

## ABSTRACT

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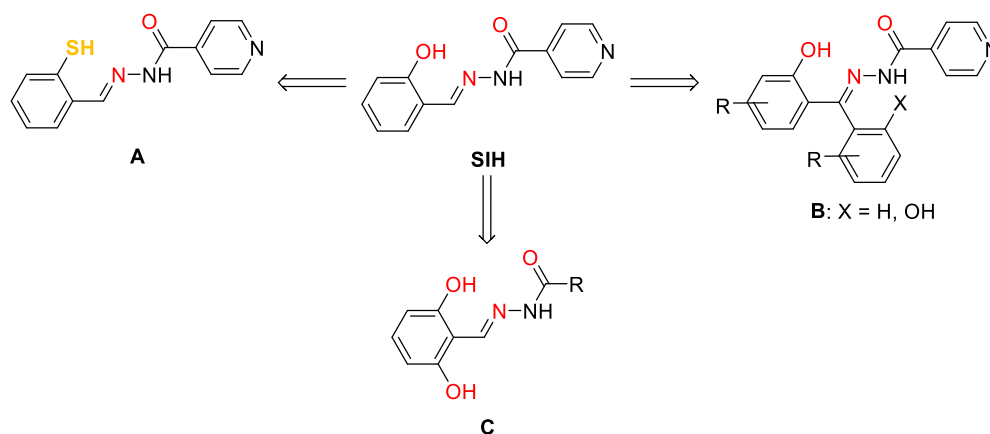
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Title of Diploma Thesis: Synthesis and *in vitro* evaluation of novel iron chelators based on salicylaldehyde isonicotinoyl hydrazone

Iron ions (Fe) are required in many vital processes. However, this transition metal may also catalyze reactions which results in the formation of toxic reactive oxygen species (ROS), e.g. Haber-Weiss reaction producing highly toxic hydroxyl radicals.

Salicylaldehyde isonicotinoyl hydrazone (SIH) is a tridental chelator selectively forming complexes with Fe ions. As a result of its low molecular weight and good lipophilicity, SIH can be administered orally. It readily enters the cells, effectively chelates the intracellular Fe ions, and is therefore able to very efficiently inhibit the Fe dependent processes, such as production of ROS, but also the synthesis of some proteins and enzymes and the processes they regulate (e.g., cellular growth and proliferation).

In this work we focused on the design, synthesis and *in vitro* evaluation of novel SIH analogues, in particular the thio analogue of SIH (thioSIH, **A**), analogues derived from (di)hydroxybenzophenone (**B**) and 2,6-dihydroxybenzaldehyde (**C**) (Figure 1).



**Figure 1.** Structures of SIH and its analogues studied in this work.

16 Analogues of SIH were successfully prepared and were evaluated for their ability to protect H9c2 cardiomyoblast cells against hydrogen peroxide-induced injury, their toxicity on the same cell line and their antiproliferative effects on HeLa (cervical cancer) cell line. Among the studied compounds, 2,6-dihydroxybenzaldehyde derivatives showed the most promising results.