



Transilvania University of Brasov, Romania



University of Medicine and Pharmacy  
"Carol Davila"  
Bucharest, Romania



Università Degli Studi di Milano, Italy



Université de Perpignan Via Domitia, France



## BOOK OF ABSTRACTS

### International Summer School

## FOOD SAFETY AND HEALTHY LIVING

## FSHL – 2021

ONLINE

### Editors

Laura GAMAN  
Mihaela BADEA  
Patrizia RESTANI  
Jean-Louis MARTY

July 4-8, 2021  
Romania

TRANSILVANIA University Press  
ISBN 978-606-19-1374-9

# International Summer School

## FOOD SAFETY AND HEALTHY LIVING

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**Book editing** – Mihaela Badea, Elena Vasilica, Laura Gaman

## FOOD SAFETY AND HEALTHY LIVING

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## C1 „FOOD SAFETY AND HEALTHY LIVING”- A CHALLENGE OF OUR LIFE

Laura GAMAN (1), Mihaela BADEA (2)

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The fourth edition of the International Summer School -**FOOD SAFETY AND HEALTHY LIVING** – FSHL 2021 - brings together academic staff from different countries (Romania, Italy, France, Slovenia, Portugal, Albania, North Macedonia, Moldova, USA), with research interests in the field of nutrition, food control, food safety for a healthy living and other connected fields.

Starting as an objective of the CEEPUS project –“*Food Safety for a Healthy Living*” coordinated by Transilvania University of Brasov, the idea of organizing of an international summer school was continued every year since 2018.

The main coordinators of this event, are “Transilvania” University of Brasov, „Carol Davila” University of Medicine and Pharmacy, Bucharest (Romania), University Degli Study di Milano (Italy) and University of Perpignan via Domitia (France). The sustaining of Synevo Romania, one of the top institutions involved in the clinical laboratory, and PalmSens (The Netherlands) are acknowledged. Romanian Society of Ethnopharmacology is the first-time participant to this event.

The main objective of the summer school FSHL 2021 is to provide multi/trans-disciplinary knowledge on food analysis for safety and healthy life. Topics as dealing with multidisciplinary approaches about water in digital area, novel food - increasing the food characteristics and applications, nutritional guidelines and environmental factors, bioactive compounds in food, laboratory techniques for food safety, food toxicology issues.

The undergraduate and postgraduate (master and PhD) students coming from different universities from Romania (Brasov, Bucharest, Galati, Târgu Mureş), Slovenia (Ljubljana), Italy (Milan), North Macedonia (Bitola), Moldova (Chisinau), Albania (Tirana), Hungay, Lituania will join this summer school with high expectations and with avidity for identifying new approached in the field of healthy nutrition and food safety.

### Elena Laura GAMAN

- PhD (2006) in Pharmacy, „Carol Davila” University of Medicine and Pharmacy Medicine
- Associate Professor, Department of Biochemistry, Faculty of Medicine, „Carol Davila” University of Medicine and Pharmacy Medicine



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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.

### Selected Publications

- **Gaman L**, Dragos D, Vlad A, Robu G C, Radoi M P, Stroica L, Badea M, Gilca M., 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
- Iosif L, **Gaman L**, Crihana I, Kovacs E, Stoian I, Lupescu O 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
- Gilca M, Piri G, **Gaman L**, Delia C, Iosif L, Atanasiu V, Stoian I A study of antioxidant activity in patients with schizophrenia taking atypical antipsychotics. Psychopharmacology, 2014., 231:4703-4710, 2014
- 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

## Mihaela BADEA

- Professor of Biochemistry, Laboratory techniques, Organic chemistry, Analytical chemistry, Methodology of scientific research at Faculty of Medicine, Transilvania University of Brasov, Romania
- PhD (2005) in Chemistry - Babes-Bolyai University of Cluj-Napoca



- Member of the doctoral school from University of Medicine and Pharmacy Carol Davila from Bucharest (Habilitation in Medicine since 2017)
- Member of the Academic Nutritional Science PhD's staff of the University of Milan (Italy) (since 2019).
- Nov. 2019 – Coordinator Research Center for Fundamental Research and Preventive Strategies in Medicine -ICDT UNITBV
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### Research interests

Productive scientific and academic activity, demonstrated by articles and projects in the life sciences, started since his student years and continued through doctoral studies in chemistry, masters in medicine, national and international projects which has led or in which she was a member.

The senior researcher has previous managerial experience in coordinating national grants (CEEX for young researchers) and acting as Romanian coordinator for an international FP7 project (PlantLIBRA - KBBE-2009 -245199), as well as a team member in international projects (funded by Balkan Environmental Associations- B.EN.A. -COSMOTE) and national projects (PNIII–TE–for young research team).

Her background in chemistry and physics (with PhD degree in chemistry since 2005- University Babes-Bolyai from Cluj-Napoca) was updated permanently in the frame of different position (Research Scholar) in USA and fellowships funded by B.EN.A..

She demonstrated high-level results applied in life sciences – environmental monitoring, food control and medicine – author of more than 50 papers in ISI journals, co-

author for one pending patent. She acted as editor and contributor - books in the field of life sciences (medicine, environment, nutrition) with the international scientific teams – Springer, Elsevier, University Press Centre, Pardubice, Czech Republic, LAP Lambert Academic Publishing, Transilvania University of Brasov, American Science Press.

She successfully coordinated conferences and International Scientific Committees - EnvEdu2005, New Trends on Sensing-Monitoring- Telediagnosis for Life Sciences - NT SMT-LS 2020, NT SMT-LS 2018, NT SMT-LS 2017, NT SMT-LS 2015, NT SMT-LS 2014; Healthy Nutrition and Public Health - IC-HNPH 2011; Analytical and Nanoanalytical Methods for Biomedical and Environmental Sciences- ICANMBES 2010, .

Dr Badea was chairing the organisation of International Summer Schools - *Food Safety and Healthy Living* –FSHL 2020, FSHL 2019, FSHL 2018; *Telemonitoring and Telediagnostic for Life Sciences* – TTLS 2013; *Bioanalytical Methods for Life Sciences* – BMLS 2011

### Selected publications

- **Badea M**, Gaman L, Delia C, Ilea A, Leaşu F, Henríquez-Hernández LA, Luzardo OP, Rădoi M, Rogozea L., Trends of lipophilic, antioxidant and hematological parameters associated with conventional and electronic smoking habits in middle-age Romanians., J Clin Med. 2019 May 12;8(5). pii: E665
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## **C2 ETHNOPHARMACOLOGY - SCIENCE TODAY**

**Angela MĂRCULESCU, Liviu GACEU**

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Ethnopharmacology is a young science that has deep roots in the history, culture and tradition of peoples. It locates man in space and time - being a balanced path from tradition to modern science.

In ethnopharmacology it is a true harmonized multidisciplinary spectrum, which actually aims at a noble goal - to move with much respect and much gratitude from the empirical methods of traditional medicine to scientific research.

Finally, the aim is to capitalize on traditional knowledge and practices, through a thorough research of natural active substances (of vegetable, animal or mineral origin) in order to achieve effective and scientifically based natural products (pharmaceuticals, food supplements and cosmetics).

The collaboration between the natural sciences (botany, agronomy, chemistry, biochemistry, pharmacodynamics, pharmacognosy, pharmacology, medicine) and the humanities (ethnology, ethnoiatry, history and linguistics, anthropology) is a key link in ethnopharmacology, in finding the right way to maintain health disease treatment.

As working methods in ethnopharmacology there are 4 distinct stages, namely:

1. Field study (anthropological, historical, natural resources, nutrition, health, etc.),
2. Analysis of information, sorting and proposals for scientific study,
3. Methods of evaluation in the laboratory - physico-chemical study (biologically active substances: extraction, identification, dosing), microbiological and toxicological study, pharmacodynamic and pharmacological study (specific actions).
4. Applications and return to the field - back to the informant with safe products for consumption - by developing traditional pharmacopoeias with scientific input, monographs for plant raw materials, integration of traditional medicine in the health system (making scientifically studied products from traditionally used plants).

Through working methods Ethnopharmacology respects traditional practices being open to scientific innovation in the field of phytomedicine. It is a research path for medicines springing from the culture and tradition of peoples - from traditional medicine, passed down from one generation to another and has proven to be very effective in the modern era.

## Angela MĂRCULESCU

### Actual position

- Professor of Food Biochemistry, Food quality management, Natural resources for food nutrients and food supplements (medicinal and aromatic plants), Methodology of scientific research at Food and Tourism at the „Transilvania” University of Braşov, Romania
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### Education and formations

- PhD (1995) in Biochemistry „Babeş-Bolyai” University of Cluj-Napoca
- Principal scientific researcher of first degree (1993) - Bucharest Institute of Chemical and Pharmaceutical Research and at the Research Station for Medicinal and Aromatic Plants
- 2001 - now: President of the Romanian Society of Ethnopharmacology
- 2002 - now: member of the European Society of Ethnopharmacology
- Director of three training projects for trainers in the field of ethnopharmacology, technologies for the extraction of biologically active substances, food allergens with the Europass Attestation Certificate
- 1995-2018: Coordinator of research programs for bachelor's and master's degrees in the field of biologically active substances in medicinal and aromatic plants
- 1990-2000 head of research laboratory in biochemistry of medicinal plants

### Research interests

- Research with students for bachelor's and master's theses, but also applied research through national or European research contracts in the field of ethnopharmacology and medicinal plants:
  - the quality of food products and nutritional supplements and of raw materials obtained from medicinal and aromatic plants (for the Romanian Traditional Pharmacopoeia);
  - modern technologies for the extraction of biologically active substances from medicinal and aromatic plants;
  - capitalization of the knowledge of traditional medicine and the realization on a scientific basis of food, cosmetic and phytotherapeutic products without risk in use (physico-chemical, microbiological, pharmacodynamic and clinical tests).

### **Important publications**

- Coordinator of the publication Ethnopharmacology - Book of Abstracts published at the Ethnopharmacology Symposiums with international participation ISSN (etnofarma.ro) starting with 2008, 2011, 2013, 2018, 2021;
- Plants in Romanian folk medicine C. Drăgulescu, A. Mărculescu Ed. UNITBV 2020 ISBN;
- Modern technologies for extraction of biologically active products, ULB Sibiu Publishing House, 2006 ISBN;
- Technology of processing and capitalization of medicinal plants Ed. ULBS 2004 ISBN.

### **Patents**

- 34 of which 7 as first author, among which the most important are the following - Patent no. 107996/1992 „Tonic drink ANGELICA” - Lazurca Dumitru, Marculescu Angela, Patent no. 92379-1987 "Volatile camphor oil" Marculescu Angela et al. Patent no. 92380-1987 „Anti-influenza ointment” Marculescu Angela et al., Patent no. 91567-1987 „Process for obtaining an essential oil from Ch. Balsamita L” Marculescu Angela et al.

### **Research projects and patents (extract)**

- Member of UNITBV for the International FP7 project (PlantLIBRA -KBBE-2009 -245199);
- CNCSIS project director CODE 749/2004 Research in order to obtain biologically active plant extracts through modern technologies in order to increase the quality and safety of food at the “Lucian Blaga” University of Sibiu completed 2007;
- Project manager of Romanian Society of Ethnopharmacology nr. 133 / 2006-2008 CEEEX Module III - PROPLANT Promotion of Romanian scientific performances in the field of production and capitalization of medicinal, aromatic and tinctorial plants Project director INMA Bucharest;
- Member of the research team from UNITBV- MEC project -partnerships- no.52-108 / 2008-2012 Advanced integrative processing of accessory forest products BIOFOREPRO - ICAS Project Director Bucharest.

### **C3 BULLYING DURING THE PANDEMIC TIME. ACTIONS TO REDUCE IT**

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The Sars-Cov2 pandemic brought with it not only problems related to lifestyle, adaptability to restrictions, but also led to a more acute perception of abusive behaviors both at work and in education or health systems.

A whole series of researches have analyzed over time the influence of pandemics on human interactions, and the current pandemic is no exception to the accentuation of such behavior.

In the current era, bullying has become more complex, the variant introduced by digital electronic technology being more and more common.

Bullying is a major public health problem that must be analyzed not only in terms of problems induced by economic or social problems, but also in terms of the impact from a medical point of view, respectively on people in some form of education or works in the health system.

However, the pandemic must also give us a lesson on collaboration within structures, so that we can deal with bullying situations.

Discussing this topic is not only a necessity but also the first step in solving this problem, and this must take into account the ethical issues that this issue raises.

#### **Liliana Marcela ROGOZEA**

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- Professor of Bioethics, History of Medicine and Health Promotion
- Department of Fundamental, Prophylactic and Clinical Disciplines
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### Research interests

Ms. Liliana Rogozea, professor, MD, PhD, Vice- rector with public relation. Her teaching and research fields are: counseling in ethics, health promotion, and human behavior.

She has expertise in curriculum development, design of research methods in international project activities (e.g. Tempus S-JEP –12156 –97, Leonardo da Vinci RO/2006/97125/EX), and member of MATRA Project „Reinforcement of the Integrated System of Extramural Mental Health Care Services in Three Counties in Romania” coordinator de: HealthNet-TPO M, September 2006, and in coordination with international co- operations, in conferences organizing.

Other international projects coordinated by prof Rogozea are: “RING – TransferRING Supports for Caregivers” (LLP- LDV-TOI-09-IT-0446), Health Rehabilitation through Physical Exercise (HARPE, Project no. 503202-LLP-1- 2009-1-UK-ERASMUS-ECDSP), Healthy Europe through learning practice (HELP, LEONARDO DA VINCI, 2011-1-GB2-LEO05-05499), “Pervasive development disorders (Autism, Asperger Syndrome, ADHD)” (P\_ASA LLP- LdV/VETPRO/2011/RO/309), Moldova Higher Education Leadership and Management / MHELM 609656-EPP-1-2019-1-MD-EPPKA2-CBHE-SP.

Also she is member of management team of “Equal opportunities for health: action for development” (CUAMM, OCI-NSA ED/2011/239-187). She has several publications abroad as well.

111 paper index in Web of Science (original article, review, editorial material, meeting abstract and proceeding)

She is editor or co-editor of 4 journals and reviewer for few national and international medical journals.

### Selected publications

- Popescu, I. G., Sechel, G., Leășu, F. G., Tântu, M. M., Cotoi, B. V., & **Rogozea, L. M.** (2018). Correlations on the protection of personal data and intellectual property rights in medical research, *Rom J Morphol Embryol*, 59(3), 1001-1005
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## **C4 INSULIN-DEPENDENT GLUCOSE UPTAKE IN MAMMALIAN PROJECTION SENSORY NEURONS - METABOLIC SENSOR OR ENERGY BOOSTER?**

**Tudor Constantin BADEA (1,2), Vladimir V. MUZYKA (1,3)**

(1) Retinal Circuits Development and Genetics Unit, N-NRL/NEI/NIH, Bethesda, MD, USA

(2) ICDT, Faculty of Medicine, Transilvania University of Brasov, Romania

(3) Institute of Cytology and Genetics, Novosibirsk State University, Noveosibirsk, Russia

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In mammalian species, physiological glucose levels and tissue metabolism are regulated through complex neuro-hormonal networks. The most important hormone controlling serum glucose is Insulin, secreted from pancreatic beta-Langerhans cells in response to increased serum glucose. The major targets of Insulin are white fat, skeletal muscle and liver. Insulin enhances Glucose uptake in skeletal muscle and fat cells by triggering a signaling cascade that exposes the Glucose transporter 4 (Glut4) onto the plasma membrane. In contrast, most neurons are not able to increase uptake of Glucose in response to insulin and rely on sufficient serum Glucose supply and other Glucose Transporter (Gluts) to ensure their metabolic energy needs. Recently, expression of Insulin Receptors (Insr) and Glut4 have been documented in subpopulation of neurons, including several hypothalamic areas, and peripheral sensory neurons. It is generally believed that Insr and Glut4 expression in neurons play a regulatory role. We have recently identified Tusc5, a dispanin required for Insulin-dependent Glut4 expression on the plasma-membrane as a molecular target of transcriptional control of Retinal Ganglion Cell type specification. We have generated a conditional knock-in reporter mouse allele for Tusc5, and found that it is expressed in RGCs, Dorsal Root Ganglia, Trigeminal Ganglia, Spiral (acoustic) ganglion, and olfactory receptor neurons. Our finding suggests that subsets of all projection sensory neurons have the capability of regulating glucose uptake in an insulin-dependent manner, with potential consequences for neuronal metabolism, glucose homeostasis and molecular mechanisms of diabetic neuropathies.

## Tudor Constantin BADEA

### Academic training

- **MD**, University “Iuliu Hatieganu”, School of Medicine Cluj-Napoca, Romania 1988-94
- **Internship** Clinical Laboratory, Medical Clinic No.1, School of Medicine Cluj-Napoca, Romania 1994-95
- **Research Fellow**, Department of Pathology, Medical School, University of Maryland at Baltimore 1995-98
- **MA**, Biological Sciences, Columbia University, New York 1998-99
- **PhD**, Biochemistry, Cell and Molecular Biology, School of Medicine, Johns Hopkins University, Baltimore 1999-2004
- **Postdoctoral Fellow**, Howard Hughes Medical Institute, Department of Molecular Biology and Genetics, School of Medicine, Johns Hopkins University, Baltimore, 2004-10



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### Positions held

- **Instructor**, Department of Immunopathology, University “Iuliu Hatieganu”, School of Medicine, Cluj-Napoca, Romania, 1995 - 2000
- **Investigator**, Head of Retinal Circuits Development and Genetics Unit, N-NRL, National Eye Institute, NIH, Bethesda Maryland 2010 – 2021
- **Scientific Researcher II**, Research and Development Institute, Faculty of Medicine, Transilvania University of Brasov, beginning September 2021.

### Research Interests

- Visual circuit development, anatomy, function, pathology and therapeutic opportunities.
- Molecular genetic manipulations in mice. Autoimmune disorders. Tissue repair and regeneration.

### Select Publications related to neuronal circuit analysis

(For a complete publication list, see [https://scholar.google.com/citations?user=enO60\\_gAAAAJ&hl=en](https://scholar.google.com/citations?user=enO60_gAAAAJ&hl=en))

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- **Badea T.C.**, (corresponding author) and Nathans J., (2011) Morphologies of mouse retinal ganglion cells expressing transcription factors Brn3a, Brn3b, and Brn3c: analysis of wild type and mutant cells using genetically-directed sparse labeling. *Vision Res*. 51(2):269-79. Epub 2010 Sep 6.
- **Badea T.C.**, (co-corresponding author) Hua L.Z., Smallwood P.M., Williams J., Rotolo T., Nathans J., (2009) New mouse lines for the analysis of neuronal morphology using CreER(T)/loxP-directed sparse labeling. *PLoS ONE* Nov 16 4(11): e7859.
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## **C5 LEGAL PROBLEMS AND LEGAL SOLUTIONS FOR THE REGULATION OF WATER RESOURCES AS A COMMON GOOD. REGULATION V. PRIVATIZATION**

**Lorenza VIOLINI**

Dipartimento di Diritto Pubblico Italiano e Sovranazionale, Research Center “Innovation for Well-Being and Environment” (I-WE), Università degli Studi di Milano, Milano, Italy

Water as a natural resource can be classified in several ways within legal systems: as a private good, as a common good, and/or as a public good according to the political decisions of power holders.

The lesson deals with all these approaches according to the leading international scholarship, to the relevant treaties, and to national experiences, taking as the main case study the case of Italy where the idea of water as a public good offered the link for a referendum against the privatization of water resources thus opening the doors to more careful use of such resources by the public.

The constitutional framework will be analyzed as well as the approach stemming from the 17 Sustainable Development Goals.

Some foreign examples will be also considered and offered to the discussion to the class.

### **Lorenza VIOLINI**

Lorenza Violini is full professor of Constitutional Law and Global Constitutional Law at the University of Milan.

She is President of the Equal Opportunity Committee of the University of Milan and Member of the CNR Board for Bioethics and Ethics of Research of the National Research Committee.

She is also Scientific Coordinator of the Research Center on INNOVATION FOR WELL-BEING AND ENVIRONMENT.

Lorenza Violini studied law at the University of Siena before obtaining a Diploma in Droit Comparé de l'Environnement from the University of Strasbourg (1980) and a Master of Comparative Law at the University of Illinois at Urbana Champaign, USA (1983).

She has been Fellow at the Albert-Ludwigs University of Freiburg – Germany (1980-1982), Visiting Scholar at the Bethlehem University – Palestine (2006)

and since 2011 she is a permanent Fellow of the Center for Ethics and Culture at the University of Notre Dame - Indiana, USA. From 1984 to 2002 she has worked at the University of Pavia.

Her research interests range from Italian constitutional law (regional law and federalism), equality and fundamental rights in comparative perspective, law/science and technology studies, sustainability and European constitutional law.

## C6 BIG DATA ANALYSIS AND LAND MONITORING FOR ONE HEALTH APPROACH

**Caterina AM La PORTA**

Dept. Environmental Science and Policy, Center for Complexity & Biosystems (CC&B),  
Research Center “Innovation for Well-Being and Environment” (I-WE), Università degli Studi  
di Milano, Milano, Italy

The “One Health” approach wants to design research in a multidisciplinary way where multiple sectors can communicate and work together to achieve better public health outcomes. In the effort to monitor critical aspects of the land such as the water pollutants to understand if they might affect the health of the population, I will discuss the use of digital technologies for health. In particular, I will report on our recent analysis of the contaminants present in rivers and groundwater in Lombardy. The goal will be to discuss with the audience the perspectives and the public health fallout of artificial intelligence and big data.

### **Caterina A. M. LA PORTA**

- Professor of general pathology group leader of Oncolab ([www.oncolab.unimi.it](http://www.oncolab.unimi.it))
- Co-founder of the Center for Complexity and Biosystems at the University of Milan ([www.complexitybiosystems.it](http://www.complexitybiosystems.it)) in 2015 with expertise in cancer plasticity and digital health.



She spent considerable time abroad collaborating with many international universities and research institutes including MIT, Cornell University, the Weizmann Institute of Science and LMU In Germany where she is currently visiting professor.

In 2017, she was named among the “100 experts” the top women scientists in Italy. In 2018, she co-founded the spinoff and startup Complexdata who launched ARIADNE an innovative platform which uses artificial intelligence to predict the aggressiveness of triple negative breast cancer ([www.ariadne.it](http://www.ariadne.it)).

Her group studied for many years tumour plasticity showing that the phenotypic switching is a tightly regulated process and miRNA222 is an important target to control the plasticity of human melanoma cells.

## **C7 ATMOSPHERIC NITROGEN WET-DEPOSITIONS: MONITORING OF THE INFILTRATION AND DISTRIBUTION PROCESSES IN SOILS**

**Stefania STEVENAZZI (1), Corrado CAMERA (1,2), Marco MASETTI (1,2), Roberto S. AZZONI (1), Elena S. FERRARI (1), Massimo TIEPOLO (1)**

(1) Dipartimento di Scienze della Terra "A. Desio", Università degli Studi di Milano, Milan, Italy

(2) CRC "Innovation for well-being and environment", Università degli Studi di Milano, Milan, Italy

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Nutrients that fall on the ground from the atmosphere represent a minor component of the total nitrogen (N) input to soils, especially when compared to agricultural, civil and industrial inputs (i.e., sewage treatment plants or sewage systems, fertilizer and manure applications). However, the atmosphere can be a significant source of nutrients that may even lead to an excess of nutrients with respect to the critical loads sustainable by ecosystems and affect natural background values of contaminants in subsurface environments (i.e., groundwater) in non-pristine areas.

A monitoring experiment was set up to collect wet atmospheric depositions in a human impacted area with multiple land uses, representing different emission sources (i.e., extended urban areas with residential buildings and industrial activities, high traffic roads and agricultural activities). Wet deposition is measured at 17 sites, homogeneously distributed in the western sector of Lombardy Region (northern Italy), in the surroundings of Milan. Rainwater collection was executed from February 2017 to February 2019. After collection, samples were analysed for pH, electric conductivity, ammonium, nitrate, nitrite, major cations (calcium, magnesium, sodium, potassium), and major anions (sulphate, chloride, fluoride).

Results show a direct relationship between high levels of air pollutants (e.g., nitrogen dioxide, sulphur dioxide, ammonia) and relatively high contaminant concentrations (e.g., nitrate, sulphate, ammonium) in rainwater samples. Considering both the variability of the spatial and temporal distributions of precipitation and the variability of concentrations of nitrogen compounds in rainwaters, over the study area the total amount of nitrogen depositions can range between 20 and 30 kg/ha·yr.

As leaching of nitrogen compounds from soils generally increases at nitrogen deposition rates higher than about 10 kg/ha·yr, this work suggests that the nitrogen atmospheric input to soils could not be neglected when evaluating the impacts of nitrogen sources to terrestrial and aquatic ecosystems, as well as to groundwater resources. To

improve the understanding of water and nitrogen redistribution in the soil top layer, an instrumented field site has been set up in a well field of the public manager of the water service of the Province of Milan, 20 km east from the City of Milan. This study highlights the need of wisely integrating air, soil and water policies for the planning and the management of equitable and sustainable cities.

### Corrado CAMERA

- PhD in Earth Sciences, Università degli Studi di Milano (2012)
- Post-doctoral fellowship, Energy Environment and Water Research Center, The Cyprus Institute (2012-2015)
- Associate Research Scientist, Energy Environment and Water Research Center, The Cyprus Institute (2015-2017)
- Assistant Professor, Dipartimento di Scienze della Terra "A. Desio", Università degli Studi di Milano (2017 to date)
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### Research Interests

- Infiltration processes monitoring and vadose zone hydrogeology
- Landslide susceptibility and climate
- Coupled atmospheric-hydrologic modelling
- Soil erosion monitoring
- Digital soil mapping
- Terraced slopes

### Selected publications

- De Filippis, G., Stevenazzi, S., **Camera, C.**, Pedretti, D., Masetti, M., 2020. An agile and parsimonious approach to data management in groundwater science using open-source resources. *Hydrogeol. J.*, online first. DOI: 10.1007/s10040-020-02176-0.
- Stevenazzi, S., **Camera, C.**, Masetti, M., Azzoni, R.S., Ferrari, S.E., Tiepolo, M., 2020. Atmospheric nitrogen depositions in a highly human impacted area. *Water Air Soil Pollut.* 231, 276. DOI: 10.1007/s11270-020-04613-y.

- Citrini, A., **Camera, C.**, Beretta, G.P., 2020. Nossana Spring (Northern Italy) under Climate Change: Projections of Future Discharge Rates and Water Availability. *Water* 12, 387. DOI: 10.3390/w12020387.
- Eliades, M., Bruggeman, A., Lubczynski, M.W., Christou, A., **Camera, C.**, Djuma, H., 2018. The water balance components of Mediterranean pine trees on a steep mountain slope during two hydrologically contrasting years. *J. Hydrol.* 562, 712-724 DOI: 10.1016/j.jhydrol.2018.05.048.
- **Camera, C.**, Masetti, M., Apuani, T., 2012. Rainfall, infiltration, and groundwater flow in a terraced slope of Valtellina (Northern Italy): Field data and modelling. *Env. Earth Sci.* 65, 1191-1202. DOI: 10.1007/s12665-011-1367-3.

## **C8 XENOBIOTICS IN WATER: THEIR EFFECT ON ANIMAL AND HUMAN WELLBEING**

**P. RESTANI<sup>1,2</sup>, F. COLOMBO<sup>1</sup>, S. BIELLA<sup>1</sup>, C. BANI<sup>1</sup>,  
C. DI LORENZO<sup>1</sup>**

<sup>1</sup> Università degli Studi di Milano, Department of Pharmacological and Biomolecular Sciences, via Balzaretti 9, 20133 Milan, Italy

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Water is an indispensable resource for the survival and well-being of living organisms. Water safety can be compromised due to several problems: from the pathogenic microorganisms to natural or industrial contaminants. The first problem concerns the microbiological contamination of water, be it drinkable or superficial. The presence of microorganisms in water is a very important risk for the population.

The presence of chemical contaminants in the water is in some cases difficult to avoid, as in the case of the presence in the soil of a high concentration of metals (arsenic, fluoride). In other cases of the presence of heavy metals can derive from both natural sources and industrial waste. In this case, the most significant metal is mercury.

Water contamination can occur in any part of the planet, but it is evident that the greatest consequences occur in underdeveloped areas, where environmental regulations are less restrictive and the ability to restore water quality is limited.

Many international centres study water contamination and seek solutions; first of all, they need analytical data, normally provided by governments.

From the analytical data, toxicologists draw conclusions on the risk that these contaminants can bring to animal and human health. In fact, contaminants can enter the food chain and lead to toxic events in both animals and humans.

In the presentation some real cases will be presented, with identification of the cause of a possible risk, which will be followed by an estimate of the possible negative consequences on animals and humans.

WHO. Chemical safety of drinking-water. Assessing priorities for risk assessment. [https://apps.who.int/iris/bitstream/handle/10665/43285/9789241546768\\_eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/43285/9789241546768_eng.pdf)

## Patrizia RESTANI

- Doctor in Pharmaceutical Chemistry and Technology (CTF) with the highest honors, at the Università degli Studi di Milano, Italy
- Post-graduation in Toxicology with the highest honors, at the Università degli Studi di Milano, Italy.
- Dept. Pharmacological and Biomolecular Sciences, Università degli Studi di Milano
- Via Balzaretti 9; 20133 Milano, Italy



### CAREER HISTORY:

- 1977-81 Fellowship at the Faculty of Agronomy, Università degli Studi di Milano
- 1981-83 Assistant Professor in Biochemistry at the Faculty of Agronomy, Università degli Studi di Milano.
- 1984-2001 Assistant professor in Biochemistry at the Faculty of Pharmacy, Università degli Studi di Milano.
- 2001 Associate Professor in Food Chemistry, Università degli Studi di Milano.
- 2012-2017 President of the course in Science and Safety of the Environment (SSCTA) at the Faculty of Pharmaceutical Sciences (Scienze del Farmaco)
- 2016 Full Professor in Food Chemistry, Università degli Studi di Milano.
- 2019-2022 President of the course in Science and Safety of the Environment (SSCTA) at the Faculty of Drug Sciences (Scienze del Farmaco)

### TEACHINGS

- Food Chemistry
- Dietetic Products
- Analytical methods for xenobiotic detection in foods
- Food safety at the PhD course in “*Nutrition and Health*”
- Dietetic Therapy at the Doctorate in “*Nutritional Sciences*”

### SCIENTIFIC RESPONSIBLE OF COURSES FOR PROFESSIONAL TRAINING

Coordinator of several training courses for chemists, medical doctors, dietitians and other scientific professionals.

- The courses organized in the period 2004-2017 are:
- *Prodotti destinati ad una alimentazione particolare ed integratori alimentari: come ideare un prodotto razionale [Dietetic products and food supplements: a guideline for the formulation]* Milano, June-July 2006 and June-July 2008

- *Integratori alimentari a base erboristica: benefici e rischi [Botanical Food Supplements. Risk and benefit].* Cremona 12.12. 2007
- *Novel foods e claim nutrizionali nello sviluppo degli integratori alimentari [Novel foods and nutritional claims in the field of food supplements].* Milano, June 2009
- *Formator's formation in the field of food allergens.* Leonardo da Vinci project LLP - LdV/VETPRO/2009/124. Milano, October 4-17, 2009.

