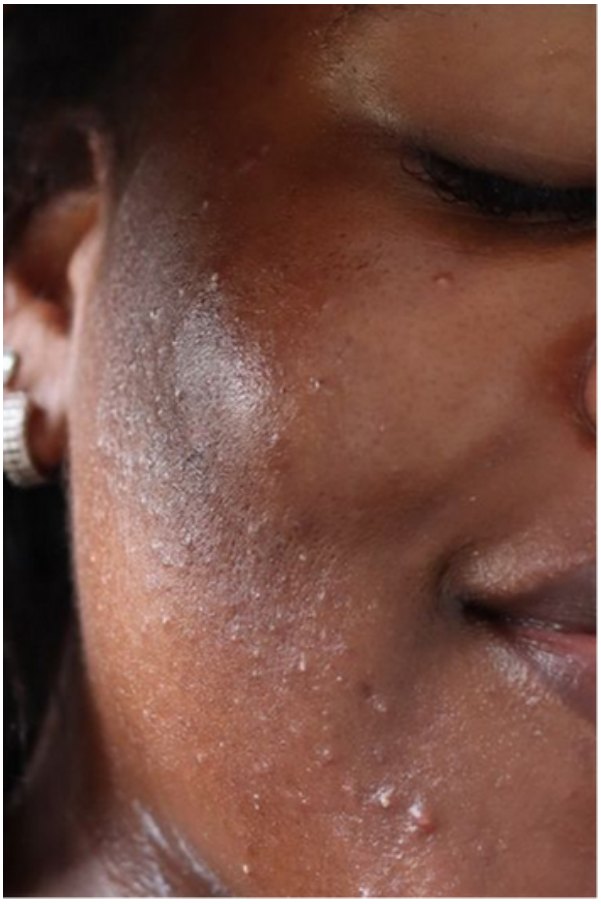
WHITEPAPER

Real life acne case study:

The effects of anti-acne products on a skin microbiome transplanted onto Labskin-S.

LabSkin
SKIN SCIENCE



THE MICROBIOME

The microbiome of a volunteer (26-year-old black female) was collected from the facial cheek area using a validated sampling method. A sterile stainless steel ring was placed against the cheek and 1mL of GS25 buffer was applied into the ring. The skin was agitated with a sterile perspex wand and the GS25 buffer containing the microbiome sample recovered.

The sample was transferred to the Labskin Limited laboratories at York. The microbiome sample was recovered and cultured on Labskin-S. The whole microbiome was cultured, but specific investigation was placed on Cutibacteria spp. as the bacteria responsible for an acne presentation when out of balance with the other skin microbiome.

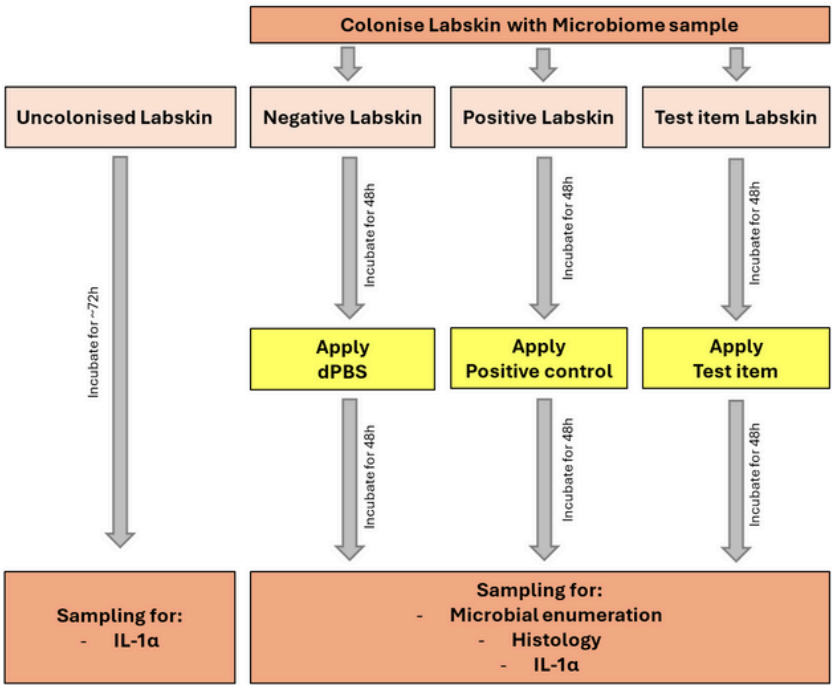
THE PROTOCOL

Labskin-S, consisting of a 1.1cm^2 surface area, were cultured to maturation with a 12-day air-liquid-interface to provide a dry top surface for microbiome and product applications. Each Labskin-S construct was colonized with an equal amount of microbiome sample, except for the uncolonized controls. All incubations were performed at 37 ◦ C/ 5% CO2.

