Validation of an ex vivo viable human skin method to predict biocide skin sensitization

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Objectives of the project:

- Develop and validate an analysis program to evaluate Langerhans cell migration in the epidermis of a human viable skin sensitization model (SSM) using different isothiazolinones (i.e., chloromethylisothiazolinone (CMI), methylisothiazolinone (MI), octylisothiazolinone (OIT) and benzisothiazolinone (BIT).
- Analyze the effect of these biocides on the expression profile of genes implicated in the sensitization pathway on primary skin cells (keratinocytes and fibroblasts) as well as a keratinocyte cell line (HaCaT) by real time qPCR.

Results:

A human viable skin sensitization model (SSM) was developed and validated to estimate the Langerhans cells (LC) migration over the epidermis in response to a treatment with four different biocides known as sensitizers. It confirms the sensitizing activities of CMI, MI, and OIT at all the concentrations tested that were above the maximal concentrations allowed in cosmetics. The SSM also demonstrated less variability than cell cultured model to assess skin sensitization based on the published literature.

Lastly, our results report for the first time the effect of BIT and OIT on primary skin cells, or keratinocytes and fibroblasts. The results are not detailed here, but overall they demonstrate that a high impact on cells may already be observed following a short exposure time.

The next steps would be to investigate the maximal concentrations inducing no LC migration over the epidermis in response to a short exposure to CMI, MI, OIT, and BIT. Likewise, the SSM should be tested using other biocide families and integrate the LC migration in dermis to optimize its relevance to optimize its suitability for use in the regulation of sensitizing chemicals.

This work will be published in a scientific journal at later stage.