#### NATIONAL AND INTERNATIONAL PAST AND PRESENT POSITIONS

- **Scientific Board** of the Centre for “*Caratterizzazione e sicurezza d'uso dei principi attivi di sostanze naturali* [Characterization and safety of active compounds from natural origin]”, School of Pharmacy, State University of Milan
- **Collaboration to** the Program for Continuous Education in Medicine of the Ministry of Health
- **Member of the Board** of the Italian Society of Toxicology (2003-2006)
- **Rapporteur** of the EU-COST Strategic Workshop: “Food & Health: the way forward” (2006)
- **Member of EFSA Focus Group on:**  
*Allergenicity (GMO Panel) 2015-2016 as a representative of the Member State Italy*
- **Member of EFSA Working Groups on:**  
*NUTRI Food Allergy 2015-2018*  
*Procedures under Article 8 of Regulation (EC) No 1925/2006 (2016-2018)*
- **Member of RENTIC** (Register of Italian Certified Toxicologists) from 2003-present
- **Technical adviser and Expert witness** for Italian Courts in relation to trials on food supplements or foods
- **Technical adviser** for Ministry of Health for analytical control of food supplements containing botanicals
- **Technical adviser** for Italian Antipoison Centres in relation to botanicals
- **Member of the Commission** for Dietetic products and food supplements of the Italian Ministry of Health (2003-2005) and (2019-2022)
- **Member of the delegation** of the Italian Ministry of Agriculture at the International Organisation of Vine and Wine (OIV) from 2003 for Food Safety, Wine and Health and Methods of analysis
- **President** of the OIV Expert Group on **Food Safety** 2013-2019
- **Member of the Expert group** of the Italian Ministry of Health for the Guidelines on “Food allergy” 2016-present

#### RESEARCH PROGRAMS MANAGED AS PROJECT LEADER

- **Municipality of Milan (2008-2009). Flagship project “Istituto dell’Alimentazione e della Salute [Institute of Food and Health]”:** Molecular and clinical studies for the development of new approaches to the prevention, diagnosis and therapy of food allergy and intolerances

- **Ministry of Agriculture (2009-2010)**. Studies for the safety assessment for allergic subjects of wines fined with milk and egg proteins
- **PlantLIBRA (Plant Food Supplements: Level of Intake, Benefit and Risk Assessment) – EU project n. 245199 – 2010-2014**

#### RESEARCH PROGRAMS MANAGED AS UNIT LEADER

- **Italian Ministry of Education (2001-2003)**. Characterization by immunochemical techniques of molecular markers to detect traces of *Arachis hypogaea* in foods
- **European Project ALLERGENTEST (2001-2005)**. Development of rapid easy-to-use immunochemical tests for the detection of proteins with allergenic potential in food. EU Project: QLK1-CT-2001-01151
- **Italian Ministry of Education (2003-2005)**. Assessment of the suitability of dairy products obtained by novel technologies for subjects suffering for specific food intolerances
- **Italian Ministry of Education (2004-2007)**. Immunochemical techniques for the characterization of molecular markers and detection of allergens in traces in foods
- **Italian Ministry of Health (2005)**. Role of advanced bio-physical analytical techniques in the detection of substances or methods used as doping
- **European Project STABIWINE (2012-2015)**: Use of biopolymers for sustainable stabilization of quality wines – PF7-SME-2012. Activity 2.2: Research for the benefit of SME associations. EU Project n. 314903.
- **Young Researchers – Applied Research (2010-2016): INTEGRall** - Developing innovative methods for detecting emerging food allergens and evaluation of their impact on consumer health: an integrated approach. Project Code: RF-2010-2319384

#### PUBLICATIONS RELATIVE TO THE TOPICS OF TEACHING

- C.L.Galli, **P.Restani**. *Can Methylmercury present in fish affect human health?*, Pharmacological Research 27, 115-127, 1993 - **ISSN: 1043-6618 - Impact Factor = 0.26**
- T.Velonà, L.Abbiati, B.Beretta, A.Gaiaschi, U.Flauto, P.Tagliabue, C.L.Galli, **P.Restani**. *Protein profiles in breast-milk from mothers delivering term and preterm babies*. Pediatric Research 45, 658-663, 1999 - **ISSN: 0031-3998 - Impact Factor = 2.671**
- M.Ventriglia, **P.Restani**, P.Morricca, P.David, L.De Angelis, C.L.Galli. *Liquid chromatography determination of imazosulfuron in drinking water and in soil using ultraviolet detection*. Journal of Chromatography A 857, 327-330, 1999, **ISSN: 0021-9673 - Impact Factor = 2.520**
- S.De Martin, **P.Restani**. *Determination of nitrates by a novel ion chromatographic method: occurrence in leafy vegetables (organic and conventional) and exposure assessment for Italian consumers*. Food Additives and Contaminants 20, 787-792, 2003, **ISSN: 0265-203X - Impact Factor = 1.462**
- C.Ballabio, E.Bertino, A.Coscia, C.Fabris, D.Fuggetta, S.Molfinio, T.Testa, M.C.Sgarrella, G.Sabatino, **P.Restani**. *Immunoglobulin-A profile in breast milk from mothers delivering full*

*term and preterm infants*. International Journal of Immunopathology and Pharmacology 20, 119-128, 2007 - **ISSN: 0394-6320 - Impact Factor = 4.665**

- A. Fiocchi, L.Terracciano, GR. Bouygue, F.Veglia, T.Sarratud, A.Martelli, **P.Restani**. *Incremental prognostic factors associated with cow's milk allergy outcomes in infant and child referrals: the Milan Cow's Milk Allergy Cohort study*. Ann. Allergy, Asthma & Immunol 101, 166-173, 2008 - **ISSN: 1081-1206 - Impact Factor = 2.353**
- S.J.P.L. van den Berg, W.Alhusainy, **P.Restani**, I.M.C.M.Rietjens. *Chemical analysis of estragole in fennel based teas and associated safety assessment using the Margin of Exposure (MOE) approach*. Food Chem Toxicol 65, 147-154, 2014 - **ISSN: 0278-6915 - Impact Factor = 2.895**
- M.Badea, L.Floroian, **P.Restani**, S.Codruta, A.Cobzac, M.Moga. *Ochratoxin A detection on antibody-immobilized on BSA-funzionalized gold electrodes*. Int J Electrochem Sci 11, 6719-34, 2016 - DOI: 10.20964/2016.08.21, **ISSN: 1452-3981 - Impact Factor = 1.469**
- G.Galbusera, C.Casalegno, S.Marroncelli, G.Triulzi, J.Santos, E.Corsini, **P.Restani**. *Toxicological evaluation of potassium polyaspartate (A-5D K/SD): Genotoxicity and subchronic toxicity*. Food and Chemical Toxicology 109, 452-464, 2017. doi: 10.1016/j.fct.2017.09.036 - **ISSN: 0278-6915 - Impact Factor = 3.977**
- M.Badea, F.di Modugno, L.Floroian, DM.Tit, **P.Restani**, S.Bungau, C.Iovan, GE.Badea, L.Aleya. 2019.. *Electrochemical strategies for gallic acid detection: Potential for application in clinical, food or environmental analyses*. Science in the Total Environment 672, 129-140, 2019, DOI: <https://doi.org/10.1016/j.scitotenv.2019.03.404>. **Online: ISSN 0048-9697 - Impact Factor = 6.551**

## **C9 WATER AS A HABITAT: EFFECTS OF GLOBAL WARMING ON ANIMAL BEHAVIOR**

**Simona NONNIS (1,2), Elisa MAFFIOLI (1,4), Francesca GRASSI SCALVINI (1), Mattia TONI (3),  
Gabriella TEDESCHI (1,2,4)**

(1) Department of Veterinary Medicine, Università degli Studi di Milano, Lodi, Italy;

(2) CRC “Innovation for well-being and environment”, Università degli Studi di Milano, Milan,  
Italy;

(3) Department of Biology and Biotechnology “Charles Darwin”, Sapienza University, Rome,  
Italy;

(4) CIMAINA, Università degli Studi di Milano, Milano, Italy.

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Environmental temperature variation may impact on all levels of biological life. Water temperature is an important environmental parameter influencing the distribution and the health of fishes, playing a central role in ectothermic animals.

In this study, a proteomic approach was used to determine the effects of environmental temperature on the brain proteome and the behavioral responses in zebrafish, a widely animal model used for environmental “omics” studies.

Proteomics is a digital discipline used to detect protein expression patterns at a given time in response to a specific stimulus, but also to determine functional protein networks that exist at the level of the cell, tissue, or whole organism.

Proteomics data obtained from adult specimens of wild-type zebrafish, kept at different temperatures, revealed that several proteins, involved in molecular processes essential for the survival of the organisms, are differently regulated at the extreme temperatures.

The digitalization of proteomics allows us to manage big data in order to understand the impact of thermal variation on the nervous system and animal behavior that is of primary importance since the results obtained could be applied from the ecological to the biomedical fields.

## Simona NONNIS

- 2002 Degree in Veterinary Biotechnology, (full marks with honours), Faculty of Veterinary Medicine, Università degli Studi di Milano (Italy);
- 2005 PhD Degree in Biochemistry, Università degli Studi di Milano (Italy);
- 2006-2010 Post-doctoral Research Fellowship at the Faculty of Veterinary Medicine, Università degli Studi di Milano (Italy);



- Since 2011 - Researcher in Biochemistry, SSD BIO/10, Department of Veterinary Medicine, Università degli Studi di Milano (Italy);
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### Research Interests

Simona Nonnis's researches devoted to the characterization of various proteins both recombinant or from natural sources and complex proteic patterns using protein chemistry and proteomic techniques. In particular, her competence, initially devoted to primary structure determination of proteins and peptides. by protein chemistry approaches, broadened to include classical proteomic techniques such as bi-dimensional electrophoresis, MALDI-TOF and nanoLC-ESI MS/MS analysis, using shot-gun, label (Stable Isotope Labeling with Amino acid in Cell culture, SILAC) or label free quantitative approaches and de-novo sequencing approaches. Her competence includes (i) set up of protocols for whole-extract protein sample preparation suitable for quantitative proteomic analysis; (ii) development and application of a of various digestion protocols adapted to the specific source of proteic material under investigation, (iii) set up of proper conditions for quantitative mass spectrometric acquisition of raw data using both LTQ-Orbitrap Velos and Orbitrap Fusion Tribrid nanoLC-coupled ESI-MS/MS spectrometers (Thermo scientific) and Autoflex III MALDI TOF-TOF spectrometer (Bruker Daltoniks), (iv) expertise in post-acquisition analysis using a number of bioinformatic tools devoted to identification, quantification and functional analysis of data obtained by high-resolution high-throughput omic approaches (including Max Quant, Peak Studio, Proteome Discoverer, Perseus, DAVID, Panther, Ingenuity Pathway Analysis, MitoMiner, BLAST).

She participated to national congresses, seminars and workshops related to proteomics techniques.

She is a member of the Italian Proteomic Association (ItPA) (2015); the Proteomics Technology Platform in Filarete Foundation (2008) and the Italian Society of Biochemistry and Molecular Biology (SIB) (2003);

Since 2012 is assistant professor responsible for the course of protein engineering and biochemical signalling for the master degree in veterinary biotechnological science and for the course of Biochemistry for the bachelor degree in animal husbandry and welfare at the Università degli Studi di Milano, Milan, Italy; Since 2013-pres is a board member of PhD program in Biochemical sciences at the Università degli Studi di Milano, Milan, Italy;

Simona Nonnis is co-author of 35 international peer-reviewed publications, one book chapter.

### **Selected publications**

- **Nonnis S**, Angiulli E, Maffioli E, Frabetti F, Negri A, Cioni C, Alleva E, Romeo V, Tedeschi G, Toni M. Acute environmental temperature variation affects brain protein expression, anxiety and explorative behaviour in adult zebrafish. *Sci Rep.* 2021 Jan 28;11(1):2521. doi: 10.1038/s41598-021-81804-5.
- Toni M, Angiulli E, Miccoli G, Cioni C, Alleva E, Frabetti F, Pizzetti F, Grassi Scalvini F, **Nonnis S**, Negri A, Tedeschi G, Maffioli E. Environmental temperature variation affects brain protein expression and cognitive abilities in adult zebrafish (*Danio rerio*): A proteomic and behavioural study. *J Proteomics.* 2019 Jul 30;204:103396. doi: 10.1016/j.jprot.2019.103396. Epub 2019 May 28.
- Migliaccio O, Pinsino A, Maffioli E, Smith AM, Agnisola C, Matranga V, **Nonnis S**, Tedeschi G, Byrne M, Gambi MC, Palumbo A. Living in future ocean acidification, physiological adaptive responses of the immune system of sea urchins resident at a CO<sub>2</sub> vent system. *Sci Total Environ.* 2019 Jul 1;672:938-950. doi: 10.1016/j.scitotenv.2019.04.005. Epub 2019 Apr 2.
- Panzeri D , Guzzetti L , Sacco G , Tedeschi G , **Nonnis S** , Airoidi C , Labra M , Fusi P , Forcella M , Regonesi ME . Effectiveness of *Vigna unguiculata* seed extracts in preventing colorectal cancer. *Food Funct.* 2020 Jul 1;11(7):5853-5865. doi: 10.1039/d0fo00913j. Epub 2020 Jun 26.
- Tripodi F, Lombardi L, Guzzetti L, Panzeri D, Milanese R, Leri M, Bucciantini M, Angeloni C, Beghelli D, Hrelia S, Onorato G, Di Schiavi E, Falletta E, **Nonnis S**, Tedeschi G, Labra M, Coccetti P. Protective effect of *Vigna unguiculata* extract against aging and neurodegeneration. *Aging (Albany NY).* 2020 Oct 5;12(19):19785-19808. doi: 10.18632/aging.104069. Epub ahead of print. PMID: 33024055;

## **C10 IODINE FOOD FORTIFICATION: TECHNOLOGICAL APPROACHES, NUTRITIONAL EFFECTS AND SAFETY ASPECTS**

**Cristina POPOVICI**

Technical University of Moldova, Faculty of Food Technology, Department of Food and Nutrition, Chisinau, Republic of Moldova

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Iodine deficiency (ID) continues to be the most prevalent nutritional deficiency disorder in the world, affecting an estimated two billion people, in both industrialized and developing countries. ID impairs growth and neurological development, which can lead to the damage of brain. Depending on its severity and stage of development at which it occurs, iodine deficiency can lead to a wide spectrum of health problems, ranging from mild intellectual impairment to severe mental retardation, growth stunting, apathy, and impaired movement, speech or hearing.

Three intervention strategies are available to prevent ID. These are supplementation, dietary diversification, and both targeted and untargeted food fortification. Food fortification increases micronutrient supply to reduce nutritional deficiencies in the population by taking advantage of existing delivery mechanisms for industry-manufactured products. Population coverage depends on the food vehicle, but impact is contingent on the additional micronutrient intake and the nutrient gap. The fortification level is often limited by the criteria of safety, technological compatibility, and cost. Nevertheless, knowledge of the dietary characteristics of the population is still necessary to select the fortification condition with the highest effectiveness potential. Successful programs require reliable food enforcement and monitoring systems; selecting efficacious products is not enough.

Sunflower oil takes up the biggest specific weight among edible fats used in nutrition in the Republic of Moldova. Iodine administration in products with a lipid origin represents a remarkable interest. First, this would allow the easy incorporation of the iodine in the food fatty products. Secondly, the daily intake of lipids being limited, would allow an easy regulation of the iodine consumption, this being complementary with that from the iodine fortified salt and other products. The purpose of present investigations consists in elucidation of efficiency and safety of fortification with iodine of foods of lipid origin.

Food fortification can be an important complement to food-based approaches, and iodine fortification of foods as one of the strategies for the control of iodine deficiency. During the study there were elaborated new technologies for iodine fortification of proposed fatty foods. Investigation data indicate that iodine fortified fats influence on the processes of metabolism and contribute to the accumulation of the iodine by animal organism, as a result of more effective digestion and assimilability of iodine from fortified foods. Application of iodine fortified fats supplies the lack of iodine in organism, does not have side effects and can be used in prevention of diseases, provoked by iodine deficiency.

## Cristina POPOVICI

- Associate Professor of New food product Development, Food Science and Technology, Gastronomy at Faculty of Food Technology, Technical University of Moldova
- PhD (2009) in Engineering (Food Technology), Technical University of Moldova
- 168 Stefan cel Mare Av., MD 2004 Chisinau, Republic of Moldova
- E-mail: [cristina.popovici@toap.utm.md](mailto:cristina.popovici@toap.utm.md)
- Phone: (+373) 68241547
- researcher ID: C-3919-2019
- ORCID ID: 0000-0002-6985-8158
- Scopus Author ID: 57200654499



### 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

- **Popovici C**, Tita A.M, Cartasev A, Resitca V, Bogdan N, Migalatiev O. Biochemical approaches for goat milk yogurt production. Scientific Bulletin Series F. Biotechnologies, Vol. XXIV, No. 2, Bucharest, Romania, 2020, ISSN 2285-1364, p. 49-54.
- **Popovici C**. Exploitation strategy of *Juglans regia* L. waste processing. Proceedings of the International Scientific Conference “Biotechnology and Food Technology” BFT – 2020 dedicated to 45 years of biotechnological education in Russia, 27-29 October, 2020 Saint Petersburg, Russia, ISBN 978-5-905240-79-9, p. 74.
- 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.
- **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.

## **C11 INSECT BIOMASS QUALITY AND SAFETY: PRESENT AND FUTURE CHALLENGES**

**Luciano PINOTTI, L. FERRARI, F. CHELI, M. OTTOBONI**

(1) Department of Health, Animal Science and Food Safety, University of Milan, Italy

(2) CRC I-WE (Coordinating Research Centre: Innovation for Well-Being and Environment),  
University of Milan, Milan, Italy

The use of alternative feed ingredients in farm animal's diet can be an interesting choice from several standpoints, even though their nutritional value, quality and safety should be always kept in mind. Among different alternative feed ingredients, insect-based ingredients can be considered a hot topic. Insects are looked as an interesting alternative protein source for feed and are expected to be increasingly used in Europe as replacers for animal-derived proteins especially in aquaculture, even though their potential for other farm species and as fat sources, cannot be excluded. From a circular economy point of view, insects are commonly reared on biomass like leftover of vegetable and fruit food (organic waste streams). This implies that micro-livestock are used to upgrade low value organic waste streams into high-value biomass. But, several concern are moved against organic waste, mainly due to safety issues. In fact, although vegetable waste streams already constitute the rearing material for insect growing, to date, the possible safety hazards associated with the use of these ingredients are hardly known. Accordingly, the aim of the present review is to address recent advances in term of insect material production and selected safety concerns.

### **Luciano PINOTTI**

- Full Professor in Animal Nutrition and Feeding at the Department of Health, Animal Science and Food Safety, University of Milan, Italy.

#### **Education**

- 2001, PhD at the University of Molise, Italy.
- 1996-1997, Postgraduate research training at the Institute for Animal Science and Health ID-DLO, Lelystad, The Netherlands (Wageningen University).



#### **Teaching and Mentoring**

- Prof. Pinotti lectures for the degree courses in animal and veterinary sciences at the University of Milan.

- Prof. Pinotti formally supervises numerous MSc and first degree students as well PhD students.
- He is also advisor for a post doc researcher.

### Projects

Prof. Pinotti is/has been coordinator/research team coordinator in several national/international projects. From 2017 Nutritional Science PhD program Coordinator From 2019 President of Nutrition Commission of the European Federation of Animal Science (EAAP).

Prof Pinotti is a member of the CRC I-WE (Coordinating Research Centre: Innovation for Well-Being and Environment), and member of the following editorial boards: -Editor Section: Product Quality, Human Health and Well-Being per la rivista Animal ISSN: 1751-7311; Journal of Animal and Feed Sciences (ISSN:1230-1388); Dairy (ISSN 2624-862X); Food and Feed Research (ISSN: 2217-5660).

### Research interests

Research activities are mainly focused on Feed quality and safety/ feed evaluation (with emphasis on alternative feed ingredients like former food/ex food, insect meals).

### Selected Publications

- **Pinotti, L.**, Ottoboni, M., Substrate as insect feed for bio-mass production. Journal of Insects as Food and Feed, 2021; article in press.
- **Pinotti, L.**, Luciano, A., Ottoboni, M., Manoni, M., Ferrari, L., Marchis, D., Tretola, M. Recycling food leftovers in feed as opportunity to increase the sustainability of livestock production(2021) Journal of Cleaner Production, 294, art. no. 126290.
- **Pinotti, L.**, Manoni, M., Ferrari, L., Tretola, M., Cazzola, R., Givens, I. The contribution of dietary magnesium in farm animals and human nutrition (2021) Nutrients, 13 (2), art. no. 509, pp. 1-15.
- Luciano, A., Tretola, M., Ottoboni, M., Baldi, A., Cattaneo, D., **Pinotti, L.** Potentials and challenges of former food products (Food leftover) as alternative feed ingredients (2020) Animals, 10 (1), art. no. 125.
- **Pinotti, L.**, Giromini, C., Ottoboni, M., Tretola, M., Marchis, D., Review: Insects and former foodstuffs for upgrading food waste biomasses/streams to feed ingredients for farm animals, (2019) Animal, 13 (7), pp. 1365-1375.

## Matteo OTTOBONI

- Laboratory technician in animal nutrition and feed evaluation, at the Department of Health, Animal Science and Food Safety, University of Milan, Italy.
- 2015-2019 Post doc (early stage researcher) at the Department of Health, Animal Science and Food Safety (VESPA) of the University of Milan.
- He got MSc degree in Animal Production Science (2012) at the University of Milan.
- He got a PhD in veterinary biotechnology (2015) at the University of Milan defending a thesis on “Innovation technology in feed formulation and production”.
- From 2019 young scientist member of Insect Commission of the European Federation of Animal Science (EAAP).



### Research Interests

Main research interests are: feed and novel feed quality & safety, methods of analysis implementation, feed formulation and technology.

## Luca FERRARI

- PhD student at the Department of Health, Animal Science and Food Safety, University of Milan, Italy.
- 2019 Master's degree in Chemical Sciences at the University of Milan, Italy.
- 2017 Bachelor's degree in Chemistry at the University of Milan, Italy.



### Research Interests

Research activities are mainly focused on Feed quality and safety/ feed evaluation (with emphasis on alternative feed ingredients like former food/ex food, insect meals).

## **Federica CHELI**

- Full Professor in Animal Nutrition and Feeding at the Department of Health, Animal Science and Food Safety, University of Milan, Italy.

### **Education**

- 1989, PhD at the University of Milan, Italy.

### **Teaching and Mentoring**

- Prof. Cheli lectures for the degree courses in animal, veterinary and biotechnological sciences at the University of Milan.
- Prof. Cheli supervised numerous MSc and first degree students as well PhD students.



Prof Cheli is a member of the CRC I-WE (Coordinating Research Centre: Innovation for Well-Being and Environment), University of Milan, and Section Editor of Toxins and the Italian Journal of Animal Science.

### **Research Interests**

Research activities are on Feed quality and safety/feed evaluation, with a focus on mycotoxin contamination.

## C12 POTENTIAL OF ALGAE SUBSTANCES IN ACTIVE COSMETICS

**Polonca TREBŠE**

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Increased solar radiation is strongly correlated with the increase of skin infections, inflammatory diseases, traumatic skin disorders, skin cancer, as well as premature skin aging (Kaffenberger et al. 2016; Andersen, 2018). Such consequences together with the rising awareness regarding skin protection from abnormal or pathologic conditions were recognized by the cosmeceuticals sector. Cosmeceuticals (derived from the words “cosmetic” and “pharmaceutical”) are cosmetic products with bioactive ingredients that combine drug-like benefits that cure skin issues, at the same time enhancing skin appearance (Ruocco et al. 2016).

In the context of cosmeceutical product development, significant progress in the investigation of freshwater microalgae and marine macroalgae was done within the last decade due to their remarkably rich bioactive composition (Ruocco et al. 2016; Zhao et al. 2018). Diverse classes of unique micro- and macroalgal metabolites served as an important source of numerous desirable biological activities such as antioxidant, anti-microbial, anti-inflammatory, anti-tumor (Michalak and Chojnacka, 2015; Rocha et al. 2018; Zhao et al. 2018). Evolutionary development of such a variety of potent natural molecules was enhanced by macroalgal adaptation to extreme marine conditions in terms of temperature, light, pressure, oxygen, salinity, as well as microbial and viral attacks, and toxicity (Ruocco et al. 2016; Zhao et al. 2018). Thus, the chemical composition of micro- as well as macroalgae varies considerably not only among different species but also within the same species that inhabited different ecosystems providing an inexhaustible source of new bioactive compounds that are far from being totally exploited. So far only 1% of microalgal species have been investigated for potential pharmaceutical and nutraceutical applications (Olaizola, 2003).

The majority of studies are based on microalgae of the genus *Spirulina*, *Chlorella*, *Haematococcus*, *Dunaliella*, *Botryococcus*, *Phaeodactylum*, and *Porphyridium*, as well as macroalgae *Fucus*, *Ulva*, *Laminaria*, *Gracilaria*, *Undaria*, *Sargassum*, and *Padina*, that are often used in cosmetics due to the presence of liposoluble vitamins, minerals, amino acids, polysaccharides, lipids, phenolic compounds, pigments, and other bioactive compounds (Ariede et al. 2017, Agrawal et al. 2018). *In vitro* experimental data suggests that polyphenols and vitamins possess anti-inflammatory, anti-allergic, anti-tumor, anti-viral, but also UV-protective properties (Pimentel et al. 2017), while fucoxanthin and phlorotannin have been reported to exhibit even more beneficial biological activities such as antioxidant, antiobesity, and

neuroprotective activities. Ulvans, complex sulphate polysaccharides (SP), semi-crystalline compounds with hydroscopic properties, soluble in water and alkalis, are associated with the marine genus *Ulva*. These polysaccharides are very interesting bioactive compounds, mainly due to their physical, chemical properties and their therapeutic potential use (ie. antiviral activity, immune-inflammatory action) (Pankiewicz et al, 2016).

Although algae are a rich source of bioactive compounds, is their extraction often problematic, mainly because the cells must be primarily damaged in order to get to the substances in them. Furthermore, cultivation and procedures need to be adapted to the algal group, as taxonomic groups are morphologically very different. It depends on the selected processes and optimization how much of the desired substance we will be able to obtain and what will be their concentration. The amount of substance produced can be regulated by the method of cultivation, as it can be influenced by factors such as temperature, salinity, nitrogen availability, nutrient ratios, lighting regime, etc. (Patil et al., 2018; Schuler et al., 2020). Extractions with liquids in the subcritical (water) and supercritical (CO<sub>2</sub>) state are currently among the most intensively studied technologies t. i. green chemistry. In addition to high ecological (non-toxicity and non-flammability of solvents) and economic (availability of solvents) acceptability, they are most distinguished by new usability potentials, including in the areas of functional foods and cosmetic and pharmaceutical ingredients.

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- Zhao C, Yang C, Liu B, Lin L, Sarker SD, Nahar L, et al. Bioactive compounds from marine macroalgae and their hypoglycemic benefits. *Trends in Food Science and Technology*. 2018.

## Polonca TREBŠE

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Polonca Trebše is professor of chemistry at the University of Ljubljana, Faculty of Health Sciences. She graduated in Chemistry in 1990 at the University of Ljubljana, Faculty of Chemistry and Chemical Technology, then she obtained her Master degree 1994 in the field of organic synthesis of heterocyclic compounds, and in 1997 received her PhD in the field of organic synthesis, all at the University of Ljubljana, Faculty of Chemistry and Chemical Technology.

In 1997, she joined the University of Nova Gorica (former Faculty of Environmental Sciences), where she was employed until 2013 when she moved to University of Ljubljana, Faculty of Health Sciences.

### Her 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;

Her current research findings have been published in more than 85 scientific papers in international journals with impact factor.

For her research work she got several awards: Krka award for years 1995 and 1997, Zois award (national scientific award) for important achievements on the field of chemistry and ecotoxicology in 2008, and Prometheus of Science for Excellence in Communication in 2020.

Polonca Trebše lectures at the undergraduate program of Environmental Health (Chemistry, Analytical chemistry, Hazardous compounds, Chemical technologies), at the master program of Environmental Health (Sampling) as well as at interfaculty doctoral program Lifesciences (module Bioengineering in Health Sciences).

She is experienced with the management of national and international research projects, she was involved in the development of new curricula, preparation of study materials, and staff training on the academic level.

She is a member of the Slovenian Chemical Society (since 1990) and a member of the European Association of Chemistry and the Environment (since 2010). She serves as a members of the Editorial Boards: Archives of Industrial Hygiene and Toxicology (2004-2008) and Environmental Chemistry Letters (2012-).

### Selected Publications

- BABIĆ, Sanja, ČIŽMEK, Lara, MARŠAVELSKI, Aleksandra, MALEV, Olga, PFLIEGER, Maryline, STRUNJAK-PEROVIĆ, Ivančica, TOPIĆ POPOVIĆ, Natalija, ČOŽ-RAKOVAC, Rozelindra, **TREBŠE, Polonca**. Utilization of the zebrafish model to unravel the harmful effects of biomass burning during Amazonian wildfires. *Scientific reports*, 2021, vol. 11, str. 1-12. doi: [10.1038/s41598-021-81789-1](https://doi.org/10.1038/s41598-021-81789-1).
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- ŠUNTA, Urška, PROSENC, Franja, **TREBŠE, Polonca**, GRIESSLER BULC, Tjaša, BAVCON KRALJ, Mojca. Adsorption of acetamiprid, chlorantraniliprole and flubendiamide on different type of microplastics present in alluvial soil. *Chemosphere*, 2020, vol. 261, str. 1-9, doi: [10.1016/j.chemosphere.2020.127762](https://doi.org/10.1016/j.chemosphere.2020.127762).
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- **TREBŠE, Polonca**, POLYAKOVA, Olga V., BARANOVA, Maria, BAVCON KRALJ, Mojca, DOLENC, Darko, SARAKHA, Mohamed, KUTIN, Alexander, LEBEDEV, Albert T. Transformation of avobenzene in conditions of aquatic chlorination and UV-irradiation. *Water research*, 2016, vol. 101, str. 95-102, graf. prikazi, doi: [10.1016/j.watres.2016.05.067](https://doi.org/10.1016/j.watres.2016.05.067).
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## **C13 ANCIENT AND MODERN CEREALS AND THEIR SAFETY FOR CELIAC CONSUMERS**

**Francesca COLOMBO, Chiara DI LORENZO, Simone BIELLA, Corinne BANI, Patrizia RESTANI**

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Cereals are part of the diet all over the world. Among cereals, wheat provides up to 50% of the caloric intake in both industrialized and developing countries, representing one of the world's primary sources of energy. Wheat, barley and rye present the highest content of gluten-like proteins. Gluten is a protein complex that plays an important role in the technological properties of cereal-based products. However, it is involved in different disease called gluten-related disorders (GRDs). Among GRDs celiac disease is the best-known clinical form with a chronic course.

Although the gluten-free products have increased significantly in quality and quantity over the last few years, research still focuses on the identification of new ingredients to improve the nutritional, sensorial and functional qualities of foods available for celiac consumers.

Interest in the consumption of ancient grains has recently increased in general population. In addition, it has been observed that there is a wide variability between ancient and modern grains, in terms of toxicity for celiac people. Contradictory results have been observed for oat in term of safety for celiac patients. In this contest, it is important to clarify the role of minor cereals (such as oat) and ancient grains in the diets of celiac patients. Although some wheat-ancient grains, such as *Triticum monococcum*, *Triticum aestivum* ssp. *spelta* and Kamut®, showed a reduced in vitro toxicity, to date, these grains are still considered toxic for celiac patients. On the other hands, according to in vivo studies, selected oat varieties could be tolerated by celiac patients. The presence of contradictory results highlights the importance of studying the safety of “unusual” cereals in more detail, in order to prevent adverse effects in celiac patients.

**Acknowledgments:** This work was supported by Fondazione Celiachia Onlus (FC) Grant n°004\_FC\_2019.

## Francesca COLOMBO

- Graduation in Environmental Toxicology at Faculty of Pharmacy, Università degli Studi di Milano (2013)
- Graduation in Human Nutrition and Food Science at Faculty of Agricultural and Food Sciences, Università degli Studi di Milano (2016)
- PhD in Nutritional Science, Università degli Studi di Milano (2020)
- Post-doctoral fellowship at the Laboratory of Food Chemistry and Toxicology (responsible: Prof. Patrizia Restani), Dept. of Pharmacological and Biomolecular Sciences, Faculty of Pharmacy, Università degli Studi di Milano (2020- present)
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### Research interest

The main areas of research include: suitability of dietetic products in the diet of subjects suffering of food allergy or intolerances; risk and benefit assessment of food supplements.

The principal analytical techniques used in the laboratory are: chromatography (HPLC, TLC, HPTLC) for the characterization of food and food supplements; electrophoresis applied to food analysis and dietetic products; immunochemical techniques (immunoblotting and ELISA) for the detection of food allergens in complex food matrices.

