Abstract

Charles University, Faculty of Pharmacy in Hradec Králové

Department of Pharmaceutical Chemistry and Pharmaceutical Analysis

Thesis title: Design, synthesis and evaluation of pyridine derivatives as potential antimicrobial compounds

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Tuberculosis is a global problem even today. It is the second most common cause of death from infectious diseases according to the WHO and resistance to common antituberculosis drugs, which have been used in therapy for decades, increases. These facts are the main reasons why research into new potential drugs is needed.

This thesis presents design, synthesis and evaluation of antimicrobial properties of a series of substituted *N*-oxazolyl and *N*-thiazolyl carboxamides of different pyridinecarboxylic acids.

Final compounds were characterized by ^{1}H and ^{13}C-NMR spectroscopy, IR spectra, melting point and HRMS (High resolution mass spectrometry).

Obtained compounds were tested for *in vitro* activity against *M. tuberculosis* H37Rv, *M. tuberculosis* H37Ra and four other clinically less important mycobacterial strains. In addition, compounds were tested for antibacterial activity against four G+ and four G- bacterial strains, antifungal activity against yeasts and fungi, and finally cytotoxicity of the compounds using HepG2 cell line.

In general, oxazole-containing compounds showed high activity against mycobacteria, especially *Mycobacterium tuberculosis* (best MIC H37Ra = 3.13 μg/mL), including multidrug-resistant strains. Promising activity was also observed against various bacterial and fungal strains. None of the compounds was significantly cytotoxic against the HepG2 cell line.