

The Sunny Skin Microbiome 2.0

Reframing daily sun protection for acne-prone skin

Executive Summary

Daily sun protection is increasingly positioned as a long-term preventive care habit. However, for acne-prone consumers, sunscreen adoption remains inconsistent due to concerns around breakouts, skin imbalance, and poor tolerability. Traditional “non-comedogenic” positioning has not fully addressed these concerns, creating a gap between protection efficacy and user confidence.

What Sunny Skin Microbiome 2.0 clarifies

The Sunny Skin Microbiome 2.0 provides clinical evidence that reframes daily high SPF from a compromise into an enabler of skin balance. By studying acne-prone skin under realistic daily UV exposure, the program demonstrates how sunscreen interacts with the skin microbiome, a key surface ecosystem influencing clarity and comfort.

Key insights for future sun care product strategy

- Daily SPF 50 supports microbiome balance
- UV-triggered *C. acnes* overgrowth is mitigated with daily protection
- Sunscreen can be positioned as a proactive skin-clarity and balance solution, not just UV defense

Implications for innovation

The Sunny Skin Microbiome 2.0 enables:

- microbiome-aware daily SPF concepts
- stronger credibility beyond “non-comedogenic” claims
- product development aligned with long-term skin health narratives
- next-generation sun care solutions for acne-prone skin consumers

dsm-Firmenich in skin microbiome

- **Pioneers in microbiome-aware sun care**, with industry-first clinical research linking UV protection, sunscreen, and the skin microbiome
- **Deep expertise across science and application**, combining photoprotection, microbiome knowledge, and formulation know-how
- **A trusted innovation partner**, translating complex science into credible, market-relevant sun care solutions

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Scientific Perspective

Repeated, low-level UV exposure represents a frequent and unavoidable environmental stress for skin. In acne-prone skin, UV is increasingly recognized as a trigger that can disturb microbial balance, notably through its influence on *Cutibacterium acnes*. While sunscreen efficacy against UV radiation is well established, its role in modulating the skin microbiome under real-life, daily exposure conditions has remained insufficiently documented *in vivo*, particularly for acne-prone skin.

Study objective and design

The Sunny Skin Microbiome 2.0 builds on dsm-firmenich's industry-first exploratory program by introducing a targeted, placebo-controlled clinical study in acne-prone skin, evaluated under repeated, sub-erythematous (daily-like) UV exposure, rather than acute or extreme irradiation.

The study design integrates:

- Global skin microbiome biodiversity assessment (Shannon Index as a measure for richness and evenness)
- Relative abundance, subtype, and metabolite analysis of *C. acnes* as a key acne-relevant microorganism
- Comparison of baseline, UV-exposed unprotected skin, and SPF 50 vs placebo-treated, UV-exposed skin

This approach enables evaluation of sunscreen not only as an UV shield, but as a modulator of UV-microbiome interactions.

The key scientific insights:

An SPF 50 sunscreen not only preserves the structural integrity of the skin microbiome but also prevents key biological shifts associated with increased acne risk by

- Stabilizing overall skin microbiome diversity
- Preventing UV-induced *Cutibacterium acnes* overgrowth
- Preserving *C. acnes* subtype diversity and lipid metabolite composition
- Reducing porphyrins, biomarkers of (more pathogenic) *C. acnes* strains

Relevance for future R&D

The Sunny Skin Microbiome 2.0 establishes a scientific framework to

- integrate microbiome endpoints into sun care research, opening a new category besides pre-, pro-, and postbiotics.
- reposition sunscreen from passive UV blocking to active ecosystem preservation
- microbiome-compatible photoprotection enables next-generation sunscreen development grounded in real-life biology with differentiated claims