BOOK OF ABSTRACTS

International Summer School

FOOD SAFETY AND HEALTHY LIVING

FSHL - 2020

ONLINE

Editors

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France

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FOOD SAFETY AND HEALTHY LIVING – FSHL 2020

C1. INTRODUCTION IN „FOOD SAFETY AND HEALTHY LIVING"

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The third edition of the International Summer School -**FOOD SAFETY AND HEALTHY LIVING** – FSHL 2020 - brings together academic staff from different European countries (Romania, Italy, France, Slovenia), and non-European countries (USA, Egypt, Russia), with a research interest in the field of nutrition, food control, food safety for a healthy living.

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 in 2018 and 2019, and now in 2020.

As co-coordinators of this event, we have the mention also „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, is acknowledged.

The main objective of the summer school FSHL 2020 is to provide multi/trans-disciplinary knowledge on food analysis for safety and healthy life. Topics as special monitoring the composition of food and food supplements, a practical guide for precision nutrition, evaluation the possibility to increase the quality of life using classical methods, sensing/biosensing assays and also artificial intelligence will be presented. The undergraduate and postgraduate (master and PhD) students coming from different universities from Romania (Brasov, Bucharest, Galati, Cluj-Napoca, Targu Mures), Poland (Lodz, Warsaw), Slovenia (Ljublijana, Nova Gorica), and Italy (Milan) will join this summer

school with high expectations and with avidity for identifying new approached in the field of healthy nutrition and food safety.

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
- Coordinator of Clinical Laboratory, undergraduate specialisation (3 years), Faculty of Medicine, Transilvania University of Brasov
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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, ICANMBES 2012.

Dr Badea was chairing the organisation of International Summer Schools - Food Safety and Healthy Living –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, Leașu 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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- Rauf S, Hayat Nawaz MA, **Badea M,** Marty JL, Hayat A, Nano-engineered biomimetic optical sensors for glucose monitoring in diabetes, Sensors 16 (11), 1931, 2016
- Restani P., Di Lorenzo C., Garcia-Alvarez A., **Badea M.,** Ceschi A., Egan B., Dima L., Lüde S., Maggi F.M., Marculescu A., Milà-Villarroel R., Raats M.M., Ribas-Barba L., Uusitalo L., Serra-Majem L., Adverse effects of plant food supplements self-reported by consumers in the plantlibra survey involving six European countries, PLoS One, 11(2) (2016) e0150089.
- **Badea M.,** Floroian L., Restani P., Cobzac SC., Moga M., Ochratoxin A Detection on Antibody- Immobilized on BSA-Functionalized Gold Electrodes, PLoS One., 11(7) (2016) e0160021.
- **Badea M**, Luzardo OP, González-Antuña A, Zumbado M, Rogozea L, Floroian L, Alexandrescu D, Moga M, Gaman L, Radoi M, Boada LD, Henríquez-Hernández LA., Body burden of toxic metals and rare earth elements in non-smokers, cigarette smokers and electronic cigarette users., Environ Res. 2018;166:269-275.
- **Badea M**., Braic M., Kiss A., Moga M., Pozna E., Pana I., Vladescu, A., Influence of Ag content on the antibacterial properties of SiC doped hydroxyapatite coatings, Ceramics International , 42(1) (2016) 1801-1811

Elena Laura GAMAN

- PhD (2006) in Pharmacy, „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**, Vîrgolici 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, Piriu 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
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C2. EFFECTS OF INTERMITTENT FASTING ON GLUCOSE AND LIPID METABOLISM

Ruxandra CIOARCA-NEDELCU

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Nowadays, obesity has become a worldwide health problem that reflects in the overall expenses of the health systems, especially in the USA. The last decade was intensively focused on creating diets and lifestyle techniques.

One of the most studied "eating pattern" nowadays is intermittent fasting (IF). Why is intermittent fasting so popular? Several studies have shown that IF is the fastest way to lose weight and improve overall metabolic status.

Eating only in a time period that can range from 12 hours to several days allows the so much wanted metabolic switch to happen. But why is this metabolic switch so important? Metabolic switch represents the moment of fasting when glycogen stores are depleted and lipolysis starts; because there are no more available carbohydrates to be consumed, body will turn instead to burning fat.

This presentation aims to explain the hormonal changes and the "behind the scenes" biochemistry of intermittent fasting.

Ruxandra CIOARCA-NEDELCU

- Resident doctor in Gastroenterology, Clinical Emergency Hospital of Bucharest
- PhD student, Carol Davila University of Medicine and Pharmacy, Bucharest
- Assistant Professor, Biochemistry Department of Carol Davila University of Medicine and Pharmacy, Bucharest
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Research interests

Oxidative stress in alcoholic liver disease. Nutrition in inflammatory bowel disease. Intermittent fasting.

C3. HEALTHY LIVING AND EATING DURING THE PANDEMIC ERA

Liliana ROGOZEA, Mihaela BADEA

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The SarsCov2 pandemic evolution change our living and eating custom and also how medical professionals give and receive information about health and health care.

All medical professional (medical doctors, nurses, kinetotherapist, etc.) must use the Internet for receive and sending information about health care, but this way of „sitting" communication needs more changing in our healthy living and eating, and of, course indicate the necessity to develop a health promotion campaign

Economic problems during the pandemic time make a lot of problem not only for poor countries but also for rich and developing countries, and are a concern not only at government level but also at individual level in all of these countries.

As we mention before „Even if there are countries where the discrepancy between people in access to basic nutrients is very high, declaratively any government speaks of some major concerns it has, considering it essential for a good governance to be able to provide water, food, access to education and to health system for all its citizens.", but in the pandemic time a lot of other problems appear, related to financial resources (so the type of food could be different) and also the calorie requirement is different due to the sedentary type of activity.

Developing a public health action in the pandemic period must take into account the problems related to healthy living and eating and analyses them including from ethical point of view.

Liliana Marcela ROGOZEA

- MD, Senior specialist in Public Health, PhD in Medicine
- Professor of Bioethics, History of Medicine and Health Promotion
- Department of Fundamental, Prophylactic and Clinical Disciplines
- Faculty of Medicine, Transilvania University of Brasov
- Vice-rector of Transilvania University of Brasov, Romania
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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 project 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 - 102 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

- Andreescu O., & **Rogozea L.** (2018). Pellagra, a social disease in an eastern European country, at the end of the nineteenth century and early twentieth century. Medical-Surgical Journal-Revista Medico-Chirurgicala, 122(3), 570-576.
- Popescu I. G., Sechel G., Leaşu 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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- Mosoiu D, **Rogozea L,** Landon A, Bisoc A, Tint D. Palliative care in heart failure: A public health emergency. American J. of Therapeutics. 2020 Mar 1;27(2):e204-23.
- Badea, M., Gaman, L., Delia, C., Ilea, A., Leașu, F., Henríquez-Hernández, L. A., ... & **Rogozea, L**. (2019). Trends of Lipophilic, Antioxidant and Hematological Parameters Associated with Conventional and Electronic Smoking Habits in Middle-Age Romanians. Journal of clinical medicine, 8(5), 665.
- Olimid, A. P., **Rogozea, L. M.,** & Olimid, D. A. (2018). Ethical approach to the genetic, biometric and health data protection and processing in the new EU General Data Protection Regulation (2018). Romanian journal of morphology and embryology, 59(2), 631-636.
- Tântu, M. M., Man, G. M**., Rogozea, L. M**., Domnariu, C. D., Pleşa, F. C., Traşcă, D. M., ... & Nemeş, R. M. (2018). Diabetic foot-epidemiological and histopathological aspects. Romanian journal of morphology and embryology, 59(3), 895-902.

C4. HYGIENIC DESIGN FOR SUSTAINABILITY

Liviu GACEU

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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 were 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 rescuer by

27% and total energy consumption (including indirect energy consumption) was reduced by 33%. GHG emissions of CO_2 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; Romania
- President of Romanian Society for Agriculture, Foood, Environment and Tourism, 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., Cojocaru 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.
- 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.

C5. SCIENTIFIC APPROACHES FOR THE EVALUATION OF RISKS ASSOCIATED WITH THE CONSUMPTION OF BOTANICALS: EXAMPLES OF CASES OCCURRED AND RELATIVE ASSESSMENT

Patrizia RESTANI (1,2), Francesca COLOMBO (1), Simone BIELLA (1), Mihaela BADEA (3), Chiara DI LORENZO (1)

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2 -CRC "Innovation for well-being and environment", Università degli Studi di Milano, Milan, Italy;
3- Faculty of Medicine, Transilvania University of Brasov, Romania

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In the last decade, an exponential growth in the number of food supplements containing botanical ingredients has been observed in the European market. This finding has led to a parallel growth of concerns regarding the quality and safety of these products that are free sale and whose use does not involve the advice of the family doctor or specialists. Data, collected during and subsequently the PlantLIBRA European Project, showed that the adverse events to botanical supplements are quite rare and in most situations with mild symptoms. However, reports of fatal cases were not lacking, so that surveillance and consumers' information must be continuous and adequate. The teaching will deal with two different situations related to adverse events assessed in the last two years by Committees responsible for consumers' safety.

The case of *Curcuma longa*

In very recent times, cases of cholestatic hepatitis have occurred after consumption of food supplements containing extracts and preparations of *Curcuma longa*. The reported events were associated with very different turmeric preparations and the adverse events had no dose/effect relationship. The analyzes carried out on the samples responsible for hepatitis cases did not highlight the presence of contaminants or

illicit added substances as possible causes of liver damage. The Curcuma content in supplements involved was high and in general associated with other ingredients that could increase the bioavailability of the active/toxic molecules. Data, collected and considered during the evaluation of the adverse events in question, have highlighted previous cases of acute cholestatic hepatitis following the use of extracts of *Curcuma longa*. From the evaluation of all available data, the reason of the case reports seems due to particular conditions of individual susceptibility, impaired hepato-biliary function or even to the concomitant intake of drugs.

