATION BETWEEN TEACHER AND STUDENTS WHILE TEACHING

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### **Summary**

The English language is the international language for communication. That is why it is used in the classroom while teaching Medical English. The objective of this article is to show the benefits and problems while using it during the process of teaching. The materials which are used include the personal experience of the author and the experience of colleagues. The methods used are comparison, description and analysis of the collected data and the conclusion made and the results obtained after this research.

**Keywords:** English, mediator, communication, teacher, students

## A HIGHLY SENSITIVE COLOR REACTION FOR SILVER(I) BASED ON TETRAZOLIUM VIOLET AND SEMICARBAZIDE HYDROCHLORIDE

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### **Summary**

We demonstrated the possibility for liquid-liquid extraction (LLE)-spectrophotometric determination of silver (I) at ppb levels with tetrazolium salts and appropriate reducing agents. Tetrazolium Violet (TV; CAS number: 1719-71-7) and semicarbazide hydrochloride (SCH; CAS number: 563-41-7) were used in the studies. The organic solvent was chloroform. Spectrophotometric measurements were conducted with an Ultrospec3300 pro-UV-Vis spectrophotometer (UK) equipped with 1-cm path-length cuvettes, and 100-mL separatory funnels were applied for LLE. In the presence of silver(I), TV is reduced from SCH to a coloured formazan (CAS number 1719-72-8) which is readily extractable in chloroform. The following experimental parameters were examined to find optimal conditions for quantification of silver(I): concentrations of reagents (TV and SCH), the concentration of NaOH, extraction time and volume of the two phases. At silver (I) concentrations in the aqueous phase above 13 ppb, an isomer of the formazan with  $\lambda_{\max} = 512$  nm was extracted. At lower concentrations, another isomer ( $\lambda_{\max} = 430$  nm), was predominantly formed. The mechanism of the formation of coloured products and the factors influencing the equilibrium between them were investigated. The effect of foreign ions was studied as well. TV and SCH can be used for a highly sensitive LLE-spectrophotometric determination of silver (I).

**Key words:** silver(I), Tetrazolium violet formazan, Spectrophotometry, Liquid-liquid extraction

## **VIOLENT CHILD DEATHS IN PLEVEN REGION FOR ELEVEN YEARS: STATISTICAL ANALYSIS OF RISK MANAGEMENT AND PRIMARY RISK PREVENTION**

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### **Summary**

The aim of the study was a detailed analysis of the violent child mortality (VCM) in the Pleven region over the last eleven years concerning risk management and primary risk prevention. Archival data on 80 forensic medical examinations of corpses at the Forensic Medicine Section at Medical University – Pleven for 2008-2018 were examined. The data were stored electronically, processed with SPSS19 and presented in tabular and graphical form. The total number of cases of VCM in Pleven region was 80. They represent 6% of all cases of violent deaths in the area. For the survey period, the average annual number of cases was 7.3. The results indicate that 51 (64%) were boys, and 29 (36%) were girls. The death spot in 62 cases (77.5%) coincided with the scene of the incident, 15 (18.8%) had died after hospitalization, and 3 (3.7%) died during transportation. More than half of the cases (55%) died because of mechanical trauma, and nearly 1/3 because of asphyxia. According to the nature of violent deaths, 65 cases were defined as accidents, and in 7 cases – as suicides. The

largest relative share of deceased children was over weekends. Risk management of the VCM is a real opportunity for a proactive approach and targeting high-risk groups. Thus, the risk could be managed adequately and on time. Possible response options, apart from avoiding, are softening and reliable primary prevention.

**Key words:** violent child deaths, risk management, primary prevention, Pleven region

## **GASTROINTESTINAL DISEASES IN FLOOD – RISK AND PREVENTION**

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### **Summary**

After flooding, a suitable environment for the development of pathogenic microorganisms is created. The risk of complicating the epidemiological situation has increased considerably. The study analyzed the awareness of the population and professionals about preventing the risk of gastrointestinal diseases during floods. A survey, descriptive and comparative methods examined the knowledge

