# Abstract

From the 50s to the 70s it has been shown that the human skin barrier primarily is located at the extracellular lipid matrix of stratum corneum. The barrier capacity is a function of the physical state and structural organization of extracellular lipid matrix. The lipid matrix is essentially composed of very long chain saturated ceramides, cholesterol and free fatty acids. Since then several models for the structure and function of the mammalien skin barrier have been proposed, but some main unsolved problems with respect to lipid organization still exit. Whether the extracellular lipid matrix is constituted by single gel-phase or if there is a coexistence of several crystalline (solid) and gel-phases, whether a separate fluid phase is present? Such a theoretical model may provide for a rational design of experimental studies on skin diseases, skin permeability, topical drug administration, skin protection, etc.

In this work we are using differential scanning calorimetry (DSC) to analyse the thermotropic phase behavior of cholesterol, synthetic ceramid and in vitro prepared mixtures composed of cholesterol, synthetic ceramid and oleic acid. We are using simplified models and we focus on the sample preparation method and on the effects of substances on the phase behaviour of the model.

The aim of this work is to find the most suitable conditions of the preparation of homogeneous and fully hydratred mixtures, to investigate the thermotropic phase behaviour of the samples by DSC and monitoring the samples by the light microscopy.