Positive control – over the counter acne treatment containing 5% benzoyl peroxide.

Test item – volunteers preferred product for acne control. Contains 2% succinic acid, 2% colloidal sulphur and 1% salicylic acid

Selective agar media for Cutibacteria spp. was used to perform microbiology enumeration.

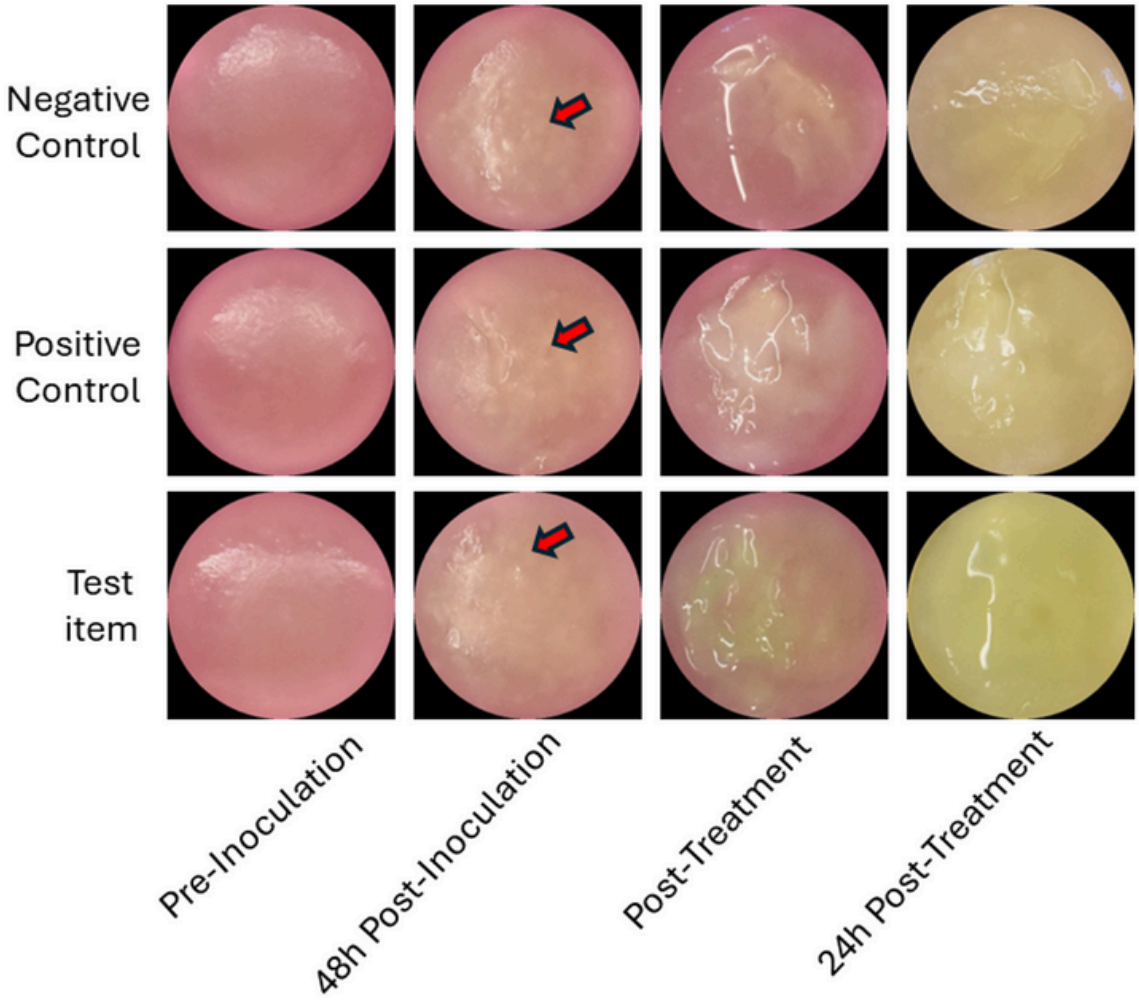


LabSkin
SKIN SCIENCE

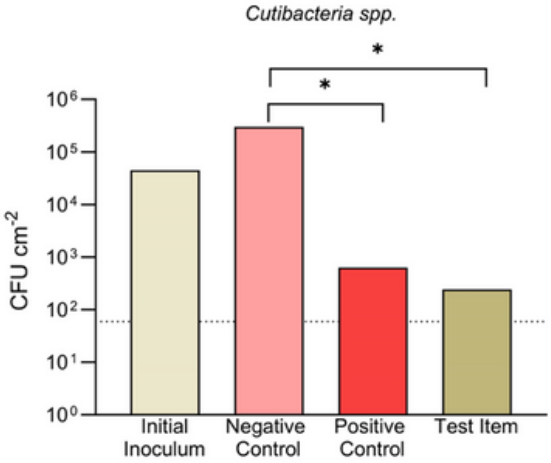
ASSESSMENT

The red arrow shows the formation of comedos (pimples) on the surface of the Labskin-**S**.

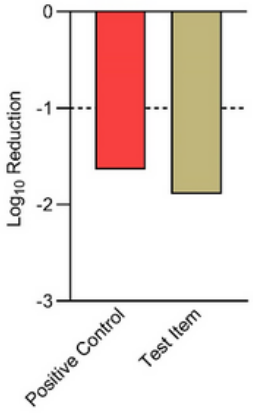
Macroscopic images



Microbiology assessment