of 306 respondents from Plovdiv, Pazardzhik and Septemvri regarding the anti-epidemic measures in floods along the Maritsa River. The survey showed that 98.1% of the respondents were aware of the risk of post-flood-related gastrointestinal diseases. Over 96% of the respondents preferred bottled water, but over 60% of them would not drink boiled water and water supplied with aquifers. Respondents from the institutions responsible for hygienic and anti-epidemic activities (RHI, 93.3%), rescue (Regional Fire Safety and Protection – 87.1%), humanitarian activities (Bulgarian Red Cross – 83.3% %), including other workplaces (96%), would not use skin protection for floods. Over 83% of respondents would not consult a doctor regarding measures to prevent gastrointestinal disease despite the risks. The results of the study showed that, regardless of their place of work, education, age and gender, people are aware of the risk of gastrointestinal disease after floods but are reluctant to take all measures to protect their health. There is insufficient health-enhancing activity and communication between institutions and populations immediately after flooding. Outbreaks of gastrointestinal diseases are inevitable after flooding. Enhanced awareness-raising measures are needed.

**Key words:** flood, gastrointestinal diseases, prevention

## **FORMING SKILLS FOR CREATING HEALTH CASE STUDIES IN FUTURE TEACHERS OF BIOLOGY**

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### **Summary**

The case study is the most common situational method for modelling and problem-solving. It is a controversial case with the possibility of multivariate solutions in search of an optimal response to the problem. Every participant is a researcher who stimulates his creative thinking. Conditions are created for linking scientific theory to practice. Discussion, brainstorming, mental maps, SWOT analysis, and other methods are used to solve case studies. This study aimed to model a single algorithm for describing case studies in future biology teachers' training on the example of hygiene-health. The article presents the basic requirements regarding the compilation of case studies as well as requirements for their application in the educational process. The methods used are theoretical analysis and synthesis, pedagogical modelling, questionnaire survey, studying the students' opinion on the effectiveness of health care cases. The results show that the proposed algorithm for case studies have great potential for varied use in the process of training future biology teachers. Their compilation and solving is a kind of creative task and allows for a better assessment of the trainees' capabilities. The development of health-related skills in the training of future biology teachers is carried out in the process of searching for an outcome and solution on the path of the independent logical processing of information through available knowledge, social and cognitive experience on the part of the students.

**Key words:** case studies (cases), education, situational method of teaching, health

## **TEMPORARY MORBIDITY IN ASSOCIATION WITH THE WORKING ENVIRONMENT AND THE WORKING PROCESS FOR A 5-YEAR RETROSPECTIVE PERIOD IN A MULTIPROFILE HOSPITAL FOR ACTIVE TREATMENT**

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### **Summary**

The study is focused on prevention of occupational musculoskeletal disorders in medical professionals. Questionnaires, risk assessment of all workplaces, and data analysis of an extensive database with special software were applied. The high general parameters related to the temporary incapacity for work of healthcare workers in a large hospital with over 1000 employees indicated the association with the working environment and working conditions. Parameters of temporary morbidity were high both in the frequency of cases (an average annual value of 109.76), and the total working day loss (2434.55). Of all diseases with temporary incapacity for work, the disorders of the musculoskeletal system and connective tissue ranked second (average annual cases were >16.52. The incidence of the days with temporary disability was 393.1, and the average duration of the cases was 23.79), as well as diseases of the nervous system (average annual cases were 5.14; the frequency of days with temporary incapacity for work was 110.11). Disorders in healthcare workers were the leading causes of sickness leave, illness and early retirement. Prevention includes risk assessment at the workplace with technical interventions such as workplace design, ergonomic work equipment and tools, and protective gear. Training of health workers and developing strategies for return to work and disability prevention from musculoskeletal disorders are necessary.

**Key words:** temporary morbidity, musculoskeletal disorders, health workers

## **USAGE OF WEB-BASED TOOLS IN THE CONTEXT OF INCLUSIVE EDUCATION**

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### **Summary**

This study was designed to provide an overview of pedagogical attitudes to the integration of digital tools and resources to support the inclusion of learners with special educational needs. It discusses these themes as a contribution to reducing the “distance” that teachers’ experience in online platforms. The study reveals pedagogical attitudes of using online tools in the context of inclusive education. The main source of data, used in this research, was obtained from empirical in-depth, individual interviews, using a non-standard questionnaire. Three main groups of research methods were used to achieve the goal solve the tasks and analyze the data collected. The theoretical framework for the study is based on a review of literature and information sources. Quantitative Data Analysis with IBM SPSS 19.0 was performed. The study found that most of the respondents had no experience of working on the web-based platforms, used limited set of online tools, and had a limited experience in both the frequency and subject areas of their application. Employing a web-based platform to facilitate student engagement in online learning raises the quality of inclusive education. Following a survey of pedagogical attitudes for using web-based platforms, the authors present what a polling of respondents consider to be useful online teaching tools for deepening inclusion.

