

## **Abstract**

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

Sphingosine phosphorylcholine (SPC) is a sphingolipid, which belongs to a lysolipid family. This compound, formed from ceramide precursor – sphingomyelin by the action of sphingomyelin deacylase, is composed of sphingoid base (*e.g.*, sphingosine) and phosphorylcholine moiety joined to a hydroxyl group. In this project, we studied how SPC influences the barrier function and microstructure of model *stratum corneum* (SC) membranes. Four permeability markers were used to study the permeability of SPC: electric impedance, trans-epidermal water loss (TEWL), flux of indomethacin and flux of theophylline. From this study we found out that the addition of SPC significantly increases the permeability to water and ions (increased values of TEWL and decreased values of electric impedance). This trend was also observed on third (permeability to theophylline) and fourth (permeability to indomethacin) permeation markers. The detrimental effect of SPC was also studied in biophysical experiments (infrared spectroscopy, FTIR). From methylene symmetric stretching of lipids in model SC membranes with an addition of SPC we observed (not significantly) the shift to higher wavenumbers, which suggest the less ordered chains of skin lipids in SC. This study could partially elucidate the role of lysolipids in some skin diseases and be helpful to clarify the understanding the lipid changes in pathology of the skin tissue.