

Module 5: The Skin Microbiome

Dry, moist, and sebaceous — three ecosystems on one organ.

Tracks: Core, Clinical, Advanced | Duration: 45 min

KEY TAKEAWAYS

- Skin is three ecosystems, not one — sebaceous, moist, and dry sites host different communities.
- *C. acnes* is commensal in healthy skin; specific ribotypes are acne-associated — it's strain, not species.
- *S. aureus* dominance in AD is both consequence and driver of flares.

EVIDENCE-GRADED CLAIMS

S. aureus colonization drives AD flares	B — Supported, context-specific	Consistently associated; precedes flares in longitudinal data; bacteriotherapy trials underway.
C. acnes strain diversity explains acne susceptibility	B — Supported, context-specific	Supported by genomic studies; ribotype RT4/RT5 associated with severe acne.
Topical probiotics treat acne and eczema	D — Plausible, unproven	Phase I/II; promising for AD (<i>R. mucosa</i>), minimal data for acne.

CLINICAL CASE

Eczema and the microbiome question

Parents of a 6-year-old with moderate atopic dermatitis ask whether 'microbiome-friendly' skincare products could replace their child's topical corticosteroids. They've read about bacteria-based creams online.

How would you explain the role of S. aureus in AD, the current state of bacteriotherapy research, and the importance of not discontinuing proven treatments for unvalidated alternatives?

SUMMARIES

For Patients

Your skin has different zones with different bacteria — oily areas around your nose and forehead host different microbes than your armpits or forearms. The bacterium linked to acne (*C. acnes*) actually lives on everyone's skin — only certain strains cause problems. Similarly, eczema flares are associated with overgrowth of *Staph aureus*.

For Clinicians

Skin microbiome composition is topography-driven: sebaceous sites (*Cutibacterium*), moist folds (*Staphylococcus*, *Corynebacterium*), dry sites (diverse, low-biomass). In acne, strain-level (ribotype) differences in *C. acnes* matter more than presence/absence. In AD, *S. aureus* colonization correlates with flare severity and precedes flares in longitudinal studies. Topical bacteriotherapy (e.g., *R. mucosa*, *S. hominis*) is in Phase II trials.

REFERENCES

- Topographical and temporal diversity of the human skin microbiome — Grice EA & Segre JA, Science 2011 [\[Link\]](#)