The case of food supplements for the modulation of mild hypercholesterolemia

One of the areas where food supplements are most often used is that of cardiovascular diseases. In this regard, there are various products present on the market having the objective of reducing moderate hypercholesterolemia. Many botanical ingredients have been studied in this regard, and among them, the two most successful products will be described here: fermented red rice (RYR) and phytosterols.

The mechanism of action of these two preparations is totally different. Phytosterols compete with cholesterol by inhibiting its absorption, while RYR shows a pharmacological activity as it naturally contains a molecule, the monacolin k, chemically identical to lovastatin.

It is quite evident that the adverse events associated with these two preparations can have very different frequency and seriousness. The use of RYR as a food supplement is not allowed in all European countries but where it is, there have been cases of adverse events with symptoms very similar to the side effects of statins used in conventional therapy.

Conclusions

The conclusions of this presentation are as follows:

- adverse events to botanicals, at least those registered, are relatively limited;
- normally the symptomatology is mild, but in some cases the event can be fatal;

- since these products can be used without medical supervision, it is essential to distinguish the various types of products also on the basis of the mechanisms of action (when known);
- consumers should be aware that botanicals are not always safe just because they are natural. In case of doubt or chronic drug therapies it is important to consult the family doctor or chemist.

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- Mazzanti G. Adverse reactions to dietary supplements containing red yeast rice: assessment of cases from the Italian surveillance system. Br. J. Clin. Pharmacol. 2017; 83:894-908.

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.

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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 Drug 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, dietetitians 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 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 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
- 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

NATIONAL AND INTERNATIONAL PAST POSITIONS

- Member of the Board of the Italian Society of Toxicology (2003-2006)
- Member of the Commission for Dietetic products and food supplements of the Italian Ministry of Health (2003-2005)
- Rapporteur of the EU-COST Strategic Workshop: "Food & Health: the way forward" (2006)
- Member of the Commission for Dietetic products and food supplements of the Italian Ministry of Health (2019-2022)

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 TOPIC OF TEACHING

- van den Berg S.J.P.L., Alhusainy W., **Restani P.**, Rietjens I.M.C.M., *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*
- Garcia-Alvarez A., Egan B., de Klein S., Dima L., Maggi FM., Isoniemi M., Ribas-Barba L., Raats MM., Meissner EM., adeaM.B, Bruno F., Salmenhaara M., Milà-Villarroel R., Knaze V., Hodgkins C., Marculescu A., Uusitalo L., **Restani P.,** L.Serra-Majem. *Usage of Plant Food Supplements across six European Countries: findings from the PlantLIBRA Consumer Survey.* PLoS One 9, e92265, 2014 - *ISSN: 1932-6203 - IF = 3.234*
- Di Lorenzo C., Dos Santos A., Colombo F., Moro E., Dell'Agli M., **Restani P**., *Development and validation of HPLC method to measure active amines in plant food supplements containing Citrus aurantium L.* Food Control 46, 136-142, 2014 - *ISSN: 0956-7135 - Impact Factor = 2.806*
- Di Lorenzo C., Ceschi A., Kupferschmidt H., Lüde S., De Souza Nascimento E., Dos Santos A., Colombo F., Frigerio G., Nørby K., Plumb J., Finglas P., **Restani P.,** *Adverse effects of plant food supplements and botanical preparations: a systematic review with critical evaluation of causality.* Br J Clin Pharmacol 79, 578-592, 2014, DOI:10.1111/bcp.12519 -*ISSN: 0306-5251 - Impact Factor = 3.878*
- Di Lorenzo C., Ceschi A., Colombo F., Frigerio G., Bianchetti M.G., Lüde S., von Dechend M., Valoti E., **Restani P.,** *Identification and quantification of biomarkers to confirm the poisoning by Ginkgo biloba seeds in a 2-year-old boy.* Toxicology Research 4, 922-30, 2015 - DOI: 10.1039/c5tx00016e **-** *ISSN: 2045-452X - Impact Factor = 2.161*
- **Restani P.,** C. Di Lorenzo, A.Garcia-Alvarez, M.Badea, A.Ceschi, B.Egan, L.Dima, S. Lüde, F.M.Maggi, A. Marculescu, R.Milà-Villarroel, MM.Raats, L.Ribas-Barba, L. Uusitalo, L.Serra-Majem. *Adverse effects of Plant Food Supplements self-reported by consumers in the PlantLIBRA survey involving six European countries.*PLoS One 11: e0150089, 2016, doi:10.1371/journal.pone.0150089 - *ISSN: 1932-6203 - Impact Factor = 2.806*
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- **Restani P.,** Di Lorenzo C., Garcia-Alvarez A., Frigerio G., Colombo F., Maggi FM., Milà-Villaroel R., Serra-Majem L.. *The PlantLIBRA consumer survey: Findings on the use of plant food supplements in Italy.* PLoS One 109, 452-464, 2017. January 2018; https://doi.org/10.1371/journal.pone.0190915. *ISSN: 1932-6203 - Impact Factor = 2.766)*
- Di Lorenzo C., Ferretti F., Moro E., Ceschi A., Colombo F., Frigerio G., Lüde S., **Restani P.**. *Identification and quantification of thujone in a case of poisoning due to repeated ingestion of an infusion of Artemisia vulgaris L. J. Food Sci. 2018 DOI 101111/1750-3841.14273. Online ISSN:1750-3841 - Impact Factor = 2.018 (2017)*
- Colombo F., **Restani P.**, Biella S., Di Lorenzo C., *Botanicals in functional foods and food supplements: Tradition, efficacy and regulatory aspects*. Applied Sciences 10, 2387-2402, 2020 doi: 10.3390/app10072387 - *Impact Factor = 2.217 (2018)*

C6. FUNCTIONAL FOODS: CLASSIFICATION AND SCIENTIFIC EVIDENCES SUPPORTING THEIR POSITIVE EFFECTS ON HUMAN HEALTH

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In the last decades, the scientific interest in the role of food in human health promotion is progressively changed, shifting from its primary purpose to provide energy and nutrients, to the new concept of food as source of bioactive compounds with functional effects. Consumers' interest in functional foods has increased as well, leading to a notable growth of the global market of these products, valued at around USD 64,871 million in 2018 and expected to reach approximately USD 99.975 million by 2025. The term "functional foods" was introduced in Japan in 1980s, as "Foods for Specific Health Use" (FOSHU). In 1991, the Functional Food Science in Europe (FUFOSE) defined a food as functional when affects beneficially one or more target functions in the body, beyond adequate nutritional effects, in a way relevant to an improved state of health and well-being and/or reduction of risk of disease [1].

The functional foods can include: (i) a food to which a component has been added (or more rarely removed) to provide benefits; (ii) a food in which a component has been replaced by an alternative component with favourable properties; iii) a food in which the bioavailability of a component has been modified; iv) a combination of these classes. One of the most critical issue is the demonstration of the positive effects when physiological effects and healthy subjects are considered. For this reason, some markers must be used

to monitor the effect of diet on the key processes involved in the maintenance of health. The gastrointestinal tract is one of the most important targets of functional foods, being the first contact point between the diet and the possible body function.
In this study, the human studies performed to support the beneficial effects of functional food ingredients will be discussed, with particular attention paid to probiotics and prebiotics, which represent some of the most important classes of functional foods on the market.

[1]. Howlett G. Functional Foods. From Science to health and claims, pp.15-19. Eds ILSI Europe, 2008. ISBN: 9789078637110

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 Biotechnologial 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 tecniques (immunoblotting and ELISA) for the detection of food allergens in complex food matrices.

Chiara Di Lorenzo is involved 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 Food Chemistry (Chemical Safety and Toxicological Environmental Sciences, Faculty of Pharmacy, Università degli Studi di Milano); Chiara Di Lorenzo holds seminars at: the course of Dietetic Products (Faculty of Pharmacy, Università degli Studi di Milano); analytical methods for xenobiotic detection in foods (training activities); Dietetic Therapy/Food Supplements (Doctorate in Nutritional Sciences), and 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 31 international peer-reviewed publications and attended as speaker/poster presenter to more than 50 scientific congresses.

Selected publications

- Di Lorenzo C., Dell'Agli M., Sangiovanni E., Dos Santos A., Uberti F., Moro E., Bosisio E., Restani P.. Correlation between catechin content and NF-κB inhibition by infusions of green and black tea. Plant Foods Hum Nutr (2013) 68:149-54. doi: 10.1007/s11130-013-0354-0.

- Sangiovanni E., **Di Lorenzo C.,** Colombo E., Colombo F., Fumagalli M., Frigerio G., Restani P., Dell'Agli M.. The effect of *in vitro* gastrointestinal digestion on the anti-inflammatory activity of *Vitis vinifera* L. leaves. Food Funct. (2015) 6:2453-63 doi: 10.1039/c5fo00410a.
- **Di Lorenzo C.**, Ruzicka J., Colombo F., Orgiu F., Frigerio G., Novak J., Badea M., Restani P.. 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.
- Colombo F., **Di Lorenzo C.** (corresponding author), Regazzoni L.,. Fumagalli M,. Sangiovanni E, Peres de Sousa L., Bavaresco L., Tomasi D., Bosso A., Aldini G., Restani P. and Dell'Agli M.. Phenolic profile and anti-inflammatory activity of sixteen Table Grape (*Vitis vinifera* L.) varieties. Food & Function, 2019, 10:1797-1807. doi: 10.1039/c8fo02175a.
- Pastor R.F., Restani P., **Di Lorenzo C.**, Orgiu F., Teissedre P.L., Stockley C., Ruf J.C.,. Quini C.I, Garcìa Tejedor N., Gargantini R., Aruani C., Prieto S., Murgo M., Videla R., Penissi A., Iermoli R.H.. Resveratrol, human health and winemaking perspectives. Crit rev Food Sci Nutr 2019, 59:1237-1255. doi: 10.1080/10408398.2017.1400517

C7. Chemical and functional characterization of pigmented cereals and their use as innovative ingredients in gluten-free diet

Francesca COLOMBO (1), Chiara DI LORENZO (1), Katia PETRONI (2), Marco SILANO (3), Ermelinda FALLETTA (4), Simone BIELLA (1), Patrizia RESTANI (1,5)

1- Dept. of Pharmacological and Biomolecular Sciences, Università degli Studi di Milano, Milano, Italy,
2 – Dept. of Biosciences, Università degli Studi di Milano, Milano, Italy,
3- Unit of Human Nutrition and Health, Department of Food Safety, Nutrition and Veterinary Public Health, Istituto Superiore di Sanità, Roma, Italy
4- Dept of Chemistry, Università degli Studi di Milano, Milano, Italy,
5- CRC "Innovation for well-being and environment", Università degli Studi di Milano, Milan, Italy

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Gluten is widely used in the modern diet thanks to its nutritional value and palatability when processed into products. In recent years, the prevalence of a wide spectrum of gluten-related disorders (GRDs) has increased. The commonly recognized GRDs are celiac disease (CD), wheat allergy (WA) and non-celiac gluten sensitivity (NCGS). Among GRDs celiac disease is the best-known clinical form with a chronic course. The oxidative stress is considered one of the mechanism responsible for the gluten toxicity in CD and some studies suggest that gluten free diet only partially reduces the oxidative stress at intestinal level. In this contest, the interest on new ingredients capable to reduce this damaging process has been increased.

