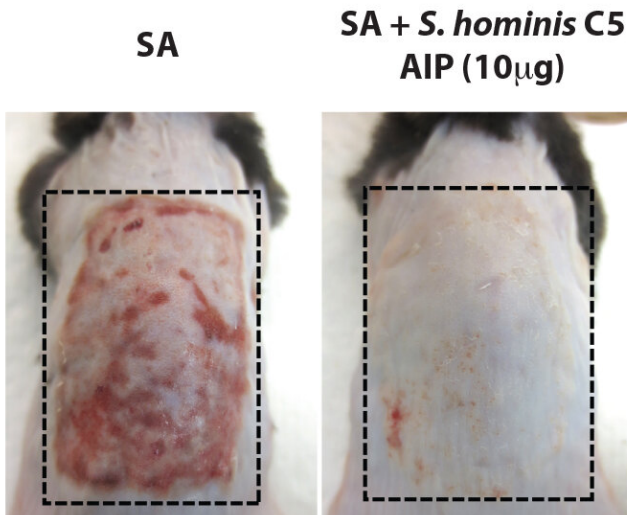


# Study shows skin microbiome imbalance likely behind eczema flareups

2 May 2019, by Bob Yirka



A peptide isolated from the commensal bacteria *Staphylococcus hominis* inhibited the activity of *Staphylococcus aureus* (SA) and prevented skin damage in mice. Credit: M.R. Williams et al., *Science Translational Medicine* (2019)

A team of researchers affiliated with multiple institutions across the U.S. has found a connection between a skin microbiome imbalance and eczema flareups. In their paper published in the journal *Science Translational Medicine*, the group describes their study of the skin microbiome and the bacteria *Staphylococcus aureus*, which has been associated with eczema.

Over the past decade, scientists have learned more about the human microbiome—studies of the gut microbiome, for example, have led to often surprising associations with a wide variety of conditions. In this new effort, the researchers looked at the [skin](#) microbiome and its possible connection to ectopic dermatitis, also known as [eczema](#).

Eczema presents as patches of rough skin that sometimes become inflamed. In many cases, blisters form, which lead to itching, scratching and bleeding. Despite a significant amount of research, medical scientists have not determined its causes or a cure. They have learned that flareups happen when the [immune system](#) overreacts to a stimulus and mounts an attack on the skin barrier. Prior research has suggested that there might be a connection between the condition and the microbiome. In this new effort, the researchers have taken steps to determine if eczema is related to a skin microbiome imbalance. They studied one specific type of [microbiome](#) bacteria, *S. aureus*, and its association with eczema.

Prior research has shown that *S. aureus* is more abundant on the skin of people who suffer from eczema. It has also led to the discovery that people who have eczema tend to have lower concentrations of cells that assist in building up skin barriers—this is why *S. aureus* is able to flourish.

To better understand the relationship between *S. aureus* and the skin biome, the researchers collected samples from [human skin](#) and bred colonies of the bacteria on mouse skin. They found that *S. aureus* made use of a process called "quorum sensing" as a means of communication between *S. aureus* individuals. The bacteria use it to know when to release toxins and enzymes that break down the skin barrier, allowing the bacteria access to interior parts of the skin, which causes flareups. The researchers also found that other bacteria living on the skin actually fight off the toxins using proteins that interfere with quorum sensing. When the researchers cultured some of the "good" bacteria and applied it to the skin of mice with eczema, it prevented flareups.

**More information:** Michael R. Williams et al. Quorum sensing between bacterial species on the skin protects against epidermal injury in atopic dermatitis, *Science Translational Medicine* (2019).

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