

13th INTERNATIONAL
CONGRESS
OF THE SERBIAN SOCIETY
OF TOXICOLOGY



1st TOXSEE
REGIONAL
CONFERENCE

Present and Future of toxicology: Challenges and opportunities



10 - 12 May, 2023 Belgrade

electronic

ABSTRACT
BOOK

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13th INTERNATIONAL
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&

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Erasmus+ projekt
u oblasti obrazovanja odraslih

DEAR COLLEAGUES, DEAR FRIENDS,

We are delighted to greet you on the **13th International Congress of the Serbian Society of Toxicology & 1. TOXSEE Regional Conference - Present and Future of toxicology: challenges and opportunities**, organized in Belgrade from 10-12 May 2023.

Five years after our last international Congress we gathered in Belgrade, to further promote contemporary toxicology, in the broadest sense of meaning, as a response to the new challenges requiring innovative approaches and solutions, as it is understood in the third decade of the XXI century.

Initial concept, to blend the top scientific level in toxicology with the potentials of its' use in broad array of clinical and other domains, proved to be right. Line-up of more than 70 first class international and regional faculties as well as best Serbian scientists and toxicology professionals in all related domains fully justify the approach. Moreover, interest and presence of more than 250 colleagues from Serbia and region witness that our professional community has recognized the approach taken and shown vast interest.

The Serbian Society of Toxicology is committed to innovation and creativity in research and education, in cooperation with collegial associations and institutions in Serbia and abroad. As a regional leader, we developed and inaugurated the regional brand TOXSEE, with the idea to gather as much as possible expertise and know-how from the region and Europe, to capture knowledge, share experience and exchange practical skills with colleagues who deal with toxicology problems daily.

Time imposes on us the need to integrate science, top knowledge and daily practice in a quality and efficient way, to contribute to the better health of the society as a whole in the most purposeful manner. Therefore, a thematic and functional connections with domains of emergency medicine, general medicine, paediatrics, ecology, in addition to already standard toxicological disciplines i.e. clinical, forensic, occupational, and experimental toxicology have been enhanced.

We are glad to host you in a pleasant atmosphere of Belgrade in mid-May, to benefit from the attractive and dynamic program, exchange knowledge, and, equally important, to refresh existing and establish new contacts with colleagues and friends, while enjoying our hospitality and cherish the moment in one of the best partying cities of Europe.

YOU ARE MOST WELCOME!!!



Prof. dr Petar Bulat

- President of the STC
- President of the 13th STC Congress

Petar Bulat



Prof. dr Biljana Antonijević

- President of the CSC
- of the 13th STC Congress

B. Antonijević



Prof. dr Predrag Vukomanović

- President of the COC
- of the 13th STC Congress

P. Vukomanović

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DETECTION OF DOUBLE-STRAND BREAKS IN DNA MOLECULES BY THE γ H2AX ASSAY AND ANALYSIS OF THE CELL CYCLE AFTER TREATMENT WITH POTENTIAL ANTITUMOR AGENTS TBQ AND ITS ALKYLTHIO AND ARYLTHIO DERIVATIVES

GENOTOXICOLOGY
AND CARCINOGENICITY

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2-tert-butyl-1,4-benzoquinone (TBQ) and its alkylthio and arylthio derivatives: 2-tert-butyl-5-(isopropylthio)-1,4-benzoquinone, 2-tert-butyl-5-(propylthio)-1,4-benzoquinone, 2-tert-butyl-5,6-(ethylenedithio)-1,4-benzoquinone, 2-tert-butyl-5-(phenylthio)-1,4-benzoquinone and 2-tert-butyl-6-(phenylthio)-1,4-benzoquinone were synthesized as analogs of biologically active compounds of natural origin with antitumor activity: quinone avarol/avarone.

The γ H2AX test was used to detect the potential genotoxic effect of TBQ and its derivatives in the HepG2 cell line. In addition, the effect of these substances on the cell cycle was monitored on the same HepG2 model system. Since the phosphorylation of histone H2AX is an early event in the cellular response to DNA double-strand breaks (DSBs), an assay based on the detection of phosphorylated histone H2AX (γ H2AX) can be used as a biomarker of genotoxicity and genomic instability. In this work, the γ H2AX test and flow cytometry were used to analyze the genotoxic potential and the effect on the cell cycle of TBQ and its derivatives.



Double-strand breaks (DSBs) in DNA are detected with γ H2AX-specific antibodies, and the cell cycle in the HepG2 cell line is analyzed by flow cytometry. Based on the obtained results, only 2-tert-butyl-5,6-(ethylenedithio)-1,4-benzoquinone induced increased formation of DSBs.

Also, the same derivative caused a significantly greater arrest of cells in the G2/M phase of the cell cycle compared to TBQ from about 27% (TBQ) to 34% of the total population with a decrease in the S phase cell population. By forming DSBs, 2-tert-butyl-5,6-(ethylenedithio)-1,4-benzoquinone leads to genomic instability of the HepG2 cell line, which results in cell cycle arrest in the G2/M phase.

KEYWORDS: TBQ, γ H2AX assay, DSBs, cell cycle