**Key words:** online tools, attitudes, special educational needs, inclusive education

## INTERCULTURAL COMMUNICATION IN A CHANGING ACADEMIC ENVIRONMENT

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### Summary

The cultural specifics of international students studying Medicine and Veterinary Medicine in Bulgaria contribute to the change of academic environment and require a serious evaluation of the conditions of their sociocultural adaptation. As part of a research project on intercultural communication observed in MU-Plovdiv, PU “Paisij Hilendarski” and Trakia University, we conducted a two-phase survey with foreign students who commented on different indicators of the environment, the dimensions of their national culture and other incidents arising from misunderstandings and cultural differences. The results of the survey are presented in the present study as we analyze the dependencies between cultural affinity, specific behaviour and reactions, characterizing the individual and the culture. Possibilities for understanding incidents are induced to prevent their occurrence. The methodology of the study is based on Hofstede’s six dimensions of national cultures and the objective assessment of the intercultural phenomena in the university environment. The authors think that these interpretations will bring a better and more thorough understanding of international students who have chosen to study in Bulgaria.

**Key words:** intercultural communication, survey, results, academic environment

## CULTURAL DIMENSIONS AND THE ROLE OF INTERNATIONAL STUDENTS FOR THE UNDERSTANDING OF THEIR RELATIONSHIP TO THE UNIVERSITY ENVIRONMENT

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### Summary

Based on a survey on cultural specifics and the reactions of international students to the academic environment in three Bulgarian universities, the authors analyze the role, interrelatedness and changes in the behaviour and cultural background of the participants in the educational process. The study is two-phase and includes representatives of 17 national cultures and several subcultures while offering basic indicators for assessing the efficiency of the university environment. In the present study, we describe the survey, topic areas, questions, reasons and difficulties, as well as interesting moments from the realization of the project. As part of the theoretical basis of the study, we focused on the existing stereotypical attitudes we found in the language that reflects the reception of otherness, not only towards Bulgarian culture but also between different cultures present on campus. Among the tasks of this project was the involvement of Bulgarian students from the University of Plovdiv “Paisii Hilendarski” as scholars and analyzers of intercultural incidents and adaptation of foreign students through interviews and self-reflection. This study contributes to finding an active and more dynamic form of communication which stimulates open dialogue, sharing and understanding the intercultural academic community.

**Key words:** intercultural communication, survey, university environment, cultural incidents

### **PHYSICIAN’S SPEECH BEHAVIOR IN MEDICAL COMMUNICATION**

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### **Summary**

Healthcare reforms require a new way of thinking and of professional behavior in modern society. A key defining factor of medical communication is the level of trust between the physician and the patient, which in many cases stimulates the success of the treatment. The Interactional Analysis methodology helps interpret a corpus of authentic speech in a medical environment. The aim of this study is to analyze the linguistic mechanisms of professional speech contact between the physician and the patient. They are the basis of important social and therapeutic issues of public interest. The study focuses on the communicative strategies and on the tactics applied in the physician’s speech behavior as a condition for successful communication. The multifaceted analysis of speech events highlights the ethical aspect in the physician’s behavior.

**Key words:** medical communication, interactional analysis, physician, patient, speech behavior, professional speech, psycholinguistics

