

Abstract

Charles University

Faculty of Pharmacy in Hradec Králové

Department of Pharmacology & Toxicology

Student: Dominika Šebová

Supervisor: PharmDr. Lucie Smutná, Ph.D.

Title of diploma thesis: Testing of influence of newly synthesized compounds on viability of cells *in vitro*

Research and development of new substances intended for therapeutic use is very difficult and time consuming process. Preclinical and clinical studies are essential part of this process in order to ensure safety, efficacy and quality of a new drug.

This thesis is focused on cytotoxicity studies, that form important part of preclinical studies of a new substance. An effect of potential drugs was tested *in vitro* on a cellular model. Cells of the HepG2 cell line, derived from well-differentiated hepatocellular carcinoma, were used in our experiment. The monitored parameter was cell viability. During the experiment, 9 substances with 9 different concentrations in concentration range 1-1000 μM were tested. Substances, that were tested had antimycobacterial effect and their basic chemical structure was derived from the antituberculous drug isoniazide. Cell viability was monitored after 24 and 48 hours of incubation of individual substance with HepG2 cells. Cell viability was determined by using colorimetric MTS assay, in which the reagent is reduced on coloured product formazan only in viable cells.

The results of the experiment are shown on graphs as a dependence of the percentage of cell viability of the HepG2 cell line on the concentration of tested substance. The half maximal inhibitory concentration, IC_{50} , was calculated for all tested substances.

The results show that the substance HE-4H is practically non-toxic, other substances had cytotoxic effect only in high concentrations, in the order of magnitude of several hundreds to thousands μM , depending on the tested substance.