

The effect of soap versus alcohol cleansing on skin surface properties

Li, Ngai Ying Denise¹; Mortimer, Emily²; Hodgson, Daniel¹; Poon, Wilson¹; Brown, Sara²; Moore, David J.^{1,*} ECFP

- 1. Edinburgh Complex Fluids Partnership, University of Edinburgh, UK;
- 2. Centre for Genomic and Experimental Medicine, University of Edinburgh, UK

David.Moore@ed.ac.uk



THE UNIVERSITY of EDINBURGH

Introduction

Skin exposure and wettability

To investigate some effects of surfactant cleansers and ethanol exposure on the stratum corneum (SC), and its barrier properties, we utilised complimentary physical and chemical characterization techniques. This approach allowed us to probe changes in the bulk and surface properties, chemical composition, surface topology and skin barrier function of treated SC.

Contact angle (CA) measurements of Images taken water droplets on porcine skin were from 20 pixabay.com performed, where $CA = (\theta L + \theta R)/2$. Exposing solution ATR FTIR Cryo SEM Ethanol solution SDS solution VS spectroscopy (1) Cryo scanning electron microscopy (SEM) provides nanometre Attenuated total reflection Fourier Physical Compositional resolution images of the skin transform infrared (ATR FTIR) changes changes surface. spectroscopy probes the chemical

Skin exposed for 1 hour at 25 °C to either:

• 85% ethanol

(sees)

0.1% sodium dodecyl sulphate (SDS) • deionised water



composition of the skin surface and the first few microns of the SC.





FTIR spectra of porcine skin in the fingerprint region. Control curves



ATR FTIR spectroscopy (2) The O-H stretch peak overlaps with the N-H stretch peak. The intensity of this peak at ~ (a.u.) 3400 cm⁻¹ indicates changes to outer SC water content. All curves are normalised to amide Il peak (see arrow) set to 1.0.



Ethanol or water \rightarrow no





change in the water content of skin. SDS → increased water content of skin Rinsing SDS → water content more similar to none exposed skin compared to no rinsing

A) Smooth skin surface with no exposure B) Rough surface after SDS exposure C) Rough surface after ethanol exposure

34° Congress IFSCC Brazil | 14-17 October | Iguazu Falls **Biodiversity and Cosmetics: Reaching Sustainable Technology**



FSCC INTERNATIONAL FEDERATION OF SOCIETIES OF COSMETIC CHEMISTS

ORGANIZERS





A Casa da Cosmetologia