### **POSTERS**

### **MEDICAL STUDENTS AND THEIR OPINION ABOUT SPECIALIZATION**

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### **Summary**

The trends observed in the state of the medical staff in Bulgaria are similar to those in other European countries. Migration of doctors to countries with higher living standards, disproportionate distribution of doctors in different regions of the country, increasing age of the working physicians are reported. The study aimed to explore attitudes of medical students to their future specialization and realization in the country after their graduation in a year. The study used a self-administered anonymous questionnaire and included 151 fifth-year Bulgarian medical students. It was performed at the end of their training in general medicine, after the final exam on the discipline in the academic year 2015/2016 and 2018/2019. The information was processed statistically with Statgraphics and Microsoft Excel. The results showed that the majority of future doctors declared willingness to continue their specialization in Bulgaria. The specialities they were currently planning to study were mainly in the areas of surgery, obstetrics and gynaecology, internal medicine and paediatrics. According to the respondents, the main weaknesses of the specialization in the country are low pay for the student, the insufficient number of specialization places, unclear allocation rules. Fewer students saw positives as possibilities for the choice of specialization and payment for the work of the trainee doctors. A significant part of the respondents thought that specializing in the country has some weaknesses. Specialization in general medicine and work as GPs was unattractive for students.

**Key words:** medical students, specialization, general medicine



## **UPDATING THE TRAINING PROGRAM FOR ERGOTHERAPEUTIC SKILLS, ARTS AND CRAFTS**

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### **Summary**

The purpose of this announcement is to present the motives for updating the learning program on the subject “Ergoterapetical skills, Arts and Crafts”, which is studied by the students of “Medical rehabilitation and Ergotherapy”. In the course of “Medical Rehabilitation and Ergotherapy”, the subject “Ergotherapeutic Skills, Arts and Crafts” has to be studied in the amount of 30 hours. The curriculum is primarily focused on the field of the technique and technologies. In this first training program, fine and applied arts were not included, and their positive impact on the psycho-emotional state of people with permanent disabilities was overlooked. It does not involve the possibility that the types of arts, the various skills and the variety of crafts can be used in the treatment and rehabilitation of patients with motor constraints or mental difficulties. The development of the speciality over the years requires updating the curriculum and improving its content to optimize training. Students acquire skills to work with a variety of materials or work on the artwork to be applied for functional upper limb recovery after various traumas and illnesses. In the course of training, it is essential to obtain the necessary theoretical, methodological and practical-technological training in the field of arts and crafts treatment, which is part of the competence of specialists in

medical rehabilitation and ergotherapy.

**Key words:** learning program (curriculum), content, art therapy, occupational therapy

## **THE CHALLENGE OF THE INTERACTIVE LECTURE IN TRAINING OF STUDENTS**

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### **Summary**

We assessed the options for stimulating students’ activity in the process of training through interactive lectures. An empiric method examination – a questionnaire survey among 57 students (n=57) from professional speciality social activities was performed. An assessment card was developed, with three main questions and an assessment scale. The results from the survey conducted were processed using percentage for each response for scoring the question, and the total number of students participated in the survey. The relevant frequency of responses only with the highest score (6) are represented because they explicitly point out the choice. Responses to the statement “During lectures the lecturer uses” were a multimedia presentation (85.96%); options to share a personal experience (71.93%); mini discussion on a problematic issue (54.38%); mini-group work (49.12%); tasks for independent work (61.40%). Responses to the statement “An interactive lecture is a tool for” were motivation for learning (57.89%); enhanced activity during the training process (75.44%); lower level of tiredness and bore

(68.42%); a higher level of interest towards the contents of the lectures (64.91%). Responses to the question “During the interactive lecture the following are being stimulated” were: exchange of information (73.68%); a partnership between lecturer and students (78.95%); feedback (68.42%); understanding through reasoning (71.93%); dialogue with students (64.91%). A lecture may be interactive if it stimulates the students’ activity with options for dialogue and interaction between lecturer and students are created, between the students themselves, and also between the students and the software product used for the multimedia presentation.

**Key words:** interactive lecture, lecturer, students, interaction

**FORCED CHILD DEATHS - A  
MODERN SOCIO-ANTHROPOGENIC  
DISASTER IN THE CONTEMPORARY  
TECHNO-DIGITAL WORD.  
SELECTED CASES OF FORENSIC  
MEDICAL PRACTICE IN THE  
PLEVEN REGION**

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**Summary**

The goal of presenting selected cases in forensic medical practice (FMP) is to focus on the problem of forced child deaths in the

contemporary techno-digital world and to focus on the issue: Is it possible to transform the negative trends of this present-day socio-anthropogenic catastrophe and reduce the risks? Retrospective data on selected forensic medical expertise (FME) of violent child deaths in Pleven region are presented. We present data selected and saved on paper and electronic media, as well as photos and expertise. Key data on nine selected cases of forced child deaths in the Pleven region are shown. The causes of death, the age and gender of victims, the circumstances surrounding the fatal outcome and some socio-anthropogenic factors in the lives of the deceased were highlighted. These selected cases give rise to reflection and provoke analytical thinking about the possibilities to change the negative, violent child deaths tendencies in Pleven region in the direction of risk reduction.

