

Food Safety and Healthy Living – Book of Abstracts

# BOOK OF ABSTRACTS

International Summer School

## FOOD SAFETY AND HEALTHY LIVING FSHL - 2018

August 26 – 30, 2018

Brasov, Romania

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## Food Safety and Healthy Living – Book of Abstracts

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**FOOD SAFETY AND HEALTHY LIVING**  
**– FSHL 2018**

C1	<b>Introduction in „FOOD SAFETY AND HEALTHY LIVING“</b> <b><u>Prof. dr Mihaela Badea (1), Prof. dr. Ioana Agache (1), Assoc Prof. dr. Laura Floroian (2), Assoc. Prof. dr. Laura Gaman (3)</u></b> 1-Faculty of Medicine, Transilvania University of Brasov, Romania 2-Faculty of Electrical Engineering and Computer Sciences, Transilvania University of Brasov, Romania 3-Faculty of Medicine, “Carol Davila” University of Medicine and Pharmacy Bucharest, Romania	<b>Pag.</b>  9
C2	<b>New trends for food sample preparation</b> <b><u>Lecturer dr. Simona Codruta Cobzac</u></b> University Babes-Bolyai from Cluj-Napoca, Romania	19
C3	<b>Monitoring of food contaminants</b> <b><u>Assoc. Prof. dr. Alina Soceanu</u></b> , Prof. dr Simona Dobrinas, Prof. dr. Doina Paula Balaban, Assoc. Prof.. Dr. Viorica Popescu University Ovidius Constanta, Romania	22
C4	<b>Food natural products for neuroprotection</b> <b><u>Assist. Prof. dr. Rui Silva</u></b> Faculty of Pharmacy, University of Lisbon, Portugal	26
C5	<b>Natural sources of antioxidants</b> <b><u>Assoc. Prof. dr. Lea Pogačnik</u></b> Biotechnical Faculty, University of Ljubljana, Slovenia	31

Food Safety and Healthy Living – Book of Abstracts

C6	UV filters - advantages and disadvantages of their use in personal care products <b><u>Prof. dr. Polonca Trebse</u></b> Faculty of Health Sciences, University of Ljubljana, Slovenia	35
C7	Use of extracts from the Romanian botanic area in the maintenance of oro-dental health <b><u>Lecturer dr. Mircea Grigorian</u></b> , Prof. dr. Victoria Badea, Prof. dr. Doina Paula Balaban, Prof. dr. Aureliana Caraiane, Prof. dr. V. Popovici University Ovidius Constanta, Romania	39
C8	Prion disease and food safety <b><u>Assist. dr. Marko Šnajder</u></b> Biotechnical Faculty, University of Ljubljana, Slovenia	44
C9	An overview on food safety hazards <b><u>Prof. dr. Mona Elena Popa</u></b> University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania	49
C10	Electrochemical sensors used in food quality control <b><u>Assoc. Prof dr. Graziella Turdean</u></b> University Babes-Bolyai from Cluj-Napoca, Romania	53
C11	Electroanalysis of lipophilic vitamins <b><u>Dr. Milan Sýs</u></b> University of Pardubice, Czech Republic	56
C12	Electroimmunoassays for fast and sensitive analysis of proteins <b><u>Assoc. Prof. dr. Radovan Metelka</u></b> University of Pardubice, Czech Republic	60

Food Safety and Healthy Living – Book of Abstracts

C13	<p>Microbiome and health status</p> <p><b><u>Assist. dr. Madalina Petran</u></b>  Faculty of Medicine, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania</p>	65
C14	<p>Determination of the contamination degree with aluminium in milk formula for prematures</p> <p><b><u>Prof. dr. Marius Moga</u></b>, Assist. dr. Nicusor Bigiu,  <b><u>Assist. dr. Diana Panait</u></b>  Faculty of Medicine, Transilvania University of Brasov, Romania</p>	69
C15	<p>Bioactive compounds of green tea and prospects of their utilization in food and pharmaceutical industries</p> <p><b><u>Prof. dr. Mark Shamtsyan</u></b>  Department of Technology of Microbiological Synthesis, St. Petersburg State Institute of Technology (Technical University), Russia</p>	74
C16	<p>Bioactive compounds from mushrooms and prospects of their utilization in food and pharmaceutical industries</p> <p><b><u>Prof. dr. Mark Shamtsyan</u></b>  Department of Technology of Microbiological Synthesis, St. Petersburg State Institute of Technology (Technical University), Russia</p>	79
C17	<p>Plant food supplements with antiinflammatory properties</p> <p><b><u>Assoc. Prof dr. Lorena Dima</u></b>  Faculty of Medicine, Transilvania University of Brasov, Romania</p>	81

Food Safety and Healthy Living – Book of Abstracts

C18	Influence of light emitting diodes (LEDs) on postharvest physiology of fruit and vegetables, Stud. Doris Kokalj, Assist Prof. dr. Emil Zlatič, <b><u>Prof Dr. Rajko Vidrih</u></b> Biotechnical Faculty, University of Ljubljana, Slovenia	86
C19	Physico-chemical and sensory analysis in food quality control: a case of honey <b><u>Assist. Prof. dr. Mojca Korošec</u></b> Biotechnical Faculty, University of Ljubljana, Slovenia	90
C20	Innovative solutions for dairy free milk processing <b><u>Assoc. Prof. dr. Cristina Popovici</u></b> Faculty of Food Technology, Technical University of Moldova	94
C21	Dietary influence on saliva and enamel integrity in patients with orthodontic appliances <b><u>Lecturer dr. Cristina Nicolae</u></b> , Prof. dr. Doina Paula Balaban, Prof. dr. Victoria Badea, Prof. dr. Aureliana Caraiane University Ovidius Constanta, Romania	98
C22	Phytoceuticals and nutraceuticals in diabetes mellitus <b><u>Assoc. Prof. dr. Marilena Gîlcă</u></b> Faculty of Medicine, "Carol Davila" University of Medicine and Pharmacy Bucharest, Romania	103
C23	Influencing the emotional background of diseases by taste-oriented herbal treatment <b><u>Prof. dr. Dorin Dragos</u></b> Faculty of Medicine, „Carol Davila“ University of Medicine and Pharmacy, Bucharest, Romania	106

Food Safety and Healthy Living – Book of Abstracts

C24	Particularities of nutrition in the elderly <b><u>Lecturer dr. Carmen Duta</u></b> Faculty of Medicine, „Carol Davila” University of Medicine and Pharmacy, Bucharest, Romania	110
C25	Environmental toxicology and chemical food safety <b><u>Prof. dr. Octavio Perez Luzardo, Prof. dr. Luis Alberto Henríquez Hernandez</u></b> University Las Palmas de Gran Canaria, Spain	111
C26	Body burden of toxic metals and rare earth elements in non-smokers, cigarette smokers and electronic cigarette users: a cross-sectional study in Romanian subjects from Brasov <b><u>Prof. dr. Luis Alberto Henríquez Hernandez (1), Prof. dr. Mihaela Badea (2), Prof. dr. Octavio Perez Luzardo (1)</u></b> 1-University Las Palmas de Gran Canaria, Spain 2- Faculty of Medicine, „Transilvania” University of Brasov, Romania	115
C27	From complicated to complexity – the emergence of a new paradigm <b><u>Prof. dr. Florin Munteanu</u></b> Center for Complexity Studies- UNESCO Center, member of Academy of Romanian Scientists, Romania	120



## **C1 Introduction in „FOOD SAFETY AND HEALTHY LIVING“**

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This international summer course has the main idea from a common CEEPUS project, having the same name - FOOD SAFETY FOR HEALTHY LIVING, where Transilvania University of Brasov is project coordinator and we have also collaborators from

- University Ovidius Constanta (Romania),
- „Carol Davila” University of Medicine and Pharmacy, Bucharest (Romania),
- University Babes-Bolyai from Cluj-Napoca (Romania),
- Faculty of Food Technology, Technical University of Moldova (Moldova),
- Biotechnical Faculty, University of Ljubljana (Slovenia),
- Faculty of Health Sciences, University of Ljubljana (Slovenia),
- University of Rijeka (Croatia)
- University of Łódź (Poland)
- University of Nova Gorica (Slovenia).

## Food Safety and Healthy Living – Book of Abstracts

In the same time we also invited to present lectures different academic staff with high visibility from Faculty of Pharmacy, University of Lisbon (Portugal), University of Agronomic Sciences and Veterinary Medicine of Bucharest (Romania), Department of Technology of Microbiological Synthesis, St. Petersburg State Institute of Technology (Technical University) from Russia, University Las Palmas de Gran Canaria (Spain) and Center for Complexity Studies- UNESCO Center (Romania).

The main objective of the summer course is the education of undergraduate and postgraduate (master and PhD) students offering, coming from different partner institutions from EU and non-EU countries, teaching methodologies and pedagogical strategies for teaching/learning/evaluation in the field of food safety in order to have a healthy living.

The aim of this summer school is to disseminate multidisciplinary knowledge in new areas of food analysis using classic and modern techniques, environmental and health monitoring.

Focused on subject areas of food control for a better life, the project identify topics as special monitoring of biological, food and environmental samples (life sciences), evaluate the answers and propose a solution, if possible.

This international summer school "FOOD SAFETY FOR HEALTHY LIVING" will improve the quality and will increase the volume of multilateral cooperation between higher education institutions in Central Europe, and not only.

## Mihaela BADEA

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### Research interests

Scientific and didactic activity demonstrated through articles and projects in the field of life sciences, international fellowships (in USA- University of North Carolina at Chapel Hill or financed by Balkan Environmental Association -B.EN.A) and research projects (CEEX projects for young researchers, FP7

project - *Plant Food Supplements: Level of Intake, Benefit and Risk Assessment* -PlantLIBRA no.245199).

One of research aim is obtaining/optimization/application of enzyme biosensors with commercial acetylcholinesterase (*Electric Eel*) and mutants (*Drosophila melanogaster*) or immunosensors for detections of biologically active compounds (pesticides and mycotoxins) in different media: water, soil, plants, baby food, cereals, herbal supplements.

Recently the application of electrochemical detection was devoted to detection of other electroactive compounds with pro/antioxidant role.

Being in the same line with the most recent scientific studies of the moment (telediagnostic, telemonitoring systems, intelligent reconfigurable systems) and, in collaboration with groups from Faculty of IESC (UTBV), Mrs. M. Badea conducted valuable scientific studies in this area, evidenced by completion of dissertation work for the master in medicine (2013), by coordinating an educational project for young master and PhD students (Erasmus Intensive Program -*Telemonitoring and Telediagnosis for Life Sciences*-12-EIP-E BRASOV01-BIS) and the organization in Brasov (July 24-26 ,2014) of the First International Conference on *New Trends Sensing-Monitoring-Telediagnosis for Life Sciences*(continued in 2015, 2017, 2018).

### **Selected publications**

- Miccoli A., Restani P., Floroian L., Taus N., **Badea M.\*** , Cioca G. , Bungau S., Sensitive Electrochemical Detection Method of Melatonin

## Food Safety and Healthy Living – Book of Abstracts

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- Rauf S, Hayat Nawaz MA, **Badea M.**, Marty JL, Hayat A, Nano-Engineered Biomimetic Optical Sensors for Glucose Monitoring in Diabetes, Sensors 16 (11), 1931, 2016
- Restani P., Di Lorenzo C., Garcia-Alvarez A., **Badea M.**, Ceschi A., Egan B., Dima L., Lüde S., Maggi F.M., Marculescu A., Milà-Villaruel R., Raats M.M., Ribas-Barba L., Uusitalo L., Serra-Majem L., Adverse Effects of Plant Food Supplements Self-reported by Consumers in the PlantLIBRA Survey Involving Six European Countries, PLoS One, 11(2) (2016) e0150089.
- **Badea M.**, Floroian L., Restani P., Cobzac SC., Moga M., Ochratoxin A Detection on Antibody- Immobilized on BSA-Functionalized Gold Electrodes, PLoS One., 11(7) (2016) e0160021.
- **Badea M.**, Luzardo OP, González-Antuña A, Zumbado M, Rogozea L, Floroian L, Alexandrescu D, Moga M, Gaman L, Radoi M, Boada LD, Henríquez-Hernández LA., Body burden of toxic metals and rare earth elements in non-smokers, cigarette smokers and electronic cigarette users., Environ Res. 2018;166:269-275.
- **Badea M.**, Braic M., Kiss A., Moga M., Pozna E., Pana I., Vladescu, A., Influence of Ag content on the antibacterial properties of SiC doped hydroxyapatite coatings, Ceramics International , 42(1) (2016) 1801-1811

## Ioana Octavia AGACHE

- Medical degree “Carol Davila” University, Bucharest and absolved Magna Cum Laude her PhD in Internal Medicine.

## Food Safety and Healthy Living – Book of Abstracts

- Professor of Allergy and Clinical Immunology at Faculty of Medicine, Transilvania University of Brasov, Romania
- President of the European Academy of Allergy and Clinical Immunology (EAACI) 2017-2019.

