MH P 3

Promene u HEL ćelijama kao rezultat uticaja kompleksa rutenijuma(II)

Milena P. Krstić, Sunčica Z. Borozan, Juan Francisco Santibanez*, Sofija P. Sovilj**, Sanja R. Grgurić-Šipka**

Fakultet veterinarske medicine, Univerzitet u Beogradu, Bulevar oslobodjenja 18, 11000 Beograd, Srbija

**Institut za medicinska istraživanja, P.O. Box 102, 11129 Beograd, Srbija*

***Hemijski fakultet, Univerzitet u Beogradu, P.O. Box 158, 11001 Beograd, Srbija*

Mnogi kompleksi rutenijuma(II) pokazali su izuzetnu citotoksicnost. U cilju istraživanja mehanizma delovanja ispitan je efekat kompleksa Ru(II) sa N-alkilfenotiazinima na HEL ćelije humane eritroleukemije. Primenom tri kompleksa Ru(II), opšte formule L[$RuCl_3(DMSO)_3$] **(1-3)**, gde je L protonovani hlorpromazin, trifluoperazin ili tioridazin, u koncentraciji 15 μM ispitan je uticaj na oksido-redukcione procese u proteinima i lipidima (sadržaj malondialdehida (MDA) i karbonilnih (CO) grupa) i aktivnost enzima antioksidativne odbrane (superoksidne-dismutaze (SOD), katalaze (CAT) i laktat-dehidrogenaze (LDH)) u HEL ćelijama. Svi kompleksi povećavaju aktivnost SOD, dok kompleks **3** inhibira 40% aktivnost CAT u poređenju sa kontrolnom grupom. Primenom svih kompleksa povećan je sadržaj MDA i CO grupa a rezultat su većeg stepena lipidne peroksidacije i oštećenja proteina. Ukupna aktivnost LDH povećana je primenom svih kompleksa, a kompleks **1** povećava njenu aktivnost 29%. Ovi rezultati ukazuju da kompleksi rutenijuma(II) oksido-redukcionim procesima dovode do apoptoze HEL ćelija.

Changes in the HEL cells as a result of the influence of the ruthenium(II) complexes

Milena P. Krstić, Sunčica Z. Borozan, Juan Francisco Santibanez*, Sofija P. Sovilj**, Sanja R. Grgurić-Šipka**

Faculty of Veterinary Medicine, University of Belgrade, Bulevar oslobodjenja 18, 11000 Belgrade, Serbia,

**Institute for Medical Research, P.O. Box 102, 11129 Belgrade, Serbia,*

***Faculty of Chemistry, University of Belgrade, P.O. Box 158, 11001 Belgrade, Serbia*

Many ruthenium(II) complexes have shown exceptional cytotoxicity. In order to examine the mechanism of action, the influence of complexes of Ru(II) with N-alkylphenothiazines in the human erythroleukemic cells HEL is examined. The three complexes, general formulae L[$RuCl_3(DMSO)_3$] (**1–3**), where L is protonated chlorpromazine, trifluoperazine or thioridazine, applied in concentration of 15 μM, are investigated on the oxidation-reduction processes in proteins and lipids (content of malondyaldehyde (MDA) and carbonyl groups (CO)) and activities of enzymes antioxidative defenses (superoxide dismutase (SOD), catalase (CAT) and lactate dehydrogenase (LDH)) in HEL cells. The complexes increased the activity of SOD, while complex **1** inhibited 40% of CAT activity compared to the control group. The higher level of MDA and content of CO groups are results from a great degree of lipid's peroxidation as well as great damage on the proteins by applying all complexes. The higher total LDH activity are noted using complexes, while complex **1** increased 29% activities of LDH. All of these results indicate that ruthenium(II) complexes through the oxidation-reduction processes lead to apoptosis of the HEL cell line

Acknowledgements: *This work was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Project No 172014).*