

ABSTRACT

Cancer is considered to be one of the most serious issues of medicine nowadays. Moreover, its incidence is still rising. Despite the huge progress in modern treatment methods, cancer therapy is still limited by many difficulties. This work focuses on the natural substances such as epigallocatechin gallate, caffeine, *Cannabis sativa* ethanol extract, *Origanum acutidens* water extract, *Mentha piperita* water extract and its effects on the human neuroblastoma cell line UKF-NB-4.

The first part of the bachelor thesis deals with determining the viability of human neuroblastoma cell line UKF-NB-4 exposed to tested substances as well as it studies the effects of those substances on the cell cycle and caspase activity. Finally, it was tested, whether those substances are able to induce apoptosis in neuroblastoma cell lines. Tests were undertaken on the MUSE™ cell analyzer and on the flow cytometer. The second part of the bachelor thesis focuses on the expression of protein p53 and retinoblastoma protein in neuroblastoma cell lines exposed to tested substances. Detection was carried out by Western blot analysis.

Epigallocatechin gallate exhibited the most significant effect on human neuroblastoma cell line. It lowers the expression of retinoblastoma protein as well as it arrests cells between G₀/G₁ and S phase of cell cycle. Epigallocatechin gallate does not seem to act as an apoptosis inductor, however it increases the expression of protein p53. When exposed to the other tested substances, there have not been objected any significant changes in human neuroblastoma cell line UKF-NB-4.

(In Czech)

key words: tissue culture cultivation, neuroblastoma, viability, epigallocatechin gallate, herb extracts