### **Research interests**

Her research in the field of Asthma and Allergy and Clinical Immunology focused on asthma phenotypes and endotypes, immune modulation and immune tolerance and integrated management of allergic diseases, with a special focus on primary care and community pharmacists.

Ioana Agache is member of the Steering Committee and co-author of several international and European Guidelines, such as ARIA (Allergic Rhinitis and its impact on Asthma), EAACI Allergen Immunotherapy Guidelines and EAACI Food Allergy and Anaphylaxis Guidelines. Ioana Agache is actually Chair of the EAACI Guidelines on the use of Biologics in asthma and allergic diseases.

She is Editor of the Global Atlas of Asthma (2013), Global Atlas of Allergy (2014), Global Atlas of Allergic Rhinitis and Chronic Rhinosinusitis (2015), Implementing Precision Medicine in Best Practices of Chronic Airway Diseases (2018), Associate Editor of Clinical and Translational Allergy and a member of the Editorial Board for Allergy and Journal of Allergy and Clinical Immunology.

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### Research interests

Main research interests are on biomaterials fields, optical sensor for cell detection, biosensors for biological compounds and toxic compounds, advanced techniques for thin films deposition and advanced techniques for surface characterization. He is a member of many scientific societies: SRF – Romanian Society of Physics, Romanian Society of Automation and Technical Informatics (SRAIT), National Society for Medical Engineering and Biological Technology (SNMITB) and International Association of Online Engineering (IAOE).

### Selected publications

- Badea M., Antuñña A. G., Zumbado M., Rogozea L., **Floroian L.**, Alexandrescu D., Moga M., Gaman L., Radoi M., Boada L. D., Henríquez-Hernández L. A., Body burden of toxic metals and rare earth elements in non-smokers, cigarette smokers and electronic cigarette users, *Environmental Research*, vol 166, pg. 269-275, 2018, ISSN: 0013-9351.
- **Floroian L.**, Ristoscu C., Candiani G., Pastori N., Moscatelli M., Mihailescu N., Negut I., Badea M., Gilca M., Chiesa R. and Mihailescu I.N., Antimicrobial thin films based on ayurvedic plants extracts embedded in a bioactive glass matrix, *Applied Surface Science*, vol 417, pg 224-234, 2017, ISSN: 0169-4332.
- **Floroian L.**, Ristoscu C., Mihailescu N., Negut I., Badea M., Ursutiu D., Chifiriuc M. C., Urzica I., Dya H. M., Bleotu C., Mihailescu I N., Functionalized antimicrobial composite thin films printing for stainless steel implant coatings, *Molecules*, 2016, 21, pp. 740-758, ISSN: 1420-3049
- Badea M., **Floroian L.**, Restani P., Cobzac S.C., Moga M., Ochratoxin A Detection on Antibody- Immobilized on BSA-Functionalized Gold Electrodes, *PLoS ONE* 2016, 11(7): e0160021. doi:10.1371/journal.pone.0160021.
- **Floroian L.**, Samoila C, Badea M., Munteanu D., Ristoscu C., F. Sima, I. Negut, M. C. Chifiriuc, I. N. Mihailescu, Stainless steel surface biofunctionalization with PMMA-bioglass coatings: compositional, electrochemical corrosion studies and microbiological assay, *Journal of Materials Science: Materials in Medicine*, 2015, vol 26, pp. 195-209, ISSN: 0957-4530.



## Elena Laura GAMAN

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### Research Interests

Main research interest is the oxidative stress associated with different diseases: mitochondrial disease in children, atherosclerosis and cardiovascular disease, neurological disease like schizophrenia, Alzheimer’s, diabetes, renal chronic disease.

## Food Safety and Healthy Living – Book of Abstracts

### Selected Publications

L Gaman, D Dragos, A Vlad, G C Robu, M P Radoi, L Stroica, M Badea, and M Gilca Phytoceuticals in Acute Pancreatitis: Targeting the Balance between Apoptosis and Necrosis Evidence-Based Complementary and Alternative Medicine, 2018, Article ID 5264592, 27 pages

Iosif L, Gaman L, Gilca M, Radoi M, Kovacs E, Stoian I, Dragos D Vegetable oils microwave heating – CUPRAC, TEAC AND FRAP values in relation with oxidative parameters Rev de chimie 68 (8), 2017

L Iosif, L Gaman, I Crihana, E Kovacs, I Stoian, O Lupescu Microwave and Electrical Oven Heating are Having Different Effects on Antioxidant/oxidative Stress Parameters of Vegetable Oils, Rev de chimie 67 (12), 2638-2642

Gilca M, Lixandru D, Gaman L, Virgolici B, Atanasiu V, Stoian I. Erythrocyte membrane stability to hydrogen peroxide is decreased in Alzheimer's disease. Alzheimer Diseases & Associated Disorders, Oct-Dec; 28(4):358-63, 2014

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Gilca M, Gaman L, Panait E, Stoian I, Atanasiu V. Chelidonium majus- and integrative review. Traditional information versus scientific findings, Forsch Komplementmed, 17(5):241-248, 2011

## C2 New trends for food sample preparation

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The determination of food quality is largely based on chromatographic analysis for the identification and determination of macro and micro-components. Food presents the most diverse and complex matrix. Apart from the fact that food is in different forms of aggregation, both its matrix and analytes can present a wide variety of physico-chemical properties. Since the analytical equipment has limited separation and detection capabilities and can only analyze liquid samples, it is necessary to prepare the samples.

This chapter presents the basic knowledge of classical and modern methods of sample preparation. Techniques used for organic compounds extraction from solid matrices such as maceration, reflux, ultrasonic solvent assisted extraction (UAE), microwave solvent assisted extraction (MAE), supercritical fluid extraction (SEF) are discussed. Different liquid-liquid extraction techniques such as dispersive liquid-liquid microextraction (DLLME), single drop microextraction (SDME), hollow fibre

microextraction (HFME), solid-phase extraction (SPE) and microextraction (SPME) are presented for liquid samples and extracts.

## Simona Codruta Aurora COBZAC

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### Research interests

Main research interests are on the chromatographic analysis methods - Thin layer chromatography; Sample preparation methods for chromatographic analysis; Analysis of food samples, environment, pharmaceuticals, medicinal plants; Chemometric methods for data evaluation.

### Selected publications

- Casoni D, Olah N, Soran L, **Cobzac S.C.A.**, Comparison of different extraction techniques for the evaluation of polyphenols content in Summer savory extracts, *Studia Universitatis Babes-Bolyai Chemia*, 2017
- Simion M, **Cobzac S.C.A.**, Image Analysis Approaches to Improve the Thin Layer Chromatography – Chemometric-Based Investigations of Natural Extracts, *Studia Universitatis Babes-Bolyai Chemia*, 2017
- Vlase L, Muntean D, **Cobzac S.C.A.**, Filip L, Development and validation of an HPLC-UV method for determination of synthetic food colorants *Revue Roumaine de Chimie*, 2014
- Pop D, Casoni D, **Cobzac S.C.A.**, Tartrazine Determination from Mustard Sample by TLC-Photodensitometry and TLC-Digital Processing of Images, *JPC - Journal of Planar Chromatography - Modern TLC*, 2012
- **Cobzac S.C.A.**, Casoni D, Fazakaş A.L, Sârbu C., Determination of food synthetic dyes in powders for jelly desserts using slit-scanning densitometry and image analysis methods, *Journal of Liquid Chromatography & Related Technologies*, 2012
- Naşcu-Briciu R.D., **Cobzac S.C.A.**, Baciuc S., Optimum Ultrasound Assisted Extraction Conditions of Some Flavonoids from Green Tea Leaves. Control Quality of Green Tea Product by TLC Fingerprinting, *Analytical Letters*, 2011
- **Cobzac S.C.A.**, Gocan S., Sample preparation for high performance liquid chromatography: Recent progress, *Journal of Liquid Chromatography & Related Technologies*, 2011

## **C3 Monitoring of food contaminants**

**A. SOCEANU<sup>1</sup>, S. DOBRINAS<sup>1</sup>, V. POPESCU<sup>1</sup>, D. BALABAN<sup>2</sup>**

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A major discussion worldwide concerns food safety, a very important issue for human health. The food supply chain includes processes, operations that transform raw materials in delicious food from our plates. Food contamination can occur at any point along the food chain during production, processing, distribution, or preparation.

Food can be contaminated through physical, chemical or biological contamination. Physical contamination is usually visible and can happen at any stage of the production or preparation process when items such as hair, glass, plasters, dirt, insects or other foreign bodies are present in food. Chemical contamination can occur when certain foods come into contact with harmful metals, through metallic containers or when soil or water is contaminated by pollution. When food becomes contaminated by bacteria or a virus, parasites, it's considering biological contamination.

## Food Safety and Healthy Living – Book of Abstracts

Contaminants are chemical substances that have not been intentionally added to food or feed but may be present in food as a result of the various stages of its production, processing, transport, or might result from environmental contamination. Contaminant levels in food are in most cases harmless for consumers. However, some contaminants may pose a risk to human and animal health through their accumulation over time or through food poisoning. Main types of contaminants in the food chain are natural toxins, environmental contaminants, process contaminants, others (veterinary medicines).

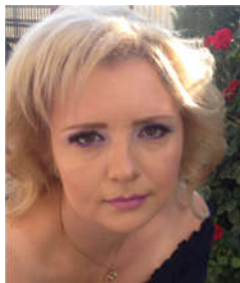
The degree of contamination of food and feed and the effect of actions to reduce contamination shall be assessed by monitoring, survey programs and more specialized research programs, where necessary. Depending on the source and level of contamination, the effects of contaminated food can cause symptoms such as cramps, nausea, diarrhea, vomiting, nerve damage, allergies and paralysis.

The presence of heavy metals, pesticide residues, PCBs, dioxins and PAHs in different types of food has been of extensive concern worldwide.

Chemical contaminants are a major concern for the food industry. Some actions can be taken to prevent or to reduce contamination of food and feed, such as: reducing environmental pollution; applying appropriate technology control measures in food production and processing, decontaminating of contaminated food and preventing contaminated food to be marketed for consumption.

## Alina Daria SOCEANU

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### Research interests

- Analysis of contaminants in food and environment samples
- Kinetic degradation of ascorbic acid in food and pharmaceutical samples
- Physical chemical characterisation of emulsions

### Selected publications

- Dobrinas S., **Soceanu A.**, Popescu V., Coatu V., Polycyclic aromatic hydrocarbons and pesticides in milk powder, *Journal of Dairy Research*, 83 (2), 261-265, 2016



## Food Safety and Healthy Living – Book of Abstracts

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## C4 Food natural products for neuroprotection

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Neurodegenerative diseases are among the main causes of death worldwide. These diseases represent an enormous burden in terms of human suffering, social distress and economic costs. Most of neurodegenerative diseases are chronic, with disabling effects that aggravate along years, and still without cure. It is well known that in most neurodegenerative diseases, neurodegeneration occurs long before the onset of first symptoms, where a large population of brain neurons are already lost. Although with distinct pathologic symptoms and specific pathways many neurodegenerative diseases share common mechanisms such as neuroinflammation, protein aggregation and oxidative stress. It becomes evident that any substance that can prevent the early neuron loss may delay, or prevent, neurodegenerative diseases, increasing long-term brain defences and can result in healthier ageing.

Many food sources (e.g. fruits, vegetables, green tea, wine) are rich in polyphenols, that revealed to be potent antioxidants and share anti-inflammatory activity, and so may have the potential to protect the brain when included in the diet.

One of the simplest experimental approaches to evaluate the neuroprotective properties of food-born molecules, like polyphenols, relies on in vitro testing, using cell culture models. Several key properties must be considered, i.e. their ability to reach the brain without damaging the blood-brain-barrier, the protection from cell death caused by disease specific inducers and their safety, which is related with polyphenols-specific neurotoxicity.

Some results show that polyphenols like epigallocatechin gallate can indeed reach the brain in physiologic concentrations and protect neurons from oxidative-induced cell death. The role of digestive absorption and metabolization of ingested polyphenols must also be considered. For that, in vitro models using specific digestive enzymes can be used, mimicking the digestive process.

Besides neurons, other nerve cell types, like microglia, are key players in neuroinflammation and constitute a target for neuroprotection, accessing the specific cellular mechanisms/pathways that can be modulated by food-born molecules. It was also shown that polyphenols from raspberry can protect microglia from oxidative-induced cell death and, more importantly, to also reduce their neuroinflammatory response. We can conclude that several mechanisms and nerve cell types are targeted by polyphenols, after they reach brain parenchyma,

enlightening the possible neuroprotective role of some nutritional constituents.

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## Research interests

Main research interests are on the Neurosciences area, in the topics of neurobiology, neurotoxicology, neurodevelopment and glial function associated to neurologic conditions and neurodegeneration. Neuroprotection mechanisms is the most relevant area of intervention, embracing the neuroprotective properties of food natural products and food-borne molecules, either introduced in the regular diet or as additives or medicines, by several cell and molecular mechanisms, beyond the traditional antioxidant properties described for food polyphenols.

