Comunicações Orais

COMUNICAÇÃO ORAL 1

Impact of benzo[a]pyrene, phenanthrene, and their mixtures on the matebolome of hepatocytes isolated from fish

Vânia Monteiro[1,2*], Isabella Bramatti[3], Filipa Amaro[1,2], Paula Guedes de Pinho[1,2], Neusa Figueiredo[3], Diana Dias da Silva[1,2,4], Marta Martins[3,†], Joana Pinto[1,2,†]

[1]Associate Laboratory i4HB - Institute for Health and Bioeconomy, Department of Biological Sciences, Laboratory of Toxicology, Faculty of Pharmacy, University of Porto, 4050-313 Porto, Portugal.

[2]UCIBIO/REQUIMTE, Department of Biological Sciences, Laboratory of Toxicology, Faculty of Pharmacy, University of Porto, 4050-313 Porto, Portugal.

[3]MARE - Marine and Environmental Sciences Centre, Department of Environmental Sciences and Engineering, NOVA School of Science and Technology (FCT NOVA), 2829-516 Caparica, Portugal.

[4]TOXRUN – Toxicology Research Unit, University Institute of Health Sciences, CESPU CRL, 4585-116 Gandra, Portugal.

[†]These authors contributed equally to this work.

[*]✉ vania.raquel.20@hotmail.com

Doi: https://doi.org/10.51126/revsalus.v4iSup.246

Resumo

Introduction: Polycyclic aromatic hydrocarbons (PAHs) constitute one of the major groups of potent carcinogens that are ubiquitous in the environment. Most studies on PAHs focus on the assessment of the individual toxicity of these substances, even though they are present in the environment as complex mixtures [1]. In this sense, risks might be substantially underestimated. **Objectives:** The present work aimed at studying the effect of exposure to different mixtures of two PAHs, phenanthrene (Phe) and benzo[a]pyrene (B[a]P), on the metabolic profile of primary seabass hepatocytes. **Material and Methods:** Hepatocytes were isolated from freshly-harvested livers of healthy subadult *Dicentrarchus labrax*, through the pancreatin digestion method, and were cultured overnight. Seabass cells were then exposed for 48h to the individual compounds (concentrations 0.1 µM, 10 µM and 50 µM) and their mixtures (Phe:BaP 1:1, Phe:BaP 1:2 and Phe:BaP 2:1, concentrations 0.1 µM, 10 µM and 50 µM). All exposures were performed in sextuplicate (n=6) including control cultures (incubated with DMSO at the highest concentration tested), and non-exposed cells. An untargeted metabolomics approach by gas chromatography-mass spectrometry (GC-MS) was carried out to analyze the intracellular metabolic profiles of hepatocytes. Overall, 36 metabolites were identified, either through database (NIST14) or confirmed by standards. Alterations on the levels of these metabolites were investigated through univariate analysis [Kruskal-Wallis analysis of variance (ANOVA)]. After statistical analysis, biological interpretation was carried out to identify the potential dysregulated metabolic pathways through the Kyoto Encyclopaedia of Genes and Genomes (KEGG). **Results:** The levels of 12 metabolites were found significantly altered after exposure to PAHs individually and/or in the binary mixtures. Metabolite classes included organic acids (e.g., propanoic acid, lactic acid, succinic

acid, oxalic acid), amino acids (e.g., tyrosine, threonine), lipids (e.g., cholesterol), and carbohydrates (galactose). The individual exposure to B[a]P and Phe may induce the perturbation of phenylalanine, tyrosine, and tryptophan biosynthesis. On the other hand, the combined exposure to Phe and B[a]P may have an impact in aminoacyl-tRNA biosynthesis, galactose metabolism, tricarboxylic acid (TCA) cycle, and steroid biosynthesis. **Conclusions:** These findings unveiled that the effects on intracellular metabolome of hepatocytes caused by the exposure to the binary mixtures of PAHs are different from those induced by the individual compounds.

Keywords: Polycyclic Aromatic Hydrocarbons (PAHs); untargeted metabolomics; mixture effects; environmental toxicology; risk assessment.

References:

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Acknowledgments: This work was supported by the Project PAHMIX (PTDC/CTA-AMB/29173/2017), the MARE (UIDB/04292/2020) through FCT/MCTES funds, and by FCT funds in the scope of the project UIDP/04378/2020 and UIDB/04378/2020 of the Research Unit on Applied Molecular Biosciences—UCIBIO, and the project LA/P/0140/2020 of the Associate Laboratory Institute for Health and Bioeconomy—i4HB.

COMUNICAÇÃO ORAL 2

Fortificação alimentar: a propósito de um caso clínico

Susana Ganhão-Arranhado[1,2,3*]

[1]*Atlântica - Escola Universitária de Ciências Empresariais, Saúde, Tecnologias e Engenharia, Fábrica da Pólvora de Barcarena, 2730-036 Barcarena, Oeiras, Portugal.*

[2]*CESPU, Instituto Universitário de Ciências da Saúde. Gandra/Portugal.*

[3]*Centro de Investigação em Tecnologias e Sistemas de Informação em Saúde (CINTESIS). Porto/Portugal.*

*✉ *susanaarranhado@gmail.com*

Doi: https://doi.org/10.51126/revsalus.v4iSup.248

Resumo

Introduction: Aging is a complex, irreversible and progressive process that involves morphological, functional, biochemical and psychosocial changes, which, although physiological, make the elderly more susceptible to changes in nutritional status. The prevalence of malnutrition in the elderly has been increasing [1]. This scenario is particularly a concern as this population group is experiencing exponential worldwide growth. Nutritional therapy for malnutrition in elders includes several Nutritional Support strategies, including Food Fortification, which, based on the "food-first" approach, seems to be well accepted, promoting increased energy and protein intake [2–4]. **Objective:** To describe a clinical case of malnutrition and anorexia in an elderly woman and a nutritional intervention based on Food Fortification. **Material and Methods:** Report of a clinical case of a 93-year-old woman, with severe weight loss, dehydrated and malnourished, with relevant personal history: Meniere's syndrome, age-related macular degeneration, urinary incontinence, recurrent urinary tract infections and bipolar hemiarthroplasia of the hip for subcapital fracture of the femur (2017). Dependent on activities of daily living and did not consume the totality of her daily meals. **Results:** Despite the poor general condition, the elderly woman showed a very significant improvement in nutritional status, after being prescribed a food plan, using Food Fortification, without including oral nutritional supplements (ONS). Weight and other parameters were recovered. **Conclusions:** Food Fortification seems to be a well-tolerated and accepted strategy, with a lower cost than SNO, presenting a positive cost-benefit, as well as proving to be effective in increasing food and nutritional intake and promoting the psychosocial dimension of food.

Keywords: malnutrition; elderly; food fortification; anorexia; nutrition.

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