

## **Construction of evaluation method for human stratum corneum and screening method for percutaneous adsorption by Raman spectroscopy**

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In this study, lipid structural change was monitored using Raman spectroscopy during heat treatment, along with the impact of lipid states on the structural and physical properties during the preparation process of the intercellular lipid model (MODEL) in stratum corneum. Moreover we demonstrated the availability of the MODEL for an evaluation of skin permeation mechanisms for skin permeation enhancers. The lipid states in preparation process was monitored by valuable temperature (VT) -Raman spectroscopy and differential scanning calorimetry. The Raman spectra were analyzed by perturbation correlation two-dimensional correlation spectra. The microstructure of MODELS prepared different temperatures and the structural changes of MODELS after application of skin permeation enhancers (vesicle and micelle solution) were detected by small angle X-ray scattering and powder X-ray diffraction measurements. The microstructures of the MODEL changed depending on the melting of lipid ingredients in the preparation process. It was recognized that VT-Raman spectroscopy is a useful and attractive tool for the sensitive monitoring of lipid state changes and lipid melting. These results suggested that monitoring lipid structural changes during the heating step is important to precisely prepare target MODEL. The MODEL structure changed after application of skin permeation enhancers. Especially the vesicle solution that promote skin permeation of low molecular weight compounds rather than micelle solution, was made the model structure disorder. It is expected that the MODEL would apply for the elucidation of skin permeation mechanisms.