## Selected publications

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Food Safety and Healthy Living – Book of Abstracts

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## C5 Natural sources of antioxidants

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It is well known that variety of food is important in terms of providing essential nutrients in the human diet. Many studies confirmed that regular consumption of fruits and vegetables rich in antioxidants can prevent cardiovascular and other diseases. For that reason the antioxidants, which allow the organism to defend against the oxidative stress, environmental pollution and other toxic substances play an important role in the healthy human nutrition.

The content of antioxidants in a particular food can vary greatly from the raw material to the finished product. The quality of the food that we actually consume thus depends not only on the quality of the initial raw material (fruit, vegetables), but also to its storage, processing and final preparation in our kitchen.

Several sources of natural sources of antioxidants will be discussed in this presentation, namely medicinal herbs, fruits (pomegranate and aronia), vegetables (kimchi and knotweed), green tea, cocoa and chocolate. The influence of processing and different preparation procedures on antioxidant capacity and total

phenolics will be presented as well. The results of our recent research showed that all investigated representatives of regularly consumed foods contain high levels of various antioxidants.

Nevertheless, it was also found that the processing and different ways of food preparation of these representatives of natural sources of antioxidants can result in a considerable decrease of many antioxidants, so they have to be treated carefully. And finally, it will be stressed in this contribution that the bioavailability studies have to be performed in bigger extend in the future in order to have better insight into the possible effects (positive or negative if consumed in too high dosages) on our health.

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### Research interests

- preparation and evaluation of antioxidants in extract of alien knotweed species, namely Japanese knotweed (*Fallopia japonica*), Giant knotweed (*F. sachalinensis*) and their interspecific hybrid – Bohemian knotweed (*F. x bohemica*)
- evaluation of brain accessibility and neuroprotection of different polyphenols, namely quercetin, epigallocatechin gallate (EGCG), cyanidin-3-glucoside (C3G), and nicotine
- simulation of digestion and evaluation of the stability of pomegranate juice anthocyanins

### Selected publications

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- **Pogačnik L.**, Poklar Ulrich N., Invasive knotweed species as a rich source of antioxidants. *Journal of EcoAgroTourism*, 2018, vol. 14, no. 1, p. 5-10
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- **Pogačnik L.**, Poklar Ulrich N., Application of optimized chemiluminescence assay for determination of the antioxidant capacity of herbal extracts. Luminescence, 2012, vol. 27, no. 6, p. 505-510

## **C6 UV filters - advantages and disadvantages of their use in personal care products**

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Sunscreens contain chemical organic filters, which mainly absorb UVB or UVA radiation, and physical filters (TiO<sub>2</sub> and ZnO), which block the UVB/UVA part of the solar radiation by reflection and scattering. Such products must be photostable, in order to spend energy effectively mainly through photophysical processes and minimize photochemical ones which involve singlet oxygen or other reactive species or intermediates. They should not penetrate deeper into the skin, and also may not be transported into the cells. Alternatively, they should prevent UVB and UVA rays from penetrating into the cell nucleus and damage DNA.

Some organic compounds used as UV filters decompose when exposed to light. The direct photolytic reactions or for the chlorination of the aromatic ring or the side chain, may occur due to the presence of chlorine and chlorinated medium (for example water pools, sea water). The formation of halogenated byproducts in chlorinated waters is inevitable, especially when they are substituted with phenolic compounds and/or amino groups. The

published data also indicate the presence of UV filters in pool water.

In this work we present our research, focused on synthesis, characterization and toxicity of different type of UV filters. Due to the combined activity of solar radiation and disinfection agents present in swimming-pool water, chlorination of parent UV filters takes place, yielding halogenated derivatives of both parent and degradation products. For example, aquatic chlorination reactions of benzophenone type of UV filters (DHHB, BP-4, BP-4) resulted in the formation of different mono and distubtited chloro derivatives. Some other studies have dealt with the aquatic chlorination of avobenzone. Recent LC/MS/MS experiments allowed elucidating the structures of these compounds being 2-chloro- and 2,2-dichloro-avobenzone. Another study involves transformation of avobenzone under the combined influence of active chlorine and UV-irradiation, where twenty-five compounds were identified as transformation products of avobenzone in such reactions. Bromination or chlorination of waters containing bromides (for example, sea water) is known to result in the formation of bromine-containing disinfection products, which have a higher toxicity compared to their chlorinated analogs. The chlorination afforded several dozens of disinfection by-products, including chlorine- and bromine-containing ones, which potentially pose a hazard to the human health. Among the main products are substituted halogenated aromatic aldehydes, acids, acetophenones, and phenols.

The existing ecotoxicity data for UV filters confirm their estrogenic hormonal activity and multiple endocrine-disrupting activities such as androgenicity, antiestrogenicity or estrogenicity.

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### Research interests

My research and expert area include studies on photochemical degradation and transport of different organic pollutants, mainly pesticides in the aquatic environment; Study of transformation and identification of different pollutants (UV filters, THMs) under disinfection conditions; toxicity assessment of various organic pollutants for selected non-target organisms in

the aquatic and terrestrial environments; Organic pollutants instrumental analysis

### Selected publications

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- Drobne D., Blažič M., Gestel C. A. M., Van Lešer V., Zidar P., Jemec A., **Trebše P.**, Toxicity of imidacloprid to the terrestrial isopod Porcellio scaber (Isopoda, Crustacea). Chemosphere, ISSN 0045-6535. [Print ed.], 2008, vol. 71, no. 7
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## **C7 Use of extracts from the Romanian botanic area in the maintenance of oro-dental health**

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Currently there is an ascending trend regarding the importance of plants and plant extracts, both in terms of prophylaxis of diseases and their possible curative role.

These properties have been demonstrated over time, starting from the simple, observational methods, by which there was evaluated the effect of plants and plant extracts, going to the present time when, through cutting-edge technology, their action could be proved, aligning by the demonstrated element, to what we call evidence-based medicine.

Our interest in the species of this genus and especially in *Usnea barbata* is given by the fact that the phytochemical analyzes carried out over time identify the presence of usnic acid, polyphenols and despides, which are antibacterial, antifungal, antioxidant and antiproliferative compounds.

The objective of the study is to evaluate the existence of possible antibacterial effects of water, acetone and ethanol extracts of *Usnea barbata* species.

Six extractive solutions from *Usnea barbata L.* were considered in our study, 3 acetonc extracts, 2 ethanolic extracts and one aqueous extract.

We performed studies upon biological products taken from the oro-dental cavity and related cavities. The following bacterial strains were isolated *Staphylococcus epidermidis*, *Staphylococcus aureus*, *Streptococcus intermedians* and *Streptococcus oralis*. and identification was made by API system.

The diffusimetric antibiogram method is based on the existence of a direct proportionality relationship between the susceptibility of the bacteria tested and the size of the bacterial colony inhibition area developed around the antibiotic tablet. Starting from this standard method, we adapted it to the specifics of this study, replacing the antibiotic tablet with a sterile filter paper disk equal in diameter to that, impregnated with the various *Usnea barbata L.* extracts used

Comparing the antibacterial action of acetonc and ethanolic extracts of *Usnea barbata L.* on both Gram-positive cocci species tested, we observe that the inhibition areas are very close in size for *Staphylococcus aureus* and *Streptococcus oralis*, while at *Staphylococcus epidermidis* are considerably higher.

The present study highlights that alcoholic and acetonc extracts obtained from *Usnea barbata L.* have an antibacterial effect.

One of the most known Gram-positive bacterial species, renowned for its particular pathogenicity and the development of increased resistance to antibiotics, *Staphylococcus aureus*, has been shown to be sensitive to the action of *Usnea barbata L.* alcoholic and acetonc extracts.



## Food Safety and Healthy Living – Book of Abstracts

Results for antibacterial action of preserved acetonetic and ethanolic extracts for 1 year are similar to those of the freshly prepared, demonstrating the stability over time of the secondary metabolites with antibacterial action from *Usnea barbata L.*

The results of this study demonstrate that *Usnea barbata L.* extracts could be used effectively in orodental infections involving bacteria resistant to common antibacterial therapy, thus completing classic antibiotic treatment.

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## Research interests

The PhD thesis and a large part of the materials published during this period focused on the deepening of the etiology of periodontal disease as well as on the identification of useful biomarkers in the early diagnosis and monitoring of this disease. Also, I was interested in finding new complementary treatments for periodontitis. In this way, by working together with my colleagues from the Pharmacy Faculty, we identified and studied plants that have compounds useful in the treatment of this disease.

## Selected publications

- Balaban D.P., Petcu L.C., Badea M., Basa M., **Grigorian M.**, Badea V., Caraiane A., Assessment of salivary enzymes activities for monitoring chronic periodontitis patients, In: New trends on monitoring and diagnosis for health sciences – Editors: Mihaela Badea, Laura Floroian, LAP LAMBERT Academic Publishing, Saarbrucken 2015, pp 77-94, ISBN 978-3-659-77699-1
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- **Grigorian M**, Balaban DP, Caraiane A, Nucă C, Badea V, Oral health promotion in aggressive periodontitis by using salivary biomarkers, 4th International Multidisciplinary Scientific Conferences on Social Sciences and Arts - SGEM2017, 24-30 august2017, Albena, Bulgaria, Conference proceedings, Book 3, Science and Society, Sociology and Healthcare, ISBN 978-619-7408-20-1, pp. 433-440

## C8 Prion disease and food safety

M. ŠNAJDER

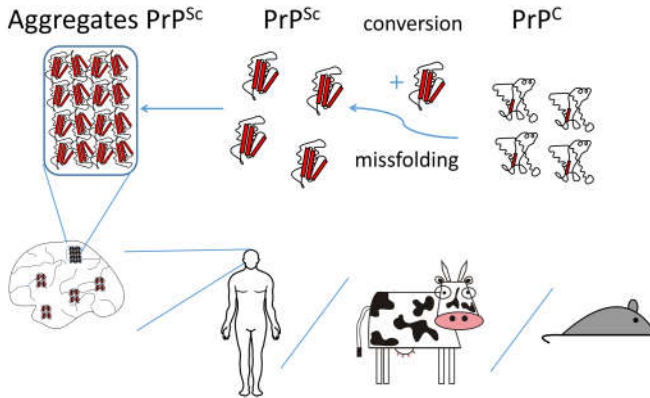
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Prion disease is the commonly used term for all transmissible spongiform encephalopathies. As the name suggests, the prion is the key agent. Prion is normal cellular glycoprotein named PrPC that is transported extracellular and is mainly located in the peripheral and central nervous system. Although various physiological functions are proposed for PrPC from its role in synaptic transmission to preserving calcium homeostasis, its exact function is still unknown. However, the beginning of transmissible spongiform encephalopathy disease occurs when normal PrPC is misfolded into the infectious one, PrPSc. Moreover, many evidences that PrPSc can be transmitted also in food chain regardless species barrier. The bovine spongiform encephalopathy epidemic (BSE) in the 1980s in the UK emerges based on transmission of infectious ovine prions that adapted to cattle and started the disease.

To increase economic profit rendering industry started using processed sheep's carcass, containing also neurones and brains, as feed supplement for cattle. Later on, the emergence of a

variant form of the human Creutzfeldt-Jakob disease was indirectly linked to the BSE epidemic via human food chain and was firstly reported in the UK implying cause was ingestion of infected beef meat.

Annual meat production reaches more than 320 million tons with beef meat share representing up to 22%. To ensure high health protection for consumers and animals, regulatory agencies from Europe and United States of America have restricted the legislation in food chain. As for 1994, meat and bone meal was banned for feeding cattle, goat and sheep and was later enhanced to all animal feeds, pet foods and using it as fertilizers. Another important action was introduced in 2000 by the prohibition to use all specified risk materials from cattle, sheep and goats that represents high risk of PrPSc. Those parts are brain, spinal cord, associated bones and nerve ganglia. Other precautions are connected with better surveillance and monitoring of the animals in slaughterhouses. New measures now help us to control and decrease transmissible spongiform encephalopathies. However, there is indeed still cause for concern because the transmissible PrPSc shows an unusual resistance to conventional decontamination processes and prion disease has very long incubation period lasting for years.



*Figure. A schematic representation of a generation of infective prion with the occurrence of transmissible spongiform encephalopathies in human and animal species.*

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### Degree

Degree: In 2008, I graduated in the field of biochemistry at the Faculty of Chemistry and Chemical Technology. After

graduation, I entered the doctoral studies in biomedicine, Biochemistry and Molecular Biology, and received PhD in 2013. From 2008, I am employed as a Research Assistant at the Biotechnical Faculty (Chair of Chemistry, Department of Food Science and Technology).

### **Research interests**

My research work is focused in the fields of biochemical and physical characterisation of proteins. Specifically, I study protease from extremophile archaeon and its recombinants forms. Firstly, we are using synthetic biology to engineer protease gene in a way, to produce higher amount of active and thermostable protease. Protease is produced in bacterial expression system like *E. coli* or *S. rimosus*.

