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The 15th International Symposium and Summer School on Bioanalysis

13-18 July 2015

BOOK OF ABSTRACTS

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FOREWORD

It is our great honor to welcome you to the 15th International Symposium and Summer School on Bioanalysis (15th ISSSB) that will be held between July 13 – 18, 2015 at University of Medicine and Pharmacy of Tg. Mureș.

The event is organized in the frame of CEEPUS CIII-RO-0010-09-1415 network, and takes part of the series of events organized under "UMF 70". The 15th ISSSB provides an overview of a broad range of interdisciplinary subjects in bioanalysis. Its main purpose is to offer an opportunity for young researchers to learn more about the current progress in the analytical techniques.

The symposium will focus on the application of bioanalytical methods in chemical and pharmaceutical research, and related topics. The scientific program will include oral lectures and poster presentations as well as practical courses on bioanalysis.

Gabriella Donath-Nagy,

Symposium chair

ORAL PRESENTATIONS

P-19 / OPTIMIZATION AND VALIDATION OF A MICROWAVE DIGESTION METHOD FOR ANALYSIS OF ELEMENTS IN WINE USING ICP-MS

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Determination of the content of metals in wine is very important since it can contains toxic elements such as Pb, Cd, As that could be harmful for the human health, but also nutritional elements, such as Fe, K, Na, Zn, Mn important for the humans. For that purpose, sample pretreatment of wine is necessary in order to remove the complex organic matrix consisting of ethanol, polyphenols, carbohydrates, proteins and other compounds. In this study, we developed a microwave digestion method for wine sample preparation followed by inductively coupled plasma - mass spectrometry (ICP-MS) for multi-element analysis. The method was optimized and validated, and following parameters were determined: linearity, limit of quantification (LOQ), limit of detection (LOQ), inter- and intra- day repeatability and reproducibility. Successful digestion of wine was obtained with 5 mL nitric acid, obtaining best recoveries for all analysed elements and values R > 90 %, on average, for total elements content. The calibration curves at seven concentration levels (0.5, 1, 3, 5, 10, 30, 50 µg/L) were constructed presenting good linearly and satisfactory correlation coefficients. A standard addition method was applied to check the method accuracy, obtaining good repeatability and reproducibility with relative standard deviation lower that 10 % for all elements. Validated method was applied on analysis of real samples and in total, 38 elements (Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, Ge, In, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Pd, Rb, S, Sb, Se, Si, Sn, Sr, Te, Ti, Tl, V, Zn) were determined in red and white wines.

Keywords: microwave digestion, elements, ICP-MS; wines.

Acknowledgement: Financial support provided by the Research Fund of the University "Goce Delčev" – Štip, R. Macedonia for the project titled "Polyphenolic and aroma profile of Vranec wines fermented with isolated yeasts from Tikveš wine area" is gratefully acknowledged.

References: Ivanova-Petropulos V., Balabanova B., Mitrev S., Nedelkovski D., Dimovska V., Gulaboski R. (2015). Optimization and validation of a microwave digestion method for multi-element characterization of Vranec wines. Food Analytical Methods, in press

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P-20 / DNA METHYLATION ANALYSIS OF GENES PLAYING A ROLE IN MULTIDRUG RESISTANCE

Maria Kaltenbrunner[1], Melanie Spitzwieser[1], Petra Heffeter[2,4], Walter Berger[2,4], Bernhard Keppler[3,4], Margit Cichna-Markl[1]

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Multidrug resistance (MDR), which describes the resistance against a wide range of chemotherapeutics with different mechanisms of action, is one of the major reasons for failure of chemotherapy. There are various mechanisms involved in resistance development. Among others, enhanced activation of detoxifying systems and activation of DNA repair mechanisms are playing an important role in acquired and intrinsic drug resistance. While acquired drug resistance is developed during drug treatment in formerly chemosensitive cancer cells, intrinsic resistance is often tissue specific.

KP772, [tris(1,10-phenanthroline)lanthanum(III)] trithiocyanate, is an anticancer compound, showing promising activity in multidrug resistant cells. The aim of this study is to investigate alterations of DNA methylation in genes playing a role in multidrug resistance of cancer cells like glutathione S-transferase P1 (GSTP1) and O-6-methylguanine-DNA methyltransferase (MGMT) in KP772-treated and untreated cells.

DNA from various cultured cells was extracted and treated with bisulfite. The DNA methylation level was determined by both, methylation sensitive high resolution melting (MS-HRM) analysis and pyrosequencing (PSQ). MS-HRM provides information about the average DNA methylation status, while PSQ allows detailed analysis of single CpGs.

So far, our results indicate cell type-specific methylation levels for GSTP1. In case of MGMT, the methylation status seems to depend on the specific target region in the promoter of MGMT.

Keywords: multidrug resistance, KP772, DNA methylation, MS-HRM, pyrosequencing