Serbian Biochemical Society
Eleventh Conference

Scientific meeting of an international character

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

"***Amazing Biochemistry"***

Prooxidative and antimigratory effects of cerium oxide nanoparticles on melanoma and pancreatic cancer cells

Jelena Žakula[1], Mirjana Miletić[2], Sonja Aškrabić[2], Snežana Pejić[1], Lela Korićanac[1*]

[1]*Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia*
[2]*Institute of Physics Belgrade, National Institute of the Republic of Serbia, University of Belgrade*

[*]*e-mail: lela@vinca.rs*

The development of new types of nanoparticles has become the focus of biomedical research in recent years. Cerium oxide nanoparticles (CONP) have shown particularly promising results as antitumor agents with a selective effect on tumor and normal cells. On the other side, melanoma and pancreatic carcinoma are among the most aggressive types of cancer with no satisfactory therapy[1,2]. Considering that, they represent important model systems for studying new treatment approaches. In this study, the antitumor potential of CONP (size below 10 nm) was studied on human A375 melanoma and PANC-1 pancreatic carcinoma cells. The obtained results indicated that analyzed CONP significantly inhibited clonogenic survival, with the number of colonies reduced on ~30% in A375 cells, while treated PANC-1 cells didn't form colonies. Growth inhibition was followed by G_2 cell cycle arrest (9% for A375, 17% for PANC-1). Percent of apoptotic PANC-1 cells was 38%, whereas ROS production increased for 78%. CONP significantly reduced metastatic potential through the decrease in cell migration and the increase in cell adhesiveness (up to 30 and 40% for A375 and PANC-1 respectively). These findings emphasize the significant CONP antitumor potential, based on the increase in ROS production, as well as a reduction of A375 and PANC-1 metastatic potential.

Acknowledgements

This study was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Grant No: 451-03-68/2022-14/200017).

References

1. Ali D, Alarifi S, Alkahtani S, AlKahtane A, Almalik A. Cerium oxide nanoparticles induce oxidative stress and genotoxicity in human skin melanoma cells. Cell Biochem Biophys 2015;71:1643-51.
2. Baskaran S, Bing-Huei C. An overview on recent in vivo biological application of cerium oxide nanoparticles. Asian J Pharm Sci 2020;15:558-75.

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

577.1(048)

SERBIAN Biochemical Society. Scientific meeting of an international character (11 ; 2022 ; Novi Sad)
"Amazing Biochemistry" : [proceedings] / Serbian Biochemical Society, Eleventh Conference, Scientific meeting of an international character, September 22nd and 23rd, 2022, Novi Sad, Serbia ; [editor Ivan Spasojević]. - Belgrade : Faculty of Chemistry : Serbian Biochemical Society, 2022 (Belgrade : Colorgrafx). - 165 str. ; 23 cm

Tiraž 150. - Str. 19: Foreword / Ivan Spasojević. - Bibliografija uz većinu radova.

ISBN 978-86-7220-124-6 (FOC)

a) Биохемија -- Апстракти

COBISS.SR-ID 73285385