

# **Abstract**

Charles University

Faculty of Pharmacy in Hradec Králové

Department of Pharmaceutical Technology

Candidate: Josef Girgel

Consultant: Doc. Dr. rer. Nat. Mgr. Jarmila Zbytovská

Title of thesis: Nanocarriers for dermal and transdermal drug delivery

The aim of this work was to map the literature and the most logically divide it and to elucidate the mechanisms of the carrier's interaction with the skin, the degree of their ability to penetrate the skin and to evaluate their potential to the next years.

Skin administration appears to be more advantageous way than others, mainly due to higher patient's compliance, avoiding the first pass effect of the liver, ensuring a stable blood concentration during transdermal administration and reducing adverse effect of the drug. However, the skin serves as an effective barrier to the external environment, especially its outermost layer called stratum corneum.

In a recent year, the interest of many research groups has focused on nanocarriers which are expected to deliver more efficient transport to and through the skin barrier due to their size ranging from tens to hundreds of nanometers. It has been confirmed that some of these carriers are able to permeate the skin. For metallic nanoparticles, their permeation is primary associated with toxicity and they are mostly used in medicine and industry. Lipid and some polymeric carriers are particularly interesting due to their biodegradability and non – toxicity.

In this thesis this issue is currently summarized. At the end of thesis, three citation and abstract databases (Web of Science, Scopus and PubMed) are compared to the number of articles published at selected time intervals. In addition, the results are mentioned from the patent database Derwent Innovation Index where is the current trend of nanocarriers development clearly visible over the 18 years.