Effect of the concentration of amino-decorated polyamidoamine dendrimers with ethylenediamine core at the (trans)dermal delivery of 5-Fluorouracil

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Dendrimers are synthetic, symmetrically tree-like branched molecules. They are composed of repeating units (monomers). They have high density of surface functional groups and spherical shape in solution. Since their molecular weight is highly controllable, they are characterized by monodispersity and this is their main difference from classical polymers.

Dendrimers have a wide spectrum of applications in biomedicine. Due to the empty space between the branches of the molecule, they can encapsulate drugs, and by conjugation and complexation to the surface groups, they are able to carry even larger drug molecules. Thus, dendrimers can be used as drug delivery systems. In addition, they have been used for skin application of several active molecules, either as topical or transdermal delivery.

Suitable properties for (trans)dermal application have been demonstrated for dendrimers which consist of monomers with amine groups and are connected with amide bonds. The goal of this thesis was the preparation of dendrimers with these characteristics and the evaluation of their concentration influence to the permeability of 5-Fluorouracil (5-FU) to human skin.

Four generations of polyamidoaminodendrimers with ethylenediamine core and peripheric amino groups have been isolated and described in this thesis. Subsequently, *ex vivo* permeation experiments were performed using Franz diffusion cells. The results show that formulations of dendrimers with concentration 5 mg/ml G3-HCl and 10 mg/ml G2-HCl increase the deposition of 5-FU in epidermis while the concentration in the acceptor phase is minimal. Thus, the use of dendrimers can be suggested as a harmless and effective way of dermal 5-FU application.