ÖSTERREICHISCHE CHEMIETAGE

September 20 - 22, 2022 | Vienna, Austria

Book of Abstracts

Austrian Chemical Society (GÖCH)

chemietage@goech.at

PO-017 Oxorhenium(V) complexes in the drug combination study

Tamara Petrović[a], Nevenka Gligorijević[b], Ferdinand Belaj[c], Sanja Grgurić-Šipka[a], Stefan Nikolić[d], Milena Krstić[e], Jelena Poljarević[a], Ljiljana E. Mihajlović-Lalić[d]

[a] University of Belgrade-Faculty of Chemistry, 11000 Belgrade, Serbia

[b] Institute for Oncology and Radiology of Serbia, 11000 Belgrade, Serbia

[c] Institute of Chemistry, University of Graz, 8010 Graz (Austria)

[d] Innovative centre, Faculty of Chemistry, 11000 Belgrade, Serbia

[e] Milena Krstić, Faculty of Veterinary Medicine, University of Belgrade, 11000 Belgrade, Serbia

Rhenium complexes merit particular attention in the area of metallodrug design due to rhenium's broad spectrum of oxidation states and consequently, the possibility to design compounds of a great structural diversity. Thus, the synthesis, chemical characterization and antitumor activity in vitro of the three Re(V) complexes is described. Novel compounds were obtained via reaction of $[ReOCl_3(PPh_3)_2]$ with corresponding ligands (pyridine-2-carboxylic acid, 3-methylpyridine-2-carboxylic acid and 6-methylpyridine-2-carboxylic acid) in acetonitrile at 78 ˚C for 3h. The complexes were fully characterized using NMR, IR, MS and elemental analysis. Their octahedral geometry with bidentate N^O ligand was confirmed by X-ray diffraction analysis. Antiproliferative effect was determined by MTT assay and only the complex with pyridine-2-carboxylic acid (**1**) showed dose-dependent cytotoxic potential, particularly toward triple-negative breast adenocarcinoma cells MDA-MB-231 with IC_{50} 68.90 ± 1.73 μM and pancreatic adenocarcinoma cells PANC-1 with IC_{50} 69.8 ± 2.3 μM. Drug combination studies in PANC-1 cells with **1** and Verapamil hydrochloride (VRP) showed slight arrest of cell cycle in the S phase and also it increase its antiproliferative potential to IC_{50} 51.4 ± 2.8 μM. Part of the research included a depletion of the glutathione (GSH) level by L-buthionine-sulfoximine (L-BSO) at sub-toxic concentrations (100 μM) in PANC-1 cells which caused an increase of activity of **1** to the IC_{50} 57.67 ± 6.51 μM.