



Factors affecting the microstructure and permeability of lipid model membranes

Diploma thesis

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Abstract

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The stratum corneum (SC), the epidermis' outermost layer, is critical for maintaining skin barrier function. The architecture of the SC is an important factor in skin moisture regulation. Free water (H_2O) can diffuse from the skin into the surrounding environment, whereas bound H_2O is associated with a variety of molecules, defined as natural moisturizing factors (NMF). This mixture of compounds includes amino acids, lactic acid, pyrrolidone carboxylic acid, glycerol, urea, and mineral ions.

The aim of this study was to investigate the potential effects of NMF components on lipid microstructure and permeability in model lipid membranes. The NMF chosen were pyrrolidone carboxylic acid, urocanic acid, glycerol, and urea with the goal of determining whether their presence can affect both lamellar and lateral organization of lipidic mixtures. The experiment showed that the NMF investigated were incapable of retaining H_2O at ambient humidity for an extended period. Furthermore, glycerol was the most effective NMF because glycerol containing lipidic membranes proved to absorb the maximum amount of H_2O and lose the least.