Zea mays L. is a cereal widely used in gluten free diet and its pigmented varieties, rich in anthocyanins, could be included as functional ingredients for the formulation of novel gluten-free products.

To evaluate this possibility, seven corn varieties with different pigmentation were included in this study. Samples were characterized using both spectrophotometric and chromatographic (HPTLC, LC-MS, HPLC) techniques and the phenolic profile was correlated with the antioxidant capacity of samples.

The pigmented varieties showed a significantly better phenolic profile compared with the common yellow varieties and, as a consequence, a higher antioxidant activity. After the chemical characterization, the pigmented varieties were tested by different cellular models (cell agglutination test and the measure of transepithelial electrical resistance) in order to confirm their safety for celiac patients.

The methods developed in this study are important tools to characterize corn samples and to investigate about the role of polyphenols in the modulation of chronic inflammatory conditions in celiac subjects.

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 financed by Celiac Foundation 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 13 international peer-reviewed publications and participated to more than 10 scientific congresses with oral or poster presentations.

Selected publications

- Di Lorenzo C., Sangiovanni E., Fumagalli M., Colombo E., Frigerio G., **Colombo F.**,.Peres de Sousa L, Altindişli A., Restani P., Dell'Agli M.. Evaluation of the anti-inflammatory activity of raisins (*Vitis vinifera* L.) in human gastric epithelial cells: a comparative study. Int J Molecular Sci (2016), 17:piiE1156;
- Di Lorenzo C., Ferretti F., Moro E., Ceschi A., **Colombo F.**, Frigerio G., Lüde S., Restani P.. Identification and quantification of thujone in a case of poisoning due to repeated ingestion of an infusion of *Artemisia vulgaris* L. J Food Sci (2018), 83:2257-2264;
- **Colombo F.**, Restani P., Novembre E., Barni S., Di Lorenzo C., Orgiu F., Biella S., Mori F.. Apovitellin identified as a novel major egg allergen in goose egg allergy. Pediatr Allergy Immunol (2018), 30:246-248;
- **Colombo F.**, Di Lorenzo C., Regazzoni L., Fumagalli M., Sangiovanni E., Peres de Sousa L., Bavaresco L., Tomasi D., Bosso A., Aldini G., Restani P. and Dell'Agli M.. Phenolic profile and anti-inflammatory activity of sixteen Table Grape (*Vitis vinifera* L.) varieties. Food & Function (2019), 10:1797-1907 ISSN 2042-6496;
- **Colombo F.**, Restani P., Biella S., Di Lorenzo C.. Botanicals in Functional Foods and

Food Supplements: Tradition, Efficacy and Regulatory Aspects. Appl Sci (2020), 10:2387-2402.

Katia PETRONI

Katia Petroni graduated in Biological Science at the Università degli Studi di Milano in 1994. In 1998 she obtained the Doctorate degree in Applied Genetics (Università degli Studi di Milano). In 2002 Katia Petroni became a research assistant (Università degli Studi di Milan) and in 2002 she obtained the role of Assistant Professor of Genetics (Università degli Studi di Milan). Since 2016, she is Associate Professor of Genetics at the Università degli Studi di Milano.

Her teachings are Genetics, Nutrigenomics, Medical genetics, Industrial Plant Biotechnology and Molecular Genetics. She coordinates a Nutrigenomic research group, whose research focus is the study of the protective role of flavonoids on chronic and degenerative diseases and, in particular, the study of beneficial effects of corn anthocyanins in mice and cellular systems.

Marco SILANO

Marco Silano graduated in Medicine and Surgery at the Università Cattolica del Sacro Cuore – Roma and post-graduated in Paediatrics (Università degli Studi di Milano). From 1999 to 2000 had obtained a Visiting Fellow at the Division of Nutritional Sciences of Cornell University – Ithaca, New York, where he studied the intestinal metabolism of long chain polyunsaturated fatty acids on *in vivo* and *in vitro* models of paediatric diseases. From 2000 to 2003 he conducted assistant and research activities at San Paolo hospital (Milano) and Bambin Gesù paediatric hospital (Roma). At present Marco Silano is the Head of the Unit of Human Nutrition and health – Istituto Superiore di Sanità. The main areas of research include the pediatric nutrition and food intolerances.

Ermelinda FALLETTA

Ermelinda Falletta awarded the Master Degree in Chemistry at The University in Palermo. Then, she has worked as graduated technician at the University of Milan and in 2013 she awarded the PhD Degree in Industrial Chemistry. At present she is the coordinator of the Laboratory analysis of the Department of Chemistry at the University of Milan.

Simone BIELLA

Simone Biella graduated in Chemical Safety and Toxicological Environmental Sciences (Università degli Studi di Milano) in March 2018. At present he is a research fellow at the Laboratory of Toxicology, Group of Food Chemistry and Toxicology (Dept. of Pharmacological and Biomolecular Sciences) coordinated by Prof. Restani. 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.

C8. A PRACTICAL GUIDE TO IMPLEMENT PRECISION NUTRITION

Mihai NICULESCU

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Precision nutrition is a relative new concept that gained traction lately, and it is considered as a major tool to be used in the prevention and mitigation of nutrition-related diseases.

This session will focus on defining the framework necessary for the implementation of precision nutrition, and what are the steps available to nutritionists and physicians in order to include personalized nutrition in the arsenal of tools used to fight against various metabolic diseases.

By including the latest technologies such as nutrigenetics, metabolomics, and metagenomics to the already existing arsenal of classical nutrition, precision nutrition can establish, with more accuracy, the details of nutritional interventions gauged specifically to the needs of a certain individual.

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
- 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

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C9. MEDICAL EXPERT SYSTEMS FOR DAILY MEAL FOR TYPE-2 DIABETICS

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Artificial Intelligence (AI) is devoted to create intelligent computer software and hardware that imitates the human mind. The main goal of AI technology is to make computers smarter by creating software that will allow a computer to mimic some of the functions of the human brain in selected applications. Advances in AI paradigms and smart healthcare systems domains highlight the need for ICT systems that aim not only in the improvement of human's quality of life but at their safety too.

On the other side, expert system (ES) is a knowledge-based system that contains the knowledge and experience of one or more experts in a specific domain that anyone can tap as an aid in solving problems. ES is an intelligent software computer program that provides expert advice as if a real person had been consulted where this advice can be decisions, recommendations or solutions. From the healthy food perspectives as well as medical point of view, a successful intelligent control of patient food for treatment purpose must combines patient interesting food list and doctors' efficient treatment food list. Actually, many rural communities in many countries have extremely limited access to diabetic diet technological centers. People travel long distances to clinics or medical facilities, and there is a shortage of medical experts in most of these facilities. This results in slow service, and patients end up waiting long hours without receiving any attention. Hence expert systems technology can play a pivotal role in such cases where medical experts are not readily available. So, the ES provides the patients with medical advices and basic knowledge on diabetes diet.

This talk discusses the potential role of the AI paradigms, computational intelligence and machine learning techniques which are used in developing the ESs. The talks focus on the reasoning and knowledge representation techniques, and their potential usage in developing recent trends of smart expert systems. This talk presents the design and implementation of an intelligent medical expert system for diabetes diet. Moreover, the talk presents the research results of the author and his colleagues that have been carried out in recent years@AIKE-Labs at Ain Shams University.

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  - International Society for Telemedicine & eHealth (ISfTeH), Gellertstrasse 19, Basel, Switzerland.
  - Secretary of the Egyptian Computer Society (1984-1990).
  - Member of the National Committee of Informatics, Egyptian Academy of Scientific Research and Technology (1992).
- Coordinator of the International Conference for Statistics, Scientific Computing, and Social and Demographic Research, Cairo, Egypt (1983-1990).
- Founder &Head of Artificial Intelligence and Knowledge Engineering Research Labs, http://aiasulab.000webhostapp.com
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- Keynote Speaker, Plenary Speaker, Invited Lecturer and Tutor of around 100 International events.

Research interest

- Intelligent Information Processing and Data Mining.
- Knowledge-Based and Expert Systems.

- Artificial Intelligence
- Image Processing and Pattern Recognition.
- Big Data Analytics and Data Science
- Intelligent Education and digital-Learning
- Medical Informatics, Bio-informatics and digital-Healthcare
- Ontological Engineering and management
- Intelligent software
- Machine learning and Computational Intelligence.
- Smart Homes and Business.
- Biometerics and Human Identification
- Opinion Mining and sentiment analysis.
- Intelligent Software engineering
- Cloud computing

Selected publications

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C10. DETERGENTS' RESIDUES DO NOT COME ONLY FROM SURFACTANTS: THE BIOCIDE CASE

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Dishwashing is a common household activity, which occurs on a daily basis. There are several different ways this is done; washing under a running tap, washing in one or two sinks. In the discourse on climate change and the scarcity of resources, the household is the center of changing human behaviour. Washing dishes in one sink is one of the methods which utilise a minimum input of resources. There are concerns however that residues from the detergent used may cause health and environmental concerns.

