

ABSTRACT

Charles University

Faculty of Pharmacy in Hradec Králové

Department of Biological and Medical Sciences

Study program: Bioanalytical laboratory diagnostics in healthcare

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Title of diploma thesis: *Mycobacterium tuberculosis* – structure and functions of the cell wall

Mycobacterium tuberculosis is an intracellular pathogen that causes a disease called tuberculosis, which, along with other selected diseases, is still one of the leading causes of mortality in the world. It is estimated that more than a million people succumb to the disease each year. The remarkable structure of the cell wall of mycobacteria has a great influence on the treatment of tuberculosis itself, together with the ever-increasing incidence of multidrug-resistant and extensively resistant strains, especially in *Mycobacterium tuberculosis*. The research of mycobacteria is given great attention. Efforts to find new substances with antimycobacterial effect acting on individual components of the cell wall, preferably on the cell wall as a complex, are actual and are part of national as well as international programs.

Theoretical part of this diploma thesis deals with current knowledge about mycobacteria with emphasis on cell wall, epidemiology of tuberculosis and current treatment of this infectious disease. Experimental part is based on the testing of newly synthesized substances with a potential antimycobacterial effect and the determination of their minimum inhibitory concentration using the microdilution broth method. A total of 73 substances were tested. Within the tested concentration range, antimycobacterial activity was demonstrated in 51 substances. For 30 substances out of the total number, a significant activity, $\leq 31.25 \mu\text{g/mL}$, was demonstrated. A total of 5 species of the genus *Mycobacterium* were used for testing. Part of the work is also a discussion summarizing the results and their relationship to the structures of the compounds.

Keywords: Mycobacteria, Tuberculosis, Cell wall, Antitubercotics, Microdilution broth method, Minimum inhibition concentration