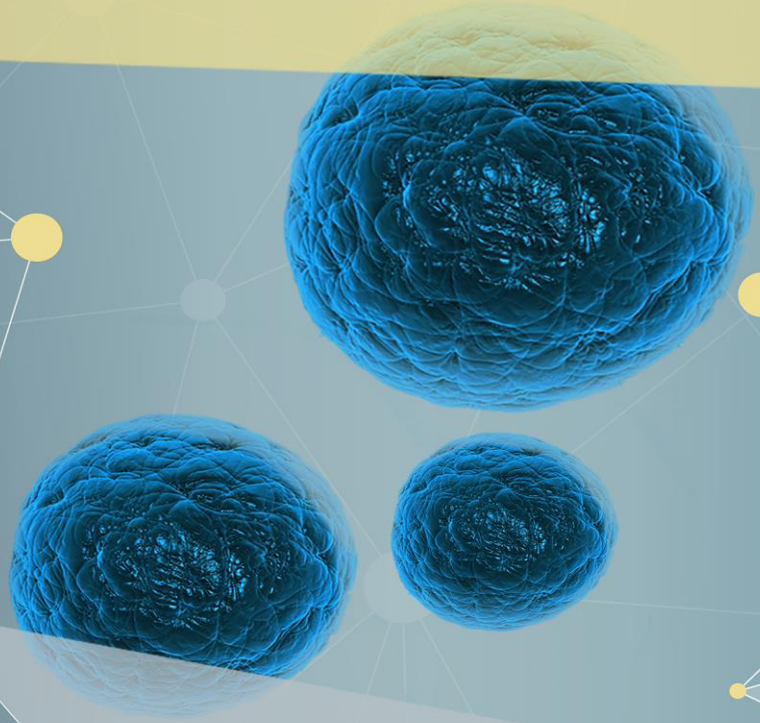
Serbian Association for Cancer Research

5th CONGRESS OF SDIR: TRANSLATIONAL POTENTIAL OF CANCER RESEARCH IN SERBIA

ABSTRACT BOOK



Virtual event
December 3

2021

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5th CONGRESS OF THE SERBIAN ASSOCIATION FOR CANCER RESEARCH

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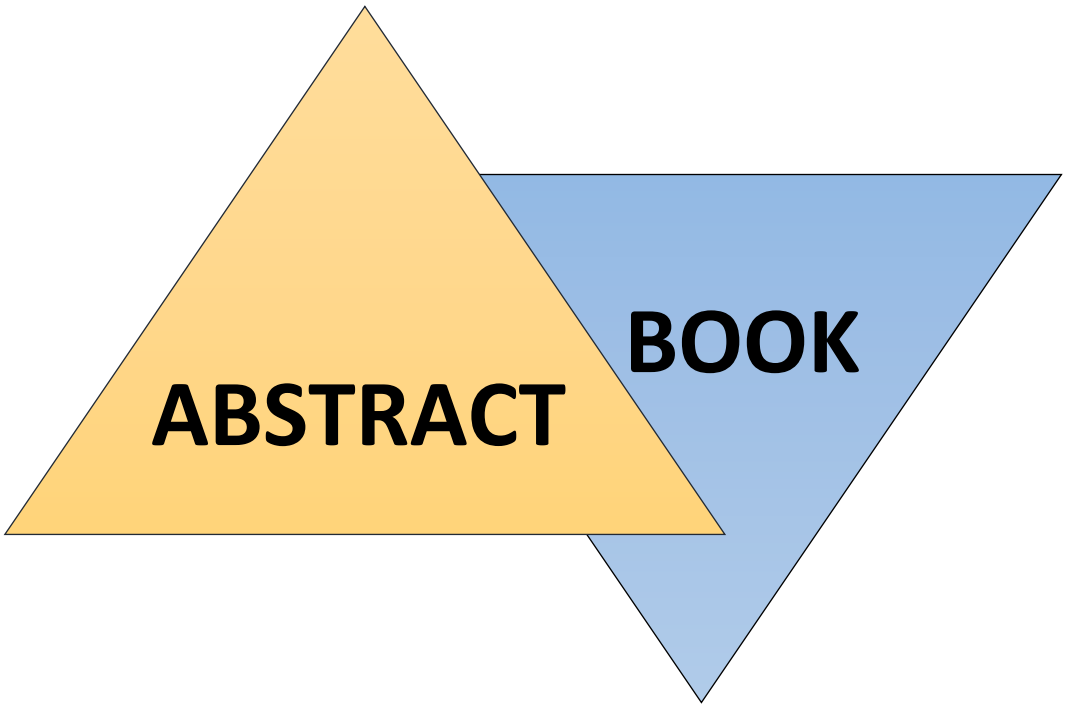

TRANSLATIONAL POTENTIAL OF CANCER RESEARCH IN SERBIA

SDIR – 5

Virtual event, December 3, 2021

THE FIFTH CONGRESS OF THE SERBIAN ASSOCIATION FOR CANCER RESEARCH

with international participation

"TRANSLATIONAL POTENTIAL OF CANCER RESEARCH IN SERBIA "

December 3, 2021, Virtual event

Serbian Association for Cancer Research (SDIR) is a member of the European Association for Cancer Research (EACR).

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dr sc. med. Mirjana Branković-Magić

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Ruthenium (II) complexes as promising candidates for cancer therapy

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Background: Acting as single compounds, both Ru(II) complexes and phenothiazines are considered promising anticancer drugs with inhibitory effects on cancer cell growth and differentiation. The complexes synthesized by a combination of Ru(II) with N-alkylphenothiazines (chlorpromazine hydrochloride (1), thioridazine hydrochloride (2) and trifluoperazine (3)) are reported to reduce the cell viability of some cancer cell lines. This study explored whether the selected complexes affect the redox homeostasis and genome integrity of normal human blood cells and induce inhibition of membrane-bound enzymes at pharmacologically relevant doses. **Material and Methods:** To evaluate the genotoxic potential of complexes, the incidences of micronuclei and cell proliferation index were investigated in cultured human peripheral blood lymphocytes. The redox modulating effects were examined by measuring the catalase activity and malondialdehyde level as a measure of oxidative stress. The influence of complexes on enzymes Na^+/K^+-ATPase and AChE bound to the cell membrane was also analyzed. **Results:** The selected complexes did not affect the activity of Na+/K+-ATPase, while AChE activity was inhibited in a dose-dependent manner. Furthermore, the results have shown that complexes 1 and 2 displayed cytotoxic and prooxidant action. Conversely, complex 3 disturbed the viability and redox homeostasis of the normal cells only at the highest concentration applied. **Conclusion:** According to our data, all investigated complexes have the potential for use in anticancer therapy. Complex 3 has shown the most promising effects and should be further examined as part of the novel therapeutic strategy to develop a more effective and less toxic therapeutic agent.

Keywords: Ruthenium (II), N-alkyl phenothiazine, cytotoxicity, redox homeostasis, anticancer agents


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