Summary

The aim of this work is to study properties of the transport of salicylic acid and its derivates across Caco-2 cell monolayers, an influence of possible inhibitors of cell transportation and a brief review of related issues. The influence of substance, which opens tight junctions between Caco-2 cells, so called absorption enhancers, is also examined. The main goal is to find out, what kind of transport takes the main part in salicylic acid transport and to compare the results to the data obtained using gentisic and 5-hydroxyisophthalic acid, and, at the same time, to study the influence of ethylenediaminetetraacetic acid as an absorption enhancer and to compare possible inhibitive effect of several compounds. It was assumed that both passive and active transport take part in the transport of salicylic acid.

The theoretical part of the thesis briefly summarizes chemical substances properties, which have an influence on their transport across cell membranes, introduces Caco-2 cells as an important instrument of drug absorption and distribution research, defines the individual types of cell transports and describes the types of transporter proteins which can be localized on the Caco-2 cell membrane.

The experimental part of the work describes the technique of Caco-2 cells cultivation and the process of transport experiments. Most of experiments were done at 37°C using a pH gradient – pH 5.5 on the apical side and pH 7.4 on the basolateral side of the membrane. The cell monolayer integrity was tested by measuring transepithelial electrical resistance and by using radio-labeled compound. The samples taken during experiment were analyzed by the high performance liquid chromatography. The amount of transported compound was quantified by the permeation coefficient and by the flux.

We can see from the results that both active and passive transport takes part in transport of salicylic acid and its derivates across the Caco-2 cell monolayer. The opening of tight junctions brought a noticeable increase of transfer of passively transported compounds; the difference was not so clear in salicylic acid results that support the hypothesis of transporter proteins involvement. The influence of inhibitive agents was obvious; the highest influence was achieved using 2-hydroxyisopropylbenzoic acid.