



ICIA

INCDO - INOE 2000
Subsidiary Research Institute for
Analytical Instrumentation Cluj-Napoca

**INCDO-INOE2000, Subsidiary Research Institute
for Analytical Instrumentation, ICIA Cluj-Napoca**

Institution

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Expression of interest

**of INCDO-INOE2000, Subsidiary Research Institute for Analytical Instrumentation, ICIA
Cluj-Napoca to join a Consortium on HORIZON EUROPE calls**

**HORIZON-CL6-2024-FARM2FORK-01- Impact of the development of novel foods based
on alternative sources of proteins**

**HORIZON-CL6-2024-FARM2FORK-01-Thematic network tackling food fraud by
translating research and innovation into practice**

**HORIZON CL6-2024-FARM2FORK-01- Preventing and reducing food waste to reduce
environmental impacts and to help reach 2030 climate targets:**

Organization details:

Country: Romania

Name of the organization: INCDO-INOE2000, Subsidiary Research Institute for Analytical
Instrumentation, ICIA Cluj-Napoca

Contact person short description and contact details:

Dr. Eng. Anca (Naghiu) Becze (AB) (Brainmap ID: UEF-iD: U-1700-039Z-3249, ORCID: 0000-0003-1418-689X, WoS h-index: 6), engineer in the food industry, senior researcher at ICIA Cluj, Dr. in Technology and expertise in veterinary health - 2012 (Brain-map: UEF-iD: U-1700-039Z-3249). Expertise: in the field of ►instrumental analysis (mass spectrometry, liquid chromatography, chain reaction a polymerase, photochemiluminescence, NIR, Raman and SEM), development, validation and execution of methods for food analysis; ►data science using Phyton (IBM certificate). Results: ►32 published ISI works; ►27 works published in magazines indexed in international databases; ►10 communications at national and international conferences; ►1invited lecture ►4 book chapters; ►189 citations; ►6 patent proposals; ►project director for international project (19BM/2016); ►5 projects-project manager (18N/08.02.2019, PN19-18.01.01, PN-III-CERC-CO- 9BG/2016, project P3 and P5 of 4PCCDI / 2018 PN-III-P1-1.2-PCCDI-2017-0251, S4 of the TREND SMIS project 105654) ►2 technical manager (project

18N/08.02.2019, P35 PN 23 05/2022) ► 25 member in the project team, national and international projects.

Short description of the organization

INCDO-INOE 2000, Subsidiary Research Institute for Analytical Instrumentation, ICIA, Cluj-Napoca (www.icia.ro), a national research institute, has as objectives: research, analytical methodologies elaboration for a wide range of samples; design and construction of laboratory analytical instruments; performing of chemical analyses and provide services of information, advice and representation for business. The research addresses environmental and health programs, development of new types of systems, equipment, optoelectronics instrumentation for analytical investigation to be applied in the fields of environmental protection, health, safety and food security, impact of global change on biodiversity, clean technologies development, bioenergy, biomass, through the laboratories Analytics and Instrumentation, Environment and Health, Bioenergy-Biomass. ICIA Subsidiary is deeply concerned, by the performed activity, to sustain and stimulate the technology transfer, in close correlation with its own research strategy. Research activity directions of ICIA Subsidiary are oriented toward fundamental, applied research and experimental development and the research laboratory "Environment and Health" is destined and focused on the realization and development of environmental technologies destined to prevent pollution and to rehabilitate the environmental factors, both natural and anthropic; elaboration of some modern methods for the assessment and monitoring of environmental factors (soil, air, water, vegetation, food); realization of analytical methods for the preservation and management of natural and artificial resources, and realization of modern methods for the food quality assessment and detect the impact of global change on the biodiversity. It is composed of: ► Laboratory "Environmental Factors", LFM: environmental quality assessment and technologies development for the environmental restoration. ► Laboratory for Assessment of microbiodiversity under the impact of global changes, BIODIVERSA: evaluation of the structures and abundance of the microbiota in the environmental samples, microbiota metabolic and physiological activities, microbiota life cycle using analytical techniques. ► Laboratory for GMO traces detection and food security, MODALIM: determination of the genetically modified organisms (GMOs), food quality and functional food. MODALIM provides support in all aspects regarding the analysis of food quality and features, animal or vegetable, from raw material to finished product. ► Laboratory for Food Chemical Residues control, REZALIM: determination of the chemical compounds naturally present in foods, pollutants (PAH, pesticides) and additives (preservatives, synthetic colorants and sweeteners).

