Serbian Biochemical Society

President: Marija Gavrović-Jankulović
Vice-president: Suzana Jovanović-Šanta
General Secretary: Isidora Protić-Rosić
Treasurer: Milica Popović

Proceedings

Editor: Ivan Spasojević
Technical support: Jelena Korać Jačić
Cover design: Zoran Beloševac
Publisher: Faculty of Chemistry, Serbian Biochemical Society
Printed by: Colorgrafx, Belgrade

Serbian Biochemical Society
Eleventh Conference

Scientific meeting of an international character

September 22nd and 23rd, 2022, Novi Sad, Serbia

"***Amazing Biochemistry"***

Cisplatin-ibuprofen conjugate free and immobilised in mesoporous silica nanoparticle SBA-15 indicate high antiproliferative potential on mouse cancer cell lines

Teodora Komazec[1*], Dijana Drača[1], Sanja Mijatović[1], Ivana Predarska[2,3], Goran N. Kaluđerović[2], Evamarie Hey-Hawkins[3], Danijela Maksimović-Ivanić[1]

[1]Department of Immunology, Institute for Biological Research "Siniša Stanković", National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia
[2]Department of Engineering and Natural Sciences, University of Applied Sciences Merseburg, Merseburg, Germany
[3]Faculty of Chemistry and Mineralogy, Institute of Inorganic Chemistry, Leipzig University, Leipzig, Germany

[*]e-mail: teodora.komazec@ibiss.bg.ac.rs

From its discovery, cisplatin therapy has widely been associated with toxicity and severe side effects. Platinum(IV) complexes, as well as immobilising them in nanomaterials could help to overcome these problems. Cyclooxygenase-2 (COX-2) is involved in cancer progresssion,[1] which encourages the development of inhibitors of COX enzymes in antitumour therapy. To determine the potential cytotoxic effect, a cisplatin-ibuprofen conjugate in free form, as well as loaded into SBA-15 nanomaterial, was tested on 4T1, CT26, B16 and MC38 cell lines. The results of 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide and crystal violet viability assays showed that both agents dose-dependently decreased the number of viable cells of all tested cell lines. Flow cytometric analysis revealed significant decrease in the division potential of B16-treated cells. In further investigations, activation of caspases proved by ApoStat assay was noticed; however, apoptosis was not identified by flow cytometry in culture of treated B16 cells. Finally, light microscopy evaluation revealed the presence of enlarged cells with prominent heterochromatin foci in nuclei upon the treatment indicating that cells entered senescent state. High antitumour potential defined at the nanomolar concentration on mouse melanoma cells make cisplatin-ibuprofen a suitable candidate for further research.

Acknowledgements

This study was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia, grant number 451-03-68/2022-14/200007

References

1. Ulrich CM, Bigler J, Potter JD. Non-steroidal anti-inflammatory drugs for cancer prevention: promise, perils and pharmacogenetics. Nat Rev Canc 2006;6:130-40.