

STSM report

STSM Topic: Development and evaluation of analytical method for determination of ceramides in the human *stratum corneum*.

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Period: 10 May to 25 May 2014

Host: Prof. Swen Malte John, Institute for interdisciplinary dermatological prevention and rehabilitation (iDerm), University of Osnabrück, Sedanstraße 115, 49090 Osnabrück, Germany, johnderm@uos.de

Purpose of the STSM:

The goal of the proposed STSM was (1) to develop the analytical method for determination of ceramides in the human *stratum corneum*, (2) to learn about the skin barrier protection measures and (3) to analyze the samples if there is enough time remained. The developed method will be applied for assessment of human *stratum corneum* ceramide levels as a skin barrier biomarker in future irritation studies.

Work carried out during the STSM:

1. Optimization of sample preparation steps in particular different solvents and combination of solvents for the extraction of different ceramides from the tape strips. Furthermore we tested 3 different HPLC columns and optimized the chromatographic conditions concerning the composition and gradient of the mobile phase.
2. Learning about the skin barrier protection measures.

Main results obtained:

- The results revealed that at least 2 extraction steps are needed to reach sufficient recovery of the ceramides. The type of the HPLC columns (reversed phase C-18 column) showed the best chromatographic performance. The chromatographic

conditions concerning the composition and gradient of the mobile phase have been optimized enabling good separation and relatively short analysis (20 minutes per run). The more detailed validation of the analytical method such as day-to-day precision, intra-individual variation in the ceramide levels still has to be done.

- Learning about the main skin barrier protection measures.
I got acquainted with different measures which are utilized to protect skin barrier in the workplace.

Future collaboration with the host institution:

Further validation of the HPLC method will be performed at home Institution. If feasible I will assist by the analyzing of the samples from the on-going study. Furthermore, it might be interesting in the future work to see the efficacy of skin barrier protection measures for the maintenance of optimal levels of the skin lipids like ceramides.

Foreseen publications/articles resulting from the STSM:

The method will be used for the current study of the University of Osnabrueck on the individual risk factors for contact dermatitis. The samples are being collected and will be analyzed after completion of the study. The results will be published.

Confirmation by the host institution of the successful execution of the STSM:

This Scientific Report will be accompanied by Host Report confirming successful execution of this STSM.