ABSTRACT

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Title of diploma thesis:	Study of the protective properties of the series of novel aroylhydrazone iron chelators against the oxidative stress-induced cardiomyocyte injury.

Oxidative stress is an imbalance between oxidants and antioxidants in favor of oxidants. In this process occurs the formation of reactive oxygen species (ROS) via the Haber-Weiss reaction, where a redox-active iron participates as the catalyst. ROS play an important role in the pathogenesis of many diseases, including cardiovascular diseases. After clarifying the role of iron in these processes, attention has focused on iron chelators. They may remove free iron ions, which thus cannot catalyse radical reactions, and prevent further development of oxidative damage to the myocardium.

The aim of this work was to study the cardioprotective effects of newly synthesized aroylhydrazone derivatives of iron chelator SIH against the toxic effects of hydrogen peroxide *in vitro*. Their own toxicities were also examined.

H9c2 cell line derived from rat embryonic cardiac myoblasts was used for evaluation of the protective and toxic effects of chelators. The evaluation was done using a cell viability assay based on the uptake of neutral red by living cells. Fluorescence microscopy was used for photographic documentation of stained cells with fluorescent probe JC-1.

The results showed that the reduced derivatives rSIH, rHAPI and rHPPI do not possess any cardioprotective effects. On the contrary, chelators BHPPI, 2API and 7HII showed better cardioprotective effects in comparison to reference chelator SIH. However, the inherent toxicity of these compounds was higher than of SIH. There was no tested chelator with a better ratio of cytoprotective effect and inherent toxicity than the reference chelator SIH.

However, this work brings a lot of findings that serve as feedback for colleagues in the chemical laboratory in planning syntheses of other promising derivatives.