In this study, a comparison was made between residues of the biocide 1,2-benzisothiazol-3(2*H*)-one and the anionic surfactant, sodium dodecyl sulphate, both compounds generally present in detergents. These comparisons were made on five different materials (glass, stainless steel, ceramic, plastic and wood), in two different types of tableware (cup and plate).

It was demonstrated that the lowest residues of biocide and surfactant were found on glass plates (0.9 ng cm^{-2}; 55.9 ng cm^{-2}, respectively) compared to residues on wooden plates (8.4 ng cm^{-2}, 226.4 ng cm^{-2}, respectively), which demonstrated the highest. The correlation of the residues to the material roughness was linear, with the ratio of the slopes proportional to the ratio of the surfactant and the biocide content in the detergent used.

The effect of surface roughness on residues of the biocide was not covered in literature before. Whereas, it is known from the food industry, that the adsorption of surfactants and polymers at the solid liquid interface depends on the nature: of the surfactant or polymer, the solvent, the temperature, chemical nature, electrostatic interactions etc. (Somasundaran and Krishnakumar, 1997) and the surface roughness

profile (Ihara et al., 2017; Gerhards and Schmid, 2013). The residues of the biocide on the plates made of different materials were in average as follows: 0.9 ng cm^{-2} (glass); 2.4 ng cm^{-2} (stainless steel); 1.3 ng cm^{-2} (ceramics), 6.1 ng cm^{-2} (plastics) and 8.4 ng cm^{-2} (wood).

The comparison of the residual amount of both surfactant and biocide on different tableware including the effect of depth (cups versus plates) indicated that the surfactant residues on cups were higher from 1.2 to 1.6 times (on all materials), whereas the biocide residues were higher from 1.5 to 5.2 times.

In the case of ecological impact, it was found that both compounds individually inhibited the growth of *Vibrio fischeri*. The samples of water coming directly from a washing sink caused a complete inhibition in both cases, which is in accordance with the EC50 values. The interesting observation comes from comparing individual toxicities from the samples containing water from rinsing plates and cups, which expressed 1.9 % of inhibition in the case of the surfactant and 11.5 % in the case of the biocide. The inhibition of the water sample containing the mixture of both caused an almost twice higher inhibition, resulting in a 20 % decreased activity of marine bacteria.

Due to these findings, more attention should be given, to ensure that washing dishes by hand is not recognised as a source of contamination.

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Participation in National research programmmes 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);
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Scientific cooperation

Memeber of Association of Chemistry and the Environment (ACE) – 2019

Selected publications

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- **Bavcon Kralj, M**, Fortuna, A, Abram, A, Trebše, P. Dish handwashing : an overlooked source of contamination. Environmental chemistry letters. 2020, vol. 18, iss. 1, str. 181-185, ilustr. ISSN 1610-3653.

C11. OPTIMIZATION OF EXTRACTION PROCEDURES TO OBTAIN BIOACTIVE MOLECULES FROM PLANTS

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Extraction techniques are usually the first step in the purification and fractionation of bioactive molecules from different plant sources. 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.

Many organic molecules with different bioactivities display an amphipathic behaviour with hydrophobic part of the molecule (e.g. aromatic rings) and the hydrophilic part (e.g. hydroxyl, carbonyl, carboxyl groups). Therefore, these molecules are poorly soluble in polar solvents (e.g. water) and non-polar solvents (e.g. ethyl acetate), but very well soluble in ethanol and its mixtures with water. 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 plethora of testing methods, preferably in combination, ranging from simple

chemically based models, to cell cultures *in vitro* or animal models *in vivo*. Ultimately, 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 conference we will use as example and discuss 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.. The results of their bioactivities will be shown along with their possible applications.

Conference

Mariana Gois Ruivo da Silva, Mihaela Skrt, Draženka Komes, Nataša Poklar Ulrih, Lea Pogačnik: Optimization of quercetin extraction from brown onion *(Allium cepa L.)* skin

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Research Interests

- preparation and characterisation of cianobacteria species *Arthrospira platensis* extracts before and after the lactic acid fermentation

- 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*)
- 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

- **Pogačnik L.**, Ota A., Poklar Ulrih N.. 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
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C12. POLYPHENOLS, FROM NEUROPROTECTION TO SAFETY

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Polyphenols are naturally occurring micronutrients that are present in many food sources like wine, green tea, grapes, vegetables, red fruits and coffee. It is generally accepted that most polyphenols are potent antioxidants and may also reveal inflammatory properties. Based on those properties, together with the relative abundance of those food products in human diet, many studies highlight their potential role in the prevention and treatment of various pathological conditions connected to oxidative stress and inflammation, like cancer, cardiovascular and neurodegenerative disorders, but also pollutant-induced cell damage.

Recent data expand the initial antioxidant-based mechanism of polyphenols action by showing that they are also able to modulate several cell-signaling pathways and mediators. A representative example of such actions is described by Patel et all (1) where the authors revise the pharmacological applications of curcumin in several diseases, as well as a wide range of pleiotropic actions in the modulation of cell signal molecules.

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 and epigallocatechin gallate may lead to some neuronal demise in a primary neuron culture model. Furthermore, high levels of quercetin disrupted the barrier properties in a human blood-brain barrier culture cell model. 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 are promising molecules for preventive and therapeutic interventions in a wide range of pathological conditions, being cancer and dementia maybe the most impactful ones, but the relations between dosage, toxicity and safety must be well know and closely monitored.

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Research Interests

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

Selected Publications

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C13. MYCOTOXINS ANALYSIS: APTAMER AS A BIORECEPTOR ELEMENT

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Mycotoxins are naturally occurring toxic, small chemical compounds (MW ~700) that are produced as secondary metabolites by certain fungi contaminating food and feed, during crop growth or processing products. According to the United Nations of Food and Agriculture Organization report, 25% of the word's food is significantly contaminated with mycotoxins. These toxins include ochratoxins (OT), aflatoxins (AF), fumonisins (F), patulin (P), zearalenone (ZON) and trichothecenes. The WHO-International Agency of Research on Cancer (WHO-IARC, 1993) underlined the carcinogenic potential of OT, AF, F, ZON, and trichothecenes in 1993.

Hence, there is a necessity for highly sensitive and selective detection systems that can quantify these organic toxins in various matrices. The classical strategies are based on the use of antibodies. Our strategies are based on aptamer based affinitity interactions. Aptamer based platforms offer enhance recognition capability and have attracted significant attention. Aptamers are synthetic short sequences of single stranded (ss) oligonucleotides (ssRNA or DNA), which are developed by an *in-vitro* selection process known as "Systematic Evolution of Ligands by Exponential Enrichment (SELEX)" technique. Among the receptors available for biosensing, aptamer exhibit the advantages of high specificity, selectivity, stability, facile labelling and modification, which makes them ideal candidates for development of new biosensing applications. Herein, we devised and demonstrated the development of facile, label free and disposable aptasensor for quantitative determination of mycotoxins using various strategies :

- Electrochemical based on EIS and DPV
- Fluorescence based on FRET
- Lateral flow with detection with gold nanoparticles

These methods allow to detect OTA, AFB1, AFM1, patuline and zearalenone at very low concentrations in various matrices such as wine, beer, apple juice, milk, cocoa beans and coffee

The developed methods served as a generic transducer platform and their applicability was further extended for the detection of antibiotics such as kanamycine and ciprofloxacin.

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- Co-founder of the company GTP Technology.
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Research interest

- Stabilization of enzymes and biomolecules and immobilization on various supports;
- Development of enzyme sensors, immunosensors and aptasensors for the detection of pollutants in the environment; toxins and mycotoxins in food
- Biosensors in F.I.A. systems,
- Biosensors for agro-food and processing control
- Studies of additives for neutraceutics and functional food
- Analytical chemistry
- Optical sensor
- A new research interest beginning in 2016 is the 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

- Khan R., Ben Aissa S., Sherazi T., Catanante G., Hayat A., **Marty JL**, Development of an impedimetric aptasensor for label free detection of patulin in apple juice, Molecules 2019, 24(6), 1017
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C14. SAMPLE PREPARATION FOR FOOD CONTAMINANTS DETERMINATION

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Chemical contaminants are organic or inorganic compounds whose presence in food even at traces levels of concentration can have negative effects on human health. Usually, the determination of food quality largely based on chromatographic analysis, both for identification and for quantification. Foods have the most diverse and complex matrices. Besides the fact that foods are in different states of aggregation, both the matrix and the compounds of interest can have a wide variety of physico-chemical properties. As the analytical equipment has limited separation and detection capabilities and can only analyze liquid samples, it is necessary to perform an additional step for sample preparation.

This chapter presents the basic knowledge of classical and modern methods of sample preparation. Extraction of organic compounds from solid sample can be accomplished by liquid-solid extraction such as Techniques used for extraction of organic compounds from solid matrices such as reflux, ultrasonic solvent assisted extraction (UAE), microwave solvent assisted extraction (MAE), supercritical fluid extraction (SEF) are discussed. Preparation of liquid samples and extracts can be carried out by using liquid-liquid extraction techniques such as dispersive liquid-liquid microextraction (DLLME), single drop microextraction (SDME), hallow fiber microextraction (HFME), or solid-liquid techniques such as solid-phase extraction (SPE) and solid-phase microextraction (SPME).

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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

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C15. ALLERGY AND INTOLERANCE – TRUTHS AND MYTHS

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In industrialized countries, probably associated with life style changes in the past decades more than 20% of the population suffer from food intolerance or food allergy. Abnormal reactions to food have a large clinical and social repercussion, which can be fatal in some cases and impair the quality of life of patients. These food reactions can be defined as a clinical abnormal response that can be attributed to ingestion, contact or inhalation of a food, its derivatives or an additive contained in it.

