

Sweat-eating bacteria may improve skin health

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Bacteria that metabolize ammonia, a major component of sweat, may improve skin health and some day could be used for the treatment of skin disorders, such as acne or chronic wounds. In a study conducted by AOBiome LLC, human volunteers using the bacteria reported better skin condition and appearance compared with a placebo control group. The researchers presented the study results at the 5th ASM Conference on Beneficial Microbes in Washington, DC.

Ammonia-oxidizing bacteria (AOB) are ubiquitous in soil and water and are essential components of the nitrogen cycle and environmental nitrification processes. The researchers hypothesized that AOB are uniquely suited for the environment of the [human skin](#) because ammonia oxidation products, nitrite and [nitric oxide](#), play important roles in physiological functions of the skin, including inflammation, blood vessel relaxation and wound healing. AOB may also improve the skin microenvironment by driving a lower pH through ammonia consumption.

For the study, the researchers used a strain of *Nitrosomonas eutropha* isolated from organic soil samples. In the blinded, placebo-controlled, study involving 24 volunteers, one group applied a suspension of the live [bacteria](#) on their face and scalp for one week, while a second group used placebo. Both groups were followed for an additional two weeks. Subjects did not use hair products during the first and second week and they returned to their normal routine for the third week.

The AOB users reported qualitative improvements in [skin condition](#) compared with no or minimal improvement reported by the control group. Use of a bacterial DNA detection assay demonstrated the presence of AOB in 83-100 percent of skin swabs obtained from AOB users during or immediately after completion of the one-week application period, and in 60 percent of the users on Day 14, but not in any of the placebo control samples. Surprisingly, in this small study, the improvement among the AOB users correlated with the levels of AOB on their skin. Neither group had AOB on their skin at the start of the study. Further analysis suggested potential modulation of the skin microbiota by AOB. Importantly, there were no adverse events associated with the topical application of AOB.

"This study shows that live *Nitrosomonas* are well tolerated and may hold promise as novel, self-regulating topical delivery agents of nitrite and nitric oxide to the human [skin](#)," said Dr. Larry Weiss, AOBiome's Chief Medical Officer. "Our next step is to conduct clinical trials to assess the therapeutic potential of AOB in patients with acne or diabetic ulcers."

Provided by American Society for Microbiology

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