Chemical Approaches to Targeting Drug Resistance in Cancer Stem Cells

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Posters

P1 Andrej Bohac (Comenius University, Faculty of Natural Sciences, Dep. of Organic Chemistry, Bratislava)
Exploitation of KDR TK Salt Bridge Containing Polar Pocket for Development of New Inhibitors – Consequences for Targeting Resistance in Cancer Stem Cells

P2. Iwona Ciechomska (Laboratory of transcription Regulation, Nencki Institute, Warsaw, Poland)
Multiple ways of drug-induced glioma cell death: relationship between ER stress, autophagy and apoptosis

P3 Serkos A. Haroutounian (*Chemistry Laboratory, Agricultural University of Athens, Greece)*
Small sized heterocyclic molecules: Synthesis and antitumor properties

P4 Magdalena Król (Department of Physiological Sciences, Faculty of Veterinary Medicine, Warsaw, Poland)
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P5 Darinka Gjorgieva (Faculty of Medical Sciences, University "Goce Delčev" – Štip, R. Macedonia)
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P6 Tamara Todorović (Faculty of Chemistry, University of Belgrade, Serbia)
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P7 Dragana Mitić (Faculty of Chemistry, University of Belgrade, Serbia)
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P8 Nenad Filipović (Faculty of Agriculture, University of Belgrade, Serbia)
Metal complexes with N-heteroaromatic monohydrazones: synthesis, structure and cytotoxic activity

P9 Krystle Blaire Theuma (Department of Anatomy, Faculty of Medicine and Surgery, University of Malta)
Combination of DNA modifying agents and differentiation inducers can enhance differentiation in HL60 leukaemia cells.

P10 Lidija Milkovic (Rudjer Boskovic Institute, Zagreb, Croatia)
Prolonged oxidative stress affects differentiation of human breast cancer stem cells)

P11 Nadia Dandachi (Division of Oncology, Dep. of Internal Medicine, Medical University of Graz, Austria)
Methylation profiling of putative breast cancer stem cells

P12 Gaëlle Blond (*SOMP*, Université de Strasbourg)
A Rapid Access of Taxol Skeleton Promoted by a Pd-Catalyzed Cascade Reaction

P13 Anna Lucia Fallacara (Dip. di Chimica e Tecnologia del farmaco, Università "La Sapienza", Roma, Italy)
Development and Optimization of new Compounds as Allosteric inhibitors of Bcr-Abl Kinase

P14 Francisca Vicente (Fundación MEDINA, Parque Tecnológico Ciencias de la Salud, Granada, España)
Microbial natural products as a source of anti-cancer agents

P15 Ruta Navakauskiene (Dep.of Mol. Cell Biology, Institute of Biochemistry, Vilnius University, Lithuania)
Proteomic Analysis of Cytosolic and Nuclear Proteins of Human CD34+ Hematopoietic Progenitor Cells, Myeloid Leukemia Cell Line KG1 and Mature Human Neutrophils

Detecting Heavy Metals Associated Genotoxicity in Plant Model Systems

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People are continuously exposed exogenously to varying amounts of chemicals that have been shown to have carcinogenic or mutagenic properties in experimental systems. Since 1971, more than 900 agents have been evaluated of which more than 400 have been identified as carcinogenic, probably carcinogenic, or possibly carcinogenic to humans. Some trace elements such as arsenic and some heavy metals such as cadmium and lead are considered by International Agency for Research on Cancer (IARC) to be either known or suspected human carcinogens at specific doses of exposure. Others, such as selenium, copper, iron and zinc, may plausibly be associated with cancer risk given by their biological roles.

Detrimental effects of heavy metals on human health are linked to many diseases (e.g. diabetes, hypertension, myocardial infarction and certain types of cancer). Consumption of plants that accumulate heavy metals or the toxic metalloid arsenic represents a serious risk for the intake of these non-essential toxic compounds (e.g. cadmium, lead, mercury, and arsenic) and once inside the body they interfere with normal biochemical function of essential metals.

Structural changes to the integrity of DNA caused by DNA-damaging agents are useful endpoints for assessing exposure to hazardous environmental pollutants on human health and biota. Studies employing molecular biomarkers suggest that individuals may differ in their susceptibility to these carcinogens, and genetic polymorphisms may contribute to this variability. Because both genetic and environmental factors influence the levels of enzymes that metabolically activate and detoxify chemicals, they can also influence carcinogenic risk. Many of the phenotypes of cancer cells can be the result of mutations, i.e., changes in the nucleotide sequence of DNA that accumulate as tumors progress. These can arise as a result of DNA damage or by the incorporation of non-complementary nucleotides during DNA synthetic processes.

In this study we evaluated the application of Random Amplified Polymorphic DNA (RAPD) as molecular marker to detect DNA damage in plant model systems caused by environmental pollutants as heavy metals are. Differences in obtain RAPD profiles can clearly be shown when comparing "DNA fingerprints" from individuals exposed and non-exposed to genotoxic agents. Results showed that RAPD-PCR technique is a powerful tool for screening DNA damage induced by non-lethal levels of organic and inorganic contaminants. A further consideration is that changes in the DNA fingerprints obtained may be used to identify target genes for particular genotoxic agents; this will open up possibilities of designing specific assays for detection of specific agents and may help explain the presence in the genome of preferential mutation points.

Keywords: genotoxicity, cancer, heavy metals