**Key words:** violent child deaths cases, socio-anthropogenic disaster, forensic medical practice, risk reduction, Pleven region

**RESEARCH OF THE PUBLIC  
OPINION ABOUT THE  
DEMONOPOLIZATION OF THE  
NATIONAL HEALTH INSURANCE  
FUND**

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**Summary**

The goal of the research is to examine the public attitude about the application of the suggested from the Ministry of Health changes in the health insurance method. An anonymous poll was conducted between November 2018<sup>th</sup> – March 2019<sup>th</sup> among 274 people, 153 of whom working

in the health sector. The issues are related to exploring the perception of the discussed changes and the views about the positive and negative impacts when dealing with challenges that occur in the system. An insignificant part of the respondents supports the increase in the health payment and believes that a real valuation of services and introduction of eHealth is necessary before proceeding to model changes. The support for the preservation of the solidarity principle is understandable but within an optimally defined package of medical services, which are funded by the health insurance. The majority of the respondents renounce the mandatory additional health insurance. The participants in the poll approve partial demonopolization expressed in a competition only in terms of additional voluntary insurance. The respondents view the expected negative effects of full demonopolization in terms of reducing public funds, an increase in the administration burden of the contractors and risk of bankruptcy of the funders. The best perceived is the option with a two-pillar health insurance model, including a basic solidarity package of medical services, funded by the Health Fund and competition between different funds for offering an upgrade of the voluntary insurance package of medical services.

**Key words:** demonopolization of the health fund, basic package of medical services, insurance funds

#### **MODERN PRACTICES IN DETERMINING FOOD DURABILITY: METHODOLOGY AND EXPERIENCE**

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#### **Summary**

The study aimed to assess and analyse modern

practices in determining the shelf life of food. We reviewed the experimental experience and the EC Regulations as a basis for determining the shelf life of foods. Currently, there is not yet a uniform methodology for determining optimal storage periods for foodstuffs in European and Bulgarian legislation. The consequences are unmotivated and incompetent decisions taken by business operators as well as the unlawful use of preservatives and other technological additives. This report is supported by the experimental experience in our country for determining the shelf life of foods such as Bulgarian yoghurt and other fermented dairy products, fresh milk, a range of culinary products, combined mayonnaise salads, fish semi-preserved products, some meat products, etc. The importance of production hygiene, processing technologies, food packaging progress, use of supplements, the bioprotection importance of starter cultures and other factors. The methodology for determining the shelf life of food requires experimental studies, tracing organoleptic dynamics and specific chemical and biochemical criteria. However, the most important are the tools of predictive microbiology. The Irish example of a national regulatory framework for sustainability assessment methodology, which corresponds with Bulgarian experience and traditions in food hygiene, is also shared. Correctly defined food durability is a fundamental factor in preventing human health-threatening changes in composition, biological value and content of harmful agents of a chemical or biological nature.

**Key words:** food durability, food safety

#### **APPRAISEMENT OF THE OCCUPATIONAL INJURY EFFECTIVENESS IN COMPANY PREVENTION POLICY**

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### Summary

Occupational injury prevention as an employer's concern is enshrined in the Bulgarian labour legislation. These responsibilities include a range of technical and hygiene measures. Occupational safety at work programs is included in company policies. The goal of this study was to draw attention to a policy of preventing injuries at work. We studied five companies in the construction industry and services, with a high risk of incidents. We compared the occupational injuries and the duration of absence from work for two consecutive years. The sample during a year included 109 employees, 17 of whom had non-fatal occupational injuries. Companies were offered prevention action plans. The tendencies for incidents of occupational injuries were compared between companies with different approaches to prevention. The trend of workplace accidents in general and related injuries declined by 12% on the average per year for groups that had implemented a plan of preventive measures. This stable pattern was reproduced with stratification variables – company industrial sector and size, frequency and nature of sickness leaves, and injury mechanism. In conclusion, using an injury prevention action plan in companies with accidents is practical and cost-effective.

