# ABSTRACT

Charles University

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Department of Pharmaceutical Chemistry and Pharmaceutical Analysis

**Title of diploma thesis**: Synthesis of thiazolidine-2,4-dione derivatives as potential drugs III

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The theoretical part is focused on the biological activity of thiazolidine-2,4-dione (TZD) derivatives, especially on their antibacterial (including antimycobacterial) and antifungal effects. The cited literature shows that in many cases the presence of an aromatically substituted thiazolidine-2,4-dione nucleus in the molecule conditions antimicrobial activity. TZD derivatives seem to be suitable candidates for the development of new drugs.

In the experimental part molecular docking of a series of 5-(hetero)arylmethylidenethiazolidine-2,4-diones, including the substances synthesized by us, was performed into the MurD ligase of *E. coli*.

Furthermore eleven syntheses of 5-(hetero)arylmethylidenethiazolidine-2,4-diones were performed using Knoevenagel condensation of TZD with (hetero)aromatic aldehydes. Ten products were successfully synthesized and were characterized by melting points, NMR, IR, and MS spectra, and their purity was verified by accomplishment of elemental analysis.

The obtained substances were tested *in vitro* against clinically important fungal and bacterial species (including mycobacteria). Interesting antimycobacterial activity was found. All mycobacterial strains showed some sensitivity to the prepared substances. Some compounds showed inhibitory activity comparable to standards. The compounds did not show significant activity in fungal and G+ and G- bacteria growth inhibition tests. The antimicrobial activity of the synthesized substances was compared with the biological activity of the appropriate rhodanine derivates as sulfur isosteres. TZDs showed lower

antibacterial and antifungal activity[1] but inhibited the growth of mycobacteria to a greater extent.