Enumeration of Cutibacteria spp. (CFU cm-2) recovered from Labskin-S. Black dotted line represents the lower limit of detection (59 CFU cm-2).



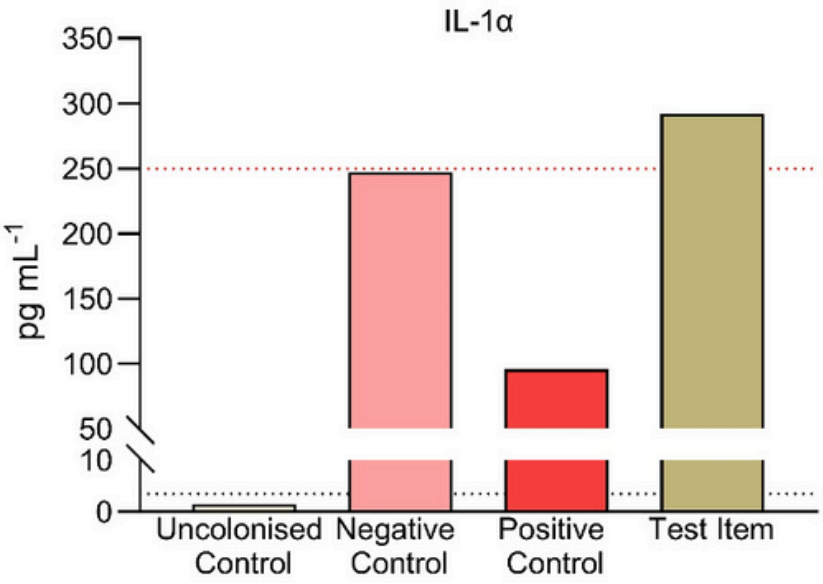
Log10 CFU cm-2 difference between the test item and Untreated control. Black dotted line represents the threshold of significant log difference.

LabSkin
SKIN SCIENCE

Microbiology results:
When compared to the negative control, both the positive control and test item contributed to a significant reduction in Cutibacteria spp. CFU counts.
When compared to the positive control, the test item contributed to a stronger reduction in Cutibacteria spp. CFU counts.

