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The Influence of Microbiome-Based Skincare Containing Bifida Ferment Lysate on Acne Healing and Its Potential as an Adjunctive Anti-Acne Treatment

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Introduction

Cutibacterium acnes, Staphylococcus epidermidis, and *Corynebacterium striatum* are three main microbiotas on the skin that play an important role in skin health. Imbalance in skin microbiomes, especially increasing amounts of *C. acnes,* may contribute to acne pathogenesis. To address this issue, products with antibacterial properties are widely used to reduce an excess number of *C. acnes*. Nevertheless, it may cause skin irritation and disrupt the skin barrier.

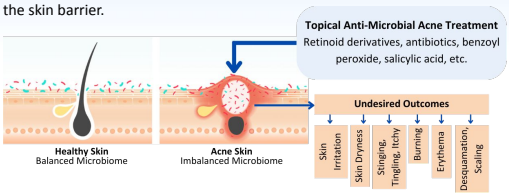


Figure 1. Influence of microbiome balance to acne pathogenesis and undesired outcomes of topical anti-acne treatment.

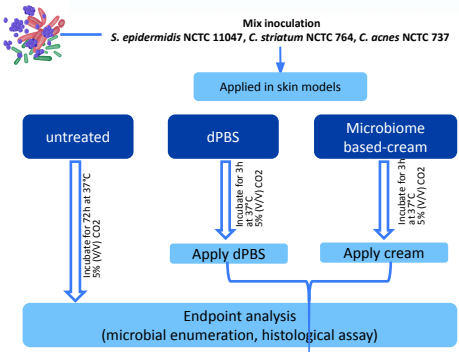
This study aims to investigate the impact of a skincare product containing microbiome ingredients on acne healing, both when used independently and in combination with anti-acne products.

Materials & Methods

Preparation of moisturizer cream

Cream containing:
- Bifida Ferment Lysate
- Prebiotic and Postbiotic Ingredients
- Moisturizers: humectant, emollient, occlusive agent
- No anti-bacterial ingredients

In-vitro microbiome study



In-vivo clinical study

Product safety and efficacy were assessed through instrumental measurement (Corneometer and Visioscan) and dermatological evaluation in 20 female volunteers having sensitive and acne-prone skin for 14 days.

The efficacy of the combined application of the product and anti-acne treatment (Benzoyl Peroxide) versus the anti-acne treatment alone was evaluated through a questionnaire in 40 female volunteers having acne-prone skin for 7 days.

Results & Discussion

The moisturizing cream, formulated with pH of 4.5-5.5 and viscosity of 5000 - 8000 cPs, underwent a 3-month accelerated stability test under various conditions. The stability test showed that the formula has a good stability profile.

In vitro assessment demonstrated that the cream has a statistically significant reduction in *C. acnes* and no significant change in *S. epidermidis* and *C. striatum*. On histological assay, there was no visible effect on the cutaneous structure of the skin model. It indicates the cream has the ability to regulate the excess number of *C. acnes* without impacting other skin microbiotas and also skin structure.

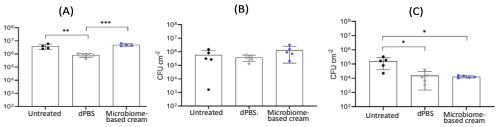


Figure 2. Cfu/cm² bacterial recovered from skin models. (A) *S. epidermidis*, (B) *C. striatum*, (C) *C. acnes*

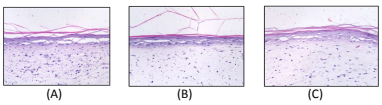


Figure 3. Representative images of skin models assay after colonisation and treatment. (A) Untreated, (B) dPBS, (C) Microbiome-based cream

Product safety was validated through dermatological assessment, confirming its **non-comedogenic** and **non-acnegenic** characteristics. Additionally, moisturizer cream showed a significant **improvement in skin moisture and smoothness** (**26.19% and 18.31% p<0.05**, respectively). This result indicates the cream could be potential as an adjunctive for anti-acne treatment and it was confirmed by the use test of microbiome-based cream with Benzoyl Peroxide as shown below.

Result of Benzoyl Peroxide + Microbiome-based Skincare for 7 Days Usage

Acne lesion number: **-29.41%**	Acne lesion size: **-55.49%**	Erythema value: **-36.36%**	Oiliness: **-7.14%**

Subjects reported an improvement in skin dryness and reduction in skin irritation (83% and 85%, respectively).

From 40 panelists, 25 subjects felt stinging and skin dryness, and 21 subjects felt skin irritation after using Benzoyl Peroxide only. In contrast, when they used Benzoyl Peroxide with microbiome-based cream, 80%, 84%, and 85.7% of those subjects agreed that they found improvement in stinging, skin dryness, and skin irritation respectively. It showed that when used with Benzoyl Peroxide, microbiome-based cream could improve acne condition while reducing the potential side effects.

Conclusions

This study underscores the effectiveness of microbiome-based skincare in regulating skin microbiome imbalance in acne vulgaris patients. Additionally, it has a potential role as an adjunctive anti-acne treatment by mitigating its side effects such as stinging, skin irritation, and dryness.

Acknowledgements

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