

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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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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CITOTOKSIČNI I GENOTOKSIČNI POTENCIJAL KOMPOZITA NA BAZI NANOČESTICA RESVERATROLA I SELENA, I NJEGOVA SPOSOBNOST INDUKCIJE SUPEROKSIDNIH ANJONA

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Kontinuirano interesovanje za nanočestice različitih materijala i njihove kompozite stvorilo je brojna pitanja u vezi njihove potencijalne toksičnosti. Polifenol resveratrol i jedinjenja sa selenom su među agensima čijoj je upotrebi nanotehnologija omogućila nov pristup. U formi nanočestica, oni pokazuju poboljšanu biokompatibilnost i biološke efekte, kao što je antimikrobna aktivnost.

Na osnovu podataka iz literature, nanočestice selena su najčešće manje toksične nego jedinjenja sa selenom. U našem istraživanju, najpre smo pripremili kompozitni materijal na bazi selena i resveratrola.

Nakon toga, kompozit i njegove komponente bili su testirani pomoću MTT tetrazolijumske boje za utvrđivanje citotoksičnosti, komet testom na genotoksičnost i nitroplavo-tetrazolijumskim testom za procenu nivoa superoksidnih anjona. U svim eksperimentima je korišćena zdrava ćelijska linija fibroblasta čoveka (MRC-5). Rezultati su pokazali da, iako čestice resveratrola ispoljavaju citotoksičnost u koncentracijama preko 12 µg/ml, one nisu genotoksične i ne indukuju stvaranje superoksidnih anjona. Sa druge strane, nanočestice selena nisu bile citotoksične ispod 150 µg/ml, ali su njima tretirane ćelije pokazale znake oštećenja DNK i povećanje produkcije superoksidnih anjona, čak i na 18 µg/ml. Kompozit je pokazao drugačije efekte, indukujući višu citotoksičnost i oksidativni stres nego ekvivalentne koncentracije komponenti, ali istovremeno nije bio genotoksičan. Moguće je da su interakcije nanočestica selena sa nanočesticama resveratrola dovele do pojave jedinstvenih osobina kompozita, potvrđujući izuzetnu važnost testiranja nanokompozitnih materijala uporedo sa njihovim komponentama.

KLJUČNE REČI: nanočestice selena, resveratrol, kompozitni materijali, citotoksičnost, komet test, antioksidansi



CYTOTOXIC AND GENOTOXIC POTENTIAL OF COMPOSITE BASED ON RESVERATROL AND SELENIUM NANOPARTICLES, AND IT'S POTENTIAL FOR SUPEROXIDE ANION INDUCTION

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The continuous interest in engineered nanoparticles of various materials, and their composites, has raised numerous questions regarding their toxicological profiles. Polyphenol resveratrol and selenium compounds are among the agents to which nanotechnology has given all new approach. Their particulate forms possess improved bioavailability and biological effects, such as antibacterial activity. Furthermore, selenium nanoparticles usually have significantly lower toxicity compared to selenium compounds. In this study, we prepared composite material consisting of selenium and resveratrol nanoparticles.

Then, composite material and its components were assessed by using tetrazolium MTT dye for determining cytotoxicity, comet assay for genotoxicity study, and nitroblue tetrazolium assay (NBT) assay to estimate levels of superoxide anions. The normal human fibroblast cells (MRC-5) were used in all the experiments. Results showed that, although the resveratrol component exhibited cytotoxicity at 12 µg/ml, it was not genotoxic, and did not induce superoxide anion production. Selenium nanoparticles, on the other hand, were not cytotoxic below 150 µg/ml, but treated cells showed signs of DNA damage and elevation in superoxide anion production even at 18 µg/ml. Composite material behaved differently, inducing higher cytotoxicity and oxidative stress than comparable concentrations of components, but also showed lack of genotoxicity. Possible interactions of selenium nanoparticles with resveratrol nanoparticles could have created unique composite properties, confirming the great importance of toxicity testing of nanocomposite materials along with their components.

KEYWORDS: selenium nanoparticles, resveratrol, composite materials, cytotoxicity testing, comet assay, antioxidants



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