Further, we are developing purification techniques, enzymatic activity assays, spectroscopic methods (fluorescence, circular dichroism, absorbance) and physical technique (differential scanning calorimetry) to study thermostable proteins. In my research field, I lead an application project in 2014, where we were developing *S. rimosus* expression system for the production of proteins. Since 2017, I have been working on a new application project where our goal is to develop an enzymatic formulation for the degradation of infective Prion protein. Project includes collaboration with the Jožef Stefan Institute, Veterinary faculty and foreign industrial partners from Switzerland.

Beside my research work, I am also involved in the pedagogical area, where I have the opportunity to lead practical exercises for underground as well as master students. Students

are from different fields: biotechnology, food science and agronomy and they are evaluated with written exams after completion of the course. I am also co-mentor for student's diploma and master's thesis.

### **Selected publications**

- AUSEC, Luka, ČRNIGOJ, Miha, ŠNAJDER, Marko, et al. Characterization of a novel high-pH tolerant laccase-like multicopper oxidase and its sequence diversity in *Thioalkalivibrio* sp. *Applied microbiology and biotechnology*.
- ŠNAJDER, Marko, MIHELČIČ, et al. Codon optimisation is key for pernisine expression in *Escherichia coli*. *PLoS one*.
- ŠNAJDER, Marko, VILFAN, et al. Enzymatic degradation of PrPSc by a protease secreted from *Aeropyrum pernix* K1. *PLoS one*.



## C9 An overview on food safety hazards

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Food Safety refers to handling, preparing and storing food in a way to best reduce the risk individuals becoming sick from foodborne illnesses. Food becomes hazardous by contamination and through human improper behaviour.

Many food outbreaks are every day happening all over the world. Although many regulations are already in place and HACCP system is mandatory in many countries, this is mainly the case for food processing area. Still in other steps of the value chain as primary production, logistic and transport as well as in retail not all of these are implemented.

Food hazards may be microbiological, chemical and physical in nature, but also human behaviour became a nowadays issue of concern. Microbiological safety is the major challenge in food safety assurance. The people who suffer from 'food-borne' diseases of microbiological origin each year, worldwide are millions. Contamination by human pathogens of food may occur at any stage during production, harvesting, handling, processing, storage or distribution to the consumer.

## Food Safety and Healthy Living – Book of Abstracts

Hence, reliable identification and characterization of hazards for any supply chain, food and group of consumers is an essential basis for risk assessment. Similarly, the regular review of which hazards are current, which are emerging with the potential to cause harm, and the severity of their effects, are essential to the future of risk assessment.

A good HACCP planning must have established appropriate control and preventive measures to ensure food safety.

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## Research interests

Main research interests are on the food science and technology area, in the topics: food safety, food packaging and food preservation, novel processing techniques.

## Selected publications

- Râpă M, **Popa ME**, Cinelli P, Lazzeri A, Burnichi R, Mitelut A, Grosu E, Biodegradable Alternative to Plastics For Agriculture Application, In Romanian Biotechnological Letters Vol. 16, No. 6 Supplement November–December 2011, Pag. 59-64;
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- Râpă M, **Popa ME**, Cornea PC, Popa VI, Geicu-Cristea M, Stoica P, Tănase EE, Degradation study by trichoderma spp . of poly (3-hydroxybutyrate) and wood fibers composites, Romanian Biotechnological Letters Vol.19, No3, 2014, 9390-9399;
- Stan A, **Popa ME**, Pretreatment and freezing storage effect on antioxidant capacity of sour cherries and correlation with color changes, Romanian Biotechnological Letters, Vol. 20, No. 5, 2015, ISSN 1224 – 5984;
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## Food Safety and Healthy Living – Book of Abstracts

Biotechnological Letters, Vol. 20, No. 5, 2015, pag. 10835-10844, ISSN 1224 – 5984;

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## **C10 Electrochemical sensors used in food quality control**

**G. TURDEAN**

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The assurance and protection of food quality is one of the earliest laws known in history and nowadays global market requires a continuous and determined effort towards the improvement of science, technology and modern analytical techniques in food production and service industries.

The most common powerful techniques used in food quality control are the chromatographic methods and/or spectroscopic methods which have advantages, but also disadvantages. As consequence, the literature is also abundant with a large number of examples of electrochemical techniques based on chemically modified electrodes.

In this context, as alternative to standard methods, two examples of materials having redox properties (e.g. myoglobin-single walled carbon nanotubes and Bi-based graphene) used for obtaining chemically modified electrodes and their applications in detecting important analytes for the food control were presented.

## Graziella Liana TURDEAN

- B.Sc. degree in Chemical Engineering in 1989 at “Babes-Bolyai” University (Cluj-Napoca, Romania)
- M.Sc. degree in Science and Environmental Techniques in 1994 from University Paris XII-Val de Marne (Paris, France)
- PhD degree in co-direction was obtained in 1997 at BBU in the field of Chemistry and at University Paris XII-Val de Marne (Paris, France) in the field of Sciences and Technique of Environment, with a thesis on “Amperometric biosensor for studying the inhibition of cholinesterases”.
- Associate professor at Chemical Engineering Department of “Babes-Bolyai” University (BBU) (Cluj-Napoca, Romania).
- Post-doc NATO-CNR stages at University “Tor Vergata” (Rome, Italy) and University “La Sapienza” (Rome, Italy) improved her professional career.
- The habilitation degree was obtained in 2016 with the thesis entitled: “Bio/molecular information processing of the fascinating world of nanostructures: from micro- to “smart” electrodes”.
- She has done short visits (1-3 weeks) at foreign universities as: University of Alcalá de Henares (Spain), University of Pisa



(Italy), University of Cagliari (Italy), Al Farabi Kazakh National University (Almaty, Kazakhstan), Polytechnic School of Chimborazo (Riobamba, Ecuador).

### **Research interests**

- materials for bio/electrochemical sensors,
- nanotechnology and materials sciences,
- electrochemical investigation techniques
- applied bio/electroanalytical chemistry.

### **Publications**

She published 54 scientific papers (42 papers in journals having ISI factor, and at 35 is first or corresponding author). The articles were cited (without self-citations) by 185 other papers. The participation at 79 international and 19 national conferences enriched her experience in validation of the research results. As teacher, she is author or co-author at 3 scholar books and 2 chapters of books. Also, she has experience as director of grants (4 national and 3 international) and as member in research teams (29 national and 3 international).

## **C11 Voltammetric determination of fat soluble vitamins**

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The aim of this study was to offer an overview of voltammetric methods which have been developed for determination of fat soluble vitamins classified in four major groups (A, D, E and K). These vitamins are defined as small naturally occurring organic compounds with electrochemical properties (capable of participating in oxidative reduction processes) which are usually presented in low concentrations. They have unique biological functions that make them essential to human health. Fundamentally, vitamins themselves cannot be synthesized in the human body and must be consumed as nutrients, although in some cases the original form that is ingested must undergo a chemical change via an enzymatic process in order to make it biologically active. Everyone must be clear that their deficiencies can create health problems. Consequently, they can find their application in several fields, such as nutrition, food technology, pharmacy, cosmetics and medicine. However, the analysis of lipophilic vitamins is rather complicated and time consuming due to their insolubility in water. The main



disadvantage is the use of organic solvents. Generally, they can be divided into two main groups, namely direct and stripping voltammetric methods. Differential pulse voltammetry and square wave voltammetry represent the most commonly used pulse electrochemical techniques due to their ability to eliminate capacity current, resulting in a high sensitivity of the faradaic current that is directly proportional to the analyte concentration. Hanging mercury drop electrode, bare glassy carbon electrode or its surface modifications and glassy carbon paste electrode belong to the most commonly used working electrodes.

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## Milan SÝS

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## Research Interests

Main research interest is on the development of sensitive electroanalytical methods and biosensors suitable for determination of biologically active compounds such as vitamins, alkaloids, pharmaceuticals, pesticides, and biological markers of different human diseases. These electroanalytical methods include several voltammetric approaches how to efficiently analyze different foodstuffs and samples from the environment. On the other hand, biosensors usually utilize enzyme tyrosinase (EC 1.14.18.1) from mushroom *Agaricus bisporus* or specific antibodies labeled with quantum dots as biorecognition elements with combination of electrochemical transducers which are usually constructed from various conductive carbon materials.

## Selected Publications

- **Sýs M.**, Vytřas K. Tyrosinase electrochemical biosensors monitoring medicinally significant substances. *Curr Med Chem* 2018; In Press.
- Žabčíková S, Mikysek T, Červenka L, **Sýs M.** Electrochemical study and determination of all-trans retinol at carbon paste electrode modified by surfactant. *Food Technol Biotech* 2018; In Press.

## Food Safety and Healthy Living – Book of Abstracts

- **Sýs M**, Jashari G, Švecová B, Arbneshi T, Metelka R. Determination of vitamin K1 using square wave adsorptive stripping voltammetry at solid glassy carbon electrode. *J Electroanal Chem* 2018; 821: 10-5.
- **Sýs M**, Švecová B, Švancara I, Metelka R. Determination of vitamin E in margarines and edible oils using square wave anodic stripping voltammetry with a glassy carbon paste electrode. *Food Chem* 2017; 229: 621-27.
- **Sýs M**, Metelka R, Korecká L, Pokorná H, Švancara I. Comparison of various bismuth film electrodes in simultaneous electrochemical detection of heavy metals for application in quantum dot-linked immunoassays. *Monatsh Chem* 2017; 148: 505-10.
- **Sýs M**, Khaled E, Metelka R, Vytřas K. Electrochemical characterisation of novel screen-printed carbon paste electrodes for voltammetric measurements. *J Serb Chem Soc* 2017; 82: 865-77.

## C12 Electroimmunoassays for fast and sensitive analysis of proteins

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The specific reactivity between the analyte of interest and a corresponding antibody is the general basis of all immunoanalytical methods applied in clinical practice. The unique nature of the biospecific reaction, which employ multiple non-covalent bonds formed by the mutual surface complementarity of interacting molecules, enables the sensing of target analyte (antigen) also in complex heterogeneous sample. Thanks to such highly biospecific reactions, the presence of even large and structurally complicated molecules, such as proteins, can be easily monitored and quantified with almost no sample pretreatment; only pre-dilution of the sample is recommended in some cases.

The results of the immunoanalysis can provide a useful information about the presence or quantity of e.g. cancer biomarkers in different body fluids or food allergens in foodstuffs.

However, due to need of acquisition of an automatic bioanalyzer, expenses of required reagents and labor costs in operating a laboratory, the price for a single analysis is still high. In countries with advanced health care, a whole range of these tests is routinely performed and their frequency continues to rise despite the rising cost. Such traditional methods are also instrumentally challenging and must be performed by analytical experts in fully equipped laboratories.

Combinations of immunochemical and electrochemical methods are becoming more attractive today, mainly for their wide accessibility, ease of implementation, lower costs of instrumentation and ability to perform measurements even outside the laboratories.

The advantages of coupling the immunochemical methods of analysis with electrochemical detection using disposable screen-printed sensors and magnetic particles will be demonstrated for the detection of ovarian cancer biomarkers HE4, CA125 and AFP and food allergen ovalbumin.

## Radovan METELKA

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### Research interests

Research interests are focused mainly on modified heterogeneous carbon electrodes, especially carbon paste and screen-printed electrodes, as electrochemical (bio)sensors for food, environmental, and clinical analysis. Scientific interests include also a research on ordered porous metal film electrodes, electroanalysis with silver amalgam electrodes, utilization of carbon-based electrodes in electroanalysis of lipophilic vitamins

or design of miniaturized electrochemical detectors for HPLC of neurotransmitters. Recent research in the field of development of electrochemical immunosensors for detection of various proteins, such as food allergens or ovarian cancer biomarkers, using screen-printed carbon electrodes and quantum dots.

### Selected recent publications

- Sýs M., Jashari G., Švecová B., Arbneshi T., **Metelka R.**, Determination of vitamin K-1 using square wave adsorptive stripping voltammetry at solid glassy carbon electrode, *Journal of Electroanalytical Chemistry*, 821, (2018) 10-15.
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- Smarzewska S., **Metelka R.**, Festinger N., Guziejewski D., Ciesielski W., Comparative Study on Electroanalysis of Fenthion Using Silver Amalgam Film Electrode and Glassy Carbon Electrode Modified with Reduced Graphene Oxide, *Electroanalysis*, 29, (2017) 1154-1160.
- Komendová M., **Metelka R.**, J. Urban, Miniaturized Biamperometric Detectors for Electrochemical Detection in Flowing Streams, *Electroanalysis*, 29, (2017) 1670-1673.
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- Sýs M., Švecová B., Švancara I., **Metelka R.**, Determination of vitamin E in margarines and edible oils using square wave anodic

## Food Safety and Healthy Living – Book of Abstracts

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- Dal Borgo S., Sopha Hl., Smarzewska S., Hocevar S., Švancara I., **Metelka R.**, Macroporous Bismuth Film Screen-Printed Carbon Electrode for Simultaneous Determination of Ni(II) and Co(II), *Electroanalysis*, 27, (2015) 209-216.
- Tyszczyk-Rotko K., **Metelka R.**, Vytřas K., Barczak M., Lead Film Electrode Prepared with the Use of a Reversibly Deposited Mediator Metal in Adsorptive Stripping Voltammetry of Nickel, *Electroanalysis*, 26, (2014) 2049-2056.
- Smarzewska S., **Metelka R.**, Guziejewski D., Skowron M., Skrzypek S., Brycht M., Ciesielski W., Voltammetric behaviour and quantitative determination of pesticide iminoctadine, *Analytical Methods*, 6, (2014) 1884-1889.
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## C13 Microbiome and health status

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The microbial communities, also known as microbiome or microbiota, colonizing the human body are diverse and highly personal. The composition and function of the microbiota play important roles in human health and disease. It is demonstrated that factors such as diet, genotype of the host, and environment influence the adult microbiome.

