## Abstract

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Title of diploma thesis: Determination of potential cytotoxic effect of experimental substances *in vitro*

The subject of this master's thesis was to evaluate the cytotoxic potential of newly synthesized substances *in vitro* in the cell model HepG2, which is cell line obtained from a human liver carcinoma. These substances were synthesized within the Department of Organic and Bioorganic Chemistry at the Faculty of Pharmacy in Hradec Králové, Charles University (GUAM, GUAM-$NH_2$, THIOSEMIK, GUAM-2, GUAM-6, GUAM-11, GUAM-12, GUAM-18, GUAM-19, GUAM-2-1, GUAM-6-3). These substances are being investigated for assumed antimicrobial activity against G+ bacteria and fungi or for their ability to inhibit cholinesterases.

The commercial colorimetric method CellTiter 96® AQueous One Solution Cell Proliferation Assay was used for *in vitro* determination of cytotoxicity, the principle of which is to measure the metabolic activity of cells based on the reduction of the tetrazolium salt of MTS to coloured formazan. The half-maximal inhibitory concentration $IC_{50}$ was used to determine the number of viable cells and for evaluation of cytotoxic potential of the experimental substances on the HepG2 cell line. The obtained values were subsequently compared with drug standards – tamoxifen and amphotericin B.

The results obtained by carrying out the MTS assay showed that the relatively low $IC_{50}$ value of most experimental substances (below 100 μM) indicates their significant cytotoxic potential against the HepG2 cell line. The greatest cytotoxic potential against the HepG2 cell line was evaluated for GUAM-11. In contrast, substances GUAM-12, GUAM-$NH_2$, GUAM and THIOSEMIK with $IC_{50}$ values > 500 μM showed negligible cytotoxic potential against HepG2 cells.