Previous relevant projects

1. Advanced research on the realization of synergistic frontier architectures used in solving global challenges and increasing competitiveness based on knowledge: Increasing food security by developing methods to determine food fraud (food adulterations), contract no. 18N/08.02.2019
2. "Obtaining and characterization of alternative proteins with application in animal and human nutrition", within the project "Frontier research regarding the creation of innovative methods, technologies, products and services used in solving global problems and increasing competitiveness based on knowledge" entitled "Nucleus Program" Consolidation of scientific excellence in optoelectronics and related fields through the synergy of national, regional and European Union research and innovation policies, according to the SNCISI 2022-2027 vision" project no. PN 23 05. Innovative materials as food supplements for health care, IMA-HEALTH, Romanian finance by the Ministry of Research and Innovation Contract 481 PED /2020
3. Food chains in the dark: diversity and evolutionary processes in caves DARKFOOD, A research project supported by a grant of the Romanian Ministry of Research and

Specific expertise relevant to the call topic

1. Senila, L.; Scurtu, D.A.; Kovacs, E.; Levei, E.A.; Cadar, O.; Becze, A.; Varaticeanu, C. High-Pressure Supercritical CO₂ Pretreatment of Apple Orchard Waste for Carbohydrates Production Using Response Surface Methodology and Method Uncertainty Evaluation. *Molecules* 2022, 27, 7783. <https://doi.org/10.3390/molecules27227783>
2. Dippong, T.; Dan, M.; Kovacs, M.H.; Kovacs, E.D.; Levei, E.A.; Cadar, O. Analysis of Volatile Compounds, Composition, and Thermal Behavior of Coffee Beans According to Variety and Roasting Intensity. *Foods* 2022, 11, 3146. <https://doi.org/10.3390/foods11193146>
3. Coroian, C.O.; Coroian, A.; Becze, A.; Longodor, A.; Mastan, O.; Radu-Rusu, R.-M. Polycyclic Aromatic Hydrocarbons (PAHs) Occurrence in Traditionally Smoked Chicken, Turkey and Duck Meat. *Agriculture* 2023, 13, 57. <https://doi.org/10.3390/agriculture13010057>
4. Fărcaș, A.C.; Socaci, S.A.; Chiș, M.S.; Martínez-Monzó, J.; García-Segovia, P.; Becze, A.; Török, A.I.; Cadar, O.; Coldea, T.E.; Igual, M. In Vitro Digestibility of Minerals and B Group Vitamins from Different Brewers' Spent Grains. *Nutrients* 2022, 14, 3512. <https://doi.org/10.3390/nu14173512>
5. Becze, A.; Babalau Fuss, V.L.; Scurtu, D.A.; Tomoaia-Cotisel, M.; Mocanu, A.; Cadar, O. Simultaneous Determination of Vitamins D₃ (Calcitriol, Cholecalciferol) and K₂ (Menaquinone-4 and Menaquinone-7) in Dietary Supplements by UHPLC. *Molecules* 2021, 26, 6982. <https://doi.org/10.3390/molecules26226982>

Infrastructure (examples)

1. ICP-QQQ Triple quadrupole with spice system and autosampler Thermo iCAP TQ ThermoFisher Scientific, Germany -If the Elan DRC II uses a single quadrupole as a mass filter to be able to extract and detect ions from samples, the latest generation iCAP TQ instrument has an extra quadrupole, for a better management of atomic interferences, helping us receive even more reliable results. The instrument is also coupled with an HPLC module, for organic and inorganic elemental speciation, allowing us to receive even more in-depth information about a sample and better understand the polluting agents from our environment
2. Microscope SEM Tescan Vega SB with EDX detector from Bruker The scanning electron microscope is a versatile multifunctional tool which allows to get images of the material's surface structure and morphology with a few nm resolution; it also gives qualitative (BSE) and quantitative (EDX, lateral resolution around 1µm) chemical information. It is used for the evaluation of zeolites, nanomaterials, algae, bioplastics etc.
3. UHPLC Vanquish H Dionex Softron GmbH, Germany - The UHPLC systems is comprised of: Binary pump: max 1500 bar, with 6 solvent lines; Autosampler: controlled temperature; Column oven: Up to 4 columns with ID tags; DAD with 10 channels + a 3D field; Florescent detector with 4 channels; Chromeleon software. It can be used to develop innovative analytical methods for the determination of organic pollutants in soils, water and vegetation in order to establish solubility and bioavailability through environmental components for plants, animals and humans and lateral and vertical migration in the eco system Also the data can be used to develop mathematical models to describe / determine plant / air / water / soil interactions
4. Liquid chromatograph 1200 Series from Agilent coupled with mass spectrometer Applied Biosystem 3200 QTrap Patented hybrid triple quadrupole/linear ion trap technology takes you far beyond the capabilities of any conventional ion trap, enabling you to screen, identify, and quantify proteins or small molecules in a single analysis. By combining true triple quadrupole scanning functionality with sensitive linear ion trap scans, you can reduce analysis time and get more information from every

experiment. It is used for the determination of new age pesticides, vitamins, amino acids, mycotoxins from food and environmental samples.

5. *Dioxin analysis system The Dioxin analysis system is formed of a Dionex AS 350 Accelerated Solvent Extractor, a Sample clean-up system (DEXTech 16) and a Gas Chromatograph coupled with mass spectrometer. It is used for the analysis of dioxin from food and environmental samples.*

More information on:

<https://erris.gov.ro/Animal-prod-and-food-safety>, <https://eris.eu/ERIF-2000-000Y-0549>

Please add links to webpages of organisation, department, unit, etc.

www.icia.ro

<https://www.youtube.com/watch?v=dYQYAY2Wwm8&t=11s>

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