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Micromolecular inhibitors of superoxide radicals

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Abstract

Background: Currently, there is a growing interest in new copper (Cu^{2+}) heterocyclic coordination compounds (CC), isothiosemicarbazide derivatives, which demonstrated multiple beneficial properties, but their effect on reactions with free radicals such as the superoxide radical has not been investigated.

Material and methods: The action of new micromolecular complexes of copper (Cu^{2+}) chloride and bromide with methyl n- (prop-2-en-1-yl)-2- (pyridin-2-ylmethylidene) hydrazine carbimidothioate on capturing activity of the superoxide radical was determined by the spectrophotometric method *in vitro* experiments.

Results: It was established that the micromolecular complexes of copper (II) chloride and bromide with methyl n-(prop-2-en-1-yl)-2-(pyridin-2-ylmethylidene) hydrazine carbimidothioate have been found to possess strong superoxide radical inhibitor properties when interacting with a superoxide radical. In addition to this, the IC_{50} of the studied compounds depends on the nature of the acid-ligand in the internal sphere of the complex and increases in the following sequence: $\text{Cl}^- - \text{Br}^-$.

Conclusions: The established property of mentioned compounds is new, because their use as micromolecular inhibitors of superoxide radicals has not been described so far. The synthesized CC expand the arsenal of superoxide radical inhibitors with high biological activity. Their possible significance for the development of new treatment strategies for diseases associated with the overproduction of superoxide radicals is discussed.

Key words: superoxide radical inhibitors, coordination compounds, isothiosemicarbazide derivatives.

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