Food intolerance is common in the modern world, and depending on data collection methods and de nitions, it affects up to 15–20% of the population. The majority of cases are due to non-immunological causes. The mechanism behind food intolerance is regarded as one of the greatest enigmas in modern medicine. These causes range from pseudoallergic reactions to enzymopathies, chronic infections, and psychosomatic reactions that are associated with food intolerance.

Allergy is an abnormal reaction of the body to one or more substances, that are generally harmless to the vast majority of people. Substances that determine allergic reactions are called allergens. Food allergies are usually immune-mediated, associated with IgE. Allergies are the most common chronic condition in Europe and the 6th leading cause of chronic disease in the United States (EAACI, 2016). It is estimated that one in three Europeans suffers from allergic diseases. This can be attributed to living conditions, such as improved hygiene, but also increased daily contact with environmental pollutants or chemicals. In addition, genetic heritage also plays an important role in the development of allergies, as can be seen in many studies. According to the Center for Disease Prevention and Control (CDC), the prevalence of IgE-mediated allergic diseases increased

by 50% between 1997 and 2011, both in developed and developing countries. The World Allergology Organization has estimated a global prevalence of allergies between 10 - 40%, with a predominant impact on overdeveloped countries.

The genetic predisposition, the biological gender-related differences, cultural and environmental factors, all these factors affect the sensitization rate and subsequently the prevalence of allergies and intolerances. In order to confirm the prevalence, pathophysiology, influencing factors and consequently the preventive and treatment strategies further studies need to be performed.

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Research interests

- Main research interests are clinical chemistry, hematology, molecular biology and genetic disease - correlations between the presence of different polymorphism and clinical aspects.
- Also improving quality in clinical laboratories, by implementing and monitoring specific indicators.

Selected publications

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C16. COMPLEMENTARY FOOD PREPARATION IN INFANTS- RISKS AND CONSEQUENCES ON HEALTH

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It is well known that breast milk provides to infants all the essential nutrients in the first 6 month of life. Complementary food is defined as the introduction of solid foods in addition to breastfeeding after 6 months of age. Complementary food is providing to the infants the growing energetic requirements together with essential nutrients that would not be sufficient with exclusive breast feeding.

Recommendations for safe handling, preparation and storage of foods is an important component of education that lies in the responsibility of primary care providers. Poor knowledge on safety in food preparation for infants has consequences on health. Foodborne diseases like microbial, parasitic, and viral diseases have important consequences on children mortality under 5 years of age. How well known are known are these principles to the doctors and nurses, how is education provided and how gaps in education can be addressed is the main topic of this presentation.

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Research interests

Dr. Andrea Neculau, MD, PhD is Associate professor of Family Medicine at Transilvania University of 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 projects during the past 20 years that have had as a main outcome guidelines development and 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

- Falup-Pecurariu O, Man SC, Neamtu ML, Chicin G, Baciu G, Pitic C, Cara AC, **Neculau AE,** Burlea M, Brinza IL, Schnell CN, Sas V, Lupu VV, François N, Swinnen K, Borys D. (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 în children: An open-label, randomized, controlled, non-inferiority trial, Human Vaccines & Immunotherapeutics,
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- **Neculau A E.**; Rogozea LM.; Andreescu O; Jinga L., Dinu EA. RN; Tint D.. Multiple Drug-Intolerant Hypertension. American Journal of Therapeutics., May 2017
- Dima L., Bălan A., Moga M., Dinu C. G., Dimienesc, O. G., Varga I., **Neculau A. E.** (2019) Botulinum toxin a valuable prophylactic agent for migraines and a possible future option for the prevention of hormonal variations-triggered migraines. Toxins,11(8), 465
- Imtiaz S.M.; Aleem A.; Saqib F.; Ormenisan A.N.; **Neculau A.;** Anastasiu, C.V. The Potential Involvement of an ATP-Dependent Potassium Channel-Opening Mechanism in the Smooth Muscle Relaxant Properties of Tamarix dioica Roxb. Biomolecules 2019, 9, 722

C17. PATTERNS OF ALIMENTATION IN ADOLESCENTS

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Poor nutrition, including starvation as well as overeating, is well known as a risk factor related with development of atherosclerotic vascular plaque in the third and fourth decades of life. Therefore, in last decades the society and medical authorities were deeply involved in researching and elaborating guidelines and recommendation for nutrition in children. The concept of primordial prevention is related with efforts coming from health policy combined with health care community and with environmental changes for an optimal nutrition.

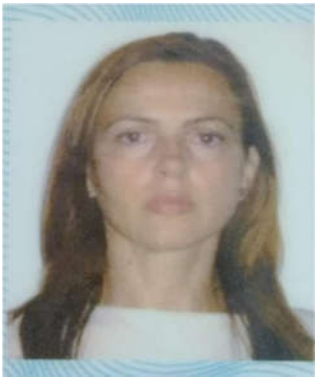
Objectives: The aim of the study was to describe eating patterns and nutritional preferences in adolescents in Brasov county.

Material and Method: There were recruited 250 children for a cross-sectional study in Brasov county, Romania. Alimentary habit, snaking, meal frequencies were declared by the subjects using a retrospective questionnaire. Parents were asked to give information about family history regarding the presence of cardio-vascular risk factors.

Results: In teenagers healthy eating pattern including home-made food, fresh fruits and vegetables were replaced step by step by fast-food or snacks. Sweetened soft drinks and energy drinks were daily consumed.

Conclusions: The main finding was that, eating pattern in adolescents should worry both parents and school authorities. The family influence on children' s eating pattern decreases as the age grow, the busy school program determine lack of a healthy alimentation.

Bianca Elena POPOVICI



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Research interests

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

Selected publications

- Manea R., **Popovici B**E, Neculoiu CD, Minea D, Calin A. Application of the Measurement of Carotid Intima-Media Thickness for Prediction of the Essential Hypertension in Children. REV.CHIM.(Bucharest) 2018; 69; no. 6.
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C18. GREEN SYNTHESIS OF METALLIC NANOPARTICLES AND THEIR POTENTIAL IMPACT ON FOOD SAFETY

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Metallic nanoparticles play an integral part in the evolution of new antimicrobials against broad ranges of pathogenic microorganisms. Silver has general antibacterial properties against a range of both Gram-negative (e.g. *Escherichia, Pseudomonas, Salmonella, Vibrio*) and Gram-positive bacteria (e.g. *Bacillus, Listeria, Staphylococcus*).

The most common method of producing silver nanoparticles is the chemical reduction of a silver salt but there are, however, numerous different manufacturing methods, including spark discharging, electrochemical reduction or solution irradiation synthesis.

In recent years, biological synthesis has emerged as an appealing alternative to traditional nanoparticle production methods. Biosynthesis involves so-called "green" methods, which entails using single and multicellular biological entities such as bacteria, actinomycetes, fungi, plants and yeasts or plant extracts, for the synthesis of nanoparticles. In addition to the use of microbes and plant extracts, other biological materials like honey, starch or ascorbic acid can be used.

The successful use of metal nanoparticles in various catalytic applications, electronics, biology and biomedical applications, materials science, physics, essentially depends on their structural features such as size, shape, composition.

Moreover, their succesful implementation in diverse applications, specifically as antibacterial agent in food packaging, to combat various food borne pathogenic bacteria, requires a proper selection of stabilizing agents and functionalization pathways, that are environmentally friendly, non-toxic and easy to implement.

Ioana POPESCU (GHIUȚĂ)

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Research interests

Main research interests include metallic nanoparticles' synthesis, characterization and application. The interest in this kind of nanoparticles has raised concerns about the environmental safety of their production methods and their antibacterial potential.

Her Ph.D. thesis, titled „Researches on the biosynthesis of metal nanoparticles using microorganisms", is the result of collaboration programs with Cyprus University of Technology, and Ben-Gurion University of the Negev, and Soroka Medical Center, Department of Microbiology, Beer-Sheva, Israel during which, a large part of her research was done, namely sample preparation, analysis and applicability, and design to develop and improve the synergism of antimicrobial activity in combination with certain commercial antibiotics. She was also engaged in microbiological studies at the Laboratory of Metals bioleaching at the Scientific and Production Center of Armbiotechnology of Armenia.

Selected publications

- Ghiuță, I., Cristea, D., Croitoru, C., Kost, J., Wenkert, R., Vyrides, I. Anayiotos, A., Munteanu, D. Characterization and antimicrobial activity of silver nanoparticles, biosynthesized using Bacillus species, Applied Surface Science 438 (2018) 66- 73;

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- **Ghiuta, I.**, Cristea, D., Chapter 17: Silver nanoparticles for delivery purposes. In book: Nanoengineered Biomaterials for Advanced Drug Delivery, Elsevier Ed. (2020) 820 pag.ISBN: 9780081029855.

C19. TOXICITY OF NANOPARTICLES IN AGRICULTURE AND FOOD PRODUCTION

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In recent years, the investigation and applicability of nanomaterials including metal nanoparticles, metal oxide nanomaterials, carbon nanotubes, in agriculture, food and sustainable environment, have been attracted attention.

Nanoparticles improve the agriculture and food industry controlling disease, enhancing the capacity of plants to absorb nutrients, synthesis of nano-fertilisers and nano-pesticides to increase the productivity without decontamination of soils, waters, and protection against several insect pest and microbial diseases.

The rapidly growing application of nanoparticles in food and agriculture, there are gaps in its knowledge of the potential aquatic environmental impact and toxicity. Nano-toxicity has several effects on human health and diseases as they can quickly enter into humans via different routes, principally respiratory, dermal, and gastrointestinal routes.

Nanoparticles based on TiO_2 semiconductor for the mineralisation of pollutants, pesticides, and organic compounds in hydroponic cultures, nutrient encapsulation and delivery, plant germination and growth, crop disease control, sustainable harvesting, packaging, and storage of vegetables and fruit, are excellent prospects. The properties of nanoparticles that contribute to nanotoxicity include particle size and composition, morphology, particle surface charge, specific surface area and the catalytic activity.