Francesca Colombo has been involve in different national and international research programs in the field of Food Safety, Dietetic products and Risk and Benefit Assessment; among which the project entitled “Naturally gluten free pigmented cereals to modulate the inflammatory status in celiac disease” and the European project PlantLIBRA (Plant Food Supplements: Levels of Intake, Benefit and Risk Assessment) coordinated by Prof. Patrizia Restani, where the research activity was focused on the phytochemical characterization of botanical ingredients.

Francesca Colombo collaborates as a didactical tutor at the course of Food Chemistry (Faculty of Pharmacy, Università degli Studi di Milano) and is responsible of experimental thesis at the same University. She is co-author of 16 international peer-reviewed publications and participated to more than 10 scientific congresses with oral or poster presentations.

### Selected Publications

- C. Di Lorenzo, E. Sangiovanni, M. Fumagalli, E. Colombo, G. Frigerio, **F. Colombo**, L. Peres de Sousa, A. Altindışli, P. Restani, M. Dell'Agli. Evaluation of the anti-inflammatory activity of raisins (*Vitis vinifera* L.) in human gastric epithelial cells: a comparative study. Int J Molecular

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- **F. Colombo**, P. Restani, E. Novembre, S. Barni, C. Di Lorenzo, F. Orgiu, S. Biella, F. Mori. Apovitellin identified as a novel major egg allergen in goose egg allergy. *Pediatr Allergy Immunol* (2018), 30:246-248;
- **F. Colombo**, C. Di Lorenzo, L. Regazzoni, M. Fumagalli, E. Sangiovanni, L. Peres de Sousa, L. Bavaresco, D. Tomasi, A. Bosso, G. Aldini, P. Restani and M. Dell'Agli. Phenolic profile and anti-inflammatory activity of sixteen Table Grape (*Vitis vinifera* L.) varieties. *Food & Function* (2019), 10:1797-1907 ISSN 2042-6496;
- **F. Colombo**, P. Restani, S. Biella, C. Di Lorenzo. *Botanicals in Functional Foods and Food Supplements: Tradition, Efficacy and Regulatory Aspects*. *Appl Sci* (2020), 10:2387-2402.
- **F. Colombo**, C. Di Lorenzo, S. Biella, C. Bani, P. Restani. Ancient and Modern Cereals as Ingredients of the Gluten-Free Diet: Are They Safe Enough for Celiac Consumers? *Foods* (2021), 10:906.

## Corinne BANI

- Graduation in Environmental Toxicology at Faculty of Pharmacy, Università degli Studi di Milano (2019)
- She is currently enrolled in Nutrition and Health Science master's degree at the Università degli Studi di Milano (expected graduation date: July 2021).
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## Research interest

She is involved in different research programs in the field of food safety, dietetic products and risk and benefit assessment of food supplements. The analytical techniques used in the laboratory are chromatography (TLC, HPTLC) for the characterization of food matrices; electrophoresis applied to food analysis and immunochemical techniques for the detection of food allergens.

Corinne Bani is co-author of 1 international peer-reviewed publication:

- Colombo F, Di Lorenzo C, Biella S, **Bani C**, Restani P. Ancient and Modern Cereals as Ingredients of the Gluten-Free Diet: Are They Safe Enough for Celiac Consumers? *Foods*. 2021; 10(4):906.

## Simone BIELLA

- Graduation in Environmental Toxicology at Faculty of Pharmacy, Università degli Studi di Milano (2018)
- He is currently enrolled in Nutrition and Health Science master's degree at the Università degli Studi di Milano (expected graduation date: July 2021).
- He is a research fellow at the Laboratory of Food Chemistry and Toxicology (DiSFeB) coordinated by Prof. Restani.
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### Research interest

He works in the field of quality control and phytochemical characterization of botanical ingredients, developing analytical methods for the determination of active and xenobiotic compounds using chromatographic and electrophoretic techniques. Thanks to his research activity, he improved his skill on the analytical techniques used in the laboratory, such as: chromatography (HPLC, TLC, HPTLC); electrophoresis (SDS-PAGE); immunochemical techniques (immunoblotting and ELISA).

Simone Biella is co-author of 9 international peer-reviewed publications and participated to 4 scientific congresses with oral or poster presentations.

### Selected Publications

- F. Colombo, P. Restani, E. Novembre, S. Barni, C. Di Lorenzo, F. Orgiu, **S. Biella**, F. Mori. 2018. Apovitellin identified as a novel major egg allergen in goose egg allergy. *Pediatr Allergy Immunol*, 30:246-248.
- C. Di Lorenzo, F. Colombo, **S. Biella**, F. Orgiu, G. Frigerio, L. Regazzoni, G. Aldini, L. Perez de Sousa, L. Bavaresco, A. Bosso, G. Aldini, P. Restani. 2019. Phenolic profile and antioxidant activity of different grape (*Vitis vinifera* L.) varieties. *BIO Web of Conferences*, 12, 04005.
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- F. Colombo, P. Restani, **S. Biella**, C. Di Lorenzo. 2020. Botanicals in Functional Foods and Food Supplements: Tradition, Efficacy and Regulatory Aspects. *Appl Sci*, 10:2387-2402

## **C14 DIETARY FIBERS: CLASSIFICATION, SOURCES AND IMPACT ON HUMAN HEALTH**

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In the last decades the role of a balanced diet as the primary tool for the health maintenance is becoming increasingly evident. Several studies have shown that a high-quality dietary pattern, including the consumption of whole grains, fruits and vegetables, seafood, high biological value proteins and low-fat foods allows a significant reduction in morbidity and mortality. As a part of a healthy diet, fibers have long been recognized for their role in digestive and intestinal function.

Dietary fibers are defined as non-digestible carbohydrates present in fruits and vegetables that can be classified according to the molecular size, the water solubility or the capability to be fermented by the gut microbiota. On the basis of molecular size, fibers can be defined as oligosaccharides (3-9 monomers) and polysaccharides ( $\geq 10$  monomers); according to the hydrophilicity, soluble (e.g. inulin, fructo-oligosaccharides) or insoluble fibers (e.g. lignin, cellulose) can be identified<sup>1</sup>. Some soluble fibers, including fructo-oligosaccharides, galacto-oligosaccharides and inulin, can also stimulate the growth of specific bacterial strains providing potential health effects beyond the gastrointestinal function.

In particular, a certain number of studies have shown a positive impact of fibers or their metabolites on several metabolic parameters, such as insulin sensitivity and inflammation<sup>2</sup>. However, currently, there is a scientific debate about the optimal intake, the essentiality in the human diet and its potential role in the improvement or modulation of chronic pathological conditions, including cardiovascular diseases, diabetes and obesity.

In the present study, an overview on the different aspects of dietary fibers will be presented, with particular attention on the scientific evidence about human health benefits and the risks associated with a diet lacking these dietary components.

<sup>1</sup> Slavin J.L. Dietary fiber: classification, chemical analyses and food sources. 1987. J. Am. Diet. Assoc., 87, 1164-1171.

<sup>2</sup> Barber T.M., Kabisch S., Pfeiffer A.F.H., Weickert M.O. 2020. The health benefits of dietary fibre. Nutrients, 12, 3209-3226.

## Chiara DI LORENZO

- Graduation in Pharmacy at Faculty of Pharmacy, Università degli Studi di Milano (2004)
- Post-graduation in Hospital Pharmacy at the Università degli studi di Milano (2008)
- PhD in Pharmaco-Toxicological, Farmacognostic and Biotechnological Sciences at the Faculty of Pharmacy, Università degli Studi di Milano (2013)
- Post-doctoral fellowship at the Laboratory of Food Chemistry and Toxicology (responsible: Prof. Patrizia Restani), Dipartimento di Scienze Farmacologiche e Biomolecolari, Faculty of Pharmacy, Università degli Studi di Milano (2013-2017)
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### Research Interests

The main area of research includes: quality control of plant food supplements, development of analytical methods for the detection of active substances and xenobiotics in foods and plant food supplements. The main analytical techniques used are chromatography (HPLC, TLC, HPTLC, GC) for the characterization of food and food supplements; electrophoresis applied to food analysis and dietetic products; immuno-enzymatic techniques (immunoblotting and ELISA) for the detection of food allergens in complex food matrices.

Chiara Di Lorenzo is involved as responsible or participant in numerous national and international research programs in the field of Food Safety, Dietetic products, Risk and Benefit Assessment; the most important was the European Project PlantLIBRA (Plant Food Supplements: Level of Intake, Benefit and Risk Assessment) in the context of the 7th EU Framework Program, involving 25 partners distributed in 4 continents.

Chiara Di Lorenzo is responsible of the laboratory activities at the courses of: 1- Food Chemistry (Chemical Safety and Toxicological Environmental Sciences, Faculty of Pharmacy, Università degli Studi di Milano); 2-Dietetic Products (Faculty of Pharmacy, Università degli Studi

di Milano); 3- Analysis of pesticides and contaminants in food and environment matrices (Chemical Safety and Toxicological Environmental Sciences, Faculty of Pharmacy, Università degli Studi di Milano). Chiara Di Lorenzo holds seminars at Dietetic Therapy/Food Supplements (Doctorate in Nutritional Sciences) and in advanced courses in Nutrition and Human Health (Università degli Studi di Milano). Chiara Di Lorenzo is thesis assistant at the Faculty of Pharmacy, Università degli Studi di Milano.

She is a member of the Italian Delegation (Ministry of Agriculture) at the OIV (International Organization of Vine and Wine) in the Group of Experts "Consumption, Nutrition and Health".

Chiara Di Lorenzo is co-author of 39 international peer-reviewed publications and attended as speaker/poster presenter to more than 55 scientific congresses.

### Selected publications

- **C. Di Lorenzo**, M. Dell'Agli, E. Sangiovanni, A. Dos Santos, F. Uberti, E. Moro, E. Bosisio, P. Restani. Correlation between catechin content and NF- $\kappa$ B inhibition by infusions of green and black tea. *Plant Foods Hum Nutr* (2013) 68:149-54. doi: 10.1007/s11130-013-0354-0.
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- **C. Di Lorenzo**, J. Ruzicka, F. Colombo, F. Orgiu, G. Frigerio, J. Novak, M. Badea, P. Restani. Classic/recommended methods and development of new methods to monitor phytochemical composition of plant food supplements and their content in active molecules. In: *Food Supplements Containing Botanicals: Benefits, Side Effects and Regulatory Aspects: The Scientific Inheritance of the EU Project PlantLIBRA*, pp. 209-226. 10.1007/978-3-319-62229-3\_8.
- F. Colombo, **C. Di Lorenzo** (corresponding author), L. Regazzoni, M. Fumagalli, E. Sangiovanni, L. Peres de Sousa, L. Bavaresco, D. Tomasi, A. Bosso, G. Aldini, P. Restani and M. Dell'Agli. Phenolic profile and anti-inflammatory activity of sixteen Table Grape (*Vitis vinifera* L.) varieties. *Food & Function*, 2019, 10:1797-1807. doi: 10.1039/c8fo02175a.
- **C. Di Lorenzo**, F. Colombo, S. Biella, C. Stockley, P. Restani. Polyphenols and human health: the role of bioavailability. *Nutrients* (2021), 13, 1, 273-303.

## **C15 INTERNATIONAL GUIDELINES FOR PREGNANCY AND LACTATION DURING COVID PANDEMIA**

**Patrizia RESTANI (1), Francesca COLOMBO (1), Simone BIELLA (1), Corinne BANI (1),  
Mihaela BADEA (3), Chiara DI LORENZO (1)**

(1) Università degli Studi di Milano, Department of Pharmacological and Biomolecular Sciences,  
Italy

(2) CRC “Innovation for Well-being and Environment”, Università degli Studi di Milano, Italy

(3) Fundamental, Prophylactic and Clinical Specialties Department, Faculty of Medicine,  
Transilvania University of Brasov, Romania

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When the population is involved in a national / international problem concerning health, there is an immediate request for information regarding the behaviours that must be followed by the "at risk" groups. COVID, as on previous occasions, immediately led to consider the extent of the risk in the elderly, children, pregnant and breastfeeding women. Everyone knows the situation regarding the elderly population and what sad consequences there have been. On the contrary, the children were practically immune. Data on these populations were collected in a short time, on the basis of the incidence of severe forms in relation to age.

Obviously, it is less easy to determine whether COVID may represent a greater risk in pregnant women and whether the infection may have consequences in the baby during growth in utero or during breastfeeding.

Based on the data collected, it would appear that pregnant women do not have a greater risk of contracting the infection than the general female population. However, there is a greater likelihood of developing more severe symptoms in the third trimester.

There is no current evidence of problems in children born to women who had contracted the virus, nor a greater risk of miscarriage in the first trimester.

Regarding breastfeeding, UNICEF believes that there is no reason to deprive a newborn of this precious source of nutrients and functional components. Furthermore, at present, the transmission of COVID-19 through breastmilk and breastfeeding has not been shown. On the contrary, it has been observed that milk produced by mothers infected by COVID contains IgA and IgG capable to neutralize SARS-CoV-2 activity.

- WHO. Coronavirus disease (COVID-19): Pregnancy and childbirth. <https://www.who.int/news-room/q-a-detail/coronavirus-disease-covid-19-pregnancy-and-childbirth>
- UNICEF. Breastfeeding safely during the COVID-19 pandemic. How to nourish your child following the current expert guidance. <https://www.unicef.org/coronavirus/breastfeeding-safely-during-covid-19-pandemic>

## **C16 PRINCIPLES OF ALIMENTATION IN PRE-SCHOOL CHILDREN - BETWEEN THEORY AND REALITY**

**Bianca Elena POPOVICI**

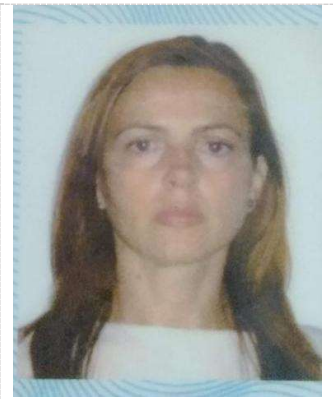
Faculty of Medicine, Transilvania University of Brasov, Romania

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Early childhood, next period to the "first 1,000 days of life", is a new stage in the somatic, neurologic and developmental achievements of children. This period is unique because of the most rapid of physical, cognitive, emotional and social growth. Nutrition is the engine for a proper evolution of this stage and therefore, a good, healthy diet promoted since early childhood could be a guarantee for a future adult healthy life. Now is the right time for foundation of the basis of education, including nutritional education. Learning from this age to choose the right diet, educating the taste, involving of the child in shopping food, cooking, helping to lay the table could be helpful for a good behavior and life style. Early food experiences have a strong impact on eating pattern and alimentary habits in next years and even in adulthood. Also, a good nutrition in early childhood could protect or minimize future health risk such iron deficiency anemia, rickets, malnutrition including obesity, diabetes, dental decay and even heart diseases, hypertension, stroke and cancer.

### **Bianca Elena POPOVICI**

- PhD (2010) in Pediatrics, "Gr. T. Popa" University of Medicine and Pharmacy Iasi
- Associate Professor, Department of Pediatrics, Faculty of Medicine, "Transilvania" University Brasov
- B-dul Eroilor nr. 29 Braşov România
- E-mail: [biancadr@yahoo.com](mailto:biancadr@yahoo.com)
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### **Research interests**

Main research interests are cardiovascular diseases in children, hypertension, obesity, metabolic syndrome and the alimentation disorders connected.

**Selected publications**

- Rosana Manea, **Bianca Elena Popovici**, Carmen Daniela Neculoiu, Dan Minea, Alina Calin. Application of the Measurement of Carotid Intima-Media Thickness for Prediction of the Essential Hypertension in Children. REV.CHIM.(Bucharest) 2018; 69; no. 6.
- **Bianca Elena Popovici**. Epidemiology, clinic and diagnosis of essential hypertension in childhood. Printing House StudIs, Iași, 2015. ISBN 978-606-775-044-7
- Buzinschi S., Laura Dracea, Hortensia Epure, Oana Falup-Pecurariu, **Bianca Elena Popovici**, Dana Vodă. Nutrition in pediatrics. Printing house Lux Libris, Brașov, 2006. ISBN(10)-973-9458-72-6; ISBN(13)-978-9739458-72-6
- **B.E. Popovici**, M. Mitrica, A. Cosor The influention of the alimentation pattern in adolescents health in Brasov region. New Trends on Sensing- Monitoring- Telediagnosis for Life Sciences, Brasov, Romania - July 24-26, 2014
- **B.E.Popovici**, M. Mitrica, M. Moga. Cardiovascular risk factors impact in childhood. 54th Annual Meeting European Society for Paediatric Research October 10th-14th, 2013 –Porto, Portugal, Book of Abstract; 374
- **Bianca Popovici**, Brumaru O. Aspects regarding of cardiovascular risk factors in children. Romanian Journal of Pediatrics 2010, vol LIX, no 4: 322-328
- **Bianca Popovici**, Brumaru O. Correlations between essential hypertension and carotid intima-media thickness in children. Medical-Surgical Journal of The Medical and Sciencists Society Iași 2011 Ian-Martie 115(1)

**C17 THE IMPORTANCE OF MATERNAL GENETICS AND EPIGENETICS IN  
PREDICTING FOOD INTAKES IN TODDLERS.  
A NEW LAYER OF COMPLEXITY IN NUTRITION?**

**Mihai NICULESCU (1,2)**

(1) Advanced Nutrigenomics, Durham, NC, USA

(2) SPHERES, Timisoara, Romania

Nutrition is not only a very complex field, but considerable debate surrounds the question about how much of a personal choice we have when deciding upon our own feeding behavior.

This presentation focuses on the potential role that maternal decisions play in the feeding of toddlers, based on maternal genotypes and their epigenetic status. Our study revealed that mothers, whose FADS2 genotypes and epigenetic status are related to a slow metabolism for omega-3/6 fatty acids, are more prone to feed their toddlers omega-3/6 rich diets, regardless toddlers' own genotypes and epigenetic status.

When assessing memory performance in the same toddlers, the impact of maternal genetics and epigenetics of FADS2 can be clearly recognized.

This study is used as an example that supports the hypothesis that maternal influences upon feeding practices in toddlers are associated with maternal genetics and epigenetics, and this association adds a new layer of complexity in early nutrition.

**Mihai NICULESCU**

- MD (1995), Carol Davila University of Medicine and Pharmacy, Bucharest, Romania.
- PhD (2005) in nutritional biochemistry, University of North Carolina at Chapel Hill, North Carolina, U.S.A.
- Founder and CEO Advanced Nutrigenomics, Cary, North Carolina, U.S.A.
- Co-founder and Science Director SPHERES (Asociația "SPHERES" pentru Inovare, Cercetare și Educație Responsabilă), Romania.
- Associate Professor, Victor Babes University of Medicine and Pharmacy, Timisoara, Romania.



- Email: [mihai.niculescu@gmail.com](mailto:mihai.niculescu@gmail.com)
- URL: <https://www.advancednutrigenomics.com/>, <https://spheres.ro/>

### Research Interests

Expert in precision nutrition, epigenomics, nutrigenomics/nutrigenetics, obesity, metabolic diseases (including liver), with extensive experience in research, study design and implementation, and scientific leadership.

- Developed the most advanced nutrigenetic test, currently licensed to companies in US and Europe;
- Developed nutrigenetic platforms and algorithms;
- Ensured requirements for FDA compliance, efficacy studies, and necessary IND and IRB documentation;
- Designed and led basic and clinical studies unraveling mechanisms involved in gene-nutrient interactions, metabolism, and maternal-child interactions;
- Designed and completed the first study establishing the epigenetic role of choline;
- Built and led teams (clinical and research) of up to 20 members;
- Mentored and taught students ranging from undergraduate to postdoctoral level;
- Expertise in the design, implementation, and interpretation of basic and translational studies, including clinical interventions using nutrients;
- Extensive publication and presentation record;
- Internationally recognized in the field of nutrient-gene interactions and nutritional epigenetics;
- Extensive expertise in reviewing scientific projects, including grant review for U.S. and abroad funding agencies;
- Ability to conceptualize, design and implement pioneering research and novel paradigms.

### Selected publications

- **Niculescu, M. D.** & Zeisel, S. H. (2002) Diet, methyl donors and DNA methylation: interactions between dietary folate, methionine and choline. *J Nutr*, 132, 2333S-2335S.
- **Niculescu, M. D.**, Craciunescu, C. N. & Zeisel, S. H. (2006) Dietary choline deficiency alters global and gene-specific DNA methylation in the developing hippocampus of mouse fetal brains. *FASEB J*, 20, 43-9.
- Da Costa, K. A., **Niculescu, M. D.**, Craciunescu, C. N., Fischer, L. M. & Zeisel, S. H. (2006) Choline deficiency increases lymphocyte apoptosis and DNA damage in humans. *Am J Clin Nutr*, 84, 88-94.
- **Niculescu, M. D.**, Pop, E. A., Fischer, L. M. & Zeisel, S. H. (2007) Dietary isoflavones differentially induce gene expression changes in lymphocytes from postmenopausal women who form equol as compared with those who do not. *J Nutr Biochem*, 18, 380-90.
- Strauss, K. A., Morton, D. H., Puffenberger, E. G., Hendrickson, C., Robinson, D. L., Wagner, C., Stabler, S. P., Allen, R. H., Chwatko, G., Jakubowski, H., **Niculescu, M. D.** & Mudd, S. H. (2007) Prevention of brain disease from severe 5,10-methylenetetrahydrofolate reductase deficiency. *Mol Genet Metab*, 91, 165-75.

- Mehedint, M. G., **Niculescu, M. D.**, Craciunescu, C. N. & Zeisel, S. H. (2010) Choline deficiency alters global histone methylation and epigenetic marking at the Re1 site of the calbindin 1 gene. *FASEB J*, 24, 184-95.
- Zhang, S., Barros, S. P., **Niculescu, M. D.**, Moretti, A. J., Preisser, J. S. & Offenbacher, S. (2010) Alteration of PTGS2 promoter methylation in chronic periodontitis. *J Dent Res*, 89, 133-7.
- **Niculescu, M.D.** & Lupu, D.S. (2011) Nutritional influence on epigenetics and effects on longevity. *Curr Opin Clin Nutr Metab Care*, 14(1):35-40.
- **Niculescu M.D.** (2011). Epigenetic transgenerational inheritance: Should obesity-prevention policies be reconsidered? *Synesis J*, 2, G18-26.
- **NICULESCU M.D.** (2012) Challenges in nutrition-related DNA methylation studies. *BioMol Concepts*, 3(2), 151-160.
- Lupu D.S., Tint D., & **Niculescu M.D.\*** (2012) Perinatal Epigenetic Determinants of Cognitive and Metabolic Disorders. *Aging and Disease*, (3)5, epub ahead of print.
- Tsang V., Fry R.C., **Niculescu M.D.**, Rager J.E., Saunders J., Paul D.S., Zeisel S.H., Waalkes M.P., Styblo M., & Drobna Z. (2012) The epigenetic effects of a high prenatal folate intake in male mouse fetuses exposed in utero to arsenic. *Toxicol Appl Pharmacol*, Aug 31, epub ahead of print.
- **Niculescu M.D.**, Lupu D.S., & Craciunescu C.N. (2012) Perinatal manipulation of  $\alpha$ -linolenic acid intake induces epigenetic changes in maternal and offspring livers. *FASEB J*, Sep 20, epub ahead of print.
- **Niculescu M.D.** (2012) Nutritional Epigenetics. *ILAR J*, 53(3-4), 270-278.
- Jackson F.L., **Niculescu M.D.**, Jackson R.T. (2013) Conceptual Shifts Needed to Understand the Dynamic Interactions of Genes, Environment, Epigenetics, Social Processes, and Behavioral Choices. *Am J Public Health*, 103 Suppl 1:S33-42.
- da Costa K.A., Corbin K.D., **Niculescu M.D.**, Galanko J.A., Zeisel S.H. (2014) Identification of new genetic polymorphisms that alter the dietary requirement for choline and vary in their distribution across ethnic and racial groups. *FASEB J*, 28(7):2970-8.
- **Niculescu M.D.** (2014) Alpha-linolenic acid alters cell cycle, apoptosis, and DNA methyltransferase expression in mouse neural stem cells, but not global DNA methylation. *J Hum Nutr Food Sci* 2(1): 1026.
- He F., Lupu D.S., **Niculescu M.D.** (2014) Perinatal  $\alpha$ -linolenic acid availability alters the expression of genes related to memory and to epigenetic machinery, and the Mecp2 DNA methylation in the whole brain of mouse offspring. *Int J Dev Neurosci*. 2014 May 24;36:38-44.
- Lupu DS, Cheatham CL, Corbin KD, **Niculescu MD.** (2015) Genetic and epigenetic transgenerational implications related to omega-3 fatty acids. Part I: maternal FADS2 genotype and DNA methylation correlate with polyunsaturated fatty acid status in toddlers: an exploratory analysis. *Nutr Res*. 2015 Nov;35(11):939-47.
- Cheatham CL, Lupu DS, **Niculescu MD.** (2015) Genetic and epigenetic transgenerational implications related to omega-3 fatty acids. Part II: maternal FADS2 rs174575 genotype and DNA methylation predict toddler cognitive performance. *Nutr Res*. 2015 Nov;35(11):948-55.
- Șerban CL, Sima A, Hogeia CM, Chiriță-Emandi A, Perva IT, Vlad A, Albai A, Nicolae G, Putnoky S, Timar S, **Niculescu MD**, Puiu M. (2019) Assessment of Nutritional Intakes in Individuals with

Obesity under Medical Supervision. A Cross-Sectional Study. IJERPH. 2019, Volume 16, Issue 17. doi: 10.3390/ijerph16173036.

- Putnoky S, Banu AM, Moleriu LC, Putnoky S, Şerban DM, **Niculescu MD**, Şerban CL. (2020) Reliability and validity of a General Nutrition Knowledge Questionnaire for adults in a Romanian population. EJCN. 2020, <https://doi.org/10.1038/s41430-020-0616-5>.

## **C18 NUTRITIONAL GUIDANCE DURING COVID-19 PANDEMIC- REVIEW OF EVIDENCE-BASED RESOURCES**

**Andrea NECULAU, Anca LACATUS**

Faculty of Medicine, Transilvania University of Brasov, Romania

The COVID-19 Pandemic has raised a lot of questions among researchers concerning the role of dietary factors in prevention and reduction of complications of the infection with the SARS-Cov-2 virus. Dietary supplements like D, C and E vitamins, minerals like Zinc, selenium, and other supplements like omega 3 fatty acids and Quercetin where extensively used ad recommended despite the reduced evidence for their health benefits. Another nutritional challenge during the lockdown period were nutritional consequences on weight and general health of the population due to reduced mobility and inappropriate food selection. Experts have drawn nutritional recommendation to maintain a normal weight and a good food hygiene. In this analysis we present a review a articles and evidence derived of it as well as research gaps and opportunities for further studies.

### **Andrea Elena NECULAU**

- MD, Carol Davila University Bucharest, 1994
- Senior family physician, 2003
- Master’s degree in public health 2008
- PhD – Transylvania University 2017

#### **In present**

- Associate Professor at the Department of Clinical, Fundamental and Prophylactic Sciences
- Teaching Family Medicine, Primary Healthcare, Community Nursing
- Erasmus coordinator for the Nursing Department
- Vice-dean of the Faculty of Medicine



#### **Research interests**

Dr Andrea Neculau, MD, PhD is Associate professor of Family Medicine at Transylvania University Brasov. She has an interest in Primary health care and Health Systems development. She is also involved in quality improvement in primary care through the participation as expert in several international projects during the past 20 years. The main outcome of her work are contributions to primary care prevention guidelines and supporting documents for health

services development. Teaching undergraduate and postgraduate programs dedicated to family medicine is an important component of her carrier. Topics addressed are preventive care, chronic illnesses, immunizations, mother, and child health.

### **Selected publications**

- Oana Falup-Pecurariu, Sorin C. Man, Mihai L. Neamtu, Gratiana Chicin, Ginel Baci, Carmen Pitic, Alexandra C. Cara, **Andrea E.Neculau**, Marin Burlea, Ileana L. Brinza, Cristina N. Schnell, Valentina Sas, Valeriu V. Lupu, Nancy François, Kristien Swinnen & Dorota Borys (2016): Effects of prophylactic ibuprofen and paracetamol administration on the immunogenicity and reactogenicity of the 10-valent pneumococcal non-typeable Haemophilus influenzae protein D conjugated vaccine (PHiD-CV) co-administered with DTPa-combined vaccines in children: An open-label, randomized, controlled, non-inferiority trial, *Human Vaccines & Immunotherapeutics*, DOI: 10.1080/21645515.2016.1223001.
- Vytautas Usonis, Teresa Jackowska, Sigita Petraitiene, Alicja Sapala, **Andrea Neculau**, Izabella Stryjewska, Raghavendra Devadiga, Monica Tafalla and Katsiaryna Holl: Incidence of acute otitis media in children below 6 years of age seen in medical practices in five East European countries. *BMC Pediatrics* (2016) 16:108.
- **Andrea E Neculau**, Rogozea, Liliana M.; Andreescu, Oana; Jinga, Loredana; Dinu, Eleonora A. RN; Tint, Diana. Multiple Drug-Intolerant Hypertension. *American Journal of Therapeutics*. 10.1097/MJT.0000000000000619 May 2017
- **Andrea Neculau**, Cristina Vecerdi, Anca Maria Lăcătuș, Marius Mărginean: Emergency Units are crowded- is that GP's fault?" *WONCA EUROPE Conference, Prague, 2017*
- **Andrea Neculau**- Romanian primary health care organization, Expert Meeting on the value of primary healthcare systems strengthening in the South-eastern European Region, Ljubljana, 6-7 Nov 2018
- **Andrea Neculau**, Liliana Rogozea, Florin Leasu, Ioana Atudorei, Dana Popa, Anca Lacatus. A study of expressed and unmet healthcare needs of the population of Brasov County Romania, in relation with family doctors. *Abstract Book of the 88th EGPRN Meeting, Tampere - Finland, 9-12 May 2019*
- Claudia, Popa, and **Andrea Neculau**. "Pregnancy monitoring in the family physician's office." *Acta Medica Marisiensis* 65 (2019).
- **Andrea Neculau**, et al. "The log book for family medicine training-feedback on the implementation process." *Acta Medica Marisiensis* 65 (2019).

## Anca Maria LĂCĂTUȘ

- MD, Iuliu Hațieganu University Cluj-Napoca, 2000
- Senior family physician, 2015
- PhD student – Transilvania University of Brasov, 2018
- anca.lacatus@unitbv.ro



### In present

Teaching Assistant at the Department of Clinical, Fundamental and Prophylactic Sciences  
Teaching Family Medicine, Nursing – Transilvania University of Brasov

### Research interests

Dr Anca Lăcătuș, MD, PhD student is currently Assistant professor of Family Medicine at Transylvania University Brasov. She has an interest in Primary health care and Health Systems development focusing on the organisation of Out of Hours Services in primary care.

She has also a strong background in emergency medicine and pediatric care.

Her main duties at the Faculty of Medicine are teaching seminar activities, practical and laboratory activity guidance, exams, tests, assessment of students' paper works, homework etc.; guidance for student thesis, management of professional competitions; mentoring student scientific research, consulting; scientific research, training for teaching.

### Selected publications

- Andrea Neculau, Cristina Vecerdi, **Anca Maria Lăcătuș**, Marius Mărginean: Emergency Units are crowded- ist hat GP's fault?" WONCA EUROPE Conference, Prague, 2017
- Andrea Neculau, Liliana Rogozea, Florin Leasu, Ioana Atudorei, Dana Popa, **Anca Lacatus**. A study of expressed and unmet healthcare needs of the population of Brasov County Romania, in relation with family doctors. Abstract Book of the 88th EGPRN Meeting, Tampere - Finland, 9-12 May 2019
- Neculau, A.E., Rogozea, L., Popa, D., Atudorei, I., Moga, M.A., Leasu, F., **Lacatus, A.M.**: Patients' Perceptions Regarding the *Availability of Primary Care Services in Romania - A Pilot Survey Among Users of Primary Care Services in Brasov County* <https://doi.org/10.31926/but.ms.2020.62.13.2.9>

## **C19 MALNUTRITION DIAGNOSIS TOOLS AND NUTRITIONAL INTERVENTION**

**Monica TARCEA, Roxana MARTIN-HADMAȘ, Irina MATRAN**

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Malnutrition is a global public health issue and it show the vulnerability of a patient's health. It is related to nutritional and health status of the individual, diet and food safety, lifestyle and biochemical parameters, environmental risk factors and quality of life as well.