The microbiome plays a major role in many metabolic, endocrine and immunological functions helping us maintaining a normal health status. Some human gut microorganisms benefit the host by fermenting dietary fibre into short-chain fatty acids, play a role in synthesizing vitamin B and vitamin K as well as in metabolizing bile acids, sterols, and xenobiotics. It plays an important role in the regulation of several biochemical and physiological mechanisms through the production of metabolites and substances, including modulation of glucose and lipid homeostasis, regulation of satiety, production of energy and vitamins. The microbiota also has important anti-carcinogenic and anti-inflammatory actions, modulating immune responses. So the question whether the increased incidence of allergies, asthma,

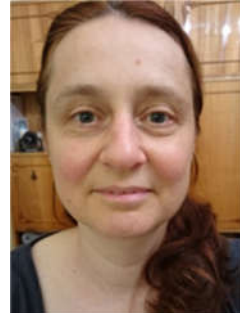
some autoimmune diseases, cardiovascular disease, and others might relate to intake of unhealthy foods, and the decreased intake of dietary fiber, emerges.

The diversity and composition of normal microbiota are dynamics, depending not only on the host physical status, genotype and immune phenotype, but also on the environmental factors like diet, antibiotic usage and lifestyle behaviours. These environmental factors may adversely alter the ecosystem producing dysbiosis that is frequently associated with increased susceptibility to infections as well as to chronic, hard manageable diseases like obesity, metabolic syndromes as diabetes and cardiovascular diseases, allergies and other inflammatory diseases.

Targeted nutritional interventions using non-digestible carbohydrates with prebiotic properties and stimulating the consumption of probiotic foods containing beneficial live microbiota may be the answer to have a normal microbiota and a proper health status. Also new therapeutic goals as fecal microbiota transplantation, from healthy individuals, and the possibility of using advanced microbiota engineering technologies to create smart bacteria for use in diagnosis, prevention, prediction and treatment of obesity, metabolic syndrome, other metabolic diseases, inflammatory diseases and possibly of some gastrointestinal cancers, are next fields of research. The microbiome-based therapeutics together with personalized medicine may be the most accurate and optimal strategy for the future treatment of different diseases.

## Elena Madalina PETRAN

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### Research interests

Understanding how biochemical mechanisms work in normal and ill children is main goal in managing normal development, using alternative therapies and also studying toxicological and metabolic implications in drugs and food safety.

### Selected publications

- Dascultu D; **Petran M E.**, Epidemiology of acute metformin poisoning in children: a 5 year study, Clinical Toxicology Volume: 56 Issue: 6 Pages: 519-520 Meeting Abstract: 146 Published: 2018

## Food Safety and Healthy Living – Book of Abstracts

- Iosif L.; Gaman L. E.; Gilca, M.; **Petran M.** et al., Flavonoids are preserving phenolic acids in vegetable oils under microwave heating, Proceedings Of The Nutrition Society Volume: 75 Issue: OCE 2 Pages: E56-E56 Published: JAN 2016
- **Petran E. M.**; Stanca S; Ulmeanu C, Severe acute poisoning in children: A 5-year retrospective study, E.Clinical Toxicology Volume: 53 Issue: 4 Pages: 293-293 Meeting Abstract: 126 Published: MAY 2015

## **C14 Determination of the contamination degree with aluminium in milk formula for prematures**

**M.A. MOGA, N. BIGIU, D. PANAIT**

*Faculty of Medicine, Transilvania University of Brasov, Romania*

Aluminium toxicity is very well documented in infants particularly due to the neurotoxicity of this heavy metal. Neonates and especially preterm babies are at risk of developing aluminium toxicity due to their immature gastrointestinal and renal tracts. The wide variety of infant formulas available today makes it important to be able to identify those potentially harmful to human health.

The aluminium role in developing of different pathologies is known and studied since 1973 when a clear connection was made to Alzheimer's disease; since then this heavy metal deserves to be studied exhaustively as it tends to be surrounding us at all levels.

The aim of this study is to investigate scientific reports on different infant formulas and to identify the type of product with the highest aluminium content. Identification of probable sources of aluminium contamination are also studied as it is well known that this element can migrate from packaging materials. The level of aluminium in human milk is important to be compared to the one in different infant formulas taking into account the daily

intake of product. Our study identified in the scientific literature that premature and soy-based formulas are having the highest content of aluminium. Current available scientific literature reveals that most of the examined samples reconstituted from milk powder contain aluminium levels above the permissible limit.

The study of daily aluminium ingestion is important to be realized after strict usage of manufacturer's guidelines for formula consumption.

## Marius Alexandru MOGA

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## **Research Interests**

Main research interests cover all aspects on Obstetrics-Gynecology area, in the topics of biology, fetal development, associated pregnancy-pathology and management of gynecological disease. The research area was extended, studying the mechanisms of action of natural compounds and how these substances could improve the symptoms of certain pathologies, how can be used for prophylactic purposes, both in benign and malignant pathologies. I also focus on a conceptual approach between overlapping and potential synergies of integrative medicine and preventive medicine, being a direction of development of medicine in the present era.

## **Publications**

- ISI articles: 31 ISI papers, 23 as main author
- BDI articles: 42
- Papers in conferences: 76 – national and international

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### Research Interests

Main research interests are on the biochemistry area, in the topics of antioxidants, neurobiology, heavy metals neurotoxicity and general toxicity, anthropology and gynecology. Determining antioxidant properties of different biological fluids is the most important area of intervention as most of pathologies tend to bring this type of alterations to the human body.

### Selected Publications

- **Panait D.**, Jufa A., Florioan L., Pascu A., Badea M.. Microwave emit electromagnetic field: study of radiation leakage. Journal of Medicine and Life Vol. 10, Special Issue second edition, 2017 <http://www.healthfoodenviron.unitbv.ro/2017/program/>
- **Panait D.**, Maxim A., Martinescu C., Maier A., Bigiu N.. The evaluation of the incidence and characteristics of IUGR in the clinical hospital of



## Food Safety and Healthy Living – Book of Abstracts

obstetrics and gynecology between 2010–2014. Journal of Medicine and Life Vol. 10, Special Issue second edition, 2017

- **Panait D.**, Bigiu N., Martinescu C., Moga M., Pseudocholinesterase decrease following exposure to insecticides in a rural area cohort of Brasov county. - Bulletin of the Transilvania University of Brasov-Series VI : Medical Sciences, Vol 10(59). No 1 ;2017- trimis spre publicare
- **Panait D.**, Dima L., Coman Gh., Rogozea L., Badea M.. Studiul nivelului de cunoștințe privind vitamina C la studenți ai Facultății de Medicină, Jurnal Medical Brasovean, nr 1:37-42, 2017
- Barbat O.A., **Panait D.**, Martinescu C., Rogozea L., Badea M.. Quality of life in dialysis patients-Brasov, 2016. Jurnal Medical Brasovean, nr 1:57-60, 2017
- **Panait D.**, Bigiu N., Martinescu C., Arvatescu C., Marcu V., Moga M.. The evolution of premature birth rate depending on socio-economic factors in Brasov county. Balkan Medical Union, vol 52, no 3, 249-253, 2017

## **C15 Bioactive compounds of green tea and prospects of their utilization in food and pharmaceutical industries**

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Tea contains a unique composition of biologically active substances. Green varieties contain unfermented flavonoids, black grades contain more complex polyphenols. The biological activity of the first is higher, but also black tea is extremely useful for the body. It is known that tea contains pectic substances, sugars, alcohols, acids (succinic, citric, lactic), amino acids, purine derivatives (caffeine, guanine, adenine, theophyllin, theobromine), pigments, phenolic compounds, vitamins, enzymes, mineral and aromatic substances, proteins, cellulose, starch, fat-soluble vitamins. Caffeine increases physical and mental performance, relieves fatigue. It also speeds up the process of removing fats, has an easy diuretic effect, and regulates the total metabolism.

The combination of microelements of tea (potassium, phosphorus, iron, manganese, barium, iodine, nickel, boron, copper, etc.) favourably affects many biochemical processes of the body and stimulates metabolism.

L-Theanine is one of the main active ingredients found in green tea, alongside caffeine and tea catechins. Theanine is the main amino acid of tea. It accounts for about 60% of the total amount of tea amino acids. In 1990-s the fermentation process that mimics the natural process in green tea leaves, resulting in a 100% pure L-isomer-theanine was developed. Able to cross the blood–brain barrier, theanine has reported psychoactive properties. Theanine has been studied for its potential ability to reduce mental and physical stress, and improve cognition.

Since ancient times, it has been said that drinking green tea induces relaxation. It was confirmed that besides its effect of giving flavour to green tea, theanine also had a noticeable relaxation effect. Most people in modern times who live especially in urban areas are exposed to many kinds of mental pressures. L-theanine is proven to be effective in promoting the sense of relaxation during the anxiety, fatigue, physical stress, and PMS. It promotes relaxation without sedation to improve the quality of sleep and refreshed awakening.

Theanine would be an effective way of linking food ingredients to make people feel relaxed.

Tea polyphenols demonstrate pronounced antioxidant, antimicrobial effects and have a potential to be used as anti-cariogenic, anti-cancer and anti-obesity agents.

## Mark SHAMTSYAN

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- Member of IAFoST (International Academy of Food Science and Technology)



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Scopus Author ID: 6504732524

## Research Interests

Main researches are in the field of biotechnology of production of biologically active compounds, development of functional food products, and influence of nutrition on health. Biologically active compounds of fungal and bacterial origin, their antioxidant, immune modulative, antitumor, antidiabetic, neuroprotective properties, as well as influence on GUT microbiota and development of functional food products or food supplements based on these compounds.

## Selected publications

- **Shamtsyan M.**, Konusova V., Maksimova Y., Goloshchev A., Panchenko A., Simbirtsev A., Petrishchev N., Denisova N. Immunomodulating and anti-tumor action of extracts of several mushrooms. *Journal of Biotechnology*, 2004. V. 113 (1-3). 77-83.
- **Shamtsyan M.** Bioactive compounds in mushrooms. In *Encyclopedia of Biotechnology in Agriculture and Food*. Edited by D. R. Heldman, D.G. Hoover, M.B. Wheeler. Taylor & Francis, N.Y., 2010. P. 76-81.
- **Shamtsyan M.**, Vorobeychikov E., Konusova V., Simbirtsev A. Immunomodulating properties of higher basidiomycetes mushrooms. *Cytokines and Inflammation*. 2012. Vol. 11. № 1. P. 26–32.
- Zukhurova M., Prosvirina M., Daineko A., Simanenкова A., Petrishchev N., Sonin D., Galagudza M., **Shamtsyan M.**, Juneja L.R., Vlasov T.. L-theanine Administration Results in Neuroprotection and Prevents Glutamate Receptor Agonist-Mediated Injury in the Rat Model of Cerebral Ischemia-Reperfusion. *Phytother Res*. 2013 27(9):1282-1287.

## Food Safety and Healthy Living – Book of Abstracts

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- **Shamtsyan M.** Food legislation and its harmonization in Russia. *Journal of the Science of Food and Agriculture* 2014, 94 (10), 1966–1969.
- **Shamtsyan M.** Potential to develop functional food products from mushroom bioactive compounds. *Journal of Hygienic Engineering and Design*, 2016, Vol. 15, pp. 51-59.
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- Antontceva E., Sorokin S., Krasnikova L., **Shamtsyan M.** Influence of *Pleurotus ostreatus* preparations on fermentation products of lactic acid cultures. *Journal of Hygienic Engineering and Design* V. 22, 2018, p. 47-52

## **C16 Bioactive compounds from mushrooms and prospects of their utilization in food and pharmaceutical industries**

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Mushrooms contain a large variety of biologically active compounds that are still not enough studied (1-3). From prehistoric period mushrooms have been used not only as food, but also for healing purposes. Recently, they start to attract growing interest of scientists and at present some of them are already used as dietary supplements or for fortification of food with functional compounds. Besides well studied immune modulating and anti-tumor properties, mushrooms possess other important effects including antioxidant, anti-hypertensive, anesthetic, cholesterol-lowering, liver protection, anti-obesity, anti-inflammatory, anti-diabetic, antiviral, anti-microbial, antifungal and some others. Mushrooms also can be a source of various surfactants and enzymes, which can be used in food and cosmetic industry.

