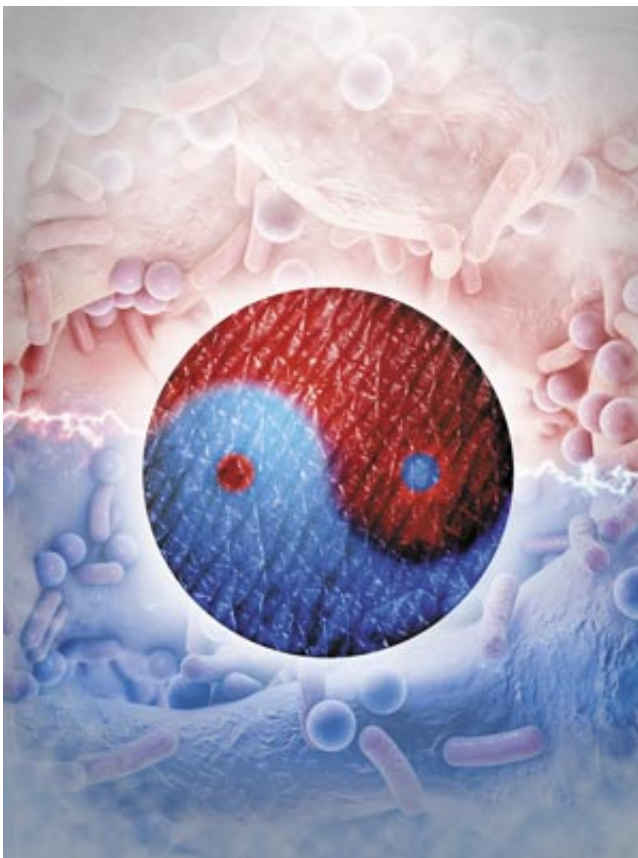


People susceptible to atopic dermatitis have different microbes living on their skin than non-sufferers

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A*STAR researchers have found that the skin disease atopic dermatitis upsets the balance of these residential bacteria even in people who are between flares. Credit: A*STAR Institute of Medical Biology

Microbial communities living on the skin of people susceptible to the skin disease atopic dermatitis differ from those of healthy individuals. This finding by A*STAR researchers provides insight into the roles that resident bacteria play in the disease and is promising for the early detection of susceptibility and potential interventional therapies.

Our skin hosts many [bacteria](#) and other microorganisms that are known collectively as the skin microbiome. Atopic dermatitis gives rise to dry, itchy, inflammatory skin and is estimated to affect up to one in five people in developed countries. Periodically the dermatitis clears, only to flare up in recurrent episodes. The relapsing nature of the disease led John Common of the A*STAR Institute of Medical Biology and co-workers to wonder whether the makeup of the skin microbes of an [atopic dermatitis](#) sufferer differs from that of a healthy individual even between flares, as such differences might explain what trigger flares.

As a test, the team developed an analysis technique to profile the metagenomes (the communities of bacteria, viruses and fungi) of 40 skin microbiome samples from people with recurrent atopic dermatitis. When they compared the results with those from another 40 individuals who had never had atopic dermatitis, they found significant variations between the two groups.

"We identified a clearly different skin microbiome signature for patients in remission from atopic dermatitis," explains Common. "This suggests that even when atopic skin looks relatively healthy and normal, there is an underlying shift in the skin microbiome. This altered microbiome may contribute to the cyclical nature of the disease flares."

The results also point to potential ways to treat atopic dermatitis. "Our study suggests that probiotic or microbe transplants could help restore the microbial balance providing long-term treatment alternatives," notes Niranjan Nagarajan from the A*STAR Genome Institute of Singapore.

The findings suggest a possible explanation for the increase in the global prevalence of atopic dermatitis—modern soaps that eradicate certain bacteria that oxidize ammonia. These bacteria were absent in the microbiomes of atopic dermatitis sufferers in the study. Thus, these ammonia-oxidizing bacteria may be important in staving off the disease.

The results have implications for other skin conditions. "This link between microbiome profile and skin health could apply to other [skin](#) diseases and subclinical conditions," notes Common.

The team is examining the development of microbiomes of infants that are at high risk of atopic [dermatitis](#) and is exploring the relevance of various strains of microbes identified in the study.

More information: Kern Rei Chng et al. Whole metagenome profiling reveals skin microbiome-dependent susceptibility to atopic dermatitis flare, *Nature Microbiology* (2016). [DOI: 10.1038/nmicrobiol.2016.106](https://doi.org/10.1038/nmicrobiol.2016.106)

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