**Key words:** occupational injury prevention, safety at work

### INFLUENCE OF MN(III) TETRAKIS(4-BENZOIC ACID) PORPHYRIN (MNTBAP) ON INTEGRAL AND CYTOLOGICAL MARKERS AFTER PARAQUAT TREATMENT

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### Summary

We tested the effect of novel superoxide dismutase mimetic MnTBAP using a paraquat pneumotoxic model. The study was carried out on 96 male Wistar rats divided into four groups: group 1 – controls; group 2 – treated with MnTBAP; group 3 – treated with paraquat, group 4 – treated with paraquat and MnTBAP. Paraquat was administered *per os* as an aqueous solution at a dose of 40 mg kg<sup>-1</sup>. MnTBAP was injected *i.p.* after receiving paraquat at a dose of 10 mg kg<sup>-1</sup>. Integral, haematological, and cytological markers in blood and bronchoalveolar lavage fluid (BALF) were investigated. The isolated application of paraquat significantly increased the lung weight coefficient, total number of leukocytes and polymorphonuclear cells in blood on day 1 after treatment, as compared to the control group. The herbicide also elevated the total cell number in BALF significantly on day 1, and this indicator remained increased until the end of observation. The expression of CD11b in the group treated solely with paraquat in BALF showed a tendency to elevate on day 1. The combined treatment with the chemical agent and MnTBAP (group 4), however, resulted in a decreased number of integral and haematological markers on day 1, as well as the total cell number and CD11b expression in BALF. Metalloporphyrines are potent antioxidants. The

protective effect of MnTBAP is well expressed up to day five after treatment in our study.

**Key words:** paraquat, MnTBAP, BALF, CD11b expression, polymorphonuclear cells

### **EFFECT OF EUK-134 ON SOME MARKERS OF INFLAMMATION AND CELL PROLIFERATION IN RAT LUNG AFTER TOTAL BODY GAMMA IRRADIATION**

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#### **Summary**

The effect of EUK-134 on some markers of inflammation and cell proliferation as well as morphological changes in rat lungs after total-body gamma irradiation were investigated. The study was carried out on 72 Wistar rats, divided into three groups: group 1, controls; group 2 - 6 Gy total body irradiation; group

3 – treated with EUK-134 and 6 Gy ionizing radiation. The levels of IL-6 and CINC-1 were determined in the plasma. Immunohistochemical and histological studies were performed on rat lung. Ionizing radiation significantly increased the levels of IL-6 and CINC-1 in comparison to the controls on day 3. The combination with EUK-134 caused a less significant increase of two indicators as compared to the controls but without a reliable difference from the irradiated group. Severe circulatory damage was seen in the lungs such as marked congestion, perivascular oedema and haemorrhages on day one after exposure. Fibrinoid necrosis, severe degenerative injury of the endothelium, inflammatory infiltrates, and airless atelectatic regions in different parts of the lungs were seen on days 3 and 7. In the group treated with EUK-134, mild congestion, intact endothelium and absence of fibrinoid necrosis were found. The respiratory airways were free with rare zones of atelectasis. Immunohistochemical testing with Ki-67 showed that the proliferative activity was decreased in the combined group, but as a whole was preserved and was more significant than the activity seen in the irradiated group. A synthetic superoxide dismutase/catalase mimetic EUK-134 produced moderate anti-inflammatory protection from radiation injury.

**Key words:** EUK-134, ionizing radiation, cytokines, inflammation, cell proliferation

### **THE CLAIM THAT OBESITY PREVENTS OSTEOPOROSIS IS IN DOUBT**

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**Summary**

Endocrine imbalance due to estrogen deficiency is the cause of osteoporosis, which is often accompanied by obesity. The increased aromatase activity arising from obesity in menopausal women as a protective factor for osteoporosis is suspected. The purpose of this study was to analyze the obesity status as a risk factor for osteoporosis in OVX rats, despite the presence of aromatase activity. For this purpose, we used 20 female Wistar rats of reproductive age – 2 months. The animals were divided into two groups: ovariectomized Group (G1) – 7 animals subjected to bilateral ovariectomy (OVX), which had developed obesity; control Group (G2) – 7 animals subjected to “false” ovariectomy. All animals of G1 showed weight gain compared to the group G2. Histomorphological analysis of femur from G1 indicated reduced areas of mineralized tissue and fat degeneration, as compared to the control group. The results showed that the values of serum  $17\beta$ -estradiol and ALP in rats of G1 statistically increased when compared to G2 ( $p < 0.05$ ). The presence of pronounced osteoporosis in G1 despite the high estradiol levels casts doubt on the claim that aromatase activity and obesity prevents osteoporosis.