## Food Safety and Healthy Living – Book of Abstracts

Mushroom beta-glucans have various beneficial effects on human health. Fortification of daily used food products with beta-glucans allows developing new functional products with immune-modulating, anti-diabetic, hypocholesterolic and hypolipidemic effects. Development of functional food products containing beta-glucans can be important and prospective in prevention or treatment of disorders associated with immune system disorders, obesity or metabolic syndrome. Biologically and surface active compounds of mushroom origin have high potential and can find wide utilization in food, and pharmaceuticals.

Enzymes, produced by mushrooms also could have important applications in food, cosmetics and pharmaceutical industries.



## **C17 Plant food supplements with antiinflammatory properties**

**L. DIMA**

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Inammation is dynamic process, the response of the organism to any type of harmful stimuli, either mechanical, toxic or infectious. Acute inflammation is the acute body response, as a mechanism of protection, to injury, starting with leucocytes migration to the site of injury and followed by a cascade of events meant to isolate or destroy the injury and to promote tissue repair through activation of innate immune cells. It involves synthesis of local mediators: early phase mediators responsible for vasodilation and increased vascular permeability (histamine, serotonin and other vasoactive substances), eicosanoids derivates of arachidonic acid pathways (prostaglandins, thromboxane, platelet-activating factor, leukotrienes, 5-HETE, etc) and newly synthesized cytokines, andhesion molecules and others.

The dysregulated inflammation leads to macrophage and T-cells recruitment and activation, with resulting damaging by products: reactive oxygen species (ROS), elastases, metalloproteases, and others. A disproportionate, prolonged response in chronic inflammation has harmful effects on the body,

such as progressive tissue degeneration and fibrosis as it occurs in the vast array of chronic inflammatory disorders (e.g. asthma, arthritis, rhinitis, conjunctivitis, and others). Additionally, inflammatory processes have been linked with many chronic diseases such as cancer, cardiometabolic or neurodegenerative diseases. The current treatment of chronic inflammatory diseases include either steroidal or Nonsteroidal Anti-Inflammatory (NSAI) drugs. Both classes have been associated with many serious adverse reactions on the long term use and their action on the pathogenesis of the disorders is limited. Traditional medicine from various parts of the world utilizes plant formulae for centuries, including for inflammatory diseases. During the last decades, many scientific studies investigated the therapeutic potential of traditionally used medicinal plants and secondary metabolites from plants with proven anti-inflammatory pharmacological effects have been found. This brings hope for new anti-inflammatory drug identification with improved tolerability profile and efficacy on the long term treatment of chronic inflammatory disorders. On the other hand, the use of botanic extracts with anti-inflammatory or antioxidant properties could find their place in the prevention and/or treatment of many other chronic diseases mediated by inflammatory processes.

The most studied plants with anti-inflammatory plants, the pharmacologic mechanism of action of their compounds and the level of evidence concerning their clinical use are summarized.

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### Research interests

Main research interests are on the areas of neuropsychopharmacology and pharmacology of plant compounds. The topics studied include inflammatory processes and oxidative stress in the pathophysiology of psychiatric disorders and / or the adverse effects of psychiatric drugs, mainly the antipsychotics, the anti-inflammatory or antioxidant effects of some active compounds in plants, and the exploration of the

therapeutic potential of active compounds from plants in neuropsychiatric disorders.

Another area of interest, as a teacher of pharmacology and as a member of Education Sub-Committee of the European Association for Clinical Pharmacology and Therapeutics, another area of interest is that of research on education.

### Selected Publications

- Manu P, **Dima L.**, Shulman M, Vancampfort D, De Hert M, Correll CU. *Weight gain and obesity in schizophrenia: epidemiology, pathobiology, and management.* Acta Psychiatr Scand. 2015;132(2):97-108.
- Rask Larsen J, **Dima L.**, Correll CU, Manu P. *The pharmacological management of metabolic syndrome.* Expert Rev Clin Pharmacol. 2018; 31:1-14.
- Garcia-Alvarez A, Egan B, de Klein S, **Dima L.**, Maggi FM, Isoniemi M, Ribas-Barba L, Raats MM, Meissner EM, Badea M, Bruno F, Salmenhaara M, Milà-Villarroel R, Knaze V, Hodgkins C, Marculescu A, Uusitalo L, Restani P, Serra-Majem L. Usage of plant food supplements across six European countries: findings from the PlantLIBRA consumer survey. PLoS One. 2014;18;9(3):e92265.
- Restani P, Di Lorenzo C, Garcia-Alvarez A, Badea M, Ceschi A, Egan B, **Dima L.**, Lüde S, Maggi FM, Marculescu A, Milà-Villarroel R, Raats MM, Ribas-Barba L, Uusitalo L, Serra-Majem L. *Adverse Effects of Plant Food Supplements Self-Reported by Consumers in the PlantLIBRA Survey Involving Six European Countries.* PLoS ONE 2016;11(2): e0150089.
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## Food Safety and Healthy Living – Book of Abstracts

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- Teodorescu A, **Dima L.**, Ifteni P, Rogozea LM. *Clozapine for Treatment-Refractory Behavioral Disturbance in Dementia*. American Journal of Therapeutics 2018;25(3):e320-e325.
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- Dell’Agli M, Di Lorenzo C, Badea M, Sangiovanni E, **Dima L**, Bosisio E, Restani P. *Plant Food Supplements with Anti-Inflammatory Properties: A Systematic Review (I)*. Critical Reviews in Food Science and Nutrition 2013;53(4):403-13.
- Di Lorenzo C, Dell’Agli M, Badea M, **Dima L**, Colombo E, Sangiovanni E, Restani P, Bosisio E. *Plant Food Supplements with Anti-Inflammatory Properties: A Systematic Review (II)*. Critical Reviews in Food Science and Nutrition 2013; 53(5): 507-516.

## **C18 Influence of light emitting diodes (LEDs) on postharvest physiology of fruit and vegetables**

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Light-emitting diode (LED) technology is growing rapidly nowadays; beside other uses it is linked with controlled-environment agriculture. LED can be used to make the vegetables grow more efficiently in greenhouse plant production systems. LED application in agriculture and food industry is highly suitable due to its unique properties such as: low radiant heat, emissions; high emissions of monochromatic light; electrical, luminous, and photon efficiency and long life expectancy. It offers easy and accurate spectral composition of emitted light with positive effects on yield, storability and nutritional quality.

Physiological effects produced by LED lighting were first studied in greenhouse technology to increase yield, phytochemical content, nutritional value, flowering control and transplant success. Beside pre-harvest applications, recent post-harvest studies show that LED with selected wavelengths prolong storage life, increase content of some bioactive compounds and consequently antioxidative potential. Having in mind phenolic compounds, LED irradiation of fruits prevents degreening of

broccoli, induces accumulation of anthocyanidins in tomatoes and cherries, increases the content of total phenols and ascorbic acid in cabbage, increases chlorophyll content in zucchini squash and increases total phenolic content in apple skin and tomato among others. This postharvest effect of LED irradiation depends on genotype, i.e. some varieties show strong response the other varieties show negligible response. Response to LED irradiation depends on storage longevity, the most responsive are in the period of harvest then the responsiveness declines with storage.

According to literature data, LED technology presents a worthy means to modulate fruit and vegetable physiological processes for pre- and post-harvest treatments.

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## Research interests

Research interests include postharvest physiology of fruits and vegetables and technology of plant derived fats. Regarding postharvest physiology of fruits and vegetables he is focusing on postharvest LED irradiation of fruits and vegetables with the aim to prolong the storage life and improve nutritional quality of apples, cherries and some vegetable. He is also studying the influence of physical treatments (hot water dipping) on fruits. In the field of fat technology he is involved in the project 'The content of trans fats in foods and population intakes - public health implications'.

## Selected Publications

- Mahne Opatič, A, Nečemer, M, Lojen, S, **Vidrih, R**. Stable isotope ratio and elemental composition parameters in combination with discriminant analysis classification model to assign country of origin to commercial vegetables: a preliminary study. *Food control*, ISSN 0956-7135. [Print ed.], Oct. 2017, vol. 80, p. 252-258,
- Zlatič, E, Pichler, A, Lončarić, A, **Vidrih, R**, Požrl, T, Hribar, J, Piližota, V, Kopjar, M. Volatile compounds of freeze-dried sour cherry puree affected by the addition of sugars. *International journal of food properties*, ISSN 1094-2912, 2017, vol. 20, iss. , [v tisku, p. 1-8],
- Bosiljkov, T, Dujmić, F, Cvjetko, M., Hribar, J, **Vidrih, R**, Brnčić, M, Zlatič, E, Radojčić Redovnikovič, I, Jokič, S. Natural deep eutectic solvents and ultrasound-assisted extraction: green approaches for extraction of wine lees anthocyanins. *Food and bioproducts processing*, ISSN 0960-3085, 2017, vol. 102, p. 195-203,



## Food Safety and Healthy Living – Book of Abstracts

- Jatoi, Ma, Jurič, S, Vidrih, R, Vincekovič, M, Vukovič, M, Jemrič, T. The effects of postharvest application of lecithin to improve storage potential and quality of fresh goji (*Lycium barbarum* L.) berries. *Food chemistry*, ISSN 0308-8146. [Print ed.], 2017, vol. 230,
- KOKALJ, Doris, HRIBAR, Janez, CIGIČ, Blaž, ZLATIČ, Emil, DEMŠAR, Lea, SINKOVIČ, Lovro, ŠIRCELJ, Helena, BIZJAK, Grega, VIDRIH, Rajko. Influence of yellow light-emitting diodes at 590 nm on storage of apple, tomato and bell pepper fruit. *Food technology and biotechnology*, 2016, vol. 54, no. 2, p. 228-235,
- SINKOVIČ, Lovro, VIDRIH, Rajko, ABRAM, Veronika, ŽNIDARČIČ, Dragan, GRDIŠA, Martina, TREUTTER, Dieter. Leaf phenolic fingerprints of chicory cultivars (*Cichorium intybus* L.) hydroponically forced in different nutrient solutions. *Lebensmittel-Wissenschaft + Technologie*, ISSN 0023-6438, 2016, vol. 74, p. 346-352

## **C19 Physico-chemical and sensory analysis in food quality control: a case of honey**

**M. KOROŠEC**

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Food products on the market need to be safe and quality. The quality of food has many aspects and it is perceived differently on individual basis, as well as between consumers and producers.

Legal norms defining the quality of the product on the market will be presented on the case of honey with focus on physico-chemical and sensory analyses for verification of compliance to these norms.

Legally set quality norms for honey will be discussed in the view of authenticity testing and sensory acceptability of this product.

## Mojca KOROŠEC

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### Research Interests

Main research interests are on the Food science area in relation to human nutrition. Choices of safe, quality and sensory acceptable foods are basis for everyday diets. In order these diets are nutritionally balanced, information on nutrients comprised in

foods is fundamental. Development and compilation of national food composition databases helps in nutrition policy decisions and enables dietary planning and evaluation on daily basis. A special focus on characterization of national foods in my research is given to honey, a traditional food product with diverse sensory characteristics, health beneficial components, and at high risk of adulteration.

### Selected Publications

- Bertoncej, J., Polak, T., Pucihar, T., Lilek, N., Kandolf Borovšak, A., **Korošec, M.** Carbohydrate composition of Slovenian bee pollens. *International journal of food science & technology*, 2018, vol. 53: 1880-1888.
- Kandolf Borovšak, A., Ogrinc, N., Lilek, N., **Korošec, M.** Feeding honey-bee colonies (*Apis mellifera carnica* Poll.) and detection of honey adulteration. *Acta alimentaria: an International Journal of Food Science*, 2017, vol. 46/2: 127-136.
- Kropf, U., Stibilj, V., Jačimovič, R., Bertoncej, J., Golob, T., **Korošec, M.** Elemental composition of different Slovenian honeys using k0-instrumental neutron activation analysis. *Journal of AOAC International*, 2017, vol. 100/4: 871-880.
- **Korošec, M.**, Golob, T., Bertoncej, J., Stibilj, V., Koroušič-Seljak, B. The Slovenian food composition database. *Food chemistry*, 2013, vol. 140/3: 495-499.
- Bertoncej, J., Golob, T., Kropf, U., **Korošec, M.** Characterisation of Slovenian honeys on the basis of sensory and physicochemical analysis with a chemometric approach. *International journal of food science & technology*, 2011, vol. 46: 1661-1671.

## Food Safety and Healthy Living – Book of Abstracts

- Pograjc, L., Stibilj, V., Ščančar, J., **Korošec, M.** Determination of macronutrients and some essential elements in the Slovene military diet. *Food chemistry*, 2010, vol. 122: 1235-1240.
- **Korošec, M.**, Bertoneclj, J., Pereyra Gonzales, A., Kropf, U., Golob, U., Golob, T. Monosaccharides and oligosaccharides in four types of Slovenian honey. *Acta alimentaria: an International Journal of Food Science*, 2009, vol. 38/4: 459-469.

## **C20 Innovative solutions for dairy free milk processing**

**C. POPOVICI**

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Dairy-free milks are finding an audience in Europe, despite consumption still ranking well below the US. The market has increasingly benefited in recent years from the perceived health and taste benefits of non-dairy products. Nut/cereal milk is an useful beverage for patients with lactose intolerance, celiac disease, as well as vegans. In addition, nut/cereal milk is a source of amino acids, vitamins and minerals complex.

