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Measurement of skin surface biomarkers by Transdermal Analyses Patch following different in vivo models of irritation: a pilot study.

Falcone D, Spee P, Salk K, Peppelman M, van de Kerkhof PC, van Erp PE. *Skin Res Technol.* 2016 Nov 1. doi: 10.1111/srt.12340.

ABSTRACT

BACKGROUND/PURPOSE: FibroTx Transdermal Analyses Patch (TAP) is a novel technology for non-invasive measurements of protein biomarkers on the skin surface, in vivo. The aim of this study was to explore the potential of TAP in detecting skin surface biomarkers following mild perturbations, in vivo, using two experimental models: tape stripping, mimicking acute barrier disruption, and histamine iontophoresis, mimicking acute and local inflammation at minimal skin barrier insult. **METHODS:** Tape stripping and histamine iontophoresis were performed in two separate experiments on the volar forearm of healthy volunteers (n = 27 and n = 10, respectively). Biomarker levels were assessed with TAP at baseline and up to 72 h after stimulation. Functional (transepidermal water loss -TEWL- and a* value) and morphological (confocal reflectance microscopy -RCM) assessments were added in the tape stripping and histamine iontophoresis experiments, respectively. **RESULTS:** Cytokines IL-1 β and IL-1RA and the antimicrobial peptide hBD-1 showed distinct dynamics, despite substantial inter-individual variation in levels, with an increase following tape stripping and a decrease following histamine iontophoresis. These dynamics could be related to the assessments made by TEWL and RCM. In the tape stripping experiment, additional biomarkers could be detected. **CONCLUSION:** TAP measurements, especially IL-1 β , IL-1RA, and hBD-1, from the skin surface were sensitive enough for monitoring dynamic changes in the skin in the two models of skin perturbation. We conclude that TAP holds promise for non-invasively unraveling the dynamics of processes related to skin perturbation and repair. © 2016 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd. **KEYWORDS:** cytokines; histamine iontophoresis; skin irritation; stratum corneum; tape stripping PMID:27800639 DOI:10.1111/srt.12340