
MICROBIOME FRIENDLY +

**The only in vitro microbiome friendly test
considering the host-microbe response.**

Clinically validated tests on lab-grown skin



LabSkin
SKIN SCIENCE ■

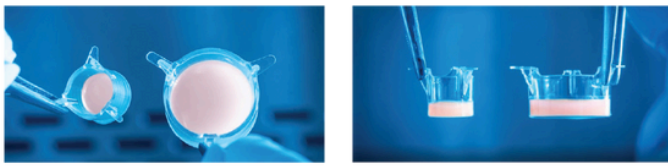
Assessing the skin microbiome through *in vitro* testing: a case study on the Microbiome Friendly + certification

Introduction/Background

In an effort to bring clarity to a potentially confusing field, LabSkin has developed the **Microbiome Friendly + certification**, a cutting-edge standard to assess a product's performance *in vitro* against a "normal" skin microbiome.

Performed on LabSkin, a full-thickness three dimensional human skin equivalent, the Microbiome Friendly + test leverages LabSkin's unique characteristics; its ability to be colonised with the skin's natural microbiota, assessing the *in vitro* potential of a product to impact the microbiome and the possibility to have a compliant product classified as "microbiome friendly".

This case study investigates the effect of two products, a Face Serum and a Cleanser, undergoing testing for the Microbiome Friendly + certification.



Results

The Microbiome Friendly controls yielded the expected results eliciting no biologically significant changes in any of the organisms, thus proving the test worked as intended.

The Face Serum yielded Log10 differences from the untreated of +0.11 for *S. epidermidis*, +0.17 for *C. striatum* and +0.11 for *C. acnes*.

The Cleanser yielded Log10 cfu/cm² differences from the untreated of +0.29 for *S. epidermidis*, -1.86 for *C. striatum* and -1.73 for *C. acnes*.

The advantages of colonising full-thickness skin models

In contrast to culture media-based models, which are generally not representative of real-world conditions, colonised 3D skin models offer several significant advantages. Broth or agar based methods are characterised by artificially high level of nutrients, and absence of signalling from the skin, while full-thickness colonised models represent a more holistic system for the testing of skin products.

Bacteria colonising 3D skin models, feed on natural food sources of the skin such as dead cells lipids, and other metabolic products.

The colonised model supports different growth requirements closely mimicking the host/microbiome interactions found on human skin, including the effect of the skin own cell's cytokines and chemokines on the microbiota.

Using a full thickness skin model it is possible to mimic the mechanical actions of certain products like wash-off or multiple treatments & wound healing.

Conclusions

According to the criteria the analysis showed the following

Face Serum: no biologically significant change on the 3X-Mix skin microbiome model thus the Face Serum is classified as microbiome friendly.

Cleanser: no biologically significant effect recorded for *S. epidermidis* however significant negative change effected on *C. striatum* and *C. acnes* thus the Cleanser is not classified as microbiome friendly.

The Face Serum is awarded the Microbiome Friendly + seal of approval and that can be use by the client in relation to the product tested.

The Cleanser is not awarded the seal however the results can further be investigated through cytokine analysis, immunohistochemistry and other advanced analyses.

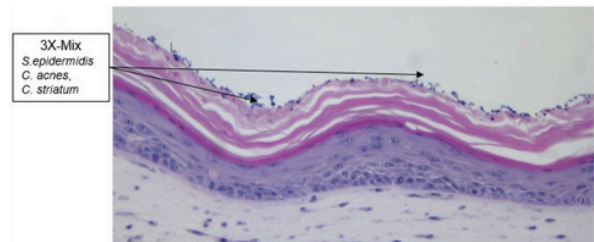
Method

Quintuplicate LabSkin₁₁ units were colonised with the 3X-Mix skin microbiome model, composed of *Staphylococcus epidermidis*, *Corynebacterium striatum* and *Cutibacterium acnes*. These bacteria are consistent as part of the normal skin flora of any generic body site.

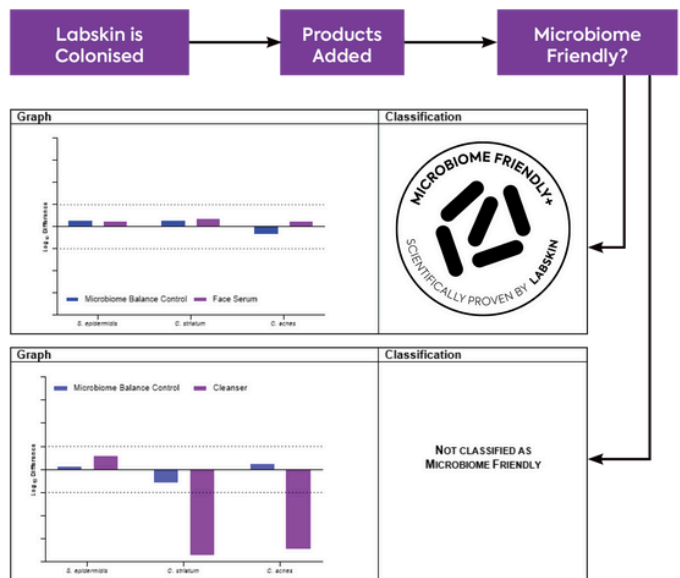
The LabSkin units were colonised with the 3X-Mix then 11µl of the test products (or Microbiome Friendly control) were aseptically applied and spread following the LabSkin Microbiome Friendly + methodology and the LabSkin₁₁ units were incubated at 37 ±2 °C in 5 ±1 % (v/v) CO₂ at ≥95% RH for 24 hours.

Biopsies were removed from each LabSkin₁₁ unit and used to assess viable microbial numbers (as colony forming units per square centimetre, cfu/cm²) via recovery on appropriate selective solid culture media. Mean cfu/cm² were converted to Log10 and used to calculate the Log10 difference between the product tested and an untreated control.

A product's microbiome friendly status is classified as the product effecting no biologically significant change on the levels of the 3X-Mix skin microbiome model colonising the LabSkin.



Results





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