Current presentation was devoted to study different types of vegetable milk, walnut milk in particular as well as its biochemical and physico-chemical properties. In this course as components for obtaining experimental samples of vegetable milk walnuts were proposed. The technology of walnut milk includes following main steps: primary walnut preparation, extraction procedure and homogenization.

Standard methods of analysis have been applied for evaluation of walnut milk chemical composition, basic quality properties as well as microstructure and rheological behaviour.

## Food Safety and Healthy Living – Book of Abstracts

Presentation gives a detailed analysis of the fatty acid composition of the product by GC-chromatography. The highest content is in the mono- and polyunsaturated fatty acids, namely the linoleic, linolenic and arachidonic acids, which are of great nutritive and biological value. Analysis of walnut milk microstructure shows that dimensions of oil drops in walnut milk are distributed in normal mode, the major part of oil volume is formed by drops with an average diameter of 2.70 microns. Presentation shows high potential and positive view on walnut milk production, in agreement with the current demand of healthy products.

### Cristina POPOVICI

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## Research interests

Main research interests are focused on following topics: food fortification with calcium and iodine (in vitro and in vivo studies), advanced extraction methods (supercritical CO<sub>2</sub>, solid/liquid) of bioactive compounds from agrofood sources/wastes; antioxidant profile and quality characteristics evaluation; nut milk processing and characterization; vegetable oil processing and stabilization; development of fermented dairy products from goat milk with functional properties.

## Selected publications

- Saykova I, Tylkowsky B, **Popovici C.** Extraction of phenolic and flavonoid compounds from solid wastes of grape seed oil production by cold pressing. *J Chem Tech and Metallurgy* 2018; 2 (53): 177-190.
- **Popovici C.**, Alexe P. The influence of natural and synthetic antioxidants on the oxidation stability of heat treated walnut oil (*Juglans regia* L.). *Modern technologies in food industry* 2014; 261-267.
- **Popovici C.** Soxhlet extraction and characterisation of natural compounds from walnut (*Juglans regia* L.) by-products. *Ukrainian Food J* 2013; 2 (3): 328 - 336.
- **Popovici C.** Mija N, Birca A, Iatco I. Compliance with labeling legislation of the Republic of Moldova in the field of confectionery products. *Acta Universitatis Cibiniensis. Series E: Food Technology* 2013; 17 (2): 61–67.
- **Popovici C.** Saykova I, Tylkowsky B. Evaluation de l'activité antioxydant des composés phénoliques par la réactivité avec le radical libre DPPH. *Revue électronique internationale pour la science et la technologie* 2009; 4 : 26 – 39.



## Food Safety and Healthy Living – Book of Abstracts

- **Popovici C.** The influence of natural antioxidants on the oxidative stability of iodine – fortified sunflower oil in the process of storage. Surface Engineering and Applied Electrochemistry 2008; 44 (5): 415-421.
- Sturza R, Deseatnicova O, **Popovici C.**, Gudumac V, Nastas I. Influence of iodinated oil and margarine on the thyroid system of rats. Chemistry Journal of Moldova. General, industrial and ecological chemistry 2008; 3 (1): 77 – 84.

## **C21 Dietary influence on saliva and enamel integrity in patients with orthodontic appliances**

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Orthodontic treatment and diet have a strong influence on each other. Nutrition and its indispensable role in orthodontic treatment has been neglected, as is evident from the few data in existing in the literature. The literature reports that orthodontic treatment induces changes in the oral environment by increasing the number of retentive surfaces for plaque, augmenting the bacterial levels of *Streptococcus mutans* (SM) and *Lactobacillus*; these modify the patient's salivary characteristics, for example, pH, buffer capacity, and salivary flow. Understanding how fixed orthodontic appliance treatment affects local saliva secretion could provide insight on possible contributions of salivary changes to the enamel integrity.

Orthodontic treatment particularities

The orthodontic treatment can correct orofacial anomalies, which can influence the patient's physique, wellbeing and social integration. The orthodontic treatment purpose is to move teeth as efficiently as possible with minimal adverse effects for teeth and the supporting tissue. There is little agreement on

the expected duration of an orthodontic treatment; however, a consensus appears to have emerged that fixed appliance treatment is too long.

#### Dietary restrictions for orthodontic patients

Orthodontic treatment is a source of physical, physiological and emotional stress that increases the mobilization and use of nutrients, thus increasing the nutritional requirements of the person. During orthodontic treatment it is important to avoid certain foods that can damage orthodontic appliances, braces and wires, which may cause delays in treatment, the main rule being: Nothing heavy, sticky or chewy! A well-balanced diet provides all the essential elements to keep the oral tissues healthy and aid in bone remodelling thus enhancing orthodontic therapy.

#### Oral hygiene for orthodontic patients

Maintaining good oral hygiene is a challenge for patients with fixed orthodontic appliances. The presence of brackets, wires and bands make it particularly difficult to clean thoroughly and as a result it is common for plaque to accumulate on the buccal surface around the base of the bracket.

#### Salivary role during the orthodontic treatment

Saliva is the principal defensive mechanism in the oral cavity and is critical for preserving and maintaining the health of oral tissues. The composition and physical properties of saliva are subject to changes by the local and systemic conditions of an individual. The quality (defined as salivary protein content, viscosity, pH and buffer capacity) and the quantity of saliva (mostly related to flow rate) play a crucial role in the equilibrium

between demineralization and remineralization of enamel in a cariogenic environment. Specific changes, such as increased pH, buffer capacity and flow rate, may contribute to decreased susceptibility to dental caries.

#### Orthodontic treatment and enamel integrity

During orthodontic treatment, loss of enamel or topographic changes comprising cracks, scarring and scratches may occur. Common complications encountered during orthodontic treatment include the demineralization of enamel and formation of white spot lesions due to the accumulation of plaque on the fixed orthodontic appliances, together with the discoloration of enamel, or enamel wear due to its contact with the brackets of the opposing teeth.

#### Conclusions

Orthodontic treatment changes the oral environmental factors. Fixed orthodontic appliances inevitably predispose patients to an increased risk of dental problems. Orthodontic therapy may alter saliva flow and saliva pH, while also changing the oral microbial flora. There is a two-way relationship between nutrition and orthodontic treatment wherein the quality of nutrition affects the pace of orthodontic treatment and the rendering of orthodontic treatment affects the nutritional intake.

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### Research Interests

Dental education, Nutrition in pediatric dentistry and orthodontics, Orthodontics and dento-facial orthopedics, Preventive pediatric dentistry and orthodontics, Pediatric dentistry

## Selected publications

- Raftu Gh, Nicolae C, Kamel E, **Caraiane A**, Socio-environmental factors associated with dental malocclusion, Revista de Chimie, 69(3), 707-709, .  
<http://www.revistadechimie.ro/pdf/37%20RAFTU%203%2018.pdf>
- Caraiane A, **Nicolae C**, Students and clinical teachers perceptions about clinical learning in dental education, 4th International Multidisciplinary Scientific Conferences on Social Sciences and Arts - SGEM2017, 24-30 august2017, Albena, Bulgaria, Conference proceedins, Book 3, Science and Society, Sociology and Healthcare, ISBN 978-619-7408-22-5, pp. 483-490.  
<https://sgemworld.at/ssgemlib/spip.php?article4648>
- **Nicolae C**, Caraiane A, Dental care provided by dental students and the patients satisfaction, 4th International Multidisciplinary Scientific Conferences on Social Sciences and Arts - SGEM2017, 24-30 august2017, Albena, Bulgaria, Conference proceedings, Book 3, Science and Society, Sociology and Healthcare, ISBN 978-619-7408-22-5, pp. 97-104.  
<https://sgemworld.at/ssgemlib/spip.php?article4426>
- Nuca C, Amariei C., Badea V, Zaharia A, Bucur L, (Arendt) Nicole C, Salivary cotinine - biomarker of tobacco consumption in the assessment of passive smoking prevalence, Revista Farmacia 60 (5), 662-674, 2012, ISSN: 0014-8237  
<http://www.revistafarmacia.ro/20105/issue52010art14-660-670.pdf>
- **Nicolae C**, Hîncu M, Amariei C., Scanning electron microscopic observation of morphological modifications produced by Fluorostom on enamel surface, Romanian journal of morphology and embryology 52(4):1255–1259, 2011, ISSN: 1220-0522,  
<http://www.rjme.ro/RJME/resources/files/52041112551259.pdf>

## C22 Phytoceuticals and nutraceuticals in diabetes mellitus

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Diabetes frequency has increased dramatically all over the world last years, possibly being the world's largest growing metabolic disease. It is estimated that the number of diabetes subjects in the world could reach up to 366 million by the year 2030. Several phytoceuticals and nutraceuticals have been shown to target the pathogenesis of diabetes mellitus and to control a number of biochemical and clinical endpoints.

The purpose of the presentation is to discuss the mechanisms, efficacy and safety of various frequently used dietary supplements in diabetes.

Medicinal plants, mainly belonging to the families Leguminoseae, Lamiaceae, Liliaceae, Cucurbitaceae, Asteraceae, Moraceae, Rosaceae and Araliaceae showed antidiabetic potential mediated by various mechanisms: increased insulin sensitivity and secretion, insulin-like effect, cytoprotective, regenerative, or antiapoptotic activity on  $\beta$ -pancreatic cells, decreased glucose absorption, accelerated glucose and lipid oxidation. Antidiabetic activity of these plants seems to be mainly attributed to the

presence of polyphenols, flavonoids, terpenoids, coumarins. Some of these phytochemicals showed more potent insulinomimetic and antidiabetic activity than conventional hypoglycaemic agents. Supplementation with certain vitamins and oligoelements (e.g. vitamin E, chrom, zinc) also showed benefits in diabetes.

The effects of phytoceuticals and nutraceuticals should be further investigated in larger and well-designed trials to better understand their antidiabetic activities and to properly place these complementary therapies in the management of diabetes mellitus.

## Marilena GILCA

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## Research Interests

Main research interests are on the

- Oxidative stress field, in the topics of alterations of antioxidant protection in various diseases (e.g. Alzheimer's disease), therapies (e.g. atypical antipsychotics) and aging process, and
- Medicinal plants, Ethnopharmacology and Complementary medicine fields, in the topics of phytoceutical intervention in various pathologies (e.g. diabetes) and understanding of patterns that shape the ethnomedical knowledge. Recent research includes phytomolecular taste as a potential predictor tool of ethnopharmacological activities, even better than the chemical class of the phytochemicals.

## Selected Publications

- Dragos, D., **Gilca, M.**, 2018. Taste of Phytochemicals: A Better Predictor for Ethnopharmacological Activities of Medicinal Plants Than The Phytochemical Class? *J Ethnopharmacol* 220, 129–146.
- **Gilca, M.**, Barbulescu, A., 2015. Taste of medicinal plants: a potential tool in predicting ethnopharmacological activities? *J. Ethnopharmacol.* 174, 464–73.
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- **Gilca, M.**, Piriou, G., Gaman, L., Delia, C., Iosif, L., Atanasiu, V., Stoian, I., 2014. A study of antioxidant activity in patients with schizophrenia taking atypical antipsychotics. *Psychopharmacol.* 231, 4703–10.

## **C23 Influencing the emotional background of diseases by taste-oriented herbal treatment**

**D. DRAGOS**

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Altered emotions are the background for many diseases, especially for psychosomatic disturbances (such as irritable bowel syndrome, functional dyspepsia, irritable bladder, functional cardiac and respiratory symptoms), but also for pathologic conditions with an important neurohumoral determinism (such as asthma, high blood pressure, peptic ulcer). We performed a statistical study that pointed out several striking associations between psychoemotional issues and medical disorders:

- Preoccupation with basic material/ subsistence-related issues (housing, money) – lower gut conditions;
- Preoccupation with relations generating discontent, indignation – urinary conditions;
- Preoccupation with hierarchical, self-assertion, performance, authority issues (not only in profession/ career) – upper gut (esophageal, gastric, duodenal) conditions;

## Food Safety and Healthy Living – Book of Abstracts

- Passionate involvement in an issue unrelated to the human basic needs (subsistence, relations, self-assertion) – cardiac conditions;
- Frustrated/ disturbed communication with other people – respiratory conditions.

Beside the recognized pharmacological activities, medicinal herbs may also alter emotional states, and thereby positively influence diseases – one of the mechanisms of action may be related to the oral sensations (including taste, thermal and mechanical sensations) imparted by the herbs and the resultant short-acting mitigation or long-acting awareness-based sublimation of the responsible emotions.

## Dorin DRAGOȘ

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## Research Interests

Main research interests are on the psychoemotional background of diseases and on herbal treatment, especially on the psychological effects of the medicinal plants. The term psychocausal phytotherapy (introduced by the author) encapsulates the idea that a given healing herb is able to influence a disease condition both on the pathological level (by its pharmacodynamic effects) and on the psychoemotional level.

