ABSTRACT

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Cancer remains to be one of the leading causes of death worldwide. Despite the progress in anti-cancer treatment, therapy of cancer is still associated with many disadvantages including an absence of selectivity as a major issue. The aim in development of chemotherapeutic drugs is to prepare more selective and better tolerated anti-cancer agents.

Topoisomerases play an important role in the therapy of bacterial infections as well as anti-cancer treatment. Both types (human topo I and II) can be targeted during anti-cancer therapy. Isoform IIα is overexpressed during proliferation of the cell and therefore it is characteristic for cancer cells. Inhibition of this isoform leads to excessive DNA damage or to malfunctions during cell proliferation and consequently to cell apoptosis. This is why inhibitors of topoisomerase IIα are studied as candidates for anti-cancer therapy.

The aim of this work was to prepare three compounds that would be later tested for inhibitory activity on human topoisomerase IIα. Optimization of the reaction conditions was performed during the synthesis and successfully obtained compound was purified to allow further *in vitro* testing. Results of the testing and details regarding the synthetic procedures will be discussed in the thesis.