ABSTRACT

Charles University

Faculty of Pharmacy in Hradec Králové

Department of Pharmaceutical Chemistry and Pharmaceutical Analysis

Title of diploma thesis: Synthesis of thiazolidine derivatives as potential drugs

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The theoretical part was focused on the literature research on the biological activity of derivatives 2-thioxothiazolidine-4-one (rhodanine) and its oxygen isostere thiazolidine-2,4-dione. There was mainly the antibacterial, antimycobacterial, and antifungal activity of variously substituted rhodanine and thiazolidine-2,4-dione derivatives reported. These derivatives seem to be suitable candidates for the development of new drugs

Within the experimental part, an *in silico* study on molecular docking of a larger series of rhodanine and thiazolidine-2,4-dione derivatives prepared in this work and earlier was performed with MurD ligase of *E. coli* as a potential bacterial target.

On the whole, seventeen syntheses were performed in the laboratory using the Knoevenagel condensation of thiazolidine-2,4-dione or rhodanine with various aldehydes, nine reactions with the aim to obtain thiazolidine-2,4-dione derivatives and eight reactions withe the goal to get rhodanine derivatives. Eleven reactions afforded successfully six thiazolidine-2,4-dione derivatives and five rhodanine derivatives. Each product was characterized by melting point, NMR, IR, and MS spectra. The purity of the compounds was verified with elemental analysis and in case of two compounds using HPLC analysis.

The synthesized substances were subjected to *in vitro* biological testing for antibacterial, antimycobacterial, and antifungal activity against clinically significant pathogens. All tested compounds showed antimycobacterial activity. None of the substances showed inhibitory activity against G- bacteria, a total of eight substances showed some inhibition of G+ bacteria. Only three substances showed antifungal activity.