We can use several validated screening tools/scores to diagnose malnutrition, relatively similar, using parameters such as recent weight loss, recent poor intake/ appetite and body weight measures and providing a numerical score to categorise risk of malnutrition. When choosing a screening tool that is suitable for your assessment, it is important to ensure the tool is validated to the population and, to avoid the most complex one (likely to be more time consuming, subject to error and may also result in a low compliance with screening), to achieve a high sensitivity, even if this is at the expense of a high specificity, also who will perform screening, how can screening be used into current medical procedures and finally what action/intervention will be taken for those screened at risk?

Nutritional evaluation is not a routine practice in Romanian clinical settings, and procedures must be standardized. Nutritional risk screening (NRS), malnutrition screening tool (MST), and patient-generated subjective global assessment (PG-SGA) are the most common screening tools, and each one possesses some benefits when screening patients for malnutrition; however, weight loss over a specific time period, dietary intake and anorexia must also be considered.

For vulnerable population, we recommend the application of MST or NRS, followed by PG-SGA, food intake determination, measurement of body weight, and its changes as well as body composition, biochemical nutritional markers, muscle function, and physical performance.

## Monica TARCEA

- Senior specialist in Environmental Hygiene and Food safety, MD, PhD in Medicine, Habil.
- Professor at the Faculty of Medicine/ University of Medicine, Pharmacy, Science and Technology from Targu Mures, Romania
- Head of Department of Community Nutrition and Food Safety
- Coordinator of *Nutrition and Dietetics* bachelor program and *Clinical and Community Nutrition* master program (2010-2020)
- University of Medicine, Pharmacy, Science and Technology „George Emil Palade” from Targu Mures, Romania



- Head of Department of Environment Health at the Mures Regional Center from the Romanian National institute of Public Health (part time)
- Competence in Community Nutrition + in Public Health + in Methodology of scientific research in Reproductive and Public Health
- Address: 3 Constantin Hagi Stoian street, bl C3, sc 1, apart 11, Targu Mures-540259, Romania
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- Phone: (+40) 744791967
- ORCID ID: 0000-0001-7299-118x

### Research interests

Public Health, Community Nutrition, Obesity, Smoking and Lifestyle risk behaviors assessment.

**Member** of Romanian Public Health Association and EUPHA, Romanian Society of Behavioral Medicine and ISBM, Healthy Nutrition Foundation, Romanian Nutrition and Dietetics Association (ARoND), Romanian Hygiene Society, Romanian Society for School Physicians, also in Editorial committee of Hygiene and Public Health Journal and Journal of Obesity & Eating Disorders.

**Member** in Hygiene Specialty Committee from Romanian Health Ministry, since 2017.

### Projects

- Consultant, Director of Evaluation Program in Public Health, Hygiene and Nutrition, World Vision International NGO in East Timor under the auspices of the UN / WHO, "Nutrition, hygiene and health status of children - KAP survey in East Timor", March -May 2002.
- Project director, Exploratory Workshop "The role of the dietitian in health promotion and in the Romanian health system", 2012 (PN-II-ID-WE-2012-4-011). UEFISCDI financing contract no. 14 of 31.05.2012, the total value of the financing contract 29,940 Lei.
- International project director, study "Smoking and Exposure to secondhand smoking among Pregnant Women and Children", part of the project "Building Capacity for Tobacco Research in Romania", period 2012-2017, Contract no. 1R01TW009280-01, no. subcontract 2011-36, project funded by the National Institutes of Health - Fogarty International Center, USA. <http://trr.umftgm.ro/> sau <http://grantome.com/grant/NIH/R01-TW009280-03>

- Project manager “Multilevel interventions for lifestyle-related diseases (risk chart, healthy nutrition, alcohol, “Life” campaign)” / Multi-level interventions for the prevention of lifestyle related non communicable diseases in Romania, funded in the RO 19 Program “Public Health Initiatives”, no. RO19-0004, through the Norwegian Financial Mechanism 2009-2014, in Partnership with the National Institute of Public Health Bucharest as Promoter, April 1, 2014 - March 31, 2016, value of eligible expenses = 17,500 Euro. Partnership agreement no. 4852 of 24.04.2014 at MS / Inst. National Institute of Public Health, at <https://eeagrants.org/archive/2009-2014/projects/RO19-0004>
- Project manager “Study about the knowledge and habits regarding food fibers in different countries”, international project with reference data PROJ / CI & DETS / 2014/0001, in Partnership with the Escola Superior Agrari di Instituto Politecnico de Viseu / Portugal, Departamento de Industrias Alimentares, September 1, 2014 - August 31, 2016, without financing.
- Project manager “Psycho-social motivations associated with food choices and eating practices (EATMOT)”, international project with reference data PROJ / CI & DETS / 2015/0008, in Partnership with the Escola Superior Agrari di Instituto Politecnico de Viseu / Portugal, Department of Food Industries, June 1, 2016-December 31, 2018, at <https://raquelguine.wixsite.com/eatmot>
- Project manager "EISuFood - Study about food habits and knowledge about edible insects as sustainable foods", international project with reference data CERNAS-IPV / 2020/003 (International Project EISuFood that includes countries like Brazil, Cape Verde, Colombia, Croatia, Greece, Latvia, Lebanon, Lithuania, Mexico, Morocco, Nigeria, Poland, Romania, Serbia, Slovenia, Spain, and Turkey). Coordinator Prof. Raquel Guiné, in Partnership with Escola Superior Agrari di Instituto Politecnico de Viseu / Portugal, Departamento de Industrias Alimentares, April 1, 2021-September 30, 2022, at <https://raquelguine.wixsite.com/eisufood>

### Selected publications

19 specialty books (2 international), 10 manuals for students, and 156 articles.

Scientific conferences participations: 108 (national and international).

Member of organizing committees for 14 national conferences.

- **Tarcea M**, Cinpeanu C. - The Importance of Obesity Prophylaxis in Young People, *Journal of Obesity & Eating Disorders (USA)*, 2019, 5(2):1-4, ISSN 2471-8203, DOI: 10.21767/2471-8203.100042 at <http://obesity.imedpub.com/archive/ipjoed-volume-5-issue-2-year-2019.html>
- **Tarcea M**, Nemes L. - Challenges of Adaptation Response in Caloric Restriction, *Journal of Obesity & Eating Disorders (USA)*, 2018, 4(2):39-40, ISSN 2471-8203, at <http://obesity.imedpub.com/inpress.php/>
- Guiné RP, Bartkiene E, Florenca S, Djekić I., Černelič-Bizjak M, **Tarcea M**, Leal M, Ferreira V, Rumbak I, Panagiotis O, Szűcs V, Klava D, Malgorzata K, Isoldi K, Correia P, Ferreira M, Cardoso AP. – Environmental Issues as Drivers for Food Choices: Study from a Multinational Framework, *Sustainability* (ISSN 2071-1050), 2021, 13:2869, **ISI cu FI=2,576**, at <https://www.mdpi.com/2071-1050/13/5/2869>

- Bacărea A, Bacărea VC, Cîmpeanu C, Teodorescu C, Seni AG, Guine RPF, **Tarcea M.** – Demographic, Anthropometric and Food Behavior Data towards Healthy Eating in Romania, *Foods*, 2021, 10:487, <https://doi.org/10.3390/foods10030487> **ISI cu FI=4,092.**
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### Research interests

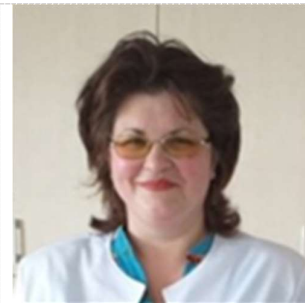
Clinical Nutrition, Pediatric Nutrition, Sports Nutrition, Community Nutrition and Public Health.

### Selected publications

- **Martin-Hadmaş RM**, Martin ŞA, Romoñi A, Mărginean CO. The Effect of Dietary Intake and Nutritional Status on Anthropometric Development and Systemic Inflammation: An Observational Study. *International Journal of Environmental Research and Public Health*. 2021; 18(11):5635. <https://doi.org/10.3390/ijerph18115635>
- **Martin-Hadmaş RM**, Martin ŞA, Romoñi A, Mărginean CO. Anthropometric Development in Children: Possible Changes in Body Mass, Basal Metabolic Rate and Inflammatory Status. *Children*. 2021; 8(6):455. <https://doi.org/10.3390/children8060455>
- **Hadmaş RM**, Martin ŞA, Mărginean O. Fat Consumption and Related Changes in Micronutrients Intake and Child Anthropometric Development. *Bulletin UASVM Food Science and Technology*. 2020; 77 (2): 1-9. <https://doi.org/10.1016/j.scispo.2019.04.004>
- Martin ŞA, **Hadmaş RM**, Dobreanu D, Resting Metabolic Rate Changes Over 4 Months Of Elite General Cross Country Roller Skiing Training. *Science & Sports*. 2019. 34(4): 236-243. [10.1016/j.scispo.2019.04.004](https://doi.org/10.1016/j.scispo.2019.04.004)
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- Martin ŞA, **Hadmaş RM**. Individual Adaptation in Cross-Country Skiing Based on Tracking. *Sports*. 2019. 7(9): 211. [10.3390/sports7090211](https://doi.org/10.3390/sports7090211)

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- Licensed in Food Technology Engineer
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- Competence in development of food for special nutritional conditions, preclinical studies, obtaining patents, submission to the European Commission for obtaining the Scientific Opinion issued by the European Food Safety Authority, implementation and certification of quality management systems, information security and information security, certification of processes manufacturing and marketing of organic products



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### Research interests

Food industry, foods for special nutritional conditions (prevention or treatment of constipation, gastroesophageal reflux, atopic dermatitis) food supplements, food safety, nutrigenetics, pharmacovigilance, nutraceuticals, nutrition.

**Member** of NNS Association - Nutrition. Nutrients. Health.

Scientific conferences participations: 25 (national and international).

Member of organizing committees for 1 national conferences and 1 international conferences.

### Projects

- Member and legal representative of S.C. Panalim S.A. for the European financing project, selected in Bucharest - "Improving the competitiveness of bakery products within S.C. Panalim S.A. through the State Aid Scheme - XS 13 / 123A / 2008", submitted in session no. 5/2008.
- Member of the project team "INITIAL INVESTMENT ON THE GBER STATE AID SCHEME (SM 4.2.) REGARDING THE FUNDAMENTAL CHANGE OF THE GENERAL PRODUCTION PROCESS OF AN EXISTING UNIT". Measure 4.2G.AFIR. European funds. Applicant SC Expertarom Food Ingredients SRL year 2017, the total value of the financing contract 684164 Lei
- Member of the project team "MODERNIZATION AND EXTENSION OF THE PRODUCTION AND STORAGE CAPACITY OF S.C. EXPERTAROM FOOD INGREDIENTS S.R.L.", Measure 4.2 GBER AFIR European funds. Applicant S.C. Expertarom Food Ingredients S.R.L., year 2018, the value of the financing contract: 2499787 Lei.

### Selected publications

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- **Matran IM**, Boțan E. - Applicability of sericulture in the food industry and medicine, Lucrări Științifice. Seria Agronomie, 2017, 60(1): 183-186, ISSN: 1454-7414, at [http://www.uaiasi.ro/revagrois/volum/Vol-60-1\\_2017.pdf](http://www.uaiasi.ro/revagrois/volum/Vol-60-1_2017.pdf)
- **Matran IM**, Cioca A, Dumitrașcu DL. - Alimente pentru boli digestive cronice. Tendințe contemporane ale dezvoltării științei: viziuni ale tinerilor cercetători, 2017,1:240-245, ISBN 978-9975-108-17-1 at [https://edu.asm.md/sites/default/files/Conferinta\\_drd\\_15\\_iunie\\_2017\\_volumul\\_2\\_\\_optim.pdf](https://edu.asm.md/sites/default/files/Conferinta_drd_15_iunie_2017_volumul_2__optim.pdf)
- **Matran IM**, Dumitrașcu DL - Legătura între alimente, factorii psihosociali și suferință, Rev Med Rom, 2018,LXV(1):24-31, ISSN 1220-5478, DOI: 10.37897/RMJ.2018.1.4, CNCSIS B+, at <http://rmj.com.ro/rmj-vol-lxv-nr-1-an-2018/>

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- Rotaru M, **Matran IM**, Iancu GM - Topical Maintenance Treatments in Chronic Dermatitis, *Acta Medica Transilvanica*, 2020,25(2):18-21, at <https://doi.org/10.2478/amtsb-2020-0042>.

## **C20 DIETARY POLYPHENOLS IN HUMAN HEALTH. ROLE IN NEURODEGENERATIVE DISEASES AND SAFETY USAGE**

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Most, if not all, edible vegetables included in human diet are rich sources of phenolic compounds. Such compounds, like polyphenols, are commonly used by the plants for several reasons, eg as metabolic intermediates, protective strategies, reproductive attractants etc. Many of those phytochemicals have been recognized as potent antioxidants, sharing also other important actions that can impact human health like their anti-inflammatory properties and their proposed capability to modulate several cell-signalling pathways and mediators.

Based on the above properties, together with the relative abundance of these food products in human diet, multiple approaches, either *in vitro* or *in vivo*, accent their potential role in the prevention and treatment of various pathological conditions connected to oxidative stress and inflammation.

The relevance of polyphenols in human health led to a significant increase in the quantity of studies devoted to their numerous proposed actions, in many different pathologies like cancer, cardiovascular and neurodegenerative disorders, but also pollutant-induced cell damage, also resulting in a growing number of clinical trials on the acute or chronic use of dietary polyphenols. Their relevance is particularly important in the case of neurodegenerative diseases, or cancer, where an effective treatment is still not available.

The proposed benefits of polyphenols, either as protective/prophylactic substances or as therapeutic molecules, may be achieved by the consumption of a natural polyphenol-enriched diet, by the use as food supplements or formulation as pharmaceutical drugs/nutraceuticals. It was also proved that the health effects of polyphenols depend on the amount consumed as well as on their bioavailability. However, the over consumption of polyphenols may raise safety concerns due to accumulation of high levels of these molecules in the organism, particularly if we consider the loose regulatory legislation regarding the commercialization and use of food supplements. We previously showed that high levels of quercetin may lead to some neuronal demise in a primary neuron culture model and disrupt the barrier properties in a human model of the blood-brain barrier. Few studies are focused on the safe use of polyphenols for disease prevention and treatment, but they are paramount to further promote their use in human health.

In conclusion, polyphenols seem to be effective molecules for preventive and therapeutic strategies in a wide range of pathological conditions, taking into account the possible issues raised by dosage, toxicity and monitoring of their safe usage.

*This work was supported by iMed.Ulisboa, Fundação para a Ciência e Tecnologia (FCT), Portugal (UID/DTP/04138/2013) and Slovene Research Agency (P4-0121 and J7-4050), Slovene Human Resources Development and Scholarship Fund (11012-18/2012).*

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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

- **Silva, R. F. M.** and L. Pogacnik. Polyphenols from Food and Natural Products: Neuroprotection and Safety. *Antioxidants* 2020; 9: 61.
- **Silva RFM** and Pogačnik L. Food, polyphenols and neuroprotection. *Neural Regeneration Res* 2017; 12: 582-3.
- Garcia G, Nanni S, Figueira I, Ivanov I, McDougall GJ, Stewart D, Ferreira RB, Pinto P, **Silva RF**, Brites D, Santos CN. Bioaccessible (poly)phenol metabolites from raspberry protect neural cells from oxidative stress and attenuate microglia activation. *Food Chem* 2017; 15: 274-83.
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- **Silva RFM**, Rodrigues CMP, Brites D. Rat cultured neuronal and glial cells respond differently to toxicity of unconjugated bilirubin. *Pediatr Res* 2002; 51: 535-41.
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## **C21 BIOAVAILABILITY AND BIOLOGICAL ACTIVITY OF NATURAL POLYPHENOLS FROM DIFFERENT SOURCES**

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Bioavailability refers to the extent and rate at which the active substance and/or its metabolite enters systemic circulation, thereby accessing the site of action. Bioavailability of active substances from food sources primarily depend on the chemical reactions that occur during digestion as well as on their ability to cross the membranes. In order to study this complex process, we first have to obtain the suitable extract. The most common procedure involves the solid/liquid extraction, where several crucial steps have to be optimized: i) selection of raw material (botanical and geographic origin, implemented part, quality of raw material), ii) solvent (chemical nature of solvent, its quality, solid-to-solvent ratio), iii) extraction device (type of extractor, continuous or batch process, batch size) and iv) the extraction process conditions (extraction time, temperature, number of cycles). The solubility of bioactive molecules in different solvents plays an important role in the selection of the appropriate separation and purification procedures. Once the extraction conditions are defined, the extracts have to be analysed for the presence of particular molecules, using different analytical procedures, namely TLC, HPLC with various detectors (e.g. MS, UV-Vis spectrophotometer, fluorimeter, refractometer) or NMR. Furthermore, the extracts are checked for the potential chemical and/or biological activities, namely antioxidant, anti-microbial, anti-cancer, anti-diabetes, neuroprotection, neurotoxicity etc. These can be checked by a variety of assays, preferably in combination, ranging from simple chemically based models, to cell cultures *in vitro* or animal models *in vivo*. At the end, all bioactivities must be confirmed in human assays. The combination of all obtained results contributes to the final understanding of potential beneficial/toxic effects of the isolated molecules or their mixtures present in the extracts.

In this lecture the optimisation of extraction procedures of bioactive molecules from the invasive knotweed species (*Fallopia japonica*, *Fallopia sachalinensis* and *Fallopia x bohemica*), microalgae spirulina (*Arthrospira platensis*) after the lactic acid fermentation (*Lactobacillus plantarum*) and onion skin will be presented. The results of their bioactivities (antioxidant, anti-microbial, anti-diabetic) will be shown along with their possible applications.

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- Bibliography: <http://splet02.izum.si/cobiss/bibliography?code=15650>



## Teaching activities

- Chemistry, Biochemistry, Food Analytical Chemistry, Analytical Biotechnology for BSc and MSc students of Food Science and Nutrition, Biotechnology, Agronomy, Animal Sciences
- Mentor of 2 PhD thesis, 13 MSc thesis, 39 BSc thesis

## Research interests

- preparation and evaluation of bioactivities in extracts of different tissues of alien knotweed species, namely Japanese knotweed (*Fallopia japonica*), Giant knotweed (*F. sachalinensis*) and their interspecific hybrid – Bohemian knotweed (*F. x bohemica*)
- preparation and characterisation of cyanobacteria species *Arthrospira platensis* extracts before and after the lactic acid fermentation
- 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

- SILVA, Rui F. M., **POGAČNIK, Lea**. Polyphenols from food and natural products : neuroprotection and safety. *Antioxidants*. 2020, vol. 9, iss. 1, p. 1-13
- **POGAČNIK, Lea**, BERGANT, Tina, SKRT, Mihaela, POKLAR ULRIH, Nataša, VIKTOROVÁ, Jitka, RUMML, Tomáš. In vitro comparison of the bioactivities of Japanese and Bohemian knotweed ethanol extracts. *Foods*. 2020, vol. 9, iss. 5, p. 1-12
- GOIS RUIVO DA SILVA, Mariana, SKRT, Mihaela, KOMES, Draženka, POKLAR ULRIH, Nataša, **POGAČNIK, Lea**. Enhanced yield of bioactivities from onion (*Allium cepa* L.) skin and their antioxidant and anti - [alpha] - amylase activities. *International journal of molecular sciences*. 2020, vol. 21, no. 8, str. 1-16
- SILVA, Rui F. M., **POGAČNIK, Lea**. Food, polyphenols and

neuroprotection. *Neural Regeneration Research*, ISSN 1673-5374, Apr. 2017, vol. 12, iss. 4, p. 582-583

- OSOJNIK ČRNIVEC, Ilja Gasan, SKRT, Mihaela, ŠEREMET, Danijela, STERNIŠA, Meta, FARČNIK, David, ŠTRUMBELJ, Erna, POLJANŠEK, Aleš, CEBIN, Nika, **POGAČNIK, Lea**, SMOLE MOŽINA, Sonja, HUMAR, Miha, KOMES, Draženka, POKLAR ULRIH, Nataša. Waste streams in onion production : bioactive compounds, quercetin and use of antimicrobial and antioxidative properties. *Waste management*. [Print ed.]. 2021, vol. 126, p. 476-486,
- **POGAČNIK, Lea**, OTA, Ajda, POKLAR ULRIH, Nataša. An overview of crucial dietary substances and their modes of action for prevention of neurodegenerative diseases. *Cells*. 2020, vol. 9, iss. 3, p. 1-25
- **POGAČNIK, Lea**, POKLAR ULRIH, Nataša. Invasive knotweed species as a rich source of antioxidants. *Journal of EcoAgroTourism*, 2018, vol. 14, no. 1, p. 5-10
- **POGAČNIK, Lea**, ROGELJ, Anže, POKLAR ULRIH, Nataša. Chemiluminescence method for evaluation of antioxidant capacities of different Invasive knotweed species. *Analytical letters*, 2016, vol. 49, no. 3, str. 350-363
- **POGAČNIK, Lea**, PIRC, Katja, PALMELA, Inês, SKRT, Mihaela, KIM, Kwang S., BRITES, Dora, BRITO, Maria Alexandra, POKLAR ULRIH, Nataša, SILVA, Rui F. M. Potential for brain accessibility and analysis of stability of selected flavonoids in relation to neuroprotection in vitro. *Brain research*, 2016, vol. 1651, p. 17-26,
- PIRC, Katja, ŠKARABOT, Miha, **POGAČNIK, Lea**, ŽEROVNIK, Eva, POKLAR ULRIH, Nataša. The effect of tyrosine residues on [alpha]-synuclein fibrillation. *Acta chimica slovenica*, 2015, vol. 62, no. 1, p. 181-189
- **POGAČNIK, Lea**, POKLAR ULRIH, Nataša. Application of optimized chemiluminescence assay for determination of the antioxidant capacity of herbal extracts. *Luminescence*, 2012, vol. 27, no. 6, p. 505-510

## **C22 BENEFICIAL EFFECTS OF RESVERATROL INTAKE AGAINST ENDOMETRIOSIS**

**Marius Alexandru MOGA (1), Nicușor Florin BÎGIU (1), Andreea BĂLAN (1), Carmen  
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Endometriosis is a gynecological pathology, which usually affects women in reproductive age. Almost 15% of the young population is diagnosed with endometriosis, which is characterized by the implantation of endometrial tissue outside the uterus. The clinical presentation of endometriosis includes symptoms such as dyspareunia, chronic pelvic pain, dysmenorrhea, and infertility. Despite long periods of studies and investigations, the pathogenesis of this condition still need to be discovered and better described.

Recent theories that have been launched suggested that chronic inflammation and abnormal angiogenesis could influence the development and progression of endometriosis. Furthermore, the importance of dietary phytochemicals and their beneficial effects against chronic inflammation have been highlighted. Resveratrol is a natural phytoalexin synthesized by plants due to ultraviolet radiation. High levels of this natural compound were found in grapes, wine, raisins, berries, nuts and stilbenes. According to the most recent studies, resveratrol possesses anti-inflammatory, anti-angiogenic, anti-neoplastic, anti-oxidative and anti-microbial activities. This compound is able to affect multiple signal transduction pathways, including several that are relevant for the mechanism of endometriosis development. This hypothesis supports that resveratrol could be a possible innovative dietary supplement with beneficial effects in the prevention and treatment of endometriosis.

The objective of this article is to bring together all the previous studies that pointed out the effects of resveratrol consumption against endometriosis. We especially focused on the anti-inflammatory pathways of this natural compound and for this purpose we performed a systematic review of the last ten years literature.

Resveratrol exerts different effects on various molecular pathways involved in inflammation, such as arachidonic acid, Nf-kB, Ah receptor or AP-1 pathways. Also, it suppresses the production of ROS and inhibits COX-2 expression and prostaglandin synthesis. Both preclinical and clinical studies were performed in order to highlight the anti-inflammatory effects of resveratrol.

In conclusion, resveratrol demonstrated its efficiency against endometriosis by targeting the inflammatory pathways of this pathology. It is effective either alone or associated with other classical therapeutic agents used in the treatment of endometriosis, such as leuprolide acetate or statins. Despite the fact that the role of resveratrol in reducing the volume of endometriotic

lesions and chronic abdominal pain is a proven fact, further studies are required in order to better understand all its mechanisms of action.

### Marius Alexandru MOGA

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- Head of Department of Medical and Surgical Specialties, Faculty of Medicine, Transilvania University, Braşov
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### Research Interests

Scientific and didactic activity demonstrated through a wide range of articles and projects in the field of life sciences, especially Obstetrics and Gynecology, and research projects (A phase 3, double blind, multicentre, randomised, placebo-controlled study to determine the efficacy and safety of SPL 7013 Gel (VivaGel) to prevent the recurrence of bacterial vaginosis- Principal Investigator; FP7 project - PlantLIBRA (Plant Food Supplements: Level of Intake, Benefit and Risk Assessment), etc.).

Main research interests are in the Obstetrics and Gynecology area, in the topics of gynecological diseases, normal fetal development and associated pregnancy-pathology. In the last years, the research area was extended, studying the mechanism of action of various natural products, which could be used for prophylactic purposes and as therapeutical agents in treating gynecological cancers and other gynecological conditions. In addition, the Chinese Traditional Medicine, and other types of complementary and integrative medicine, these trends being a direction of development of medicine in the present era represent a new direction of the research activity.

### Selected publications

- **Moga, M. A.**, Dimienescu, O. G., Arvătescu, C. A., Ifteni, P., & Pleş, L. (2018). Anticancer Activity of Toxins from Bee and Snake Venom-An Overview on Ovarian Cancer. *Molecules*, 23(3), 692.

- **Moga M.A.**, Bălan A., Dimienescu OG, Dima L. Complementary/alternative treatment in breast cancer: complement or crime? Ο ΓΚΟΛΟΓΙΚΟΙ & ΕΝΔΟΣΚΟΠΙΚΟΙ ΠΡΟΒΛΗΜΑΤΙΣΜΟΙ (2019). ISBN 978-960-599-255-2
- **Moga, M. A.**, Dimienescu, O. G., Arvatescu, C. A., Mironescu, A., Dracea, L., & Ples, L. (2016). The Role of Natural Polyphenols in the Prevention and Treatment of Cervical Cancer-An Overview. *Molecules*, 21(8), 1055
- **Moga M.A.**, Bălan A., Anastasiu C.V., Dimienescu O.G., Neculoiu CD, Gavriș C. An Overview on the Anticancer Activity of *Azadirachta indica* (Neem) in Gynecological Cancers. *Int J Mol Sci*. 2018, 19(12).
- **Moga, M.A.**, Balan, A., Dimienescu, O.G., Burtea, V., Dragomir, R.M., Anastasiu, C.V. Circulating miRNAs as Biomarkers for Endometriosis and Endometriosis-Related Ovarian Cancer- An Overview. *JCM*. 2019
- Andreea Balan, **Marius Alexandru Moga**, Lorena Dima, Catalina Georgeta Dinu, Carmen Constantina Martinescu, Diana Elena Panait, Claudia Alexandrina Irimie, Costin Vlad Anastasiu. An Overview on the Conservative Management of Endometriosis from a Naturopathic Perspective: Phytochemicals and Medicinal Plants. *Plants*. 2021, 10, 587

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### **Research Interests**

Main research interests are on bioactive compounds in various plants and their role in preventing or treating different pathologies, (especially pathologies on Obstetrics and Gynecology) study of their dose dependent effect, toxicity and extract standardization. Other topic of interest is represented by medical anthropology applied in different aspects of day to day life.

### **Selected publications**

- The role of gasless laparoscopy in differential diagnosis of acute abdomen. Moga MA, Arvatescu CA, Pratilas GC, **Bigiu NF**, Dinas K, Burtea V. *Hippokratia* vol.18, Issue no.4, 2014 (IF=0,355 / 2013)
- Ganglioneuroblastoma during pregnancy – A rare case report. M.A. Moga, A. Daniilidis, **N.F. Bigiu**, C. Andrei, K. Dinas, D.G. Festila, *Clinical and Experimental Obstetrics & Gynecology* 2016, 43 (2), 265-267, ISSN 0390-6663( IF=0,52/2015)
- Heavy metals monitoring using TLC. Badea M., Moga M., Taus N., **Bigiu N.**, Cobzac SC. *Journal of Environmental Protection and Ecology – Vol.10, Issue 4, pag.1006-1012, 2009, ISSN: 1311-5065 (IF=0,169/2009)*

- Moga M., Preda Gh., Marceanu L., Miclaus R., **Bigiu N.**- Life style factors related to bone mineral density in postmenopausal women. *Journal of Environmental Protection and Ecology*, Official Journal of the Balkan Environmental Association, Sofia, vol. 9 no. 1, 2008, pg. 67-69 ISSN 1311-5065
- Moga M., **Bigiu N.** - Healthy facts about nutrition in pregnancy, *Journal of Environmental Protection and Ecology*, 2007, in press, indexed ISI: JOURNAL OF ENVIRONMENTAL PROTECTION AND ECOLOGY Quarterly ISSN: 1311-5065 SCIBULCOM LTD, PO BOX 249, SOFIA, BULGARIA, 1113
- M. Moga, Mihaela Badea, **N. Bigiu** – Environmental factors in congenital anomalies, *Journal of Environmental Protection and Ecology*, 2008, in press, indexed ISI: JOURNAL OF ENVIRONMENTAL PROTECTION AND ECOLOGY Quarterly ISSN: 1311-5065 SCIBULCOM LTD, PO BOX 249, SOFIA, BULGARIA, 1113
- Predictive markers of intrauterine growth restriction. M. Moga, Maria Mihalache, C. Arvatescu, Alina Pascu, Diana Tint, Victoria Burtea, C. Anastasiu, **N. Bigiu**. *Gineco. eu* , Vol. 10 Issue 2 , 2014, ISSN 1841-4435
- Is maternal HBsAg carrier status associated with adverse pregnancy outcome?. M. Moga, C. Anastasiu, **N. Bigiu**. *Gineco. eu* , Vol. 9 , No. 31 (1/2013), ISSN 1841-4435
- Polychlorinated biphenyls impact on pregnancy. M. Moga, **N. Bigiu**, Mihaela Badea, Victoria Burtea. *Archives of the Balkan Medical Union* Vol. 49, No.1 pg.61-65, 2014, ISSN: 0041-6940

### **Andreea BĂLAN**

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### **Research Interests**

The main interest in the research activity consists of the analysis of novel potential strategies of management for various gynecological pathologies. A special interest is manifested in the field of gynecological cancers and endometriosis. Natural agents, which may be used as therapeutical agents, such as polyphenols caught my attention and represent the target of my research. In the last period, a special attention was given to dietary supplements and natural products, which could be used for prophylactic purposes as well as therapeutical agents in treating gynecological cancers and other gynecological pathologies, such as endometriosis. Complementary medicine also represents a topic of interest that I have deepened, and I want to continue the research in this field so vast and controversial for the medical world.

### Selected publications

- Moga M.A., **Bălan A.**, Anastasiu C.V., Dimienescu O.G., Neculoiu CD, Gavriș C. An Overview on the Anticancer Activity of Azadirachta indica (Neem) in Gynecological Cancers. Int J Mol Sci. 2018, 19(12).
- Moga M.A., **Bălan A.**, Dimienescu OG, Dima L. Complementary/ alternative treatment in breast cancer: complement or crime? Ο ΓΚΟ ΛΟΓΙΚΟΙ & ΕΝΔΟΣΚΟΠΙΚΟΙ ΠΡΟΒΛΗΜΑΤΙΣΜΟΙ (2019). ISBN 978-960-599-255-2
- Moga, M. A., Dimienescu, O. G., **Bălan, A.**, Scîrnețiu, I., Barabas, B., Liana, P. (2018). Therapeutic Approaches of Botulinum Toxin in Gynecology. Toxins, 10(4), 169.
- Moga, M.A., **Bălan, A.**, Dimienescu, O.G., Burtea, V., Dragomir, R.M., Anastasiu, C.V. Circulating miRNAs as Biomarkers for Endometriosis and Endometriosis-Related Ovarian Cancer— An Overview. JCM. 2019
- Moga, M.A., Dimienescu, O.G., Bigiu, N.F., **Bălan, A.**, Ples, L. Postmenopausal vulvovaginal atrophy - a systematic review of a public health problem solved with CO2 Laser therapy. Archives of the Balkan Medical Union. 2018, Suppl 1, 53.
- Bobescu E., **Balan A.**, Moga M.A., Teodorescu A., Mitrica M., Dima L. Are There Any Beneficial Effects of Spirulina Supplementation for Metabolic Syndrome Components in Postmenopausal Women? Marine Drugs. 2020, 18(12), 651.
- Moga M.A., Dima L., **Balan A.**, Blidaru A., Dimienescu O.G., Podasca C., Toma S. Are Bioactive Molecules from Seaweeds a Novel and Challenging Option for the Prevention of HPV Infection and Cervical Cancer Therapy? - A Review. Int J Mol Sci. 2021.
- **Balan A.**, Moga M.A., Dima L., Dinu C.G., Martinescu C.C., Panait D.E., Irimie C.A., Anastasiu C.V. An Overview on the Conservative Management of Endometriosis from a Naturopathic Perspective: Phytochemicals and Medicinal Plants. Plants. 2021, 10, 587.

