

the formation of single strand breaks and micronuclei after 24 h. The effects of binary mixtures were similar to those obtained with the corresponding concentrations of CYN alone. Also the trend of gene deregulation induced by the binary mixture was comparable to that induced by CYN alone. We can conclude that non-cytotoxic concentrations of CYN and MCLR in binary mixtures do not exhibit synergistic or potentiating genotoxic effects in HepG2 cells.

**Acknowledgments:** Slovenian Research Agency (MR-KHercog, ProgramP1-0245) and Spanish Ministry of Economy and Competitiveness (AGL2015-64558-R) for the financial support.

<http://dx.doi.org/10.1016/j.toxlet.2016.06.2088>

#### P24-005

##### Influence of decabrominated diphenyl ether on oxidative stress in brain caused by cadmium



M. Curcic<sup>1</sup>, A. Buha<sup>1,\*</sup>, V. Milovanovic<sup>1</sup>, M. Antunovic<sup>2</sup>, S. Djordjevic<sup>2</sup>, S. Vucinic<sup>2</sup>, D. Djukic Cosic<sup>1</sup>, Z. Bulat<sup>1</sup>, V. Matovic<sup>1</sup>, B. Antonijevic<sup>1</sup>

<sup>1</sup> Department of Toxicology “Akademik Danilo Soldatović”, University of Belgrade-Faculty of Pharmacy, Belgrade, Serbia

<sup>2</sup> Faculty of Medicine, Military Medical Academy, Belgrade, Serbia

The objective of this study was to assess BDE-209 influence on oxidative stress in rats brain caused by Cd. Effects were examined on male Wistar rats, weighing 200 g, exposed to dose of 1000 BDE-209/kg/day, to doses of 2.5, 7.5 and 15 mg Cd/kg/day and all three combinations, by gavages, during 28 days. Animals were treated according to the decision of the Ethics Committee of the Military Medical Academy, No. 9667-1/2011. Evaluation of the oxidative stress in brain was based on level of malondialdehyde (MDA), superoxide-dismutase (SOD) and –SH groups. Benchmark doses of 5% (BMD5) were calculated using PROAST software.

Cadmium caused slight decrease in MDA, while in combinations with BDE-209 caused effect same like dose of 2.5 mg Cd/kg/day. Cd did not cause significant difference in SOD comparing with controls; however in combination with BDE-209, dose dependent decrease was observed. Cadmium alone caused dose dependent increase in level of –SH groups. Addition of 1000 mg BDE-209 to whole dose range of Cd diminished its effect. The results of the present work add up to the issue of BDE-209 and Cd mixture toxicity profile with a focus on relationship between doses of and oxidative stress in brain. Effect of BDE-209 on Cd induced oxidative stress in brain homogenates could be interpreted by calculated BMD5, namely for single Cd it was 0.522 mg/kg/day while for Cd in combination with 1000 mg BDE-209 BMD5 was 0.138 mg Cd/kg/day indicating significant influence of BDE-209 on antioxidative system in brain [Project III 46009].

<http://dx.doi.org/10.1016/j.toxlet.2016.06.2089>

#### P24-006

##### EDCs mixture effects in human cell lines



E. Ribeiro<sup>1,2,3,4</sup>, C. Ladeira<sup>1,2,3,4,\*</sup>, S. Viegas<sup>1,2,3,4</sup>

<sup>1</sup> Environment and Health Research Group – Lisbon School of Health Technology, Lisbon, Portugal

<sup>2</sup> Research Center LEAF – Linking Landscape, Environment, Agriculture and Food – Instituto Superior de Agronomia, Lisbon University, Portugal

<sup>3</sup> Research Group in Genetics and Metabolism (GIGM), Lisbon School of Health Technology, Lisbon, Portugal

<sup>4</sup> Centro de Investigação em Saúde Pública, Escola Nacional de Saúde Pública, Lisbon, Portugal

Endocrine disrupting chemicals (EDCs) are exogenous agents commonly employed in a wide variety of consumer products and indoor/outdoor applications. Human exposure to these compounds either by environmental and/or occupational sources is omnipresent, persistent and occurs in complex mixtures which, therefore, can origin a mixed “body burden” of contaminants.

Extensive research in human cell lines, particularly from sex hormone responsive tissues, show that EDCs can simultaneously and differentially trigger specific signalling pathways, predominantly associated to estrogen receptors. Evidences demonstrate that EDCs endorse distinct cellular responses in different cell lines, however most of the studies have focused exclusively in the independent action of the tested compounds whereas information regarding EDCs mixtures effects is still scarce.

We performed a revision of the state of the art in Pubmed focused in studies that evaluate EDCs mixture effects. Based on published data a review of the utilized EDCs, tested doses, studied cell lines and observed effects of co-exposure studies is presented.

Although, the independent action of chemicals is still considered the main principle of EDCs mixture toxicity, evidences demonstrate that some effects cannot be predicted when analysing single compounds independently and thus it is undoubtedly that the daily doses of each compound are not the only one that can be taken in to consideration. There is an emergent concern that the current toxicological assessment based in a chemical-by-chemical approach may not be adequately protective in the context of EDCs mixtures and that recognizing potential aggregate and cumulative exposures are crucial for an adequate risk assessment.

<http://dx.doi.org/10.1016/j.toxlet.2016.06.2090>

#### P24-007

##### Chemical and *in vitro* toxicological analysis of the vapor from a novel tobacco vaporizer with tobacco capsule



Y. Takahashi<sup>1,\*</sup>, Y. Kanemaru<sup>1</sup>, T. Fukushima<sup>1</sup>, K. Eguchi<sup>2</sup>, J. Miller-Holt<sup>3</sup>

<sup>1</sup> Scientific Product Assessment Center, R&D group, Japan Tobacco Inc., Kanagawa, Japan

<sup>2</sup> Product Quality Research Center, R&D group, Japan Tobacco Inc., Kanagawa, Japan

<sup>3</sup> Scientific and Regulatory Affairs, JT International S.A., Geneva, Switzerland

There has been a rapid increase in the prevalence of new and emerging tobacco and nicotine containing products, primarily e-cigarettes and heated tobacco products. The novel tobacco vaporizer (NTV) generates a nicotine-free liquid vapor via electrical heating. The vapor subsequently passes through tobacco capsules