Toxicity mechanism of nanoparticles can be assessed by knowing the interaction between the engineering nanoparticles to a representative of various trophic levels, including bacteria, plants, and multicellular aquatic organisms. Algae are one of the typical experimental models analysed qualitative and quantitative to provide a better

understanding of nanoparticles toxicity because of their sensitivity to environmental changes in term of organic and inorganic pollutants. The algae growth inhibition, the algal biomass measurements, the cell density, the chlorophyll measurement, are a measure of nanoparticle toxicity on the aquatic environment. The plants are also exposed to various nanoparticles through the soil or water in hydroponic systems. The main plant indices of phytotoxicity are the gemination percentage, root elongation, biomass and leaf number.

Luminita ANDRONIC

- Habilitation in Environmental Engineering, Technical University of Cluj-Napoca, Romania, 2018
- PhD in 2010 in Material Science and Engineering
- Professor of Chemistry, Wastewater treatment, Emerging Pollutants: source, advanced processes of depollution and Environmental Chemistry at Faculty of Product Design and Environment.
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Research interests

The main research interest refers to the optimization of photocatalytic processes that involves new solutions, development of photocatalyst based on semiconductors allowed thermodynamic modelling of bandgap position in hybrid systems of two semiconductors, a new approach to multi-component systems of dyes by simultaneous analysis of mixed solutions of two dyes using first-order derivative absorption spectra of dyes solutions, developed and prototyped of a laboratory photoreactor with controlled radiation (UV and/or Vis), heterogeneous photodegradation of industrial wastewater from textile industry, photodegradation of wastewater - laboratory and scale-up experiments in solar pilot plant.

Other areas of my interest include:

- advanced oxidation technologies (photocatalysis, catalytic wet oxidation, Fenton process, and combination of them),
- Photocatalytic technologies used in the built environment,
- Photocatalytic conversion of CO_2 into valuable fuels,
- Microalgae for wastewater treatment technologies,
- Toxicity of nanoparticles in food and agriculture.

The scientific recognition has been proven through publishing more than 35 contributions to International Conferences with posters and oral presentation, over 65 publications in peer-reviewed journals and conference proceedings, 45 publications indexed in ISI Thomson Journals (19 as the principal author), 2 books and 4 chapters in books published in international publishing houses. The scientific research carried out so far led to the coordination of the two international projects as director and 1 project as scientific responsible, a member of over 15 national and international projects. The impact of international and national scientific activity of the candidate measured over 550 citations in Web of Knowledge and index Hirsch is 16.

Selected publications

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- Isac L., Cazan C., Enesca A., **Andronic L.**, (2019) Copper Sulfide Based Heterojunctions as Photocatalysts for Dyes Photodegradation, Frontiers in Chemistry 7, 694-703.
- Enesca A. **Andronic**, **L.**, Duta A., Visa I., (2018) Sustainable Wastewater Treatment for Households in Small Communities. In: Visa I., Duta A. (Eds) Nearly Zero Energy Communities. Book Series: Springer Proceedings in Energy, Editura Springer International Publishing, p. 550-565, Print ISBN: 978-3-319-63214-8

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- **Andronic L.**, Isac L., Miralles-Cuevas S., Visa M., Oller I., Duta A., Malato S., (2016) Pilot-plant evaluation of TiO_2 and TiO_2-based hybrid photocatalysts for solar treatment of polluted water, Journal of Hazardous Materials 320, 469-478.
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C20. SENSORS AND BIOSENSORS BASED ON NANOSTRUCTURED MATERIALS APPLIED IN BIOANALYSIS

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The development of novel and ultrasensitive sensors and biosensors based on nanomaterials is a challenging research field. The nanomaterials could be used as sensitive materials, as mediator of the electron exchange or as immobilization matrix for the biological receptors. The main advantages of nanomaterials in sensing are principally related to high surface-volume ratio and the large specific surface having as affect a major increment of the selectivity and the sensitivity. Among nanomaterials, a special attention is dedicated to carbonaceous nanomaterials, which present enhanced interfacial adsorption features, high rate of electron transfer, excellent electrocatalytic properties, and biocompatibility.

The aim of this work is to present the principal findings in the field of electrochemical sensors and biosensors based on carbonaceous materials for the detection of analytes with importance in bioanalysis. It will be described the sensitive materials, deposition of bio-nano-materials on sensitive element, characterization methods of sensitive layers, electrochemical behavior studies, development and optimization of the electroanalytical methods, and the validation in real samples.

Constantin APETREI

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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, IR spectroscopy, 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

- Ghasemi-Varnamkhasti M., **Apetrei C.,** Lozano J., Anyogu A., Potential use of electronic noses, electronic tongues and biosensors as multisensor systems for spoilage examination in foods, Trends in Food Science & Technology, 80 (2018) 71-92.
- **Apetrei C.,** Iticescu C.,Georgescu L.P.. Multisensory System Used for the Analysis of the Water in the Lower Area of River Danube, Nanomaterials. 2019; 9(6): 891.
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- Dragostin O.-M., Tatia R., Keshari Samal S., Oancea A., Zamfir A. S., Dragostin I., Lisa E.-L., **Apetrei C.**, Zamfir C. L.. Designing of Chitosan Derivatives Nanoparticles with Antiangiogenic Effect for Cancer Therapy. Nanomaterials 2020, 10, 698.
- Dinu A., **Apetrei C.** .A Review on Electrochemical Sensors and Biosensors Used in Phenylalanine Electroanalysis. Sensors 2020, 20, 2496.

C21. CHEMICALLY MODIFIED ELECTRODES USED IN FOOD QUALITY CONTROL

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One of the earliest laws known in history is related to the assurance and protection of food quality, terms that in our days we know as "food safety". That means a continuous and determined effort towards the improvement of science, technology and modern analytical techniques in food production and service industries.

The global market, the growing food industry and the increased demand for the long-term storage and preservation of food are interested to assure that the food is stored and handled in a safe manner so that it does not become the locus of foodborne illness. Food standard methods and processes (into production, storage, shipment, and consumption steps) are very important all along the supply chain from the farm, to our table.

The most common and powerful techniques used in food quality control are the chromatographic methods and/or spectroscopic methods which have advantages, and drawbacks. In this context, as alternative to standard methods, the electrochemical techniques based on chemically modified electrodes could be an attractive choice. The aim of this presentation is to describe how to obtain, characterize and apply chemically modified electrodes in the field of food quality control.

Graziella Liana TURDEAN

- Associate professor at Chemical Engineering Department of "Babes-Bolyai" University (BBU) (Cluj-Napoca, Romania).
- B.Sc. degree in Chemical Engineering in 1989 at BBU (Cluj-Napoca, Romania),
- M.Sc. degree in Science and Environmental Techniques in 1994 from University Paris XII-Val de Marne (Paris, France).

The PhD degree in co-direction was obtained in 1997 at BBU in the field of Chemistry and at University Paris XII-Val de Marne (Paris, France) in the field of Sciences and Technique of Environment, with a thesis on "Amperometric biosensor for studying the inhibition of cholinesterases".

Post-doc NATO-CNR stages at University "Tor Vergata" (Rome, Italy) and University "La Sapienza" (Rome, Italy) improved her professional career. The habilitation degree was obtained in 2016 with the thesis entitled: "Bio/molecular information processing of the fascinating world of nanostructures: from micro- to "smart" electrodes". She has done short visits (1-3 weeks) at foreign universities as: University of Alcala de Henares (Spain), University of Pisa (Italy), University of Cagliari (Italy), Al Farabi Kazakh National University (Almaty, Kazakhstan), Polytechnic School of Chimborazo (Riobamba, Ecuador), Polytechnic School of Barcelona (Spain).

She published 62 scientific papers (49 papers in journals having ISI factor, and at 40 is first or corresponding author). The articles were cited (without self-citations) by 279 other papers. The participation at 85 international and 22 national conferences enriched her experience in validation of the research results. As teacher, she is author or co-author at 3 scholar books and 2 chapters of books. Also, she has experience as director of grants (4 national and 3 international) and as member in research teams (29 national and 3 international).

The research interests include: materials for bio/electrochemical sensors, nanotechnology and materials sciences, electrochemical investigation techniques and applied bio/electroanalytical chemistry.

Selected publications

- Ngo T. T. H., Fort I. C., Pham T. H., **Turdean G. L.** ✉, Paracetamol detection at a graphite paste modified electrode based on platinum nanoparticles immobilised on Al-SBA-15 composite material, Studia Universitatis Babes-Bolyai Chemia, **2020**, 65(1), 27-38
- Cotolan 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**, accepted
- 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, Electrocatalysis, **2019**, 10, 573–583
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- Fort I. C., **Turdean G. L.** ✉, Barabas R., Popa D., Ispas A., Constantiniuc M., Study of the hydrogen peroxide based whitening gel on the corrosion of dental metallic alloys, Studia Universitatis Babes-Bolyai Chemia, **2019**, 64 (1), 125-133
- **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
- Sacara A.-M., Pitzalis F., Salis A., **Turdean G. L.**, Muresan L. M., Glassy Carbon Electrodes Modified with Ordered Mesoporous Silica for the Electrochemical Detection of Cadmium Ions, ACSOmega, 2019, 4, 1410-1415,
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- Deac A. R., Muresan L. M., Cotet L. C., Baia L. **Turdean G. L.** ✉, Hybrid composite material based on graphene and polyhemin for electrochemical detection of hydrogen peroxide, Journal of Electroanalytical Chemistry, 2017, 802, 40-47
- Morar C., **Turdean G. L.,** Bende A., Lameiras P., Antheaume C., Muresan L. M., Darabantu M., New p-aminophenol-based dendritic melamines. Iterative synthesis, structure, and electrochemical characterisation, Comptes Rendus Chimie, 2017, 20(4), 402-414

C22. THE ROLE OF ANTIOXIDANTS IN PHOTOPROTECTION

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Overexposure to ultraviolet (UV) irradiation from the sun plays an important role in the development of skin cancers and skin aging. This awareness in reflected in the development of newer sunscreen formulations with protection extending to the long range of UVA wavelenghts to ensure optimal photoprotection. Since the formation of free radicals, predominantly reactive oxygen species (ROS), are mainly induced by UVA, the reseach lately is focued on the role of free radicals on skin health.