### Carmen Constantina MARTINESCU

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### Research Interests

Main research interests are on general medicine and medical anthropology applied in different aspects of day-to-day life.

### Selected publications

- Balan A., Moga M.A., Dima L., Dinu C.G., **Martinescu C.C.**, Panait D.E., Irimie C.A., Anastasiu C.V. An Overview on the Conservative Management of Endometriosis from a Naturopathic Perspective: Phytochemicals and Medicinal Plants. *Plants*. 2021, 10, 587.
- Balan A., Dvornic P., Nisioi C., **Martinescu C.**, Panait D.E., Moga M.A. Hormonal fluctuations related to depressive symptoms in menopause. *Bulletin of Transilvania University of Braşov, Series VI: Medical Sciences*. 2020, 13 (62).
- Dimienescu O.G., Moga M.A., Bigiu N.F., **Martinescu C.**, Ciobanu C., Arvatescu C.A. Retrospective evaluation of the incidence and treatment of cervical cancer. *Bulletin of Transilvania University of Brasov*. 2017, 10(59), 9-16.
- **Martinescu C.**, Glavce C, Ispas A.T, Toma S. Vomeronasal Organ In Humans – Structure And Functions: A Short Review. *Revista Română de Anatomie funcțională și clinică, macro- și microscopică și de Antropologie*.2020. Vol. XIX, no. 1, p.36.
- 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. *Archives of the Balkan Medical Union*, 2017, 52(3), p.249-253.

### **Dana Gabriela FEȘTILĂ**

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- Doctor of Medical Sciences
- Member of the editorial board of the journal *Cient Periodique Medicine (CPQ Medicine)*
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  - Romanian Association of Excellence in Orthodontics (AREO)
  - Balkan Medical Union (UMB)
  - Italian Society of Orthodontics (SIDO)
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### **Research Interests**

In my opinion, research is crucial to excellence in clinical care. While that seems self-evident, the reason research and patient care need to exist side by side and be pursued with equal vigor has several levels. First and foremost, advances in research, both clinical, basic and in-between offers the benefit of immediate therapies for the patients. Second, the ability to offer clinical trials to patients who have diseases for which effective therapies are not available gives both patients and their doctors a sense of hope and optimism for the future.

My main interest in the research activity consists of the analysis of novel potential strategies of management for various medical and surgical pathologies. Also, natural agents, which may be used as therapeutical agents, caught my attention in the last period.

#### **Selected publications**

- Adriana Elena Bulboacă, Alina Porfire, Sorana D. Bolboacă, Cristina Ariadna Nicula, **Dana Gabriela Feștilă**, Alexandra Roman, Ruxandra Mioara Râjnoveanu, Armand Râjnoveanu, Gabriela Dogaru, Paul-Mihai Boarescu, Vasile Rus, Corneliu Angelo Bulboacă, Alexandra Ina Bulboacă, Ioana Stănescu. Protective Effects of Liposomal Curcumin on Oxidative Stress/Antioxidant Imbalance, Metalloproteinases 2 and -9, Histological Changes and Renal Function in Experimental Nephrotoxicity Induced by Gentamicin. *Antioxidants* **2021**, 10, 325.
- Stănescu, I.; Bulboacă, A.E.; Micu, I.C.; Bolboacă, S.D.; **Feștilă, D.G.**; Bulboacă, A.C.; Bodizs, G.; Dogaru, G.; Boarescu, P.M.; Popa-Wagner, A.; Roman, A. Gender Differences in the Levels of Periodontal Destruction, Behavioral Risk Factors and Systemic Oxidative Stress in Ischemic Stroke Patients: A Cohort Pilot Study. *J. Clin. Med.* **2020**, 9, 1744.

#### **Lorena DIMA**

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- Professor of Pharmacology (Department of Fundamental Disciplines and Clinical Prevention)
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- Management of the scientific research activity, quality management of the didactic process, organization and monitoring of the training process of the students in the study programs of the department
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#### **Research Interests**

Main research interests are on the areas of neuropsychopharmacology and pharmacology of plants compounds. The studied topics 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. Furthermore, in the last years, the effects of bioactive compounds from plants on the gynecological pathologies has become an area of major interest.

### **Selected publications**

- Moga M.A., Bălan A., Dimienescu OG, **Dima L.** Complementary/alternative treatment in breast cancer: complement or crime? Ο ΓΚΟΛΟΓΙΚΟΙ & ΕΝΔΟΣΚΟΠΙΚΟΙ ΠΡΟΒΛΗΜΑΤΙΣΜΟΙ (2019). ISBN 978-960-599-255-2.
- **Dima L**, Bălan A, Moga MA, Dinu CG, Dimienescu OG, Varga I, Neculau AE. Botulinum Toxin a Valuable Prophylactic Agent for Migraines and a Possible Future Option for the Prevention of Hormonal Variations-Triggered Migraines. *Toxins (Basel)*. 2019 Aug 8; 11(8). pii: E465.
- 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.
- 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.
- Paunescu H, **Dima L**, Ghita I, et al. A Systematic Review of Clinical Studies on the Effect of Psychoactive Cannabinoids in Psychiatric Conditions in Alzheimer Dementia. *Am J Ther*. 2020; 27(3):e249-e269.
- Balan A., Moga M.A., **Dima L.**, Dinu C.G., Martinescu C.C., Panait D.E., Irimie C.A., Anastasiu C.V. An Overview on the Conservative Management of Endometriosis from a Naturopathic Perspective: Phytochemicals and Medicinal Plants. *Plants*. 2021, 10, 587.
- Bobescu E., Balan A., Moga M.A., Teodorescu A., Mitrica M., **Dima L.** Are There Any Beneficial Effects of Spirulina Supplementation for Metabolic Syndrome Components in Postmenopausal Women? *Marine Drugs*. 2020, 18(12), 651.

## **C23 SUPPLEMENTATION WITH RESVERATROL, PIPERINE AND ALPHA-TOCOPHEROL DECREASES CHRONIC INFLAMMATION IN A CLUSTER OF OLDER ADULTS WITH METABOLIC SYNDROME**

**Raúl Francisco PASTOR (1), Marisa Gabriela REPETTO (2), Fabiana LAIRION (2), Alberto LAZAROWSKI (3), Amalia MERELLI (3), Zulma Manfredi CARABETTI (1), Isabel PASTOR (1), Elena PASTOR (1), Laura Valeria IERMOLI (1), Carlos Amadeo BAVASSO (1), Roberto Héctor IERMOLI (1)**

(1) Unidad Polifenoles, Vino y Salud, Cuarta Cátedra de Medicina, Hospital de Clínicas “José de San Martín” Facultad de Medicina, Universidad de Buenos Aires, Argentina.

(2) Departamento de Físicoquímica y Química Analítica, Facultad de Farmacia y Bioquímica, Universidad de Buenos Aires; Instituto de Bioquímica y Medicina Molecular (IBIMOL) Consejo Nacional de Ciencia y Tecnología (UBA-CONICET), Buenos Aires, Argentina.

(3) Departamento de Bioquímica Clínica, Facultad de Farmacia y Bioquímica, Universidad de Buenos Aires, Instituto de Fisiopatología y Bioquímica Clínica (INFIBIOC), Buenos Aires, Argentina

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Metabolic Syndrome (MetS) is increasing worldwide regardless of culture, genetic, gender, and geographic differences. While multiple individual risk factors, such as obesity, hypertension, diabetes, and hyperlipidemia, can cause cardiovascular disease (CVD), it is the intercurrency of these risk factors that defines MetS as a cluster that creates an environment for atherosclerosis and other manifestations of CVD. Despite the advances in the knowledge and management of each of the components of MetS, there are two molecular biology processes, chronic inflammation and oxidative stress, which are still underdiagnosed and undertreated. In order to assess the effect of a dietary supplement on chronic inflammation in MetS, we conducted a clinical trial with volunteers receiving a formula composed of resveratrol, piperine and alpha tocopherol (FRAMINTROL®), together with their habitual treatment, for three months. The inflammatory state was evaluated by ultrasensitive C reactive protein (US CRP) and ferritin in plasma, and oxygen consumption and chemiluminescence in neutrophils. The results showed that ferritin decreased by 10% ( $p < 0.05$ ), US-CRP by 33% ( $p < 0.0001$ ), oxygen consumption by 55% ( $p < 0.0001$ ), and spontaneous chemiluminescence was by 25% ( $p < 0.005$ ) after treatment. As far as we know, this is the first study showing a chronic inflammation decrease in MetS patients due to the administration of a biopower Resveratrol-piperine and alpha tocopherol dietary supplement together with conventional therapy.

### **Isabel PASTOR**

- MD, Specialist in Family Medicine.
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#### Research interests

- Oxidative stress
- Nutrition
- Aging

#### Selected publications

- Pastor, R.F.; Repetto, M.G.; Lairion, F.; Lazarowski, A.; Merelli, A.; Manfredi Carabetti, Z.; **Pastor, I.**; Pastor, E.; Iermoli, L.V.; Bavasso, C.A.; Iermoli, R.H. Supplementation with Resveratrol, Piperine and Alpha-Tocopherol Decreases Chronic Inflammation in a Cluster of Older Adults with Metabolic Syndrome. *Nutrients* 2020, vol. 12, pp. 3149.
- Pastor R, Mariani M, Villach M, Cascón P, Giudice M, Pastor E, **Pastor I**, Iermoli R and Penissi A. A Novel Approach to Measure the Total Antioxidant Power of Wines through Near Infrared Spectroscopy and Its Relevance in Human Nutrition. *Journal of Health Science*, vol. 7, pp. 209-214, (2019).
- Pastor R., González E., Cassini M., **Pastor I.**, Sauré M., Saavedra E. and Iermoli R. “Blueberry Extract Reduces Oxidative Stress in Patients with Metabolic Syndrome”. *Journal of Life Sciences*, vol. 10, pp. 145-152, (2016).

#### Raúl Francisco PASTOR

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#### Research interest

- Aging
- Health span

- Wine and Health
- Plant food supplements

### Outstanding Contribution

- Discovered winemaking with Resveratrol without the addition of sulfur dioxide (SO<sub>2</sub>)

### Selected Publications

- **Pastor RF**, Repetto MG, Lairion F, Lazarowski A, Merelli A, Manfredi Carabetti Z, Pastor I, Pastor E, Iermoli LV, Bavasso CA, Iermoli RH. Supplementation with Resveratrol, Piperine and Alpha-Tocopherol Decreases Chronic Inflammation in a Cluster of Older Adults with Metabolic Syndrome. *Nutrients*. 2020 Oct 15;12(10):3149. doi: 10.3390/nu12103149. PMID: 33076345; PMCID: PMC7602615.
- **Pastor, Raúl Francisco** et al. 'The Supplementation with Resveratrol and  $\alpha$ -Tocopherol Could Reduce the Risk of Sarcopenia in Dogs by Counteracting the Oxidative Stress'. *Nutrition and Healthy Aging* vol. 5 no. 2, pp. 133-139, 2019.
- **Raúl Francisco Pastor**, María Laura Mariani, Marianela G. Villach, Pablo N. Cascón, Miriam Giudice, Elena Pastor, Isabel Pastor, Roberto H. Iermoli and Alicia B. Penissi. A Novel Approach to Measure the Total Antioxidant Power of Wines through Near Infrared Spectroscopy and Its Relevance in Human Nutrition. *Journal of Health Science* 7 (2019) 209-214 doi: 10.17265/2328-7136/2019.04.001
- **Raul Francisco Pastor**, Gonzalez E., Cassini MS., Pastor I., Sauré M., Saavedra E., Siman Menem MI., Drago S. and Iermoli RH. Blueberry Extract Reduces Oxidative Stress in Patients with Metabolic Syndrome. *Journal of Life Sciences* 10 (2016) 145-152 doi: 10.17265/1934-7391/2016.03.005
- **Raul Francisco Pastor**, Magdalena Raquel Gargantini, Marcelo Murgo, Sebastián Prieto, Humberto Manzano, Carla Aruani, Claudia Inés Quini, Maria-Isabel Covas and Roberto Héctor Iermoli. Enrichment of Resveratrol in Wine through a New Vinification Procedure *Journal of Life Sciences* 9 (2015) 327-333 doi: 10.17265/1934-7391/2015.07.00

## **C24 THE ROLE OF BIOACTIVE DIETARY COMPONENTS IN CANCER PREVENTION**

**Laura Ioana GAVRILAȘ<sup>1</sup>, Lorena FILIP<sup>1</sup>, Ana Maria COZMA<sup>1</sup>, Oana STANCIU<sup>1</sup>, Roxana BANC<sup>1</sup>, Daniela CIOBÂRCĂ<sup>1</sup>, Doina MIERE<sup>1</sup>**

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Cancer has become a global health problem with high morbidity and mortality rates worldwide. Cancer incidence is higher in developed and industrialized countries and in urban areas as well. Both dietary habits and lifestyle factors have a strong contribution in the development of cancer. Also, environmental factors including sedentary lifestyle, smoking and alcohol consumption are important determinants of cancer risk. On one hand, frequent consumption of red and processed meat especially high temperature cooked meat has been associated with cancer carcinogenesis, especially colorectal cancer. On the other hand, a healthy dietary pattern based on adequate intake of fruit, non-starchy vegetables and whole grains can protect from developing neoplastic disease. The beneficial effects of plant-based foods are mostly attributed to the bioactive food components such as: resveratrol, curcumin, quercetin, etc. known as chemopreventive agents in. Moreover, caloric restriction and being physically active as part of a healthy diet has been shown to reduce tumor genesis.

The main objective of this presentation is to highlight the most recent research data on bioactive dietary components thought to be powerful tools in cancer prevention and treatment due to their ability to modulate important pathways involved in cell proliferation, tumor growth, apoptosis, invasion and metastasis.

### **Laura Ioana GAVRILAȘ**

#### **Work experience**

- 2012 – Present – Clinical Nutritionist-Dietitian working on dietary and nutritional counseling in various physiological and pathological situations (Collaborations with different clinics and Private Practice)
- October 2019 – Lecturer in the Department of Bromatology, Hygiene and Nutrition (University of Medicine and Pharmacy “Iuliu Hatieganu” Cluj-Napoca)



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|---|--|
| <ul style="list-style-type: none"><li>• February 2015 – Sept 2019 – Assistant Professor in the Department of Bromatology, Hygiene and Nutrition (University of Medicine and Pharmacy “Iuliu Hatieganu” Cluj-Napoca)</li></ul> |  |
|---|--|

### **Education and Training**

- 2014 - 2018 PhD in Pharmacy, University of Medicine and Pharmacy "Iuliu Hatieganu" Cluj-Napoca (Thesis title: Role of Nutrition and Lifestyle Factors in Colorectal Cancer available at <http://www.umfcluj.ro/sustinute-ro/category/55-rezumat-2018> )
- 2012-2014 Master's degree in nutrition and Quality of Life, University of Medicine and Pharmacy "Iuliu Hatieganu" Cluj-Napoca
- February 2012 - June 2012 – Erasmus Student – Practice in Clinical Nutrition and Dietetics, Nutritional Clinic “Fundacio Lluís Alcanyis”, University of Valencia, Spain
- 2009-2012 Bachelor's degree in “Nutrition and Dietetics”, University of Medicine and Pharmacy "Iuliu Hatieganu" Cluj-Napoca

### **Scientific Achievements**

8 scientific articles, all published as main author of which 5 published in ISI Journals and 3 in BDI Journals. 2 Publications were published in highly prestigious journals – Red Zone Journals. Cumulative Impact Factor of published papers = 9.7. Total number of citations is 17 (WOS) and 27 (GS). Hirsch Index is 3 according to Google Scholar, 1 according to Web of Science and 1 according to Scopus.

### **Projects**

- 2020-2022 - Project leader in PN-III-P1-1.1-PD-2019-0468 - Exploring the therapeutic potential of curcumin in irinotecan-resistant colorectal cancer cells
- 2019 – Member in POCU/74/6/18/109014 FARMAPract - Integrated activities of professional practice and guidance for the specialties Pharmacy, Nutrition and Dietetics
- 2017-2019 Member in an international project from The University Agency of La Francophonie in Europe (“Creation of a regional university network in the field of health, nutrition and food security”) (<https://reseau-sain.org/>)
- 2016-2018 - Project leader in Doctoral Research Project 7690/8/15.04.2016 Study of the synergic effect of resveratrol and curcumin in colorectal cancer cell lines - implications of microARN, University of Medicine and Pharmacy “Iuliu Hatieganu” Cluj-Napoca

### **Conferences and presentations**

11 Conference Attendances of which 4 were Oral Presentations and 7 were Poster Presentations. 4 Participations were at International Conferences.

### **Prizes and awards**

1. 2017 - 1 UEFISCDI award for publishing an ISI article (red zone)
2. 2015 - Young Research Grant at the 12th European Nutrition Conference of the Federation of European Nutrition Societies, Berlin, Germany

**Affiliations**

1. Department of Bromatology, Hygiene, Nutrition, University of Medicine and Pharmacy “Iuliu Hatieganu”, Cluj-Napoca, Romania
2. Board Member of the Romanian Dietetic Association (ADR)

## **C25 SUPPLEMENTS IN OBESITY MUSCLE DYSFUNCTION**

**Bogdana VIRGOLICI (1), Adriana DINU (1), Daniela MIRICESCU (1), Alexandra TOTAN (1),  
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Maria GREABU (1), Maria MOHORA (1)**

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**Introduction.** Metabolic syndrome is associated with obesity and high cortisol level. Insulin resistance, systemic inflammation and oxidative stress are the principal culprits in metabolic syndrome pathogenesis and muscle comorbidity is present.

The aim of this study was to evaluate the beneficial effects of some antioxidant Supplements on cardiac and skeletal muscle on obesogenic diet Wistar rats with high cortisol level. Different forms of Supplements as: Vitamin E- natural, synthetic or nanoparticles Poly Lactic-Co-Glycolic Acid (PLGA-NPs), Luthein as PLGA-NPs and nuts were used.

**Material and methods.** Wistar rats (age 10-12 months) were fed for 6 weeks with a hypercaloric diet (100kcal/day/rat above the normal energy intake) and Prednisone (1mg/kg/day) and from the beginning of the experiment they were divided in equal groups, in accordance to the associated treatment. The Supplements given by gavage were: synthetic Vitamin E (1mg/kg/day) for group **OE**, and Vitamin E (1mg/kg/day) PLGA-NPs for group **ON**, Luthein (1mg/kg/day) PLGA-NPs for group **OL**, **nuts** (15 g peanuts/day/rat) for group **OAS**. The groups **OM** (only with obesogenic diet) and **OP** (with obesogenic diet and Prednisone, without any supplement) were enrolled. The serum lipid and antioxidant profile, the hematoxylin-eosin staining and immunohistochemical stains analyses of the skeletal and cardiac muscles were done. CD 38 lymphocyte antibodies for inflammatory status and perilipin antibodies were used.

**Results.** All the supplements improved the lipid and antioxidant profile observed in groups OP and OM and maintained partially or totally the architecture of the muscle fibers and reduced inflammation.

**Conclusion** The all forms of Vitamin E–natural, synthetic and charged in nanoparticles and also luthein charged in PLGA-NPs can prevent the structural and metabolic muscle disturbances associated to obesity metabolic syndrome.

## **Bogdana VIRGOLICI**

Bogdana Virgolici graduated “Carol Davila” University of Medicine and Pharmacy of Bucharest in 1992 and in 2003 she received her PhD degree in medicine with her Thesis: “Redox systems in senile cataract-systemic aspects”.

She was an external physician (1992-1993) in town Braila. Since 1993, she has been doing an intense didactic activity at the Biochemistry department of “Carol Davila” University of Medicine and Pharmacy, holding different grades, being associate professor since 2017. She has been teaching medical biochemistry for students from the first year and clinical biochemistry for students from the second year.

She was medical resident in the University Hospital, Bucharest, between 1993-1996 and she obtained the degree of general practitioner. She worked for 5 years (2001-2005) as specialized physician at the emergency room at the Emergency University Hospital, Bucharest.

She graduated short courses like: "Foundation Course in Medical Education", University of Bristol Medical School (1997). Emergency medicine course, Emergency University Hospital, Bucharest (2002), abdominal general ultrasounds course, Carol Davila Hospital, Bucharest (2003) and obtained the certificate of research manager –S.C. Schultz Consulting SRL, Bucharest (2012).

She obtained FEBS fellowships for summer school (2001), Advanced Course "Free Radicals, Nitric Oxide and Inflammation: Molecular, Biochemical and Clinical Aspects", Antalya-Turkey, FEBS awards to attend the FEBS Congress (2001, 2002, 2011) and a romanian governmental research fellowship (2003) for few months in Belgium, Antwerp.

She attended (2012-2013) the postdoctoral program, POSDRU/89/1.5/S/60746, from European Social Fund in the research field of Beta pancreatic cell in diabetes mellitus and regenerative medicine and attended it with the thesis : “The importance of the proinsulin/peptid C ratio in assessing the insulin resistance and diabetes mellitus”.

Among her didactic activity she published as coauthor and principal author, more than 15 books and we can mention: “The Practical Guide for medical students” (2011- winner of the book salon price, “Aspects of Clinical Biochemistry” (2011) and “Elements of clinical biochemistry” (2015) which were highly praised by students and each year more than 300 students has been attending her lectures on clinical biochemistry. She is the first author and also corresponding author of the chapter „Obese Childhood Dyslipidemia Management Beyond Statins: MUFA, PUFA, and Sea-buckthorn Supplements”, in the book LIPOPROTEINS FROM BENCH TO BEDSIDE edited by Gerhard Kostner and Indumathi Chennamesetty, (<http://www.intechopen.com/>), 2015.

She supervised more than 50 graduating students thesis and she has been carrying on teaching and research activity with great interest and very good results.

She has been casual reviewer for eight international medical journals and assessor UEFISCDI for: „Exploratory Workshop and for Advanced Studies Schools”.

She has been speaker in more than 20 national and international Conferences, has participated with poster presentation in more than 100 international Congresses, author of 50 articles (more than half being ISI/Pubmed), with more than 350 citation, Hirsh index 7.

For one year ( 2017- 2018) she was the project director and led the project "Algorithm for estimating the severity of the fatty pancreas in obese children", financed by the Clinic SC Chiajna Medical Center SRL. She worked also as a member in 7 research projects, one international "Between-country comparative study on the relationship between dietary habits, nutritional and oxidative stress status and complications in diabetes mellitus", 2003-2005, a bilateral Romania-Flandra project. The most recent project, in which she is a member, is still going on „The adipose tissue at the crosstalk of pathogenic pathways between diabetes and vascular disease “ PN-II-ID-PCE-2011-3-0429; 3, IDEI project nr. 183/28.10.2011.

Her research work is focused on oxidative stress (spectrophotometry, HPLC, ELISA methods). She published articles about redox modifications in obesity, diabetes mellitus, metabolic syndrome, atherosclerosis, non-alcoholic fatty liver disease, chronic ocular diseases, chronic renal failure and aging. She did clinical and experimental studies on obesity. In the last five years she has published articles, as principal author, regarding the beneficial effects of some antioxidant supplements in preventing obesity complications.

### **Selected publications**

- Alexandra Gabriela Catianis, **Bogdana Virgolici** (corresponding author), Carmen Beatrice Dogaru, Laura Anca Popescu, Daniela Miricescu, Alexandra Totan, Horia Marius Virgolici, Maria Mohora, The serum selenium level, the activity of some selenodependent enzymes and the lipid profile in childhood obesity , Revista de chimie, volume: 71, year: 2020, issue: 12, <https://doi.org/10.37358/rc.20.12.8396>
- Adriana Dinu, **Bogdana Virgolici** (corresponding author), Daniela Miricescu, Alexandra Totan, Elvira Gagniuc, Horia Virgolici, Daciana Costina Stefan, Maria Greabu, Maria Mohora, Renoprotective effects of PLGA nanoparticles loaded with vitamin E in wistar rats, on hypercaloric diet , Revista de Chimie, Volume: 71, Year: 2020, Issue: <https://doi.org/10.37358/RC.20.6.8187>
- A.Dinu, **Bogdana Virgolici** (corresponding author),, Daniela Miricescu, Alexandra Totan, Horia Virgolici, Maria Greabu, Maria Mohora, The ocular protective effects of PLGA nanoparticles loaded with lutein, in fat diet Wistar rats, treated with sistemic glucocorticoids Ref: Ro J Med Pract. 2020;15(1) DOI: 10.37897/RJMP.2020.1.11
- Constantinescu M.Z., Căsăriu E.D., Popescu L.A., Condrut E., Lixandru D., Miricescu D., Virgolici H., Mitrea N., Mohora M., **Virgolici B.** (corresponding author), Sea buckthorn pulp oil or fresh fruit improve the metabolic profile and liver and pancreas histological aspect in a high fat diet mouse model, published by the Association for reno-metabolic and nutrition Studies-ASRMN, in the book "Interdisciplinary approaches in diabetic chronic kidney disease", ed Niculescu, pg 176-186, 2016, ISI Web of Science Thomson Reuters Database.

## **C26 DIETARY CHOLINE / BETAINE AND CARDIO-METABOLIC SUBCLINICAL AND CLINICAL EVENTS IN TWO LARGE US COHORTS**

**Aurelian BIDULESCU, Cuiqiong HUO**

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Eggs, beef, chicken, fish, and milk, as well as select plant foods like cruciferous vegetables and certain beans, are particularly good sources of choline, providing  $\geq 10\%$  of the daily requirement per serving. There is a wide variation in choline intake in the diet, with nationally representative data showing that only 11% of adult Americans achieve the adequate intake (AI) for choline. Higher self-reported dietary choline intakes have been linked to lower concentrations of proinflammatory markers, a less metabolically deleterious body fat distribution, and a lower risk of developing lung and breast cancer. Choline, a conditional essential nutrient for humans whose requirements vary based on sex/gender, physiological status, intestine / gut bioflora, common genetic variants, age of development, etc., is associated with its metabolite betaine (main methyl donor), folate, and methionine through methylation pathways. Low dietary intake of choline and betaine may change the epigenetic regulation of a series of genes, thereby accelerating the process of atherosclerosis and affecting insulin sensitivity, fat deposition, and energy metabolism pathways. It also weakens the ability to methylate homocysteine to methionine, leading to an increase in plasma homocysteine that is associated with a higher risk of several chronic diseases, including cardiovascular disease, cancer, cognitive decline, and bone fractures. Given the involvement of choline and betaine in the one-carbon cycle with possible epigenetic effects, there is a growing interest in the association between dietary choline and betaine intake (found in a variety of foods) and the risk of diseases in humans.

This presentation aims to describe among two U.S.A. biracial studies the associations between dietary choline and betaine dietary intake with cardiovascular and metabolic / diabetes outcomes. The first study explored choline and betaine in relationship to cardiovascular disease risk and its subclinical markers (such as coronary and aortic calcium deposition, left ventricular mass, and carotid internal media thickness widely used in clinical risk assessment), using data from the Jackson Heart Study, an exclusively African American US National Institute of Health – sponsored ongoing community-based cohort. Higher choline intake was associated with a lower risk of ischemic stroke, while higher betaine intake was associated with a higher risk of coronary heart disease, with sex differences for the subclinical markers of cardiovascular risk and curvilinear trajectories that inform dietary guidelines. The second study, based on data from the NIH-sponsored biracial Atherosclerosis Risk in Communities Study, investigated the association between choline and betaine intake with type 2 diabetes. Differences by sex/gender were

present with female participants with higher dietary intake of choline having a slightly higher risk of developing type 2 diabetes.

Considering that trimethylamine-N-oxide, a precursor of choline present in many foods is currently ascertained for its role in diabetes development, chronic kidney disease and cardiovascular disease, our studies contribute to the assessment of cardio-metabolic risk. Animal models have suggested that high TMAO levels are prothrombotic or proatherogenic, contribute to obesity and impaired glucose intolerance, and induce renal damage. Moreover, as phosphatidylcholine is synthesized and dependent on gut microbiota composition, our study has implications during this era of novel pandemics.

### **Aurelian BIDULESCU**

- European Baccalaureate (majors: Mathematics and Physics), Caragiale National College, Ploiesti, Romania, 1986
- Medical Doctor MD, Carol Davila School of Medicine, Bucharest, Romania, 1994
- Master of Public Health, MPH, Yale University School of Medicine, Department of Epidemiology and Public Health, New Haven, CT, USA, 2002
- PhD, University of North Carolina, Chapel Hill, School of Public Health, Departments of Epidemiology and Nutrition, Chapel Hill, NC, USA, 2006



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Dr. Bidulescu is a versatile scientific writer who published extensively (~65 PubMed-retrievable scientific articles, and more than 100 articles, book chapters and high-impact conference abstracts). He has a broad background in medicine, public health and epidemiology, with clinical training in metabolic diseases (in Romania and France), a US-based training in environmental and genetic toxicology at Yale University School of Medicine (Department of Epidemiology and Public Health), and in cardiovascular disease and nutritional epidemiology at the University of North Carolina at Chapel Hill School of Public Health.

Within the NIH-funded Atherosclerosis Risk in Communities (ARIC) Study, Dr. Bidulescu published methodological and analytical studies that included methyl-donor nutrients (such as betaine) and their association with coronary artery disease, stroke and diabetes. He is the PI of the Jackson Heart Ancillary Study that provided measurements for adiponectin (“Developing predictive biomarkers for left ventricular hypertrophy in obese African Americans”) and the principal investigator on the JHS ancillary study that provided measurements for ghrelin and high molecular weight adiponectin (“The visceral adiposity tissue role in the association of ghrelin and

adiponectin multimers with CVD in African Americans; A JHS Vanguard Pilot Project”). A third JHS ancillary study ascertains the relationship between genetic exom variants and treatment resistant hypertension among African Americans from several studies. As first author and/or as senior/corresponding author Dr. Bidulescu contributed to several of the JHS cohort’ published manuscripts (including the first JHS adjudicated events article), as well as to publications (as first/senior author) for four other large NIH-funded studies (ARIC, REGARDS, MESA and NHANES).

Dr. Bidulescu participates in the development of a series of projects leveraging his professional network established through participation within several ongoing NIH-funded cohorts and repositories (i.e., the Cross Cohort Collaboration entity), projects assessing some cardio-metabolic / chronic diseases and related diet and genetics from a public health disparity aspect. Consequence of his interests in global public health and cardio-metabolic related genetics from a migration perspective, Dr. Bidulescu is a member of the US – Caribbean Alliance for Health Disparities Research, and of the ADIPOGen European-North American Genetics Consortium.

During the last 20 years Dr. Bidulescu taught methodology and subject epidemiology courses to graduate (master and doctoral) students. Currently at Indiana University School of Public Health Bloomington, Indiana (Department of Epidemiology and Biostatistics), he is the instructor for two required epidemiology courses (a Chronic Disease Epidemiology and an Advanced Epidemiology Methods). Dr. Bidulescu was invited to present to domestic and international conferences, as well as to give guest lectures for continuous professional education courses for faculty and physicians/scientists. Several of his students presented at national conferences and published findings in impactful journals. Dr. Bidulescu is an associate editor for two journals (‘Journal of Clinical Endocrinology and Metabolism’ and ‘Frontiers in Genetics’), an active reviewer for more than 20 journals (including Circulation, American Journal of Preventive Medicine, Diabetes Care, American Journal of Epidemiology, etc.) and an intensive National Institutes of Health (NIH) study section member (CHSA, CHSB, KNOD, etc.).

