

Abstract

Charles University

Faculty of Pharmacy in Hradec Králové

Department of Pharmacology & Toxicology

Student: Eliška Bobková

Supervisor: PharmDr. Eduard Jirkovský, Ph.D.

Title of diploma thesis: The Effects of Quercetin on Cobalt Chloride Cytotoxicity in the H9c2 Cell Line

Cobalt is a chemical element found in nature and in the human body as part of vitamin B₁₂. In excessive amounts, it exerts cytotoxic effects on human cells. Quercetin is a flavonoid widely distributed in nature and is ingested by the human body through food. Possible beneficial effects of quercetin, such as on cardiac tissue, have been extensively studied. The aim of this study was to determine the IC₅₀ value for CoCl₂ and quercetin, followed by evaluating the protective effect of pretreatment with quercetin against CoCl₂-induced toxicity. The research was conducted on the H9c2 cell line. Cytotoxicity was assessed using the MTT assay. The results showed that exposure of H9c2 cells to CoCl₂ for 24 hours led to decreased viability at a concentration of 1 mM. Both dose and time dependence were demonstrated. However, cytotoxic effects of quercetin on the H9c2 cell line were not observed after 48 hours of exposure to concentrations ranging from 1 nM to 10 μM. After 24 hour pretreatment with quercetin at concentrations of 100 nM or 1 μM, followed by 24 hour co-incubation with CoCl₂ at concentrations ranging from 10 nM to 10 mM, revealed a protective effect of quercetin and suppression of CoCl₂-induced cytotoxicity across all tested concentrations