Sunscreens are one of the most widely adopted public strategies to protect from UV irradiation. Chemical UV-filters are compounds incorporated on sunscreen formulations to absorb specific wavelengths of ultraviolet radiation, UVA (320–400 nm), UVB(290–320 nm) or both. The high capacity of UV-filters to absorb UV should remain stable for the entire period of sun exposure in order to achieve the expected photoprotection for commercial sunscreen products. Current sunscreens on the market tend to offer more UVB then UVA protection and do not offer adequate protection against UVA induced ROS.

Some UV-filters are photochemically unstable, which impair their absorbance after UV exposure. UV-filters molecules absorb the incoming UV radiation and reach an excited state. However, the excited molecules return to the basal state by different mechanisms. UV filters may react with disinfection agents, used in swimming pools, and form different halogenated disinfection by-products (DBPs). These mechanisms can lead to the formation of new compounds which can be inactive, decreasing sunscreen effectiveness, can interact with skin biocomponents causing photoallergy and phototoxicity reactions or even interact with other UV-filters or other ingredients presentin sunscreen formulations leading to the formation of another compounds with unknown toxicity.

Antioxidants (AOxs) are often used in the cosmetic industry to reduce skin ageing due to UV radiation and in sunscreen formulations to complement the photoprotection offered by the UV-filters, preventing or reducing potentially photogenerated reactive species. Different topical antioxidants are used to replenish the natural reservoirs in the skin. Topical AOxs have the potential to diminish the ROS generated from the UVA radiation. Different Aoxs, such as Vitamin C, E, A, selenium, silymarin, polyphenols, resveratrol and beta-carotene may be used in the sunscreens.

Literature

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- Jansen R., Wang S.Q., Burnett M., Osterwader U., Lim H.W., 2013. Photoprotection Part I. Photoprotection by naturally occuring, physical, and systemic agents. J. Am. Acad. Dermatol. 69(6), 853-864.
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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 2013when 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 then 80 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.

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

- **Trebše P.,** Polyakova OV., Baranova M., Bavcon Kralj M., Dolenc D., Sarakha M., Kutin A., Lebedev, A.T., Transformation of avobenzone in conditions of aquatic chlorination and UV-irradiation. Water research, ISSN 0043-1354. [Print ed.], 2016, vol. 101, str. 95-102, doi: 10.1016/j.watres.2016.05.067.
- Lavtižar V., Helmus R, Kools S A. E., Dolenc D, Gestel, C. A. M. Van, **Trebše P.,** Waaijers S. L., Kraak M H. S., Daphnid life cycle responses to the insecticide chlorantraniliprole and Its transformation products. Environmental science & technology, ISSN 0013-936X. [Print ed.], 2015, vol. 49, no. 6, str. 3922-3929, graf. prikazi, doi: 10.1021/es506007q.
- Bavcon Kralj M., Černigoj U, Franko M., **Trebše P.,** Comparison of photocatalysis and photolysis of malathion, isomalathion, malaoxon, and commercial malathion - Products and toxicity studies. Water research, ISSN 0043-1354. [Print ed.], 2007, vol. 41, no. 19, str. 4504-4514.
- Drobne D., Blažič M., Gestel C. A. M., Van Lešer V., Zidar P., Jemec A., **Trebše P.,** Toxicity of imidacloprid to the terrestrial isopod Porcellio scaber (Isopoda, Crustacea). Chemosphere, ISSN 0045-6535. [Print ed.], 2008, vol. 71, no. 7
- Bavcon Kralj M., **Trebše P**., Franko M., Applications of bioanalytical techniques in evaluating advanced oxidation processes in pesticide degradation. TrAC, Trends in analytical chemistry, ISSN 0165-9936, 2007, vol. 26, no. 11, str. 1020-1031.

C23. IMMUNE MODULATING ACTION OF BETA-GLUCANS

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Despite progress in the development of new anti-infective drugs, the problem of the prevention and treatment of infections remains far from completely resolved. Therefore, in our time, the question of the use of immunotherapy for the treatment of infectious diseases and any similar approaches aimed at activating the body's own defenses that have formed during evolution is of particular relevance. This direction is referred to as host-directed therapy, as opposed to antibiotics and other direct-acting drugs. Basically, the success of this approach is associated with the activation of innate immunity factors, which are highly conservative and have a wide range of anti-infectious effects due to the existence of receptors that recognize the conservative structures of pathogens that are absolutely necessary for their viability.

Among the immunostimulants currently existing on the pharmaceutical market, a special place is occupied by preparations created on the basis of various microorganisms (bacteria, viruses, fungi and protozoa). According to modern concepts, the effect of these drugs is due to the presence of specific conservative components, the so-called pathogen-associated molecular patterns (PAMP), which are recognized by genetically determined receptors of the innate immunity system, which leads to activation of the effector defense mechanisms for several hours and subsequent the formation of protective (adaptive) immunity for 7-14 days.

In recent years, the immunostimulating properties of beta-D-glucans obtained from certain types of edible mushrooms have been actively studied.

At present, about 700 species of mushrooms exhibiting certain types of biological activity are known. Of greatest interest to researchers is the immunostimulating activity of beta-D-glucans, which are components of the cell wall of fungi. The mechanism of action of

these polysaccharides is realized through their interaction with specific receptors on the cells of innate immunity. Stimulation of immune responses determines the therapeutic effects caused by beta-D-glucans: antitumor, anti-infective and anti-allergenic effects.

The problem of finding new medical preparations with immunomodulatory effects is extremely relevant. Significantly limits the use of immunomodulatory drugs the route of administration. Beta-D-glucans obtained from higher mushrooms are of great interest in this regard, because they are non-toxic, have high biological activity even when administered orally.

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Research interests

Main researches are in the field of biotechnology of production of biologically active compounds, development of functional food products, and influence of nutrition on

health. Biologically active compounds of fungal and bacterial origin, their antioxiodant, immune modulative, antitumor, antidiabetic, neuroprotective properties, as well as influence on GUT microbiota and development of functional food products or food supplements based on these compounds.

Selected publicatons

- Shamtsyan M., Konusova V., Maksimova Y., Goloshchev A., Panchenko A., Simbirtsev A., Petrishchev N., Denisova N.. Immunomodulating and anti-tumor action of extracts of several mushrooms. Journal of Biotechnology, 2004. V. 113 (1-3). 77-83.
- Shamtsyan M.. Bioactive compounds in mushrooms. In Encyclopedia of Biotechnology in Agriculture and Food. Edited by Heldman D. R., Hoover D.G., Wheeler M.B.. Taylor & Francis, N.Y., 2010. P. 76-81.
- Shamtsyan M., Vorobeychikov E., Konusova V., Simbirtsev A., Immunomodulating properties of higher basidiomycetes mushrooms. Cytokines and Inflammation. 2012. Vol. 11. № 1. P. 26–32.
- Zukhurova M., Prosvirnina M., Daineko A., Simanenkova A., Petrishchev N., Sonin D., Galagudza M., Shamtsyan M., Juneja L.R., Vlasov T.. L-theanine Administration Results in Neuroprotection and Prevents Glutamate Receptor Agonist-Mediated Injury in the Rat Model of Cerebral Ischemia-Reperfusion. Phytother Res. 2013 27(9):1282-1287.
- Shamtsyan M., Dmitriyeva T., Kolesnikov B., Denisova N.. Novel milk-clotting enzyme produced by Coprinus lagopides basidial mushroom. LWT-Food Science and Technology, 2014, 58 (2), 343–347
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- Shamtsyan M.. Potential to develop functional food products from mushroom bioactive compounds. Journal of Hygienic Engineering and Design, 2016, Vol. 15, pp. 51-59.
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- Antontceva E., Sorokin S., Krasnikova L., **Shamtsyan M..** Influence of Pleurotus ostreatus preparations on fermentation products of lactic acid cultures. Journal of Hygienic Engineering and Design V. 22, 2018, p. 47-52

C24. VITEX AGNUS CASTUS- USEFUL REMEDY FOR TREATMENT OF PREMENSTRUAL SYNDROME

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Vitex agnus castus has a rich history of use in problems related to genital disorders in women. It has proven benefic action in premenstrual syndrome, postmenstrual disorders, infertility problems for both women and men, in abnormal uterine bleeding, uterine fibroids and mastodynia. It is a plant specific for the Mediterranean region with both flowers and seeds used in herbal remedies. The scientific literature shows available work on pharmacological characteristics but further research needs to be taken on toxicity, dosage and standardization.

The main bioactive compounds are represented by vitexin, casticin, and diterpenoids. Bearing all this information in mind complex analysis of the scientific literature should be further performed in order to actively identify all information related to how to incorporate this herbal remedy in a standard drug for genital female disorders.

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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, 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 such as social impact of COVID-19 pandemic.