### **Relevant Publications**

Consequence of the *three Jackson Heart Ancillary Studies* that provided, among other biomarkers such as B-type natriuretic peptide and ghrelin, measurements for serum adiponectin in all JHS participants (“Developing predictive biomarkers for left ventricular hypertrophy in obese African Americans”), we were able to disseminate our findings as follows. We demonstrated 1) an inverse relationship between adiponectin and left ventricular mass (LVM) in normotensive and non-insulin resistant participants, whereas adiponectin was directly associated with LVM in those with hypertension and insulin resistance (suggesting that adiponectin may interact with LVM in mediating long term CVD risk); 2) that adiponectin was inversely associated with visceral adipose tissue and directly associated with the 'buffering' abdominal subcutaneous adipose tissue; 3) that African Americans (AA) without obesity or insulin resistance exhibit a direct association between global individual European ancestry and adiponectin levels; that is abolished in the setting of increased adiposity; and 4) that adiponectin levels were directly associated (instead of inversely) with incident stroke among women, after accounting for insulin resistance and hypertension. These suggest race-specific pathways

through which adiponectin (a global 'endo-phenotype' for cardiometabolic disease) regulates CVD.

- **Bidulescu, A**, Liu, J, Musani, SK, Fox, ER, Samdarshi, TE, Sarpong, DF, Vaccarino, V, Wilson, PW, Arnett, DK, Din-Dzietham, R, Taylor, HA & Gibbons, GH, (2011). Association of Adiponectin with Left Ventricular Mass in African Americans: The Jackson Heart Study. *Circulation: Heart Failure*; 4(6): 747-753 (PMID: 21840935; PMCID: PMC3218236)
- **Bidulescu, A**, Liu, J, Hickson, DA, Hairston, KG, Fox ER, Arnett, DK, Sumner, AE, Taylor, HA & Gibbons, GH,(2013): Gender differences in the association of visceral and subcutaneous adiposity with adiponectin in African Americans: the Jackson Heart Study *BMC Cardiovascular Disorders*; 13:9 (PMID: 23433085; PMCID: PMC3586352)
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- **Bidulescu, A**, Liu, J, Chen, Z, Hickson, DA, Musani, S, Samdarshi, T, Fox, E, Taylor, HA & Gibbons, GH, (2013). Associations of adiponectin and leptin with incident coronary heart disease and ischemic stroke in African Americans: the Jackson Heart Study. *Frontiers in PublicHealth*; 1:16. (PMID: 24350185; PMCID: PMC3854845)
- Davis, SK, Gebreab, SY, Xu, R, Riestra, P, Khan, RJ, Sumner, AE, Hickson, DA & **Bidulescu, A**, (2015). Association of adiponectin with type 2 diabetes and hypertension in African Americans men and women: the Jackson Heart Study. *BMC Cardiovascular Disorders*, Feb 25;15(1):13 (PMID: 25885320; PMCID: PMC4354999)

Because several mechanisms have been described through which dietary intake of choline, an essential nutrient, and its derivative betaine (a main methyl donor), may be associated with subclinical atherosclerosis, and because an estimation of dietary intakes of choline and betaine has become possible only recently, Dr. Bidulescu's initial population studies were nutritional epidemiologic studies that have assessed the contributions of these dietary nutrients to cardiovascular risk. Acute choline deficiency in rodent models causes lipid accumulation in liver, heart and arterial tissues. Human studies indicated that diets at both the lower and higher end of normal intake for choline have adverse health consequences. Our study in the ***Atherosclerosis Risk in Communities Study (ARIC)*** showed a modest association of choline and betaine intake and CVD (not protective). There is a recommended adequate intake for choline (about 550 mg/day) but in our ARIC cohort choline intake has been estimated to vary as much as three-fold, and clearly below the recommended intake.

- **Bidulescu, A**, Chambless, L, Siega-Riz, AM, Zeisel, S & Heiss, G. (2007) Usual choline and betaine dietary intake and incident coronary heart disease: the Atherosclerosis Risk in Communities (ARIC) study. *BMC Cardiovascular Disorders*,7:20. (PMID: 17629908; PMCID: PMC1934379)
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Atherosclerosis Risk in Communities (ARIC) Study. Nutrition Journal 2009; 8(1):14. (PMID: 19232103; PMCID: PMC2654540)

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- Han P, **Bidulescu A**, Barber JR, Zeisel SH, Joshu CE, Prizment AE, Vitolins MZ, Platz EA. Dietary choline and betaine intakes and risk of total and lethal prostate cancer in the Atherosclerosis Risk in Communities (ARIC) Study. Cancer Causes Control. 2019 Mar 1. doi: 10.1007/s10552-019-01148-4. [Epub ahead of print] PMID: 30825046
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## Cuiqiong HUO

- Bachelor of Medicine (2017), China Medical University, Liaoning, China
- Master of Public Health, MPH (2019) in Epidemiology, Indiana University, Indiana, U.S.A
- PhD doctoral student in Epidemiology, Indiana University, Indiana, U.S.A
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### Research Interests

- Chronic disease with emphasis on coronary heart disease
- Health behaviors: physical activity, sedentary behavior, smoking
- Nutrition - dietary pattern
- Measurement error in dietary intake and physical activity
- Transparency of journal policies

## **C27 PLANAR CHROMATOGRAPHY AND ITS APPLICATION IN MEDICINAL PLANTS IDENTIFICATION**

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The combination of high-performance thin-layer chromatography (HPTLC) with image analysis (IA) and chemometrics becomes an attractive tool for natural extracts investigations. The large variability of these samples requires powerful image acquisition devices, multivariate image processing techniques and advanced chemometric methods to facilitate the interpretation of the chromatographic data.

The aim of this study is to classify/grouping a set of 39 plant samples belonging to 17 different medicinal plants from three geographical areas (Romania, Macedonia and Hungary). For this purpose, high-performance thin-layer chromatography (HPTLC) coupled with image processing techniques and multivariate statistical analysis was used. Chromatograms of the hydroalcoholic extracts of the studied plants were obtained by single one-dimensional development with the ethyl acetate - formic acid - water system (80:10:10, v/v/v) and one-dimensional double development with the ethyl acetate - formic acid - water system (80:10:10, v/v/v) for the first development and the toluene - ethyl acetate system (95:5, v/v) for the second development. The visualization was performed by fluorescence quenching, by fluorescence at 365 nm and by derivatization followed by plate inspection at 365 nm. Chromatographic fingerprints were acquired on pure color channel selection (red, green, blue) and on the gray channel. The data matrices were processed using the tree clustering multivariate exploring technique. Following this study, a good classification/grouping of the samples according to the species was obtained. The influence of the development, visualization mode and color - channel for fingerprint acquisition on the classification/grouping were also revealed.

The proposed methodology could be considered as a promising tool with future applications in plant material investigations even from the taxonomic perspective classification.

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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

- Covaci E., Şenilă M., Leopold L.F., Olah N.K., **Cobzac S.C.**, Petropulos V.I., Balabanova B., Cadar O., Becze A., Ponta M., Moţ A.C., Frenţiu T. Characterization of *Lycium barbarum* L. Berry cultivated in North Macedonia – a chemometric approach, Journal of Berry Research, 2020, 10(2), 223-241
- **Cobzac S.**, Casoni D, Badea M, Balabanova B, Ruzdik NM, Ultraviolet-Visible (UV-Vis) spectroscopy and cluster analysis as a rapid tool for classification of medicinal plants, Studia Universitatis Babes-Bolyai, Seria Chemia, 2019, 64(4), 191-203
- **Cobzac S**, Olah N, Burtescu R, Petrescu D.C., Brasovan A, Chise E, Hanganu D, Phytochemical screening of different crategus oxiacantha extracts, Studia Universitatis Babes-Bolyai, Seria Chemia, 2017, 62(3), 57-73
- **Cobzac S**, Gocan S, Olah N, Hanganu D, Ede B, Oprean R, Toma CC, Morgovan C, Chise E, Brasovan A, Characterization of orthosiphon stamineus benth extracts by reversed-phase thin layer chromatographic methods, Studia Universitatis Babes-Bolyai, Seria Chemia, 2017, 62(3), 9-18
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- **Cobzac SCA**, Casoni D, Badea M, Bros I, Investigation on image processing parameters for plate evaluation in tlc analysis of mycotoxins, Studia Universitatis Babes-Bolyai, Seria Chemia, 2017, 62(3), 89-102

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- **Cobzac S**, Chise E, Campean R, Hanganu D, Olah N, Turcas V, Ardelean A, Quality control parameters of *Ribes Nigrum* l. buds for establishing the optimal harvesting period, *Studia Universitatis Babeş-Bolyai, Seria Chemia*, 2016, 61(2), 265-294
- **Cobzac S**, Daraban A, Olah N, Campean R, Furtuna F, Dehelean Gh, Bojita M, Hanganu D, Comparative study of polyphenols from propolis extracts of different origin, *Studia Universitatis Babeş-Bolyai, Seria Chemia*, 2015, 60(3), 125-132

## **C28 ADVANCES AND TECHNOLOGICAL INNOVATIONS IN GLUCOSE MONITORING SYSTEM**

**Graziella Liana TURDEAN**

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*Diabetes Mellitus* is a chronic disorder that is a consequence of inadequate levels of (Type 1), or aberrant sensitivity to (Type 2) insulin and affecting millions of people worldwide.

In the context of Covid-19 pandemic, it was observed that patients with confirmed Covid-19 infections present more severe forms when associated with chronic diseases (*i.e.*, diabetes, kidney, heart, liver, lung and immunological chronic diseases).

In this context, invasive, minimally invasive and non-invasive blood glucose monitoring devices using continuous or flash glucose monitoring were largely employed for obtaining information about the illness and to implement appropriate treatment to patients.

Since 1967, when Updike and Hicks reported in their article the first enzyme-based electrode for detection of glucose [1], remarkable research for new concepts and sensor architectures has been made. Considering the growing interest in painless and continuous monitoring of blood glucose, today several performant commercially devices are available.

After more than 60 years of research, an overview of the development and evolution of devices simple and able of providing quantitative or semi-quantitative analytical information, from the perspectives of materials, sensing principle, device designs and fabrication processes are presented. Key considerations about the use, performance, accuracy and traceability are also, discussed [2-3].

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## Graziella Liana TURDEAN

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### Research interests

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

### Selected publications

- Barabas R., Fort C. I., **Turdean G. L.** ✉, Bizo L. ✉, *Influence of HAP on the morpho-structural properties and corrosion resistance of ZrO<sub>2</sub>-based composites for biomedical applications*, Crystals, **2021**, 11, 202, 1-16.
- Ngo H. T. T., Fort I. C., Pham T. H., **Turdean G. L.** ✉, *Ordered Mesoporous Silica Incorporating Platinum Nanoparticles as Electrode Material for Paracetamol Detection*, Electroanalysis, **2021**, 33, 323-335.
- Cotelan N., Mureşan L. M., Salis A., Barbu-Tudoran L., **Turdean G. L.** ✉, *Electrochemical detection of lead ions with ordered mesoporous silica-modified glassy carbon electrodes*, Water, Air and Soil Pollution, **2020**, 231, 217-224.
- Szoke A., Zsebe Z., **Turdean G. L.** ✉, Muresan L. M., *Composite Electrode Material Based on Electrochemically Reduced Graphene Oxide and Gold Nanoparticles for Electrocatalytic Detection of Ascorbic Acid*, Electroanalysis, **2019**, 10, 573–583.
- **Turdean G. L.** ✉, Craciun A., Popa D., Constantiniuc M., *Study of electrochemical corrosion of biocompatible Co–Cr and Ni–Cr dental alloys in artificial saliva. Influence of pH of the solution*, Materials Chemistry and Physics, **2019**, 233, 390-398.
- Rusu M. M., Fort C. I., Cotet L. C., Vulpoi A., Todea M., **Turdean G. L.**, Danciu V., Popescu I. C., Baia L., *Insights into the morphological and structural particularities of highly sensitive porous bismuth-carbon nanocomposites based electrochemical*, Sensors and Actuators B-Chem., **2018**, 268, 398-410.
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## **C29 MYCOTOXIN ANALYSIS: AN OVERVIEW ON THE NOVEL DETECTION CONSTRUCTS**

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The analysis of foods to assess the presence of chemical contaminants is a practice of crucial importance for ensuring food safety and quality. Over the past decade, the control of food safety has been mainly carried out through product testing rather than process control. Chemical contaminants can be present in foods and feed mainly as result of the use of agrochemicals, such as residues of pesticides and veterinary drug contamination from environmental sources (water, air and soil pollution), cross contamination or formation during the food processing, migration from food packaging materials, presence or contamination of natural toxins.

Natural toxins are defined as poisonous substances, which are synthesized by various organisms as animals, certain plant species or by microorganisms. Due to their ubiquitous occurrence and the wide range of chemical structure of produced toxins, they represent an important economic and health risk.

Among them, mycotoxins are toxic metabolites produced by fungi, mostly by saprophytic moulds on different foodstuffs. Additionally, they are also present in many plant pathogens. They have harmful effect on human and animal health. Mycotoxins are considered as harmful naturally occurring secondary metabolites. Mycotoxin contamination has attracted the worldwide attention, and has been considered as major financial problem due to the huge economic losses mainly based on human health, animal productivity, and national and international level trade there must be a proper legislation to set the acceptable limit of toxins for the purpose to minimize the exposure to mycotoxins. This kind of legislation will help in taking action against the improper usage of chemicals in agriculture sector, storage of products such as wheat, rice and other crops, and proper control of those products is required in future to ensure health impact of human beings and animals

The classical techniques have some drawbacks such as high cost and less sensitivity etc. In order to address these issues, various methods have been developed. Among these, biosensors are considered as promising tool in the assessment of mycotoxin food contamination. Electrochemical and optical aptasensors are promising methods. They offer the advantages of low cost, low power consumption, and high stability. This presentation mainly focuses on the methods development in the sense that how mycotoxins can be detected from new emerging

bio-analytical approaches. Several applications of determination of mycotoxins in food and feed will be discussed.

**Keywords:** aptasensors, mycotoxins, electrochemical, optical

## Jean-Louis MARTY

- Worked in University of Perpignan Via Domitia (UPVD) from 1975 to 2018
- Full professor from 1993 to 2018
- Since 2018 Honorary Professor of University of Perpignan Via Domitia
- 2000 - Co-founder of the company GTP Technology.
- 2019 - Creation of the company **Sensbiotech** which works as consulting in the field of Biotechnology
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### Education

- Doctorat d'Etat, Université de Perpignan Via Domitia, 1987
- PhD in Biochemistry, Université de Montpellier, 1980
- Engineer in Biochemistry, INSA Lyon 1973

### Career

- Vice President for International Relations 2012-2016
- Responsible ERASMUS Exchanges 2008-2012
- Director of IMAGES Laboratory 2003-2008

### Honours

- Invited Professor by Tokyo Medical and Dental University (Japan): November 2018
- Invited Professor by University Federal de Marhanao (Brazil) October 2018
- Invited Professor by JST (Japan Science Technology) 2010
- Invited Professor by JST (Japan Science Technology) 2007
- Honorary Professor of Transylvania University of Brasov (2005)
- Doctor Honoris Causa of University of Bucharest (2000)

He has over 300 publications- including book chapters and text books. He supervised 30 PhD with students from 12 nationalities.

He belongs to the Editorial Advisory Boards of some journals.

### Research interest

- Stabilization of enzymes and biomolecules and immobilization on various supports; Development of biosensors for the detection of pollutants in the environment; toxins and **mycotoxins** in food

- Studies of additives for nutraceuticals and functional food
- Analytical chemistry
- Optical sensor
- Smart packaging. The objective is to develop recyclable packaging with anti-oxidant and antimicrobial activities. All the compounds used for the fabrication will be issue from bio-production

### Selected publications

#### 2021

- M. Majdinasab, M. Daneshi, **J.L. Marty**. Recent developments in non-enzymatic biosensors for detection of pesticide residues: Focusing on antibody, aptamer and molecularly imprinted polymer. *Talanta*, 2021 Accepted May
- A. Teniou, A. Rhouati, **J.L. Marty (Review Cover)**. Mathematical Modelling of Biosensing Platforms Applied for Environmental Monitoring. *Chemosensor* , 2021, 9(3),50; DOI:10.3390/chemosensors9030050
- A Rhouati, A.Teniou, M. Badea, **J.L. Marty**, Analysis of Recent Bio-/Nanotechnologies for Coronavirus Diagnosis and Therapy. *Sensors* 2021, 21(4), 1485; <https://doi.org/10.3390/s21041485>
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#### 2020

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- M. Majdinasab, S. Ben Aissa, **J.L.Marty** . Advances in Colorimetric Strategies for Mycotoxins detection : Toward Rapide Industrial Monitoring. *Toxins*, 2020, 13
- S. Ben Aissa , M. Mastouri, G. Catanante , N. Raouafi, **J-L. Marty**. Investigation of a Truncated Aptamer for Ofloxacin Detection Using a Rapid FRET-Based Apta-Assay. *Antibiotics* 2020, 9, 860; doi:10.3390/antibiotics9120860
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**C30 EMERGING POLLUTANTS FROM PESTICIDES TO MICROPLASTICS****Mojca BAVCON KRALJ**

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Despite the known harmful effects of pesticides on the environment and past bad experiences, ensuring sufficient quantities of quality food without their usage is nowadays unfeasible. Development of new active compounds for pesticides is necessary due to fast development of resistance in pests. Microplastics (MPs), on the other hand, are becoming persistent environmental pollutants as well, since they have been found in various environments and matrices. Once MPs are released into the environment, they are exposed to several emerging pollutants (e.g. polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), pesticides) coming from various anthropogenic sources, such as wastewaters, urban runoff, and landfill leachate. When studying the relationship between pollutants and MPs, interesting observations were found. In the aquatic environment, higher concentrations of pollutants were determined on the MP particles than in the surrounding water, suggesting that MPs can not only affect aquatic organisms by injuring their intestinal tract, but also by ingesting the pollutants, adsorbed on MPs. The driving mechanisms of adsorption in case of triazole fungicides onto polystyrene (PS) MPs in aqueous environment were determined to be hydrophobic and electrostatic interactions (Fang et al., 2019). Besides, it was found, that the presence of polyethylene (PE) MPs significantly prolong the half-life of pesticides, especially for those with an initially moderate half-life and higher values of octanol-water partition coefficient ( $\log K_{ow}$ ), thus prolonging the persistence of pesticides in water (F. Wang et al., 2020).

In our research, the interactions between two types of MPs and three pesticides in the mixture with alluvial soil were studied. Adsorption of acetamiprid, chlorantraniliprole and flubendiamide in concentrations of 1, 5 and 10 mg L<sup>-1</sup> onto polyester fibres and polypropylene particles of 0.5 to 1 mm size was studied at 1 % and 5 % (w/w) of their content in soil. The adsorption of pollutants (pesticides) on MPs strongly depends on pollutant's  $\log K_{ow}$  values. Enriched MPs can be transformed into a source of pollution, as the MPs particles enable adsorbed pollutants to migrate long distances and as such affect the distribution of pollutants in the environment. The more hydrophobic the substance is, the highest is the notable adsorption on MPs (ACE from 277 to 690 ng·g<sup>-1</sup>; CAP from 964 to 3737 ng·g<sup>-1</sup>; whereas FLU from 1154 to 3815 ng·g<sup>-1</sup>), regardless of the type and morphology of MPs, proving that MPs in soil systems act as carriers to pollutants. In relation to the content of MPs in soil, it was noted also, that their presence decreases the capability of pesticide retention from 4 % to 15 %, making them more

available for migrating through soil system to groundwater reservoirs, where they can cause contamination of drinking water sources.

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### **Mojca BAVCON KRALJ**

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#### Education:

- 2001 degree in chemistry, University of Ljubljana
- 2007 Ph.D. in Environmental Sciences, University of Nova Gorica



#### **Participation in National research programmes and projects:**

Programmes: 1999 – 2003 Experimental methods in the environment, (P0-0502-1540, principal investigator M. Franko); 2015 - Mechanisms of health maintenance (P3-0388, principal investigator T. Bulc Griessler)

Projects: Slovene and EU: Closing material flows by wastewater treatment with green technologies (Slovene) (J2–8162; 1.5.2017–30.4.2020); An attempt to interpret the results of biomonitoring in conjunction with data on environmental pollution, with an emphasis on air pollution and an assessment of the potential effects of these pollutants on the health of the population (V3–1722; .4.2018–30.11.2019); High-Performance Nanostructured Coatings ? breakthrough in concentrated solar power (J2–7371; 1.1.2016–31.12.2018); Potential substances of very high concern in the context of REACH regulation (V1–1641; 1.10.2016–30.9.2018); Optimization and implementation of methods and measures for reducing the damage caused by larvae of common cockchafer in Slovenia (V4–1104; 1.10.2011–30.9.2014); Cumulative and synergistic effects of different chemicals on honeybees (V1–1129; 1.10.2011–30.9.2012); Peach aromas – the missing parameter in fruit quality (Slovene) (Z4–2287; 1.5.2009–30.4.2011); Elaboration and evaluation of a toxicity test for engineered nanoparticles with terrestrial isopods (J1–9475; 1.1.2007–31.12.2009); Use of yeast for determination of toxicity of selected neonicotinoids on the genome level (J1–9808; 1.1.2007–31.12.2009 (V4–0312; 1.10.2006–30.9.2008); Self-cleaning and photocatalytic

coatings for environmental applications (L1—7150; 1.9.2005—31.8.2008); The transformation of pollutants with ozone and advanced oxidation processes (L1—7165; 1.9.2005—31.8.2008);

INTERREG program Slovenia-Italy 2007- 2013; 2011-2014 AGRI-KNOWS – Knowledge transfer in agriculture as added value in environmental protection – INTERREG program Slovenia-Italy 2007- 2013.

Scientific cooperation:

Member of Association of Chemistry and the Environment (ACE) - 2019

**Selected publications**

- **BAVCON KRALJ, Mojca**, DIVANOVIĆ, Hena, KOŠENINA, Suzana, KETE, Marko, LEBEDEV, Albert T., ARTAEV, Viatcheslav, TREBŠE, Polonca. Effect of humic acids, nitrate and oxygen on the photodegradation of the flubendiamide insecticide : identification of products. *Environmental chemistry letters*, ISSN 1610-3653, Jun. 2018, vol. 16, iss. 2, str. 591-597, graf. prikazi. <https://link.springer.com/article/10.1007/s10311-017-0691-6>, doi: 10.1007/s10311-017-0691-6. [COBISS.SI-ID 5375339], [JCR, SNIP]
- **BAVCON KRALJ, Mojca**, DILCAN, Gizem Evrim, SALIHOĞLU, Güray, MAZUR, Dmitry M., LEBEDEV, Albert T., TREBŠE, Polonca. Photocatalytic degradation of chlorthaliduron : effect of humic acids, nitrates, and oxygen. *Journal of analytical chemistry*. 2019, vol. 74, no. 14, str. 1371-1377, graf. prikazi. ISSN 1061-9348. DOI: 10.1134/S1061934819140077. [COBISS.SI-ID 5761899], [JCR, SNIP]
- LEBEDEV, Albert T., **BAVCON KRALJ, Mojca**, POLYAKOVA, Olga V., DETENCHUK, Elena Andreevna, POKRYSHKIN, Sergey Alexandrovich, TREBŠE, Polonca. Identification of avobenzone by-products formed by various disinfectants in different types of swimming pool waters. *Environment international*. [Print ed.]. 2020, vol. 137, str. 105495-1-105495-8, ilustr. ISSN 0160-4120. DOI: 10.1016/j.envint.2020.105495. [COBISS.SI-ID 5783147], [JCR, SNIP]
- **BAVCON KRALJ, Mojca**, FORTUNA, Anja, ABRAM, Anže, TREBŠE, Polonca. Dish handwashing : an overlooked source of contamination. *Environmental chemistry letters*. 2020, vol. 18, iss. 1, str. 181-185, ilustr. ISSN 1610-3653. <https://link.springer.com/article/10.1007/s10311-019-00918-5>, DOI: 10.1007/s10311-019-00918-5. [COBISS.SI-ID 5664107], [JCR, SNIP, Scopus do 29. 3. 2020: št. citatov (TC): 1, čistih citatov (CI): 1]
- ŠUNTA, Urška, PROSENC, Franja, TREBŠE, Polonca, GRIESSLER BULC, Tjaša, **BAVCON KRALJ, Mojca**. Adsorption of acetamiprid, chlorantraniliprole and flubendiamide on different type of microplastics present in alluvial soil. *Chemosphere*. [Print ed.]. Dec. 2020, vol. 261, str. 1-9, ilustr. ISSN 0045-6535. <https://www.sciencedirect.com/science/article/pii/S0045653520319573>, DOI: 10.1016/j.chemosphere.2020.127762. [COBISS.SI-ID 25545475]
- ŠUNTA, Urška, TREBŠE, Polonca, **BAVCON KRALJ, Mojca**. Simply applicable method for microplastics determination in environmental samples. *Molecules*. 2021, vol. 26, iss. 7, str. 1-17, ilustr. ISSN 1420-3049. <https://www.mdpi.com/1420-3049/26/7/1840/pdf>, DOI: 10.3390/molecules26071840. [COBISS.SI-ID 57399043]

## **C31 VOLTAMPEROMETRIC SENSORS BASED ON CONDUCTING POLYMERS USED IN FOOD ANALYSIS**

**Constantin APETREI**

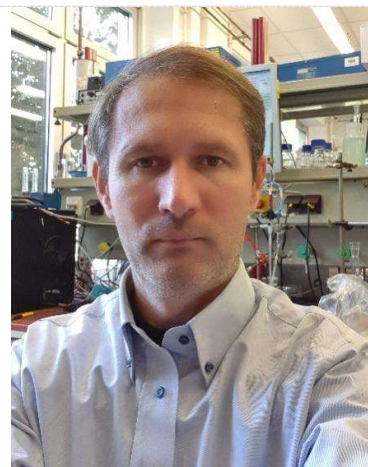
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Conducting polymers are a class of polymers with sensitive properties due to the semiconducting properties related with the degree of doping with different ions. These properties could be used in the developing of different type of sensors, where the conducting polymers are the main sensitive element or, part of a bio-nano-composite, support for immobilization for biologic components, molecularly imprinted materials etc. Synthesis of the conducting polymers could be carried out by different methods the chemical and the electrochemical being the most extended. However, the electrosynthesis is more appropriate in the field of sensors because the synthesis and deposition of the sensitive layer is carried out in a single step. There are numerous conducting polymers involved in the sensors development, among these could be mentioned the polypyrrole, polyaniline, polythiophene and their chemical derivatives. Different electrochemical techniques can be used for the detection of the analytes, such as voltammetric, conductometric, potentiometric, voltamperometric, and impedimetric techniques. The electrochemical sensors based on the conducting polymers were extensively studied and employed for the detection of numerous classes of compounds of interest in food products such as wines, beers, olive oils, meat and meat products, fish etc. There are two possible approaches of the conducting polymers based sensors. One is the develop of a sensitive selective sensor for one specific analyte and another one is developing of several unspecific sensors used for obtaining chemical fingerprinting of food samples. In the first case, electroanalytical methods were developed and the sensors are fully characterized regarding the sensitivity, selectivity, analytical recovery and applicability in the real food samples. The second approach is related to developing sensors array coupled with chemometrics methods for data analysis, in this case resulting models for discrimination and classification, and correlations with another type of data such as sensorial analysis results. In this study will be presented different voltamperometric sensors based on conducting polymers used in the electroanalysis of several food samples of interest for their nutritional, health and sensorial properties.

## Constantin APETREI

- Habilitation (2015) in Chemistry, “Dunărea de Jos” University of Galati
- PhD (2007) in Chemistry, “Dunărea de Jos” University of Galati
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### Research interests

Development of novel sensors and biosensors, characterization of sensors and biosensors, electrochemistry, electronic sensory systems: e-tongue, e-nose, e-eye; chemometry, food chemistry, food analysis, synthesis and characterization of organic compounds, UV-VIS, FTIR, HPLC, TLC, GC-MS, deposition of sensitive materials onto substrates using different methods: Langmuir-Blodgett, Layer-by-Layer, electrodeposition, high vacuum sublimation, spin-coating.

### Selected publications

- **Apetrei, C.**, Alessio, P., Constantino, C.J.L., de Saja, J.A., Rodriguez-Mendez, M.L., Pavinatto, F.J., Fernandes, E.G., Zucolotto, V., Oliveira, O.N. Biomimetic biosensor based on lipidic layers containing tyrosinase and lutetium bisphthalocyanine for the detection of antioxidants, *Biosensors and Bioelectronics* 26 (2011) 2513-2519, [doi:10.1016/j.bios.2010.10.047](https://doi.org/10.1016/j.bios.2010.10.047)
- I.M. Apetrei, **C. Apetrei**, Application of voltammetric e-tongue for the detection of ammonia and putrescine in beef products, *Sensors and Actuators B: Chemical* 234 (2016) 371–379. <http://dx.doi.org/10.1016/j.snb.2016.05.005>
- A. Tabacaru, V. Colombo, **C. Apetrei**. Development of Sensor based on Copper(II) Thiocyanate Pyridine Polymeric Complex for Detection of Catechol. *IEEE Sensors Journal* 19 (2019) 10198-10206
- Bounegru, A. V.; **Apetrei, C.** Voltammetric Sensors Based on Nanomaterials for Detection of Caffeic Acid in Food Supplements. *Chemosensors* 8 (2020) 41. <https://doi.org/10.3390/chemosensors8020041>.
- Geană, E.-I, Artem, V., **Apetrei, C.** Discrimination and classification of wines based on polypyrrole modified screen-printed carbon electrodes coupled with multivariate data analysis. *Journal of Food Composition and Analysis* 96 2021, 103704, <https://doi.org/10.1016/j.jfca.2020.103704>

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## **C32 LABORATORY DIAGNOSTIC OF UNCOMMON FOODBORNE PATHOGENS**

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Foodborne diseases are caused by contamination of food and occur at any stage of the food production, delivery, and consumption chain. They can result from several forms of environmental contamination including pollution in water, soil, or air, as well as unsafe food storage and processing.

Foodborne diseases encompass a wide range of illnesses. Most present as gastrointestinal issues, though they can also produce neurological, gynecological, and immunological symptoms.

Many foodborne infections are not identified by routine laboratory procedures and require specialized, experimental, and/or expensive tests that are not generally available.

Because many ill persons do not seek attention, and of those that do, many are not tested, many cases of foodborne illness go undiagnosed, and most illnesses are not laboratory-confirmed.

- For example, it is estimated that 29 Salmonella illnesses occur for every one that is laboratory-confirmed and that many hospitalizations and deaths caused by Salmonella infection are not ascertained.

The aim of this presentation is to shed some light on the more uncommon foodborne pathogens and the crucial role of correct laboratory testing in these cases.

### **Maximilian TEDESCU**

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**Research interests**

- Applications of MALDI-TOF mass spectrometry in the analysis of antibiotic resistance in bacteria; spread of MDR strains; emergent bacterial pathogens
- HLA typing and tissue transplants
- Applications of immunophenotyping lymphoproliferative syndromes

### **C33 FUNCTIONALIZED SENSORS AS VERSATILE TOOLS FOR FOOD ANALYSIS**

**Cecilia CRISTEA, Oana HOSU, Mihaela TERTIS, Bogdan FEIER, Andreea CERNAT**

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In the last decade, a wide range of electrochemical sensors, biosensors and immunoassays were developed for various targets and some of them are commercially available today. But are they offering superior features compared to other analytical techniques?

Quantification of a biological or a biochemical processes is of utmost importance for medical, biological and biotechnological applications. Electrochemical (bio)sensors provide an attractive means to analyze the content of a real sample due to the direct conversion of a biological event to an electronic signal.

The combination of the electrochemical transducers with different natural or biomimetic elements led to the development of a plethora of sensors; for instance, those based on affinity or on immunological recognition (between an antibody and its antigen). In the past decade, DNA strands and more recently, microRNA and peptides gained their place as outstanding receptors in sensors design.