Immunology assessment

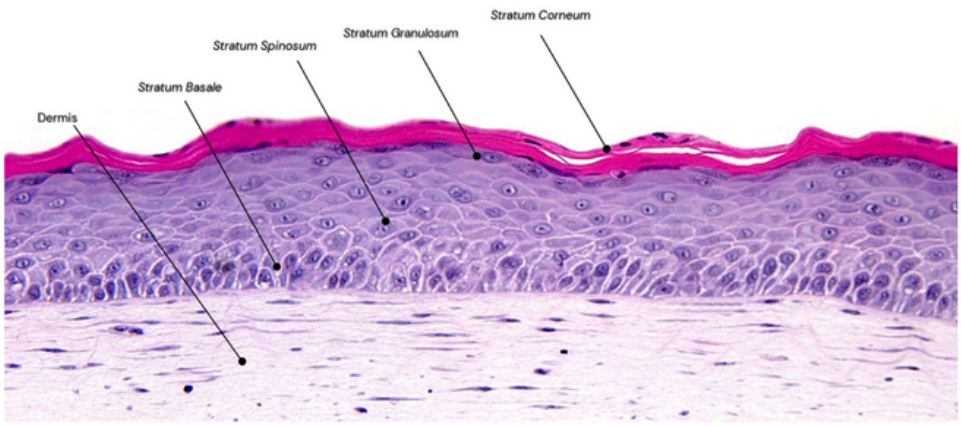
The undernatent from the microbiology assessment was evaluated for the presence of Il-1α (RnD Systems – Biotechne) a pro-inflammatory cytokine, a marker for irritation in the skin.



Immunology results
When compared to the untreated control, all test groups triggered a release of IL-1α pro-inflammatory cytokine.
The test item contributed to the largest release of IL-1α pro-inflammatory cytokine.

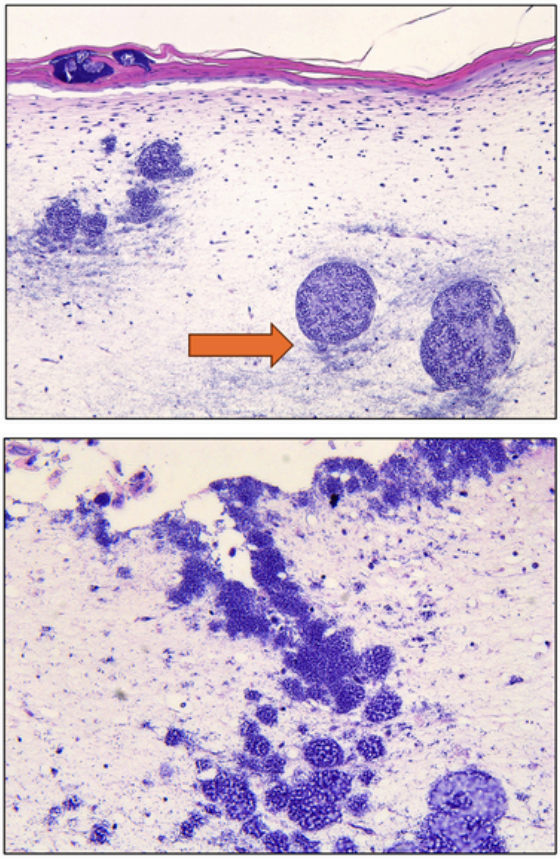
Histology Assessment

Formalin-fixed paraffin embedded (FFPE) full thickness biopsy samples from each Labskin-S constructs were sectioned and stained with Hematoxylin and Eosin (H&E).



H&E stained image of uncolonised Labskin-S showing the distinct layers of the epidermis and the fibroblast dermal layer.

LabSkin
SKIN SCIENCE



H&E images of Labskin-S samples colonised with the volunteer's skin microbiome samples. These images show the presence of Cutibacteria spp. in the samples, the successful creation of comedos in the dermis (orange arrow in the first image), and progressive infection of the Labskin-S constructs (second image).

CONCLUSIONS

We were successfully able to recover a skin microbiome sample and transfer it onto Labskin-**S** constructs.

An over-the-counter acne treatment and a blemish treatment, part of a best selling skincare range, were applied to the colonized Labskin-S constructs.

The blemish treatment contributed to a greater reduction in the number of recovered Cutibacteria spp. colonies. However, it also contributed to a larger release of pro-inflammatory IL-1α. This means that although this product may be effective in reducing the number of Cutibacteria spp. on the skin surface, it may cause a more irritating effect.

The Cutibacteria spp. in the skin microbiome sample was able to form comedos (pimples) in the Labskin-S constructs.

GET IN TOUCH

Ready to revolutionise your product testing with Labskin.

Talk to our expert team to find out how we can support your research and development needs.

www.labskin.co.uk

info@labskin.co.uk

+44 (0) 7387 001 146 (Office Line)

York Biotech Campus, Sand Hutton, York, England, YO41 1LZ