# ABSTRACT

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| Title of diploma thesis: | *In vitro* study of novel derivatives of iron chelator salicylaldehyde isonicotinoyl hydrazone |


Heart disease is one of the most common causes of death and disability worldwide. Oxidative stress, which can also be generated or propagated by iron ions, plays an important role in the development of cardiovascular diseases. Excessive amounts of this metal lead to the apoptosis, necrosis, as well as recently described regulated cell death - ferroptosis. This type of cell death is associated with cardiomyocytes, but studies have also been described linking ferroptosis to other pathological conditions, such as cancer, nervous system disease, ischemia-reperfusion injury, kidney damage and blood disease. Therefore, research on iron chelators capable of forming a non-toxic complex with iron and thus preventing cell death is promising not only from the point of view of cardiovascular diseases.

This work is focused on the *in vitro* study of new potential iron chelators derived from the structure of salicylaldehyde isonicotinoyl hydrazone (SIH). SIH selectively and firmly chelates iron ions inside cells and by changing its molecule we wanted to obtain more advantageous properties. We tested a total of 9 new chelators and compared them with the properties of the reference substance SIH. The experiments were performed on the most frequently used cell line for the study of cardiovascular diseases, on rat H9c2 cardiomyoblasts. The protective properties of the substances were evaluated after 24 hours, the intrinsic toxicity of the substances was tested after 24 and 72 hours of incubation. Cell viability was assessed using a neutral red uptake assay. After analysis of the protective and toxic properties of the substances, we have identified several cytoprotective agents, however, none of the new tested derivatives showed better properties compared to SIH.