Electrochemical (bio)sensors found their application in the detection of carbohydrates, alcohols, antibiotics, acids in fermented foods, pesticides (organophosphorus, carbamates) in food and in farm products. Enzyme-based biosensors are currently used in food quality control for measuring aminoacids, amines, carbohydrates, heterocyclic compounds, carboxylic acids, gases, inorganic ions, cofactors, alcohols and phenols in wine, beer and yoghurt. Aptasensors and MIP-based sensors could be applied for the detection of small molecules such vitamins, antibiotics, proteins responsible for food allergies and pathogenic organisms in meat, poultry, eggs, honey, fish and water.

An overview on the design and optimization of such electrochemical (bio inspired) sensors developed with applications in food safety/control will be presented.

## Cecilia CRISTEA

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- PhD in Chemistry (Babes Bolyai University) and in Electrochemistry (Rennes 1 University, France)
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- Habilitation in Pharmacy, Iuliu Hatieganu University of Medicine and Pharmacy Cluj-Napoca



- Member of the Scientific Council of the Bioelectrochemical Society - BES
- Member of the organising and scientific committees of several summer schools and international conferences ("Journées d'électrochimie, 2009", 6-10 July 2009, Sinaia, (Romania); the Third International Regional Symposium on Electrochemistry: South-East Europe, RSE-SEE, 13-17 May 2012, Bucharest (Romania); the "Electrochemistry for environment and biomedical applications" summer school, 17-21 June 2013, Cluj-Napoca (Romania); the 3<sup>rd</sup> International Workshop on "Specific Methods for food safety and quality", 27<sup>th</sup> September 2016, Beograd (Serbia); the "International Conference on Advancements of Medicine and Health Care through Technology", 4-6 June 2014 and 24-26 October 2016, Cluj-Napoca (Romania); *the Summer school in Bioelectrochemistry-SMOBE*, August 2016, 2018 in Antwerp (Belgium), *The XXVith International Symposium on Bioelectrochemistry and Bioenergetics* of the Bioelectrochemical Society, 9-13 May 2021, Cluj-Napoca).
- Member of the editorial board of *Current Analytical Chemistry (Bentham)*, *Sensors*, *Biosensor – Section Editor (MDPI)*.
- Guest Editor for *Current Opinion in Electrochemistry*, *Biosensor*, *Frontiers in Bioengineering and Biotechnology*, *Sensors*.
- Diploma and the medal “Gheorghe Spacu” awarded by the Romanian Society of Chemistry for the achievements in the scientific activity in 2019.

## Research Interests

The main research interest, as well as the **main contributions**, are given in the field of design and development of modified electrodes, the elaboration of various nanoplatfoms for electrochemical sensors development, immobilization of carbon nanotubes, graphene, metallic nanoparticles on the surfaces of electrochemical and optical transducers, entrapment of enzymes into conductive polymeric films for the development of biosensors for biomedical and pharmaceutical analysis, the use of graphite felt electrodes for organic electrosynthesis and sensors development for heavy metals detection, the use of antibody and aptamers for immunosensors development for the detection of ovarian and breast cancer biomarkers and of some drugs, design of hybrid sensors (electrochemical and SPR) for cancer biomarkers and antibiotics detection, the use of electrochemical impedance spectroscopy in sensors characterization. In this dynamic research field several transducers (carbon, metallic, hybrid-

based transducers) and different bioelements (enzymes, antibodies, aptamers, microRNA) as well as an important number of techniques (electrochemical techniques: voltammetry, amperometry, electrochemical impedance spectroscopy; spectral techniques: UV-VIS, FTIR, Raman; separation techniques: HPLC, GC-MS, electrophoresis) were employed.

**Selected publications:**

- Geanina Stefan, Oana Hosu, Karolien De Wael, María Jesús Lobo-Castañón, **Cecilia Cristea**, Aptamers in Biomedicine: Selection Strategies and Recent Advances, *Electrochimica Acta*, 376 (2021) 137994
- Adrian Blidar, Stanislav Trashin, Erik N. Carrión, Sergiu M. Gorun, **Cecilia Cristea**, Karolien De Wael, Enhanced photoelectrochemical detection of an analyte triggered by its concentration by a singlet-oxygen generating fluoro photosensitizer , *ACS Sensors*, 5(11), (2020), 3501–3509
- Mihaela Tertis, Petrica Ionut Leva, Diana Bogdan, Maria Suci, Florin Graur, **Cecilia Cristea**, A Highly Sensitive and Selective Label-free Aptasensing Platform for Electrochemical Detection of Interleukin-6 - Application in Colorectal Cancer Detection, *Biosensors and Bioelectronics*, 137 (2019) 123-132
- Bogdan Feier, Adrian Blidar, Laurian Vlase, **Cecilia Cristea**, The complex fingerprint of vancomycin by electrochemical and mass spectrometry analysis, *Electrochemistry Communications*, 104 (2019) 106474
- Alina Adumitrăchioaie, Mihaela Tertiş, Maria Suci, Florin Graur, **Cecilia Cristea**, A novel immunosensor based on graphene-oxide/chitosan modified screen printed electrode for the detection of serotonin in various biological fluids, -*Electrochimica acta*, 311(2019), 50-61
- Ioana Tiuca Gug, Mihaela Tertis, Oana Hosu, **Cecilia Cristea**, Salivary biomarkers detection: Analytical and immunological methods overview, *Trends in Analytical Chemistry*, 113 (2019) 301-316
- Bianca Ciui, Mihaela Tertiş, Andreea Cernat, Robert Săndulescu, Joseph Wang, **Cecilia Cristea**, Finger-based printed sensors integrated on a glove for on-site screening of *Pseudomonas aeruginosa* virulence factors, *Analytical Chemistry* 90(2018) 7761–7768

## **C34 HYGIENIC DESIGN FOR SUSTAINABLE DEVELOPMENT**

**Liviu GACEU**

Faculty of Food and Tourism, Transilvania University of Brasov, Romania

This presentation starts with the definition of Hygienic design concept and European Hygienic Engineering & Design Group as a non-profit consortium of: Equipment manufacturers; Food industries; Suppliers to the food industries; Research institutes and universities; Public health authorities. Since 1989, the European Hygienic Engineering & Design Group is guiding the food industry in hygienic design solutions by offering practical guidelines, test procedures, training and education.

The Benefits of Hygienic Design are: Hazard control (allergens, microbiological, chemical, foreign matter); Improved product quality; Life cycle cost reduction; Quick change over execution; Pest control; Human safety; Housekeeping; Equipment reliability; Dietary compliance (Halal, Kosher, organic); Regulatory Compliance.

The objectives of EHEDG are :guidance on hygienic design and engineering to ensure food safety and quality: to offer a platform for the food industry to discuss issues on hygienic design; to develop guideline documents on hygienic design requirements and practices based on science and technology to ensure compliance to legislation; to maintain a transparent and unambiguous hygienic equipment certification scheme: to identify areas where hygienic design knowledge is insufficient and initiate and promote research and development in those areas.

The activity of EHEDG is marked by: guidelines, like: Air Handling; Bakery Equipment; Cleaning in Place; Cleaning Validation; Cleaning & Disinfection; Conveyor Systems; Dry Materials Handling; Fish Processing; Food Refrigeration; Heat Treatment; Hygienic Systems Integration; Hygienic Design Principles; Materials of Construction in Contact with Food .

The second subject evaluated in this presentation is: “Environmental impact during sanitation of Hygienic designed equipment vs conventionally designed equipment”.

Cleaning and Disinfection (Sanitation) of equipment and facilities in food industry is critical for food safety and quality. Frequency of sanitation is generally high to reach the high hygiene standards required for food safety reasons. Sanitation is one of the most water and energy consuming operations and wastewater generator in the food industries. As indicated in the FDM BREF 2006, cleaning and disinfection is the main water consumer operation in most food sectors, such as dairy, fish, drink or meat, with the amount depending on the type and size of equipment to be cleaned and the materials processed. The question that is following naturally is: “Hygienic Design is assuring Food Safety but is also environmental friendly ?” The answer is done by the presentation of ECODHYBAT project that applied the big concept of hygienic design.

The project approached activities at industrial scale which are representative of dairy and fish processing. The equipment configuration was re-designed following hygienic criteria under an integrated approach. Sanitation demonstrative trials were performed in order to evaluate the environmental improvement achieved while hygienic level in equipment is maintained.

The expected results have to demonstrate that the design of productive equipment following hygienic criteria reduces the overall impact of the sanitation operations while maintaining hygienic assurance levels.

The hygienic diagnosis was carried out in two fish processing lines in PESCANOVA. In the first case, the following equipment was selected: Mixer batter tank; Mixer paste tank; Mixer bread tank; Lobular pump; Butterfly valve; Ball valve; Hose coupling. In the second case study was used a production line of packaged milk. The following equipment was selected: Flash cooler; Aseptic cross-way valves; Tank cleaning devices; Dumping devices UHT; Agitators seal; Heat keeping tubes; Tank cover in aseptic tanks; End of the product pipe in aseptic lines; Anti splashing device for discharge tubes; Recover product machines (hopper and piston system); Conveyor belts; Centrifugal pumps; Single seat valves; Flow meters; Sensors.

The final results show reducing of water consumption by 36,5% and total water use (including indirect water use) by 30,5%. Direct energy consumption was recuer by 27% and total energy consumption (including indirect energy consumption) was reduced by 33%. GHG emissons of CO2 was reduced by 34,7% and the volume of waste water was reduced by 36,5%.

## Liviu GACEU

- PhD (2001) Mechanical Engineering – Transilvania University of Brasov;
- Habilitation in Engineering and Management, Transilvania University of Brasov;
- Coordinator of Food Product Engineering study programme (4 years), Transilvania University of Brasov;
- President of Romanian Society for Agriculture, Food, Environment and Tourism, [www.rosita.ro](http://www.rosita.ro)
- President of the Romanian European Hygienic Engineering and Design Group Regional Section: <https://ehedg.ro/>
- Ambassador for Romania of Global Harmonization Initiative: <https://www.globalharmonization.net/romania>
- Chief Editor of the Journal of EcoAgroturism, <http://www.unitbv.ro/ecoagrituourism>
- Teacher of the course-level degree in following subjects:
  - a. Computer Aided Design
  - b. Machinery and equipment for milling and baking
  - c. Application of the computer in Food and Tourism
- Research team member of the Interdisciplinary Platform RENATSIL, Transilvania University of Brasov.



- Computer Aided Design and Modeling: AUTOCAD, PRO-ENGINEER, I-DEAS, ABAQUS, ANSYS
- Knowledge in computer networks, and operating the following programs: Microsoft Office, FoxPro, Adobe Photoshop, CorelDraw, MathLab, Labview
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#### Research Interests

- Automation in food and agriculture
- Technologies, equipment and facilities for milling and baking
- Grain-drying equipment
- Programmer-computing;
- Applied Electronics;
- Computer hardware and software;

#### Selected publications

- Buculei, A., Amariei, S., Oroian, M., Gutt, G., **Gaceu, L.**, Birca, A., Metals migration between product and metallic package in canned meat, LWT - Food Science and Technology, Volume 58, Issue 2, October 2014, Pages 364-374, Elsevier, ISSN: 0023-6438;
- Sukhmanov, V., Shatalov, V., Petrova, J., Birca, A., **Gaceu, L.**, The influence of high pressure on bio-system reaction kinetics and the preservation of vitamin C, LWT - Food Science and Technology, Volume 58, Issue 2, October 2014, Pages 375-380, Elsevier, ISSN: 0023-6438;
- Thierheimer, W., Tane, N., Gruia, R., **Gaceu, L.**, Thierheimer, D., Ola, D., Cojocar, V., Clinciu, M., Risk Arising from Transport Activities, Environmental Engineering and Management Journal, December 2010, pag. 1167-1170. ISSN: 1582-9596. Gheorghe Asachi Technical University of Iasi, Romania;
- Oprea O. B., **Gaceu L.**, Tucu D., Valorisation of winery waste by using GSP (grape seed powder) as flour substitution in bakery industry, Symposium "Actual Tasks on Agricultural Engineering", Opatija, Croatia, 2017, pp. 371-376, ISSN 1848-4425.
- Frioui M., Shamtsyan M., **Gaceu L.**, Oprea O. B., Mnerie D., Rheological influence of (1–3)(1–6) mushrooms  $\beta$ -glucan, used as flour substitution in bakery industry, Symposium "Actual Tasks on Agricultural Engineering", Opatija, Croatia, 2017, pp. 377-384 , ISSN 1848-4425;
- Spirchez C, Lepadatescu B., **Gaceu L.**, Comparative study of different effectiveness of building insulation of wood in Romania, 12 th International Conference-Standardization, Prototypes and Quality A means of Balkan Countries Collaboration, pag.135-138, 22-24, 2015, Kocaeli Univ. Izmit, Turkey;
- Oprea O.B., Apostol L., Bungau S., Cioca G., Samuel A.D., Badea M., **Gaceu L.**, Researches on the Chemical Composition and the Rheological Properties of Wheat and Grape Epicarp Flour Mixes, REV.CHIM.(Bucharest), Vol.69, Nr. 1, 2018, pag.70-75, ISSN 2537-5733.

## **C35 THE ROLE AND SIGNIFICANCE OF FOOD HANDLER IN FOOD SAFETY MANAGEMENT SYSTEM**

**Andrej OVCA**

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Properly trained personnel coming into contact with food is a fundamental part of any food safety management system. Any person who directly handles packaged or unpackaged food, food equipment and utensils, or food contact surfaces is therefore expected to comply with food hygiene requirements. This presentation will analyse the role and importance of food handlers in food safety management, with particular emphasis on formal education and training.

The results of a national cross-sectional study among future professional food handlers, which we will discuss in more detail, show that formal training, although adequately planned, does not address all aspects of food safety along the food supply chain equally. Furthermore, it does not adequately sensitise individuals to the perception of food-related health risks. The concepts of food supply chain and co-responsibility for food safety are not familiar to the respondents. At the end of formal vocational training, elements of the preventive food safety management system (HACCP) are poorly known and/or misinterpreted. Trainees in food service differ significantly from other trainees in food-related courses in terms of knowledge, attitudes and practical work. The influence of formal education on knowledge regarding new technologies is weak and selective. At several levels, the teacher is identified as the key person for achieving the learning objectives. However, the approach where the teacher himself takes responsibility for food safety measures deprives students of this kind of practical experience during their formal education.

There is an ongoing and urgent need to change incorrect hygiene-related behaviours, which can be achieved through a systematic approach, regular training specifically designed for staff and ongoing active monitoring of staff food handling techniques. Providers of food safety education and training should therefore be aware of the critical issues in the existing approach to staff food handling education and training.

## Andrej OVCA

- Assistant professor for Sanitary engineering at University of Ljubljana, Faculty of Health Sciences.
- Departmental coordinator for international relations.
- Representative for Faculty of Health Sciences by the International Organization for Environmental Health (IFEH), Departmental coordinator for international cooperation.
- Editor-in-Chief at International Journal of Sanitary Engineering,
- Member of The European Public Health Association.



- 2002-2006 - Bachelor's degree in Sanitary engineering at the University of Ljubljana (Cold chain maintaining in trade and its understanding among consumers).
- 2006-2010 - Master's degree in Environmental Science at the University of Nova Gorica (Isolation and characterization of zinc species in selected components of the vegetarian diet).
- 2011-2018 – PhD at University of Ljubljana, Interdisciplinary doctoral study program Biosciences (Compliance of formal education with food safety needs within food supply chain).
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- ORCID: <https://orcid.org/0000-0001-7465-948X>

### Research interests

Hygiene, food hygiene and food safety with special interest in human as a risk factor for food safety.

### Selected publications

- **OVCA A.,** ŠKUFCICA T., JEVŠNIK M. Temperatures and storage conditions in domestic refrigerators - Slovenian scenario. Food control, May 2021, vol. 123, str. 1-7, doi: 10.1016/j.foodcont.2020.107715.
- **OVCA A.,** JEVŠNIK M., RASPOR P. Food safety practices of future food handlers and their teachers, observed during practical lessons. British food journal, 2018, vol. 120, no. 3, str. 531-548. doi: 10.1108/BFJ-05-2017-0292.
- **OVCA A.,** JEVŠNIK M., KAVČIČ M., RASPOR P. Food safety knowledge and attitudes among future professional food handlers. Food control, Feb. 2018, vol. 84, str. 345-353, doi: 10.1016/j.foodcont.2017.08.011

- **OVCA A.**, JEVŠNIK M., RASPOR P. Future professional food handlers' perspectives towards food safety. *British food journal*, vol. 119, iss. 2, str. 411-424, doi: 10.1108/BFJ-07-2016-0335.
- **OVCA A.**, JEVŠNIK M., JEREB G., RASPOR P. Effect of educational intervention on young people, targeting microbiological hazards in domestic kitchens. *Food Policy*, 2016, vol. 61, str. 156-162., doi: 10.1016/j.foodpol.2016.03.004.
- Co-author of university textbooks “*Hygiene of facilities and processes*”, “*Introduction to food safety and quality*” and “*Sampling methods*”.

## **C36 FOOD PROCESSING AS A TOOL ON REDUCTION OF PESTICIDE RESIDUES**

**Edlira SHAHINASI**

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Tirana, Albania

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Pesticides are chemical compounds (insecticides, fungicides, herbicides etc.) which are globally used to protect crops and increase productivity, but extensive/or inappropriate application of pesticides affects whole ecosystem by polluting soil, air and water and at the same time entering residues in human food chain. The presence of these residues in food chain may increase incidences of all types of cancer including leukaemia, lymphomas, breast, brain, bone and stomach cancers, chronic kidney diseases, suppression of the immune system etc.

Nowadays, consumers are becoming more aware regarding safety and quality food products. Consumers and the industries are trying to use cost-effective strategies and decontamination techniques which bring the concentration of pesticides below Maximum Residue Levels.

Many studies related to food processing techniques at domestical and/or industrial level, have demonstrated significantly reduction of pesticide residues content in foods and food products. The simplest domestical process includes washing with water. To improve the efficiency of this operation a convenient and successful alternative could be washing with diluted aqueous solutions of acetic acid, sodium bicarbonate or salt solution. Preparatory steps like peeling, trimming etc. remove only the residues which are located on the skin which mean that these simple processes are quite effective to remove non-systemic pesticides, meanwhile heat treatment processes like boiling, drying, steaming, cooking, frying are related to physiochemical processes (co-distillation, thermal degradation and evaporation)

Many other techniques such as refining, fermentation and curing have been reported to affect the pesticide level in foods to varied extent. Milling, baking, wine making, malting and brewing resulted in lowering of pesticide residue level in the end products, whereby each operation involved during processing usually adds to a cumulative effect of reduction of pesticides present in the material.

However, the successful use of processing techniques depends on several factors, including the initial concentration at the time of harvest and pesticide properties (physical and chemical nature of pesticides).

### **References**

- Yigit N., Velioglu Y.S. 2019. Effects of processing and storage on pesticide residues in foods- Critical review. Food Science and Nutrition : <https://doi.org/10.1080/10408398.2019.1702501>
- Corrias F., Atzei A., Lai C., Dedola F., Ibba E., Zedda G., Canu F., Angioni A. 2020. Effects of Industrial Processing on Pesticide Multiresidues Transfer from Raw Tomatoes to Processed Products. Foods 2020, 9, 1497; doi:10.3390/foods9101497
- Tijana Đorđević T., Rada Đurović-Pejčev R. 2016 Food processing as a means for pesticide residue dissipation. Pestic. Phytomed. (Belgrade), 31(3-4), 2016, 89–105
- Mohammad M.R., Moradjoo R., Mehran M., Koorosh K., Farahmankia Z., Taran J. 2016. The Effect of Washing and Peeling on Reduction of Dithiocarbamates Residues in Cucumber and Tomato. J. Hum. Environ. Health Promot. 2016; 1(2): 99-104
- Kaushik G., Santosh S., Naik S.N. 2009. Food processing a tool to pesticide residue dissipation – A review. Food Research International 42 (2009) 26–40

### **Edlira SHAHINASI**

- PhD in Food Science and Biotechnology, 2019
  - Lecturer of Chemistry at Department of Chemistry, Faculty of Biotechnology and Food, Tirana Agricultural University, Street Pajsi Vodica, Koder-Kamez, Tirane, Albania
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Edlira Shahinasi has been graduated in 2002 as Chemical Engineer at the Faculty of Natural Sciences; University of Tirana. She joined Tirana Agricultural University in 2004 and in 2006 she got Master Degree in the environmental issues, Faculty of Natural Sciences.

In 2009 Mrs. Shahinasi attended a Postgraduate Specialization Program in “Food Quality and Chemistry of Natural Products” in Crete, Greece whereas in 2015 she completed an internship period at University of Jaen, Spain where she has acquired specific expertise in the evaluation of sensorial analysis of olive oil.

Edlira Shahinasi has obtained her PhD in 2019 in Food science and Biotechnology. She has long experience in teaching and is familiar with the laboratory work. She lectures modules of inorganic chemistry; analytical chemistry at the undergraduate programs of Nutrition Science and Environmental Engineering and module of Analytical Chemistry and Instrumental Methods at master program.

She has attended several training courses at universities such as University of Ljubjana, Faculty of Health Science, Slovenia; Jastus Liebig University Giessen, Research Centre for Biosystems (IFZ) Giessen, Germany; “St. Kliment Ohridski” University of Sofia, Bulgaria; University of Novi Sad, Faculty of Technology etc.

**As a result of her interdisciplinary studies her main work is focused on:**

- Pesticide residues in food, ecotoxicology and environmental fate of pesticides
- Physico-chemical analysis of water discharges from food industry and environmental impact
- Minimization of environmental pollution based on green chemistry and circular economy concepts

During her academic career Mrs. Shahinasi has been participated in International Conferences and has published several research articles in national and international journals.

She has been expert or member of several national and international research projects in the field of food and environment founded by European Union, UNDP, GIZ, ReLOaD etc. She currently is Committee Member of COST action network (Rethinking Packaging for Circular and Sustainable Food Supply Chains of the Future).

**Selected publications**

- Ariola Devolli, Merita Stafasani, **Edlira Shahinasi**, Frederik Dara, Hikmete (2021) “Determination of vitamin C Content in commercial fruit juices by volumetric and spectrophotometric methods” Journal of Hygenic Engineering and Desing Vol 34, 124-131. Scopus Indexed
- Mariola Kodra, Ariola Devolli, Dhurata Feta, Merita Stafasani, **Edlira Shahinasi** (2019) “Evaluation of total protein and moisture content in processed meat (sausages) of Tirana markets” Journal of Hygenic Engineering and Desing Vol 27, 27-30. Scopus Indexed
- **Edlira Shahinasi**, Ferdi Brahushi (2019) “Efficacy of sterol-inhibiting fungicides on the control of scab disease (*Venturia Inaequalis*) in apple tree” European Journal of Engineering Research and Science. ISSN (Online) : 2506-8016 Vol. 4, No. 6, June 2019
- **Edlira Shahinasi**, Vojslava Bursic, Martina Mezei, Ferdi Brahushi, Magdalena Cara; Gorica Vukovic, (2019): “Fate of Myclobutanil Residues after Application on Apples Growing to Korca District, Albania”. Journal of Food Science and Engineering 9 (2019) 81-87. ISSN: 2159-5828 (print) 2164-5795 (online). doi: 10.17265/2159-5828/2019.03.001 Copernicus Indexed
- **Edlira Shahinasi**, Ariola Devolli, Mariola Kodra (2018): Chapter 7-Chromium In Matta G. and Gjyli L. (eds) Inorganic Toxicity: Environment & Human Health Publisher LAP LAMBERT Academic Publishing.
- **Edlira Shahinasi**, Ferdi Brahushi, Ariola Devolli, Mariola Kodra (2017): “The ecotoxicology of pesticides group of triazole and their use to control apple scab (*Venturia inaequalis*)”. Journal of Hygenic Engineering and Desing Vol 18, 36-42 (2017). Scopus Indexed

## **C37 HUMAN BIOMONITORING - A TOOL FOR EXPOSURE ASSESSMENT TO MYCOTOXINS**

**Oana Maria MÎRZA, Lorena FILIP, Anamaria COZMA-PETRUȚ, Roxana BANC, Laura GAVRILAȘ, Daniela CIOBÂRCĂ, Doina MIERE**

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Risks associated with mycotoxins depend on both hazard and exposure. It is indispensable from a public health perspective to develop acceptable methods to assess human risk associated to the presence of mycotoxins in food. Mycotoxin exposure assessment has been traditionally evaluated combining food consumption and occurrence data (indirect approach). Exposure assessments using the indirect approach have important limitations due to the heterogeneous distribution of mycotoxins in foods, the limited accuracy of food consumption data and the inter-individual differences in mycotoxin metabolization. These limitations may be overcome with the measurement of specific biomarkers (direct approach named biomonitoring), since biomarker excretion correlates very well with the intake of some mycotoxins and leads to a more realistic scenario to assess the exposure to mycotoxins. Moreover, sometimes, this approach has the advantage of a non-invasive sampling. The process of biomonitoring includes the detection of the parent compound (mycotoxins) and/or its main phase I and phase II metabolites (e.g. glucuronide conjugates), measured in accessible body fluids (plasma, serum, urine, blood, breast milk), particularly urine.

For all these reasons, the aim of the present research is to provide a short review of the general approaches to biomonitoring of different mycotoxins and the occurrence of toxigenic fungi and their mycotoxins, using recent data in the literature.

### **Oana Maria MÎRZA (STANCIU)**

- Lecturer at “Iuliu Hațieganu” University of Medicine and Pharmacy (UMPh) Cluj-Napoca, Faculty of Pharmacy, Department of Bromatology, Hygiene, Nutrition.
- Her work as a teacher includes as main activities: guiding students in the laboratory activities of Bromatology, Hygiene, and Nutrition (Romanian and English Pharmacy study programs) and Food Chemistry and Hygiene (Nutrition and Dietetics study program); teaching students in Culinary technology and chemistry (Nutrition and Dietetics study



program); supporting students in the development of their BSc and MSc thesis. In addition, being part of the department that coordinates the Nutrition and Dietetics program, I was continuously involved in the curriculum design and curriculum update, making this program sustainable, modern and European.

- Bachelor degree, Faculty of Pharmacy at UMPH Cluj-Napoca, with a diploma thesis entitled “Phytoestrogenic potential of some lignans from forest fruits” (2013)
- Master’s degree in “Drug and Environmental Toxicology” at UMPH Cluj-Napoca, with a diploma thesis entitled “Tricothecenes A and B - contaminants of wheat derivatives” (2014-2015)
- PhD degree in Pharmacy and Food Science at UMPH Cluj-Napoca and University of Valencia (Spain), defending the international co-supervised PhD thesis entitled “Mycotoxin contamination of grains and grain derivatives in Romania”, with the academic title *summa cum laude* (2013-2017)
- Pharmacy specialization in “Pharmaceutical laboratory” to Municipal Hospital Cluj-Napoca (2014-2017)
- Formation in Project management, Entrepreneurial Skills and Trainer to Romanian Academy, Cluj-Napoca Branch (certificates provided by the Romanian Ministry of Labour (2015)
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- ORCID ID: <https://orcid.org/0000-0003-3771-9003>

### Research Interests

- She obtained two Doctoral Research Grants and she benefited from two ERASMUS+ mobility fellowships at the Laboratory of Food Chemistry and Toxicology at the Faculty of Pharmacy from the University of Valencia (2 years).
- Also, she received the Young Researcher Prize - Healthy Nutrition/Food Section at the 1st International Conference of LIFE Sciences and Technology for WELLBEING in Romania, and an Early Career Research Grant provided by the European Food Safety Authority (EFSA) for traveling to the EFSA Conference in Parma, Italy.
- Her research activities have been situated in the fields of food safety and nutrition. She published the first data about emerging mycotoxins in cereals from Romania and the first studies about the risk associated with the exposure to both regulated and unregulated *Fusarium* mycotoxins for the Romanian population.
- In the present, she is also Postdoc Researcher of the Romanian Ministry of Education, working on the exposure assessment of Romanian population to multiple mycotoxins, using human biomonitoring.
- She published 14 articles *in extenso* in various ISI-indexed international journals, more than 35 abstracts in book of abstracts, registering a WOS H-index of 6 and more than 210 citations.
- She has contributed to 7 book chapters published in national publishing houses.

**Selected publications**

- **Stanciu O** et al, Occurrence and co-occurrence of Fusarium mycotoxins in wheat grains and wheat flour from Romania, *Food Control* (2017) 73:147-155 – IF = 3.496 (red area)
- **Stanciu O** et al, Presence of Enniatins and Beauvericin in Romanian Wheat Samples: From Raw Material to Products for Direct Human Consumption, *Toxins* (2017) 9(6):189 – IF = 3.030 (red area)
- **Stanciu O** et al, Climatic conditions influence emerging mycotoxin presence in wheat grown in Romania – A 2-year survey, *Crop Protection* (2017) 100:124–133 – IF = 1.834 (red area)
- **Stanciu O** et al, Study on Trichothecene and Zearalenone Presence in Romanian Wheat Relative to Weather Conditions, *Toxins* (2019) 11(3):163 – IF = 3.895 (red area)
- **Stanciu O** et al, First study on trichothecene and zearalenone exposure of the Romanian population through wheat-based products consumption, *Food and Chemical Toxicology* 121 (2018) 336–342 – IF = 3.977 (red area)

## **C38 ROLE OF HEAVY METALS IN WINE QUALITY AND THEIR IMPACT ON HUMAN HEALTH**

**Ariola DEVOLLI**

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Albania

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Wine is an alcoholic beverage, obtained from yeast fermentation of natural sugars present in grapes, which besides water, alcohol and sometimes sugar contains a great variety of components, inorganic as well as organic. The composition of wine is influenced by many factors related to the specific production area: grape varieties, soil and climate, culture, winemaking, transport and storage.

Metals in wine can originate from both natural and anthropogenic sources, and its concentration can be a significant parameter affecting consumption and conservation of wine. Since metallic ions have important role in oxide–reductive reactions resulting in wine browning, turbidity, cloudiness, and astringency.

Consumption of wine may contribute to the daily dietary intake of essential metals (i.e., copper, iron, and zinc) but can also have potentially toxic effects if metal concentrations are not kept under allowable limits. Moreover, metals in wine may affect human health. Copper in excess may cause serious health consequences or result in the long-term bioaccumulation and toxicity in the body. Excessive iron intake above the tolerable upper intake level (UL) causes gastrointestinal distress while excess copper intake is likely to result in liver damage. Therefore, a strict analytical control of metal concentration is required during the whole process of wine production. Detection of toxic metals in wines is an important and challenging analytical task which requires multi-element methods of good selectivity, sensitivity and robustness.

This lesson aims to present a review of existing literature regarding the determination of heavy metal amount in wine, methods applied for their measurement and possible sources. The main focus will be set on copper and iron determination and their specific forms in wine; which are of particular importance for the wine quality and human health.

## Ariola DEVOLLI

- PhD in Food Engineering 2010
- Asoc professor at Department of Chemistry, Faculty of Biotechnology and Food, Tirana Agricultural University, Street Pajsi Vodica, Koder-Kamez, Tirane, Albania
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Ariola Devolli has been graduated in 2001 as Chemical Engineer at the Faculty of Natural Sciences; University of Tirana. In 2006 she got her Master Degree in Food Engineering at the Faculty of Natural Sciences, University of Tirana and at the same Faculty in 2010 she got PhD in Food Engineering.

Ariola Devolli has experience in Food Industry from 2001 to 2009 and in 2010 she joined University of Agriculture, where she lectures Inorganic Chemistry, Analytical Chemistry at the undergraduate programs of Agri-Food Technology and Environmental Engineering. She is teaching Instrumental Methods of Analytical Chemistry at the master program of Horticulture and Food Chemical Analysis at master program of Food Analysis.

During her experience in food industry and in academic field she has been participated in 40 International Conferences and has published 30 research articles in national and international journals.