**Key words:** estrogen deficiency, obesity, osteoporosis

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**THE NITRATE CONTENT IN  
DRINKING WATER OF PLEVEN  
REGION AND IMPACT ON  
VULNERABLE POPULATION**

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**Summary**

The excess nitrate content in Bulgaria’s drinking water is a problem extremely relevant for groundwater. The purpose of this study is to assess the practical risk to the vulnerable group of the exposed population of nitrates in drinking water in Pleven region (PIR) – children between 0 and 1 year. Data on the infrastructure of water supply in the area is analyzed. The factors contributing to the retention of high nitrate values in drinking water for the period 2010-2015 in the PIR were studied. An analysis of a vulnerable contingent in exposed settlements has been carried out and possible preventive measures related to limiting the actual consumption of contaminated tap water are considered. There is a lack of practical control of usage of nitrogen fertilizers in agriculture. The legal requirements for organizing protection zones around drinking water sources have not been met. The analysis of the demographic data of the exposed settlements shows that the injured child contingent is severely limited due to the age structure of the population and the modern migration processes in the exposed small settlements. There is a normative readiness to ensure the availability and use of bottled drinking water intended for consumption by the wounded child contingent in Bulgaria. The country has experience with analogous cases, namely minimizing the harmful effects on the population if the deviations of the

maximum limit values in the drinking water by other parameters are exceeded (fluorine).

**Key words:** drinking water assessment

## **STUDYING CONSUMER ATTITUDES TOWARDS HEALTHY FOOD IN VENDING MACHINES IN THE UNIVERSITY ENVIRONMENT**

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### **Summary**

Marketing of fresh fruit, vegetables (FV) and nuts vending machines in schools or workplaces is a healthy option for improving the nutrition of a population. The study aimed to explore attitudes of university students and academic staff to the instalment of vending machines for healthier food on the territory of the university. We included 198 students, and 80 lecturers and administrative staff of MU-Pleven in a cross-sectional study. The participants completed standardized self-reported questionnaires. The questions were divided into three groups: food intake of fresh FV and nuts, attitude

towards the use of healthier vending machine foods, and demographic characteristics. Data were processed by using IBM SPSS Statistics v.24.0. Half of the participants (53%) reported daily consumption of seasonal fresh fruit and vegetables. Women consumed more fresh FV than men (Mann-Whitney U test=5434.0,  $p=0.001$ ,  $r=0.238$ ), and employees – than students and lecturers ( $p=0.023$ ). Only 6% followed the recommendation for intake at each meal. There was little awareness of the participants about current recommendations for dietary intake of FFV. A high proportion of the participants (82%) reported that there was no access to healthy food on the territory of the university and that vending machines (77.3%) would improve their intake of fresh FV and nuts. These findings suggest that offering healthy foods by vending machines can significantly increase the low daily consumption of fruit and vegetables of students, lecturers and administrative staff.

**Key words:** fresh fruit, vegetables, healthy food, vending machines, daily consumption

## **STUDY OF THE COMMON PROBLEMS IN BIOLOGY TRAINING OF FOREIGN STUDENTS - FUTURE MEDICAL STUDENTS IN BULGARIA**

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### **Summary**

The purpose of the study was to analyze the

common difficulties in acquiring biology by foreign students at the Department of Foreign Languages at Sofia University “St. Kliment Ohridski” in preparation for admission tests at the medical universities in the country. Observations were made on students from all groups in the period 2016-2019 who were studying biology in English. The success rate was measured through in-and-out course tests. Narrative interviews were also conducted to assess the students` attitudes towards the subject and their motivation. Research showed that the students` knowledge of English plays a significant role in acquiring of biology knowledge. Another essential prerequisite for overcoming the difficulties was their preliminary biology knowledge. The motivation, with which students approach their future medical education, was also an essential factor for their achievement.

**Key words:** biology, training, medical students, knowledge