Selected publications

- **Panait DE,.** Jufa AC, Floroian L, Pascu AM, Badea M, Popa M, Macocian EV, Cioca G, Bungau S. Electromagnetic pollution of the environment due leakage radiation from microwave ovens. Revista de Materiale Plastice, 2019, http://www.revmaterialeplastice.ro/article_eng.asp?ID=5128
- **Panait DE**, Martinescu C, Maier A, Bigiu N. Is fetal pain real pain? Proceedings of the 14th National Congress of Urogynecology, 7-9 Septembrie 2017, ISBN 978-88-95922-98-0
- **Panait D.**, Dima L., Coman Gh., Rogozea L., Badea M., Studiul nivelului de cunostinte privind vitamina C la studenti ai facultatii de medicina. Jurnal Medical Brasovean, Vol 1: 37-43, 2017
- Barbat O.A., **Panait D**., Martinescu C., Rogozea L., Badea M., Quality of life in dyalisis patients-Brasov, 2016. Jurnal Medical Brasovean, Vol 1: 57-61, 2017;
- **Panait D.,** Bigiu N., Martinescu C., Coman Gh., Moga M.A.. Decreased pseudocholinesterase following exposure to organophosphorus pesticide in a rural area population of Brasov county. Bulletin of the Transilvania University of Braşov. Series VI: Medical Sciences , Vol. 10 (59) No. 1 – 2017;
- **Panait D**., Bigiu N, Martinescu C, Arvatescu C, Marcu V, Moga M, The evolution of premature birth rate depending on socio-economic factors in Brasov county. Archives of the Balkan Medical Union, vol. 52(3):249-253,2017;
- Cobelschi C., Hogea M., **Panait D.,** Pascu A., Gavris C., Maier A.; Ileocecal Tuberculosis-Case report. Bulletin of the Transilvania University of Brasov, Series VI: Medical Sciences; Vol. 9(58) No. 2:1-4; 2016

C25. MARINE ALGAE – NOVEL CANDIDATES FOR THE PREVENTION AND TREATMENT OF HPV INFECTION AND CERVICAL CANCER

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In Europe, cervical cancer represents the second leading cause of death in women. The infection with human papillomavirus (HPV) is the leading cause of cervical cancer, even though the risk associated with different HPV types has not been adequately assessed. Recently, the studies on the prevention and treatment of HPV are attracting more and more attention all over the world. Marine-derived polysaccharides and other bioactive compounds have been shown to possess a variety of anti-HPV and related cancer activities. Marine algae-derived products play an important role in preventing inflammatory reactions and carcinogenesis by modulating the effects of oxidative stress.

Our study aims to bring together all the previous studies based on the anti-HPV effect of marine algae polysaccharides. Moreover, the anticarcinogenic mechanisms and medical applications of certain marine algae will be summarized.

This paper is a review of the English literature published in the last ten years. We performed a systematic research aiming to evaluate the possible mechanisms of anti-HPV actions of marine bioactive compounds and their potential for therapeutic application in cervical cancer.

Marine algae are known for natural richness in minerals, vitamins, polyunsaturated fatty acids, low lipids content, as well as high content of bioactive molecules. Marine polysaccharides possess important biological properties and increasing

body of evidence showed their efficiency in the prevention of cervical cancer in HPV-infected women. Sulfated polysaccharides and terpenoids from brown algae are considered as promising bioactive molecules with anticancer activity. Heterofucans from *Sargassum filipendula* exhibited anti-proliferative effects on cervical cells. Fucoidan mediated the growth inhibition of HeLa cervical cells. Carrageenans from red algae were also observed to inhibit HPV infection by preventing the binding of HPV virions to cells.

In conclusion, considering all the previous results, the anti-HPV and related cancer agents derived from marine organisms have the potential to treat both unapparent HPV infection as well as visible clinical diseases.

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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. 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., & Pleș, 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
- Dul, A.M., **Moga M.A.**, Dimienescu O.G., Sechel G., Burtea V., Anastasiu C.V. Therapeutic Approaches of Resveratrol on Endometriosis via Anti-Inflammatory and Anti-Angiogenic Pathways. Molecules. 24(4), 667.

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Research Interests

Main research interests are in the Obstetrics and Gynecology area, in the topics of gynecological cancers and carcinogenesis, associated to natural products, which might be used as complementary therapy. Knowing the exact mechanism of the carcinogenesis and all the factors involved in this process, and also the properties of food natural products and food-borne molecules, either introduced in the regular diet or as additives or medicines, we could discover new management strategies for this incurable disease.

Selected publications

- Moga, M. A., **Dimienescu O. G.**, Arvătescu, C. A., Ifteni, P., & Pleș, L. (2018). Anticancer Activity of Toxins from Bee and Snake Venom-An Overview on Ovarian Cancer. Molecules, 23(3), 692.
- 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
- Dull, A.M., Moga, M.A., **Dimienescu O.G.**, Sechel, G., Burtea, V., Anastasiu, C.V. Therapeutic Approaches of Resveratrol on Endometriosis via Anti-Inflammatory and Anti-Angiogenic Pathways. Molecules. 24(4), 667.

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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, carcinogenesis process, and factors involved in the progression to malignancy. 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. 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? O ΓKO ΛOΓIKOI & ENΔOΣKOΠIKOI ΠPOBΛHMATIΣMOI (2019). ISBN 978-960-599-255-2
- Moga M. A., Dimienescu O. G., **Bălan A.**, Scîrneciu, 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.

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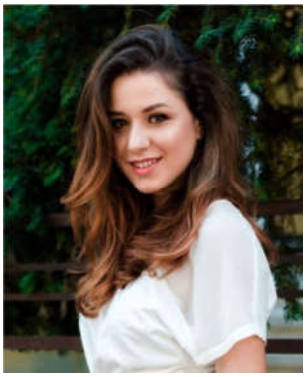

Research Interests

The research interests in the Obstetrics and Gynecology domain covers maternal and fetal medicine concept and the impact of the external factors in pathogenesys of gynecological syndroms and diseases. Drawing attention to ethiopathogenic factors allows an overview of important reproductive health problems, as well as establishing the proper management suitable for the treatment and prevention of these conditions.

Selected publications

- Moisei C., Sima R.M., **Aldea F.,** Ples, L., What the nature can do when somebody wants to obtain a pregnancy? Case report and review of the literature. Maedica J Clin Med,Suppl. 2016, 11(202), 161.
- Mehedintu C., Antonovici M., Teodorescu C., Berceanu, C., **Aldea F.,** Unilateral renal agenesia – Case presentation. Peri 2(1646)
- Dimienescu O.G., Moga, M.A., **Aldea F.,** Anastasiu, C.V., Arvatescu, C.A., Balan, A., Diagnostic si prognostic ecografic in infectiile cu CMV din sarcina – review. Gine Suppl 1, 2019, 23(1), 39.
- Dimienescu OG, Moga M, Arvatescu C, Balan A, **Aldea F.**, Anastasiu CV. Preterm birth – risk factors and predictors in a tertiary hospital in Romania. J Perinat. Med. 2019, 47, eA382. Doi: 10.1515/jpm-2019-2501.

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Research Interests

Scientific and didactic activity demonstrated through many articles and projects, especially in the field of Obstetrics.

Research projects

- Head of research grant "Carol Davila" held in Germany, Homburg, Saarland University, June-November 2018
- member of the project "Integrated methodology for counseling, unitary reporting and risk management in the prenatal diagnosis of fetal congenital anomalies"
- member in the project implementation team: "Investigation of the benefits of prebiotics with intravaginal administration in the treatment of bacterial and fungal vaginitis" project code 2DM / 16.09.2016

Selected publications

- Findeklee S, Radosa JC, Takacs Z, Hamza A, **Sima R.**, Solomayer E, Sklavounos P. Fertility preservation in female cancer patients: current knowledge and future perspectives. Minerva Ginecol. 2019 Aug;71(4):298-305
- Ples L, **Sima R. M.**, Ricu A, Moga MA, Ionescu AC., The efficacy of cervical cerclage combined with a pessary for the prevention of spontaneous preterm birth. J Matern Fetal Neonatal Med. 2019 Oct 21:1-5.
- **Sima R. M.**, Albu D, Ionescu AC, Dimitriu M, Popescu M, Tomescu D, Chicea R, Ceausu I, Iordache I, Poenaru M, Matei A, Calin A, Ples L. The Impact of Ulipristal Acetate (UPA) versus Dienogest on Pain Related to Endometriomas Evaluated with Visual Analogue Scale (VAS).Rev.Chim.2019Apr;70(4):1500-1506
- Stanescu AD, Banica R, **Sima R. M.,** Ples L. Low dose aspirin for preventing fetal growth restriction: a randomised trial J Perinat Med. 2018, 46(7):776-779.
- Matei A, Ionescu C, Gorun F, Gheorghiu D, Rosu GA, Dan A, **Sima R. M.**, Furau CG, Ilinca C, Navolan D.Insights on Hysteroscopic Procedures and Their Place in Romanian Gynecologic Practice-The Experience of Two Medical Units. Diagnostics (Basel). 2020 May 6;10(5). pii: E281.

- Ples L, Popescu I, Margarit I, Ionescu CA, Cazaceanu A, Moga MA, Popescu M, Tomescu DR, **Sima R. M.**. Factors affecting the decision to undergo abortion in Romania: Experiences at our clinic. J Eval Clin Pract. J Eval Clin Pract. 2020 Apr;26(2):484-488.

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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 cancers has become an area of major interest.

Selected publications

- Moga M.A., Bălan A., Dimienescu O.G., **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 M. A., Dinu C. G., Dimienescu O. G., Varga I., Neculau A.E. . 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 F. M., Isoniemi M., Ribas-Barba L., Raats M. M., Meissner E. M., 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.

DEficit JAjocid – DEJA

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2-Faculty of Health Sciences, University of Ljubljana, Slovenia
3-Biotechnical faculty, University of Ljubljana
4-Unichem d.o.o., Slovenia

The project deals with the development of a product based on modified waste eggshells, which expands the range of nutrients needed in the production of vegetables, taking into account the basic ecological laws. In the search for potential opportunities for its development and application in the real environment, we encountered a positive response from enterprice, which sees the product as an innovative market potential that would complement the range of organic fertilizers that prevent and treat physiological diseases due to calcium deficiency.

The product was tested by students in a real pot experiment of growing selected vegetables, sharing various additives of natural origin, which are produced in each household on a daily basis.

By actively participating in the development of the product in a real business environment, young people are able to take responsibility, and acquire and develop various competencies needed to transition to the labor market.

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Team – DEJA

All projects start with an idea for a product or other desired outcome. Generally, projects are split into three key elements: people, time and money. A great achievement is done by a team of people who have spent a lot of time involved in the success of a particular piece of work that has taken them out of their usual day-to-day activities. In this particular project DEJA team consists of five students, bachelor and master, three pedagogical mentors and one working mentor provided by partner company Unichem d.o.o..

Each of the student has got a specific role in a project. Moreover, students with a different background have opportunities for an interdisciplinary environment to work and develop in. Unichem d.o.o. is the leading Slovene company producing high-quality products for the care and protection of plants, with the special focus on ecological gardening which makes it compatible and credible partner

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