Asoc.Prof Ariola Devolli has expertise in several national and international projects founded by European Union, UNDP, GIZ, ReLOaD etc. She currently is substituent member of COST action network (Rethinking Packaging for Circular and Sustainable Food Supply Chains of the Future)

### Research interests

- Heavy metals in food products
- Physico-chemical analysis, quality and shelf life of food products
- Physico-chemical analysis of water discharges from food industry and environmental impact
- Minimization of environmental pollution through green chemistry and circular economy concepts

### Selected articles

- **Ariola Devolli**, Merita Stafasani, Edlira Shahinasi, Frederik Dara, Hikmete (2021) *“Determination of vitamin C Content in commercial fruit juices by volumetric and*

*spectrophotometric methods*” Journal of Hygenic Engineering and Desing Vol 33, 124-131 (2020). Scopus Indexed

- **Ariola Devolli**, Mariola Kodra, Ariola Morina. “*Determination of Fe and Cu in wine with AAS technique*” NETCHEM Final Conference Proceedings, Serbia, January 2020
- Mariola Kodra, **Ariola Devolli**, Dhurata Feta, Merita Stafasani, Edlira Shahinasi. “*Evaluation of Total Protein and Moisture Content in Processed Meat (sausages) of Tirana Markets*”. Journal of Hygenic Engineering and Desing, Vol 27, pp. 27-31 (2019). Scopus Indexed
- **Ariola Devolli**, Frederik Dara, Merita Stafasani, Edlira Shahinasi, Mariola Kodra. “*The influence of protein content on beer quality and colloidal stability*” International Agriculture, Biological & Life Science Conference, September 2-5, 2018 Edirne, Turkey. IJIAAR journal.
- **Ariola Devolli**, Edlira Shahinasi, Merita Stafasani, Dhurata Feta, Frederik Dara. “*Evaluation of brewery waste and its reduction methods*” 2<sup>nd</sup> International Conference on Agriculture and Life Science, May 7-9, 2018 Tirane, Albania. AJAS journal.
- Merita Stafasani, **Ariola Devolli**, Dhurata Feta, Edlira Shahinasi. “*The stability of Turkey oak (Queecus cerris l.) wood in wáter*”. 2<sup>nd</sup> International Conference on Agriculture and Life Science, May 7-9, 2018 Tirane, Albania. AJAS journal
- Merita Stafasani, **Ariola Devolli**, Edlira Shahinasi, Mariola Kodra, Frederik Dara. “*The stability of Turkey oak (Queecus cerris l.) and Hungarian oak (Queecus fraintetto ten) in cold wáter*”. International Agriculture, Biological & Life Science Conference, September 2-5, 2018 Edirne, Turkey. Proceeding Book.
- Frederik Dara, **Ariola Devolli**. Arta Kodra “*An artificial neural networks modell for predicting bod of ishem rivers*”. International Agriculture, Biological & Life Science Conference, September 2-5, 2018 Edirne, Turkey
- **Ariola Devolli**, Frederik Dara, Arta Kodra. “*Assessment of surface waters quality and the determination of main pollutants* “.1<sup>st</sup> International conference "The holistic approach to environment" (HAE). Sisak,Croatia, September 2018.
- Shahinasi Edlira, **Devolli Ariola**, Kodra Mariola. Chapter-7 Inorganic Toxicity: Chromium. Inorganic Toxicity: Environment and Human Health, Book, Lambert Academic Publishing 2018
- **Ariola DEVOLLI**, Mariola KODRA, Msc. Edlira SHAHINASI, Merita STAFASANI “*A survey of private well water quality in suburb of Albania capital city* “ ITEMA 2017. [www.itema-conference.com](http://www.itema-conference.com)
- Edlira Shahinasi, Ferdi Brahusi, **Ariola Devolli**, Mariola Kodra, “*The Ecotoxicology of Pesticides Group of Triazole and Their use to Control Apple Scab (Venturia Inaequalis)*” Journal of Hygienic Engineering & Design –JHED Vol. 18, pp. 36-42 (2017). Scopus Indexed
- **Ariola Devolli**, Mariola Kodra, Edlira Shahinasi, Merita Stafasani, Frederik Dara. “*Determination of Optimal Kieselguhr Doses to Improve Beer Filtration*” UBT 6th Annual International Conference, October 27-29, 2017. Durres Albania.
- Mariola Kodra ,**Ariola Devolli**, Edlira Shahinasi, Dhurata Feta. “*Quality and safety of vegetables based on nitrogen determation and intake*”. UBT 6th Annual International Conference, October 27-29, 2017. Durres Albania
- Frederik Dara, **Ariola Devolli**, “*Applying ANN Techniques to Automated Visual Apple Sorting*” Journal of Hygienic Engineering & Design –JHED, Vol. 15, pp. 55-63 (2016). Scopus Indexed

- **Ariola Devolli**, Mariola Kodra, Edlira Shahinasi, Dhurata Feta, Frederik Dara, “*Hygienic Control in Beer Bottling and Dispensing System*” Journal of Hygienic Engineering & Design –JHED, Vol. 15, pp. 5-11 (2016). Scopus Indexed

## **C39 PARASITIC FAUNA OF FISH AND RISKS TO PUBLIC HEALTH**

**Dijana BLAZHEKOVIKJ - DIMOVSKA**

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Fish and fish products, from a nutritional aspect, are very important for proper nutrition and prevention of health in humans. The high nutritional value of fish meat is due to the favorable composition and ratio of proteins, fats, minerals and vitamins, as well as the significant presence of unsaturated fatty acids, especially n-3 PUFA (polyunsaturated fatty acids). For these reasons, there is increasing demand for fish meat as a healthy food, but there are serious safety issues related to the presence of parasitic fauna in fish.

Water and fish quality are very important parameters to protect public health with a special emphasis on the parasitology. Parasites are among the pathogenic factors that are very important for fish health and responsible for economic losses in the fish industry. Parasitic diseases represent negative factor, which in intensive fish farming can cause considerable damages in fisheries and aquaculture. Parasites in the waters where they are present could cause fish reduction, thereby directly affecting on fish stocks in the country.

Food - borne parasitic infections can represent an important public health problem with considerable economic impact. Certain parasite species have been reported in humans, but only a few cause serious diseases.

The main goal of this study is to present the most common and important parasite species in fish, as well as to increase public awareness of the risks associated with consumption of fish containing infectious parasite species.

## Dijana BLAZHEKOVIKJ - DIMOVSKA

### Work experience

- Faculty of Biotechnical Sciences, University “St. Kliment Ohridski” Bitola, Macedonia
- 2019 - to present Vice-Dean for Science and International Cooperation
- 2018 - to present Associate Professor
- 2013 - 2018 Assistant Professor
- 2007 - 2013 Teaching Assistant



### Education

#### 2009 - 2013

PhD in Biotechnical Sciences (Title: Parasite fauna and mycoses in cyprinid fish in the fish breeding facilities in the Republic of Macedonia)

University “St. Kliment Ohridski”, Faculty of Biotechnical Sciences - Bitola, Macedonia

#### 2005 - 2009

MSc in agricultural sciences (Technological microbiology)

Ss. Cyril and Methodius University, Faculty of Agricultural Sciences and Food - Skopje, Macedonia

#### 2000 – 2004

Bachelor for processing animal products

University “St. Kliment Ohridski”, Faculty of Biotechnical Sciences – Bitola, Macedonia

### Teaching

#### First cycle of studies:

- Quality and safety of fish and fish products
- Hygiene and safety in aquaculture
- Fish technology
- Fisheries
- Aquaculture

#### Second cycle of studies:

- Hygiene and safety in aquaculture
- Modern technologies in aquaculture

#### Third cycle of studies:

- Technology of fish processing and conservation
- Contemporary trends in freshwater fisheries

### Participation in projects

20.05 - 20.09.2021 - “Parasitofauna in fish from Prespa Lake as an indicator of the situation of the aquatic environment”. Ministry of Environment and Physical Planning of Republic of Macedonia. Coordinator.

01.01.2020 - 31.12.2021 - “Composition and diversity of communities of parasites from the genus *Dactylogyrus* at cyprinid fish from reservoirs “Strezhevo” in R.N. Macedonia and “Danjiangkou” in P.R. China”. Bilateral Macedonian-Chinese scientific research project. Ministry of Education and Science of the Republic of Macedonia.

30.09.2020 - 29.09.2024 - COST Action CA19145 - European Network for assuring food integrity using non-destructive spectral sensors (SensorFINT).

25.10.2019 - 24.10.2023 - COST Action CA18239 – Conservation of freshwater mussels: a pan-European approach (CONFREMU).

01.07.2018 - 31.12.2020 - “Comparative analysis of the *Gyrodactylus* (Platyhelminthes: Monogenea) diversity in Europe’s oldest lakes (Lakes Ohrid and Prespa - Macedonia) and the Austrian Danube system by means of morphological taxonomy and DNA barcoding”. Bilateral Macedonian-Austrian scientific research project. Ministry of Education and Science of the Republic of Macedonia. Coordinator.

01.01.2018 - 31.12.2019 - “Parasitic diseases at herbivorous fish from cyprinid aquaculture facilities in R. Macedonia and P.R. China”. Bilateral Macedonian-Chinese scientific research project. Ministry of Education and Science of the Republic of Macedonia.

#### **Selected publications:**

- **Blazhekovikj - Dimovska D.** (2019): „Protozoan parasites in common carp (*Cyprinus carpio*, L. 1758) from cyprinid aquaculture facility in Pelagonia region (Bitola, Macedonia)“. XXI International Scientific Conference “The Teacher of the Future”. Budva, Montenegro. International Journal, Institute of knowledge management, Vol. 31.3, pp. 675-680.
- **Blazhekovikj - Dimovska D., Sara Dolevska, Sara Dimeska** (2019): „Bacteriological and parasitological study of cultured common carp (*Cyprinus carpio*, L. 1758) from cyprinid fish farm in Pelagonia region (Bitola, Macedonia)“. Balkan Conference “Health and Food Technologies”. Scientific work of the Union of Scientists. Plovdiv, Bulgaria. Series B. Natural Sciences and the Humanities, Vol. XIX. p.p. 32-37.
- **Blazhekovikj - Dimovska D., Stojanovski S.** (2019): „First records of *Ichtiophthirius multifiliis* on cyprinid fishes from aquaculture facilities in Macedonia“. X International Agricultural Symposium “AGROSYM 2019”. Jahorina, Bosnia and Hercegovina. Book of Proceedings, pp. 1593 - 1599.
- **Blazhekovikj - Dimovska D., Stojanovski S.** (2019): „Parasite fauna in common carp (*Cyprinus carpio* L., 1758) from fish cage culture system on Tikvesh Reservoir (N. Macedonia)“. VIII UBT Annual International Conference “Food Sciences and Technology”. Prishtina, Kosovo. Book of Proceedings, pp. 38-45.
- **Blazhekovikj - Dimovska D., Stojanovski S.** (2020): „First record of *Apiosoma piscicola* (Blanchard, 1885) (Ciliophora: Epistylididae) in common carp (*Cyprinus carpio* Linnaeus, 1758) (Pisces: Cyprinidae) from aquaculture facilities in North Macedonia“. Annals of Parasitology. 66 (2): pp. 227–230.

- Stojanovski S., **Blazhekovikj - Dimovska D.**, Smiljkov S. (2020): „Parasite Fauna of the Prespa Roach *Rutilus prespensis* (Karaman, 1924) (Cyprinidae) in Lake Prespa, Republic of North Macedonia“. *Acta Zool. Bulg.*, Supplement 15, pp. 55-59.
- **Blazhekovikj - Dimovska D.**, Stojanovski S. (2020): „Grass Carp (*Ctenopharyngodon idella* Valenciennes, 1844) (Pisces: Cyprinidae) as host of new parasite species in the Ichthyoparasitofauna of Macedonia“. *J. BioSci. Biotech.* 9 (2): 29-35.
- **Blazhekovikj - Dimovska D.**, Ahmed S. (2020): „Some qualitative properties of common carp (*Cyprinus carpio* L. 1758) from different aquatic environment in N. Macedonia“. *Carpathian Journal of Food Science and Technology.* 12 (4): 31-40.
- **Blazhekovikj - Dimovska D.**, Stojanovski S. (2020): „Ectoparasitic species of the genus *Trichodina* (Ciliophora: Peritrichida) parasitizing Macedonian freshwater fish“. *Acta Biologica,* 27: 11-20.
- **Blazhekovikj - Dimovska D.**, Stojanovski S. (2021): „Protozoan distribution in farmed cyprinid fish from Macedonia“. *Food and Environment Safety - Journal of Faculty of Food Engineering, Ștefan cel Mare University – Suceava,* XX (1): 35-42.

## **C40 APPLICATION OF HURDLE TECHNOLOGY, PRESERVATION AND FOOD SAFETY**

### **Fatbardha LAMÇE**

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Food processing technology is constantly evolving, accompanied by the creation of many food processing units through the use of specific equipment and appliances, as well as following appropriate procedures in accordance with the legal standards of the food industry.

In addition to the development and improvement of technology, special attention has been given to the preservation of food products. The improvement of the storage process is presented mainly as a necessity for the protection of food from alteration, thus stimulating the increase in the shelf life of the products, through technological processing, also offering opportunities for continuous consumption, regardless of the period and place of production.

The conversion of raw materials into final food products, through mechanical and chemical transformations, thanks to the operational processes of agri-food technology, requires time and money. This is why food science has recently focused primarily on the application of combined food processing technologies combining food preservation techniques involving the application of two or more barriers to destroy microorganisms in a balanced form, which is the basis of Hurdle Technologies.

This section intended to provide information on the application aspects of Hurdle Technologies, including key techniques and new processing technologies to ensure food stability, safety and quality.

### **Fatbardha LAMÇE**

- PhD (2016), Faculty of Biotechnology and Food, Agricultural University of Tirana;
- Lecturer – Scientific Researcher, Faculty of Biotechnology and Food, Agricultural University of Tirana;
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### Research Interests

The main interests of scientific research are mainly focused on minor components of foods stuff using new application food processing schemes, with the main objective of improving the quality and safety of food.

### Selected publications

- **F. Lamçe**; K. Sini: "Isolation and characterization of oenological yeast". Albanian Journal of Agricultural Sciences (AJAS). Nentor 2013: Vol. 12, Issue 4:p. 669 – 776, ISSN 2218 – 2020.
- **F. Lamçe**; K. Sini: "Influence of selected yeasts in the qualitative characteristics of wine, compared to spontaneous fermentation". International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET). Tetor 2015: Vol. 4, Issue 10, ISSN 2319 - 8753
- **F. Lamçe**; K. Sini: "Isolation and technological characterization of *Brettanomyces anomalus* in wine". International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET). Shkurt 2016: Vol. 5, Issue 2, p (1608 – 1613), ISSN 2319 – 8753.
- E. Kukali, O. Kyçyk, **F. Meta**, and K. Gozhdari: "Chemical and physic components of Shesh i bardhe: Grape cultivar in Albania." Journal of Agricultural Science and Food Research. J Agri Sci Food Res 2017, Volume 8: Issue 4. ISSN: 2666-1543.
- A. Gashi, Gj. Vuksani, **F. Meta**, O. Kyçyk, E. Kukali: "The Effectiveness of the Concentration of Fytohormones in the Micro Propagation of CAB6P (*Prunus cerasus*)". International Journal of Sciences: Basic and Applied Research. Impact Factor: 0.398. ISSN 23074531. 2018.
- F. Hoxha, **F. Lamçe**, M. Beqo, R. Kongoli, I. Malollari, O. Kyçyk: "Quality Evaluation of Commercialised Honey in Tirana Using Physicochemical Analysis". Albanian Journal of Agricultural Sciences, 2018, Vol. 18 Issue 1, p36-31. ISSN: 2218- 2020, © Agricultural University of Tirana.
- **F. Lamçe**, O. Kyçyk, K. Gozhdari, S. Zejnelhoxha and E.Kukali: "The influence of stems and oak chips on the fermentation and color stabilization during maturation of red wines produced by cv. Shesh i Zi". Journal of Central European Agriculture, 2020, 21 (1), p.129-134. ISSN 1332-9049.
- O. Kyçyk, **F. Lamçe**, K. Gozhdari, J. Karaulli dhe E.Kukali: "Variability of Quality Indicators in Authoctonous Cultivar Shesh i Bardhe on Three Different Ecozones of Albania". Albanian Journal of Agricultural Sciences, 2020, Vol. 19 Issue 4, p55-59. ISSN: 2218- 2020, © Agricultural University of Tirana.
- **F. Lamçe**, O. Kyçyk, J. Karaulli, A. Shkurti and E.Kukali: "Study of Phisico – Chemical Components of Gemza and Pamid grape Varieties Cultivated in Albania". Albanian Journal of Agricultural Sciences, 2020, Vol. 19 Issue 3, p532-39. ISSN: 2218- 2020, © Agricultural University of Tirana.

## **C41 TRADITIONAL BEEKEEPING TECHNOLOGY AND HONEY QUALITY IN MACEDONIA**

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Traditional beekeeping holds a special place in Balkan culture, and the wealth of forests and unspoiled land have made honey production a precious asset for many mountain communities. In Macedonia, specifically, this tradition has a unique aspect: to protect our indigenous breed, the presence of a native bee subspecies, *Apis mellifera macedonica*. It means traditional keeping of bees in skeps or baskets, with a conical shape, by dimension, height (60 - 70 cm) and diameter of the base (40- 50 cm). As a material for construction is used young hazel branches as supports, fold as a wall covering (it is possible that the whole covering is made of young hazel branches) and insulation coating with a mixture of cattle dung (manure) with finely chopped hay. Small bundles of wild rye stems are also used as additional insulation. The knitting technique consists of several sequential procedures: making the base of the skeps, placing hazelnut branches on previously peeled bark, knitting procedure with ivy twist around the placed branches (rods) and carrying out by coating the prepared mixture manually with gloves twice (immediately after knitting and 2-3 days after the first layer will be dry). Settlement (moving) of the bee family in the skeps includes the following steps: just before settling, the mulch is sprayed with a pre-prepared solution of sucrose: water (ratio 1:1) and then the walls are coated with rubbed green lemon balm (*Melissa officinalis*); the skep is placed just above the swarm so that the bees can enter the skep attracted by the coating inside. The bees are smoked from below to force them to climb up the skep (duration of the procedure 20-30 min). Once the bees have entered, the skep is lowered and placed on a pre-prepared floor. Advantages of traditional beekeeping are: due to the limited space in the skep, the bee family in a short period of time reaches the maximum of its development, while the bee family enters the swarming and gets 2-3 swarms (an advantage in traditional beekeeping); bees overwinter better, the cone shape allows the bee family to move easily towards the food - honey and maintain the optimal temperature. Disadvantages of this technique of keeping bees are: obtaining low honey yield and non-economic profitability; severe manipulation during the routine check of the bee family, especially during the treatment against the *Varroa destructor* tick. Honey and other bee product obtained in this traditional way in skeps have high quality, attractive for consumers - lovers of traditional beekeeping. Skeps are ideal for organic and ecological production, are suitable to the physiological behaviour of bees, have specific production and maintenance with low costs.

Breeding bee colonies is a tradition that has a great impact on the development of apiculture and ecological agriculture, as well as it is a rich heritage of our nation and country.

**Vesna KARAPETKOVSKA-HRISTOVA**



Vesna KARAPETKOVSKA-HRISTOVA, Ph.D. (Doctor of Biotechnical Sciences, Genetics and Selection of Domestic Animals), Associate professor at the Faculty of Biotechnical Sciences, University "St. Kliment Ohridski" – Bitola, has research experience in Livestock Production, Food Safety and Quality, Environmental Pollution.

She is the author of more than 80 papers in the field of Biotechnical Sciences of each about 40 papers were published in international journals with impact factor. She took participation at about 40 International Conferences and Congresses. She worked as a reviewer for five (5) international scientific journals.

She took part in three international projects: TEMPUS, IPA –Cross Border Project, Erasmus + Programme and five (5) scientific projects financed by the national Ministries and Municipality. She was a local coordinator of one Tempus project 159143-TEMPUS-1-2009-1-HU-TEMPUS-JCPR (2009-2014), as well as assistant and external expert at five national projects oriented to Rural development, Agriculture and Climatic changes, Farming and Sustainability. Currently, she is a member of the national project supported by the EU entitled “Guidelines and measures to reduce the impact of local agricultural activities on climate changes”.

She has an experience in coordination and experience as an expert for evaluation of soil degradation - IPA /2010/DN023658/ CN362856. She is a member of presidency of NGO – Movement for the Environment –Molika, Bitola. Also, she is a president of NGO Simbioza Linkesti, Bitola, organisation for education, support and stimulation of youth and women in the agro-food sector, ecology and biodiversity. For the past several years she is working in the field of Biotechnology, Apiculture and Traditional Agriculture.

**Selected publications**

- Biljana Bogdanova Popov, **Vesna Karapetkovska -Hristova**, Stefce Presilski,, Mohhamad Ali Shariati, Stevo Najman. (2017). “Assesment of heavy metals in propolis and soil from Pelagonia region, Republic of Macedonia”, Macedonian Journal of Chemistry and Chemical Engineering, Print ISSN 1857-5552; Online ISSN 1857-5625, Vol 36 (No. 1), pp. 23-33. DOI pattern: 10.20450/mjcce.2017.1004. (SCI expanded IF= 0.40).

- Jovchevski, N., Makarijoski, B., Presilski, S., Bogdanova Popov, B., Ali Shariati, M., Usman Khan, M., **Karapetkovska -Hristova, V. (mentor)**, (2017), “Heavy metals level of propolis in R. of Macedonia”, Scientific works of the Union of scientists in Bulgaria, Plovdiv, BULGARIA, Series C. Technics and Technologies, Vol. XV, ISSN 1311-9419 (Print), 2017.
- **Vesna Karapetkovska-Hristova**, Borche Makarijoski, M. Ayaz Ahmad, Godswill Ntsomboh-Ntsefong, Esraa Mousa, Biljana Trajkovska, Gordana Dimitrovska", Study Of Fat Content Dynamics In Dairy Products With The Simulations Of Artificial Neural Network (ANN) Model", IOSR, Journal of Environmental Science, Toxicology and Food Technology (IOSR-JESTFT) ISSN: 2319-2402, p- ISSN: 2319-2399, Volume 12, Issue 3 Ver. I (March. 2018) (2018): pp. 68-74. (IF = 3.462)
- Naco Jovcevski, **Vesna K. Hristova (mentor)**, (2018):"Traditional keeping of bee families in skeps", X th Review of student papers, National Conference, Faculty of agricultural sciences and food –Skopje, MACEDONIA, 19 th December, 2018.
- Sara Gorcevska, Naco Jovcevski, Vlade Kozarevski, **Vesna Karapetkovska –Hristova, (mentor)**, (2019), “ Beekeeping technology and honey production at individual apiary from Dihovo province, R.N. Macedonia, Balkan Conference “Health and Food Technologies”, 27-28 June 2019, Scientific Research of the Union of Scientists in Bulgaria-Plovdiv, R. BULGARIA, Vol XIX, pp.16-19.
- Bardhyl Limani, **Vesna Karapetkovska - Hristova**, Dijana Blazekovic-Dimovska, Slavco Hristovski (2020):"Assessment of Heavy metals Concentrations in Cow’s Milk collected from Polog Region, Republic North Macedonia”, International Journal of Advanced Science and Technology, Vol. 29, No.02, pp. 1815-1821. <http://sersc.org/journals/index.php/IJAST/article/view/3432> (Scopus journal).
- **Vesna Karapetkovska - Hristova**, Zarko Bebic, Borche Makarijoski, Bardhyl Limani, Godswill Ntsomboh Ntsefong.(2021), Association between Age at First Calving and Milk Yield in Holstein Cows reared in Pelagonia, IAR J Eng Tech; 2021; 2(1):16 -20.

## **C42 SUPPLEMENTATION OF AMINO ACIDS INTAKE IN LIVER DISEASE**

**Elena VASILICA**

“Carol Davila” University of Medicine and Pharmacy, Bucharest, Romania

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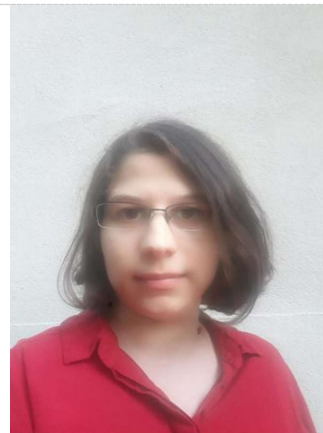
The liver is one of the most important metabolic centers in the human body. Liver disease can and will affect the liver's ability to regulate the nutritional state and the energy balance. Patients with liver disease are exceptionally prone to the development of nutritional deficiencies. Furthermore, as the liver disease progresses and worsens, the patient's appetite lowers, thus decreasing the nutrient intake, which aggravates the nutritional deficiency. Patients with liver disease can be deficient both in macronutrients and micronutrients. Nutritional status is very important in patients with hepatic disease, because patients with poor nutritional status have a higher incidence of complications, a worse quality of life and a worse long-term prognosis than patients with good nutritional status.

Patients with hepatic disease have an imbalance in their amino acid metabolism, due to the hepatic cell's inability to properly use amino acids and the low exogenous intake. Correcting the imbalance by supplementing their amino acids intake has shown to improve their nutritional status, resulting in fewer complications, a better prognosis and a better quality of life.

This presentation aims to detail the type of amino acids used in the treatment of the nutritional deficiency in patients with liver disease and their effect on the liver function.

## Elena VASILICA

- Resident doctor in Laboratory Medicine, Fundeni Clinical Institute, Bucharest
- PhD student in Biochemistry, “Carol Davila” University of Medicine and Pharmacy, Bucharest
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### Research Interests

Amino acid metabolism in chronic liver diseases. Amino acids as diagnostic biomarkers for liver disease. Amino acids as treatment for liver disease.

## **C43 CELIAC DISEASE –DIAGNOSIS AND GLUTEN FREE DIET**

**Ruxandra CIOARCA-NEDELCU**

“Carol Davila” University of Medicine and Pharmacy, Bucharest, Romania

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The aim of this presentation is to raise awareness about the importance of early diagnosis and early dietary gluten withdrawal in celiac disease in order to prevent the development of one of the most severe complications of this autoimmune disorder: intestinal lymphoma.

Celiac disease is defined as a chronic autoimmune condition characterized by an abnormal small intestinal mucosa, that improves clinically and histologically when treated with a gluten-free diet and relapses when gluten is reintroduced. Gluten is a protein widely found in grains such as wheat, barley and rye.

Celiac disease may develop at any stage in life. Usually, it is not diagnosed in people older than 60 years. Pediatric cases typically appear in children between 9 to 18 months. Celiac disease may also occur in adults and is usually precipitated by an infectious diarrheal episode.

Gastrointestinal symptoms in adults include chronic diarrhea, steatorrhea, unexplained weight loss, abdominal pain and bloating. Testing should also be performed in patients with symptoms of irritable bowel syndrome and refractory lactose intolerance.

Extraintestinal signs/symptoms suggestive of celiac disease appear mainly due to malabsorption of liposoluble vitamins group, of vitamin B12, B9 and iron. Chronic elevation in serum aminotransferases, extreme fatigue, recurrent headaches, recurrent miscarriages, unexplained infertility, haemorrhagic syndrome, dermatitis herpetiformis, chronic aphthous stomatitis, dental enamel hypoplasia, premature osteoporosis, peripheral neuropathy and cerebellar ataxia are the most encountered extraintestinal manifestations.

Diagnosis is made by asking in the first place for specific serologic tests (Anti-endomysial antibodies -IgA, Anti-tissue transglutaminase antibodies-IgA, IgG). All patients with positive serologic tests results should be recommended an upper endoscopy with a distal duodenum biopsy.

Endoscopic trademarks of celiac disease include atrophic intestinal mucosa, loss of folds, fissures, nodularity and visible submucosal blood vessels.

Histologic features of celiac disease may include increased intraepithelial lymphocytes, atrophic mucosa with complete loss of villi, enhanced epithelial apoptosis, and crypt hyperplasia.

In order to obtain clinical, endoscopic and, finally, the “so wanted” histological remission of celiac disease, the following dietary advice can be given to all patients:

- Avoid foods containing wheat, rye, and barley.

- Oats should be introduced into the diet with caution, and patients should be monitored for adverse reactions.
- Rice, corn, potatoes and soybean or tapioca flours are safe.
- Dairy products should be avoided since many patients with celiac disease can have secondary lactose intolerance.
- Read labels on prepared foods, condiments and drugs carefully, paying particular attention to additives and excipient that may contain gluten.
- Distilled alcoholic beverages and vinegars, as well as wine, are gluten free. However, beers, ales, lagers, and malt vinegars should be avoided because they are often made from gluten-containing grains and are not distilled.

In conclusion, celiac disease is a chronic autoimmune disorder, with a potentially severe outcome when left untreated, that may require, depending on the clinical manifestations, a multidisciplinary approach. Early diagnosis and gluten-free diet may improve the overall longevity and quality of life in most patients.

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### **Research interests**

Oxidative stress in alcoholic liver disease. Nutrition in inflammatory bowel disease and celiac disease. Intermittent fasting. Biological changes in alcoholic cirrhosis.

**Projects of the Transilvania University of Brasov  
– BE IN CENTER!!**

**DISTANCE EDUCATION METHODS - SKILLS, KNOWLEDGE, RESEARCH,  
HEALTH ASSESSMENT (MED-ACCES)**

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The current epidemiological situation requires new approaches to the way teaching and learning processes take place among medical students. The project 'MED-ACCES - Distance education methods - skills, knowledge, research, health assessment' aims to digitize student self-assessment processes by developing a database accessible on the E-learning platform and functional applications on both Android and on IOS, intended for students at the Faculty of Medicine in Brasov from various study programs - Medicine, Clinical Laboratory, Balneophysiokinetotherapy and recovery, Nursing. They can also be used as teaching and evaluation support materials by teachers, both during periods when the teaching takes place under special conditions (of an epidemiological nature, for example) and when it takes place under normal conditions.

The database accessible on the E-learning platform (also valid on the UNITBV application) will include interactive grids, radiological and ultrasound images explained in various pathologies, cardiological and pulmonary auscultations, videos in Romanian with various medical, recovery and laboratory techniques. Access to teaching materials developed through the project will be made only with the personal institutional address of the student or teacher (@student.unitbv.ro or @unitbv.ro).

**Keywords:** *online teaching, educational methods, medical education, database for medical students*



*Aknlowdgements: This project is funded by Transilvania University of Brasov, under the competition “Be in Center!”*

## **VISUAL TEACHING METHODS FOR CONSOLIDATING AND ASSESSING KNOWLEDGE AND SKILLS IN LIFE SCIENCES (VISUAL-LIFE)**

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In order for the graduates in the field of life sciences to develop certain abilities, it is required of the classical teaching methods to adapt to the online reality of today's education. One of the main priorities of online education is represented by creating an interactive visual support, in order to compensate the lack of practical applications.

The team of the VIZUAL-LIFE project aims to create material that will improve teaching methods and will consolidate through practical examples the theoretical knowledge gained by the student. The project proposal promotes innovative visual methods for teaching, assimilating knowledge and evaluating it, supporting teachers and students to use different technologies in creative, collaborative and inclusive ways.

The team involved in this project will transform classic teaching materials and tools into educational resources suitable for online communication such as: animated presentations of mechanisms / processes, videos on specific topics of life sciences, interactive digital panels, exhibition panels, atlases. These will follow the formation of skills in the field of applied life sciences, respectively: bioanalytical methods (organic chemistry, biochemistry, analytical chemistry, physiology, cell biology, immunology, microbiology, bacteriology and virology, etc.), plant and animal bioresource processing technologies, etc. Educational materials will be available to students and teachers using the benefits of a web page with a high degree of interactivity, which plays a key role in compensating for the lack of direct contact and the actual practical applications.

The solutions proposed by this project are absolutely necessary for the active involvement of students in the online teaching-learning-assessment processes, but also for assisting and supporting teachers in course, laboratory and seminar activities. The materials created by the work team from three of the faculties of the Transilvania University of Brașov (Faculty of Medicine, Faculty of Food and Tourism, Faculty of Electrical Engineering and Computer Science) will be able to be used by teachers on the eLearning platform of UNITBv, but also on a complementary website organized for online learning, specially created by students

from the Faculty of Electrical Engineering and Computer Science that offers systematized and interactive access options for teaching-learning-assessment.

The inter / multidisciplinary approach of the topics in the field of life sciences will create a familiar, intuitive and at the same time innovative framework, in which teachers and students can collaborate interdisciplinary in all cycles of bachelor, master, doctoral studies.



*Aknnowledgements: This project is funded by Transilvania University of Brasov, under the competition "Be in Center!"*