P31. In Vitro Antioxidants and Antilipoxygenase Activity Of Some Thiosemicarbazones and Their Non-Platinum Coordination Compounds

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Various studies have shown that an important role in the initiation, promotion, and progression of several types of human cancers plays the oxygen free radicals (ROS), since they are involved in mutagenesis, apoptosis, ageing, and carcinogenesis. Many anticancer agents cause severe side-effects, which is due to its cytotoxic effect on normal cells. Therefore, the development of novel antioxidant chemotherapeutics is very important. In this sense, the non-platinum metal coordination compounds with macrocyclic ligands based on halogensemicarbazides are of great interest. They exhibiting nontrivial anticancer properties (potent inhibitors of the proliferation of breast cancer cells, prostate, liver, and other leukemias), exceeding tens and hundreds of times antitumor activity of doxorubicin - preparation currently used extensively in oncology.

The aim of present investigations was to investigate the antioxidant activity and antilipoxygenase activity of some non-platinum metal coordination compounds in vitro experiments. The total antioxidant activity of 18 coordination compounds of various concentrations was determined according to the method described by Re et al.(1999) with modifications. The lipoxygenase (LOX) activity was tested by the ferrithiocyanate (FTC) assay method of Weiqiang Luet al.(2013) with some modifications.

Analyzing the research results of ABTS test, we state that tested coordination compounds - CMT-104, CMC-38, CMT-122, CMT-67, CMG-17, CMD-8, CMA-4, CMC-4, CMG-69 - show the best antioxidant activity (IC_{50} was found to be in the range 1,0 - 9,1 μM) compared with trolox (33,3 μM), ascorbic acid (28,0 μM) and doxorubicin (9,3 μM). The compounds CMJ-33, CMSA-4, CMSA-21 and CMG-33 have a good antioxidant activity [IC_{50} – 16,0 - 16,7 μM]. The antioxidant activity of other coordination compounds is lower, comparable with the ascorbic acid and trolox. The research results of the lipoxygenase activity show that the complexes (CMC-4, CMC- 34, CMC-38, CMT-67, CMT-104, CMT-122, CMD-4, CMD-8, CMD-23, CMJ-33, CMC-4, CMC- 34, CMC-38) have a better result [IC_{50} – in the range 0.025 – 0.400 μM] in comparison with quercetin [IC_{50} - 15,6 μM].

Thus, the studied complexes because of their potential antioxidant properties can show chemopreventive effects through interference with ROS, which act as secondary messengers in signaling pathways crucial for cancer cell proliferation and invasion, and also by inhibiting inflammation and tumor promotion via deactivation of pro-oxidative enzymes, including inhibition of LOX-mediated arachidonic acid metabolism.

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