

## **Abstract**

Charles University, Faculty of Pharmacy in Hradec Králové

Department of pharmaceutical technology

Candidate: **Omar Mahrous Farid Bataalla**

Supervisor: **PharmDr. Andrej Kováčik, Ph.D.**

Consultant: **Dr. Georgios Paraskevopoulos, PhD.**

Title of Thesis: **Effect of Glucosyl Sphingosine on the *stratum corneum* Permeability**

Glucosyl sphingosine (GSP) belongs to a large lysolipid subclass of sphingolipids, which is formed from ceramide (Cer) precursors by its hydrolysis. Patients with some skin diseases, such as atopic dermatitis, have lower amounts of barrier Cer in comparison to a healthy skin. As a result, they have higher quantity of GSP with low moisture content due to impaired barrier function. The aim of my work was to investigate the effect of GSP on skin permeability (in this thesis, the uppermost epidermal layer, the stratum corneum, was used) by using four permeability markers, trans-epidermal water loss (TEWL), electrical impedance, flux of theophylline and flux of indomethacin. The electrical impedance showed higher permeability to ions in tissues with GSP (statistically significant) in comparison to the controls. An addition of GSP also increased the permeability to water, small polar molecules and large lipophilic molecules (both statistically insignificant). I also investigated the role of GSP on the lipid chain order and microstructure of SC (studied by infrared spectroscopy). After the application of GSP, the lipid chain disorder partially increased (shift to higher wavenumbers). The general idea of this study was to confirm/disprove the effect of lysolipids on the skin permeability. The results could be useful for further study of human skin pathophysiology, *e.g.*, Gaucher disease or atopic dermatitis.