## Selected Publications

- „The Critical Role of Psychosomatics in Promoting a New Perspective upon Health and Disease”. Dorin Dragoș, Maria Daniela Tănăsescu. *Journal of Medicine and Life*. vol. II, Nr. 4, pag. 343-349, 2009
- „The Effect of Stress upon the Defense Systems”. Dorin Dragoș, Maria Daniela Tănăsescu. *Journal of Medicine and Life*, vol. III, Nr. 1, pag. 10-18, 2010
- „Stress and Inflammation”. Dorin Dragoș, Maria Daniela Tanasescu. *Revista medicală română – Romanian Medical Journal*. volumul LVIII, nr. 1, pag. 31-36, 2011.
- „Questionnaire about psychology/disease correlation – I”. Dorin Dragoș, Diana Gabriela Ojog, Oana-Madeleine Pănescu, Elena-Claudia Rusu, Maria Daniela Tănăsescu. *Journal of Medicine and Life*, vol. IV, Nr. 1, 2011
- „Psychoemotional Features in Irritable Bowel Syndrome”. Dorin Dragoș, Olivia Ionescu, Diana Gabriela Ojog, Maria Daniela Tănăsescu. *Journal of Medicine and Life*, vol. V, Nr. 4, 2012

## Food Safety and Healthy Living – Book of Abstracts

„Phytomedicine in Joint Disorders“. Dorin Dragos, Marilena Gilca, Laura Gaman, Adelina Vlad, Liviu Iosif, Irina Stoian, Olivera Lupescu. *Nutrients* 2017, 9(1), 70;

"Taste of phytocompounds: A better predictor for ethnopharmacological activities of medicinal plants than the phytochemical class?". Dorin Dragos, Marilena Gilca. *Journal of Ethnopharmacology*. 2018; 220:129-146

## **C24 Particularities of nutrition in the elderly**

**C. DUTA**

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Pharmacy, Bucharest, Romania*

Protein-energy malnutrition is a health concern among elderly. So that, improving nutritional status by increasing energy and protein intake will be benefit for health of the older adults.

Many studies show that nutritional interventions have a positive effect on energy intake and body weight. Dietary counselling combined with oral nutritional supplements is the most effective intervention.

## **C25 Environmental toxicology and chemical food safety**

**O.P. LUZARDO, L.A. HENRÍQUEZ HERNANDEZ**

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The growing dependence of modern society on the chemical industry is constantly threatening the safety of food. There are numerous contaminants that may be present in food and may originate from environmental contamination, such as toxic metals and halogenated organic compounds; chemical products used in the production of food, such as pesticides and veterinary medicines; contaminants formed during the production and cooking of food; contaminants derived from the packaging of food or natural toxins in food.

The Eurobarometer of 2010 investigated the perception of consumers about the risks related to food. Although most of the respondents did not mention spontaneously and generally any specific concern about food-related risks, 19% mentioned chemicals, pesticides and other substances as the main causes of concern. However, when specific questions were raised regarding food safety, up to 72% of respondents were very or very concerned about the presence of pesticides, antibiotics and hormones in meat, or contaminants such as mercury and dioxins.

## Food Safety and Healthy Living – Book of Abstracts

The adverse effects of food exposure to environmental contaminants can be shown in a multitude of ways, being particularly relevant the development toxicity and endocrine disruption, identified to pregnant women (fetuses) and children as the most vulnerable groups. One of the biggest challenges in toxicology today is to predict the risks associated with chemical mixtures. Exposure to contaminants through the diet occurs as a mixture rather than as individual compounds. Therefore, food safety depends to a large extent on the possibilities of predicting the risks of mixtures. The two most frequently used models are the addition of concentration and independent action. The main difference between the two models is the assumption of the mode of action of the chemicals in the mixture. In addition to concentration, it is assumed that chemicals work through a common mode of action and can be considered as dilutions with each other. In the independent action it is assumed that the chemicals act independently through different modes of action and the mixing effect is predicted by the probabilities of response of the individual chemicals. We have investigated the effects of mixtures of food-related chemicals on the secretion of steroids in the human adrenocortical cell line. The results were compared with the predicted effects of the two prediction models. In general, the chemicals acted additively in the secretion of hormones, which could be predicted in both models.

In this lecture we will use the history of the birth and massive use of a fashionable pesticide - glyphosate - as the thread of a story that could be titled from when the act of eating became a dangerous activity, and we present many of the results



of our research group in the evaluation of the risks of the chemical mixtures contained in different food groups on European consumers.

## Octavio Pérez LUZARDO

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### **Brief curricular notes**

Octavio Pérez Luzardo, VMD, PhD, has specialized in Analytical Toxicology with environmental applications, including food safety and risk analysis. He is the manager of the Clinical and

## Food Safety and Healthy Living – Book of Abstracts

Analytical Toxicology Laboratory at the Research Institute of Biomedical and Health Sciences (IUIBS) of Universidad de Las Palmas de Gran Canaria.

He has held various teaching positions for 25 years in the University, and in 2016 he has become Full Professor of Toxicology at the University of Las Palmas de Gran Canaria, with teaching duties in the Faculties of Medicine and Veterinary Medicine of this University, either in pregraduate and postgraduate programs. He is also Secretary of the Department of Clinical Sciences of this University.

He is the author of more than 150 publications with a total of 92 JCR publications (> 50% in Q1 journals) with more than 2500 citations, an H index of 27, and a i10 index of 54. He has written or edited several books or book chapters on topics. During these years he has played a prominent role in the field of environmental toxicology, developing numerous studies aimed at evaluating the presence of environmental contaminants in human, animal or environmental samples and evaluating their effects on living organisms. He is also a specialist in toxicological risk assessment and has developed several analytical methods, which have been fully validated and published in international journals. He has been the leading researcher of several national and European research projects. He is a member several excellence research networks, such as CIBER of Obesity and Nutrition of the Spanish Ministry of Health; European Raptor Biomonitoring Facility of the European Union; and the Human Biomonitoring Programme of the European Union.

**C26 Body burden of toxic metals and rare earth elements in non-smokers, cigarette smokers and electronic cigarette users: a cross-sectional study in Romanian subjects from Brasov**

**L.A. Henríquez Hernandez (1), M. Badea (2), O.P. Luzardo (1)**

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Smoking is considered an important source for inorganic elements, most of them toxic for human health. During the last years, there has been a significant increase in the use of e-cigarettes, although the role of them as source of inorganic elements has not been well established.

A cross-sectional study including a total of 150 subjects from Brasov (Romania), divided into three groups (non-smokers, cigarette smokers and electronic cigarettes smokers) were recruited to disclose the role of smoking on the human exposure to inorganic elements. Concentration of 42 elements, including trace elements, elements in the ATSDR's priority pollutant list and rare earth elements (REE) were measured by ICP-MS in the blood serum of participants.

Cigarette smokers showed the highest levels of copper, molybdenum, zinc, antimony, and strontium. Electronic cigarette

(e-cigarette) users presented the highest concentrations of selenium, silver, and vanadium. Beryllium, europium and lanthanides were detected more frequently among e-cigarette users (20.6%, 23.5%, and 14.7%) than in cigarette smokers (1.7%, 19.0%, and 12.1%, respectively); and the number of detected REE was also higher among e-cigarette users (11.8% of them showed more than 10 different elements). Serum levels of cerium and erbium increased as the duration of the use of e-cigarettes was longer. We have found that smoking is mainly a source of heavy metals while the use of e-cigarettes is a potential source of REE. However, these elements were detected at low concentrations.

## Luis Alberto HENRÍQUEZ HERNÁNDEZ

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### Research interests

Environmental toxicology, persistent organochlorine pollutants, biomonitoring of human populations, level of contamination of food, inorganic elements, electronic waste, legal medicine, abuse drugs, ethanol in medico-legal autopsies, forensic sciences, toxicology.

### Publications years 2017-2018

- Badea M, Luzardo OP, González-Antuña A, Zumbado M, Rogozea L, Floroian L, Alexandrescu D, Moga M, Gaman L, Radoi M, Boada LD, **Henríquez-Hernández LA**. Body burden of toxic metals and rare earth elements in non-smokers, cigarette smokers and electronic cigarette users. *Environ Res*. 2018 Jun 13;166:269-275.
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## Food Safety and Healthy Living – Book of Abstracts

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- **Henríquez-Hernández LA**, Luzardo OP, Boada LD, Carranza C, Pérez Arellano JL, González-Antuña A, Almeida-González M, Barry-Rodríguez C, Zumbado M, Camacho M. Study of the influencing factors of the blood levels of toxic elements in Africans from 16 countries. *Environ Pollut.* 2017 Nov;230:817-828.
- **Henríquez-Hernández LA**, Luzardo OP, Valerón PF, Zumbado M, Serra-Majem L, Camacho M, González-Antuña A, Boada LD. Persistent organic pollutants and risk of diabetes and obesity on healthy adults: Results from a cross-sectional study in Spain. *Sci Total Environ.* 2017 Dec 31;607-608:1096-1102.
- **Henríquez-Hernández LA**, Carretón E, Camacho M, Montoya-Alonso JA, Boada LD, Bernal Martín V, Falcón Cerdón Y, Falcón

## Food Safety and Healthy Living – Book of Abstracts

Cordón S, Zumbado M, Luzardo OP. Potential Role of Pet Cats As a Sentinel Species for Human Exposure to Flame Retardants. *Front Vet Sci*. 2017 May 31;4:79.

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- **Henríquez-Hernández LA**, Montero D, Camacho M, Ginés R, Boada LD, Ramírez Bordón B, Valerón PF, Almeida-González M, Zumbado M, Haroun R, Luzardo OP. Comparative analysis of selected semi-persistent and emerging pollutants in wild-caught fish and aquaculture associated fish using Bogue (Boops boops) as sentinel species. *Sci Total Environ*. 2017 Mar 1;581-582:199-208.
- **Henríquez-Hernández LA**, Carretón E, Camacho M, Montoya-Alonso JA, Boada LD, Valerón PF, Falcón-Cordón Y, Falcón-Cordón S, Almeida-González M, Zumbado M, Luzardo OP. The heartworm (*Dirofilaria immitis*) seems to be able to metabolize organochlorine pesticides and polychlorinated biphenyls: A case-control study in dogs. *Sci Total Environ*. 2017 Jan 1;575:1445-1452.

**C27 From complicated to complexity – the emergence  
of a new paradigm**

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Complexity Science is not a label placed on a collection of methods, theories or patterns. It is a new way to approach Reality. It is a new vision obtained by the integration of the knowledge acquired in studies and researches carried out in the last century under the following names: Topology, Dynamic Nonlinear Systems, Fractal Geometry, Synergy, Theory of Dissipative Systems, Chaos Theory, Catastrophe Theory, Artificial Intelligence and Computational Science.

Complexity Science tries to answer a number of fundamental question:

- How can one study the genesis of a system (emergence, self-expression, self-organization)?
- How can the dynamics and evolution of hierarchical systems (especially the living ones) be reconstructed from the experimental data studies?
- How should sensors be placed (and what type?) to capture essentially the interactions that take place in hierarchical



systems in general and in biological organisms in particular (or in an ecologic niche?

- How can a complex system be objectively assessed when the defining of the border itself is a difficult problem and also the dependence of the system on the cumulated history in its evolution and the particularities of the evolution of the environment?
- How in this context of complexity science can be interpreted the emergence and development of Consciousness, the exponential evolution of the biosphere, of human civilization?

In order to answer the above questions, besides a good theoretical knowledge, it is necessary:

- The adequacy of the experimental context to the new requirements imposed by the study of complex systems (dissipative systems evolving away from the thermodynamic equilibrium);
- Appropriate modification of the measuring and control apparatus and suitability of the experimental protocol in a manner capable of capturing essential aspects of complex systems;
- Training the specialists to be creative in this new conceptual universe.

To have a grasp of this new approach in science we invite you to this short seminar.

## Florin MUNTEANU

- Born on March 27, 1952, in Braşov;
- B.S. - Polytechnic University, 1976.
- Doctorate in Sciences: Industrial Engineering;
- specialized in applied complexity science in engineering, econophysics, geodynamics and environment, as well as policies for integration into education of the informational and communicational technologies.



- Member of the Academy of the Scientists from Romania, Chief Editor of Annals of the Academy of Romanian Scientists (ARS): Series: Earth Sciences.
- Correspondent member of the Academy of Technical Sciences from Romania.
- Chairman of the UNESCO Chair in Geodynamics – Romanian Academy.
- Founding President of the Center for Complexity Studies – UNESCO Center, the main promoter of the complexity science paradigm in Romania.
- Founder of the youth training program for a scientific career in complexity science. NEXUS-T network, developed nationally, includes universities, high schools and secondary schools for

the assurance of the continuity of the educational process, additionally with a special program of cognitive development and initiation, necessary for intuition development and for the abilities of integrating transdisciplinary the information from the surrounding environment.

### **Areas of specialty**

- Consultancy and mentoring for training in the human resources for knowledge based economy (mind building; transformational leadership).
- Designing and production of the technical and conceptual framework for the transfer of knowledge and forming the specific abilities for working in interdisciplinary teams, capable to operate efficiently in a “stormy economy.
- The coordination of the activities for continuous personal development through specific techniques for a continuous learning.