

Abstract

Charles University

Faculty of Pharmacy in Hradec Králové

Department of Pharmaceutical Technology

Candidate: Pavel Hladký

Consultant: PharmDr. Barbora Švecová, Ph.D.

Title of Thesis: Formulation and (trans)dermal application of imiquimod

Imiquimod (IMQ) is an active pharmaceutical substance which belongs to the group of heterocyclic imidazoquinolines. The mechanism of its effect is an induction of cellular immune response after topical administration, that is used for a treatment of tumors or viral diseases of the skin. In the Czech Republic it is available like a cream called Aldara[®], the content of IMQ is 5 %. Although Aldara[®] is an effective medicine, many problems are associated with its use, especially high price, undesirable effects, disposable use, environmental pollution, etc.

The aim of this work was to prepare new liposomes for topical administration containing lower amount of IMQ (0.5 %) and evaluation of penetration of IMQ into human skin *in vitro*. To improve the entrance of the drug into the skin transdermal penetration enhancers were used.

Permeation experiments were performed in Franz diffusion cells on human skin under conditions as close as possible to the physiological environment of the organism. Subsequently, the individual layers of the skin (*stratum corneum*, the epidermis, the dermis and the part outside the application area) were analysed by HPLC.

Permeation experiments were evaluated in two schemes depending on the time of administration of liposomal formulations on the skin: after 8 and 24 hours. All tested formulations showed lower concentration of IMQ in all layers of skin after 8 hours of application compared to Aldara[®]. Prolongation of the application time to 24 hours, increased amount of IMQ in the target tissue (epidermis) just in case of the Aldara[®] cream.