

NIH team describes protective role of skin microbiota

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A research team at the National Institutes of Health has found that bacteria that normally live in the skin may help protect the body from infection. As the largest organ of the body, the skin represents a major site of interaction with microbes in the environment.

Although immune cells in the [skin](#) protect against harmful organisms, until now, it has not been known if the millions of naturally occurring [commensal bacteria](#) in the skin—collectively known as the skin [microbiota](#)—also have a beneficial role. Using mouse models, the NIH team observed that commensals contribute to protective immunity by interacting with the immune cells in the skin. Their findings appear online on July 26th in *Science*.

The investigators colonized germ-free mice (mice bred with no naturally occurring microbes in the gut or skin) with the human skin commensal *Staphylococcus epidermidis*. The team observed that colonizing the mice with this one species of good [bacteria](#) enabled an immune cell in the mouse skin to produce a cell-signaling molecule needed to protect against harmful microbes. The researchers subsequently infected both colonized and non-colonized germ-free mice with a parasite. Mice that were not colonized with the bacteria did not mount an effective immune response to the parasite; mice that were colonized did.

In separate experiments, the team sought to determine if the presence or absence of commensals in the gut played a role in skin immunity. They observed that adding or eliminating beneficial bacteria in the gut did not

affect the immune response at the skin. These findings indicate that microbiota found in different tissues—skin, gut, lung—have unique roles at each site and that maintaining good health requires the presence of several different sets of commensal communities.

This study provides new insights into the protective role of skin commensals, and demonstrates that skin health relies on the interaction of commensals and immune cells. Further research is needed, say the authors, to determine whether skin disorders such as eczema and psoriasis may be caused or exacerbated by an imbalance of skin commensals and potentially harmful microbes that influence the skin and its [immune cells](#).

More information: S Naik et al. Compartmentalized control of skin immunity by resident commensals. *Science*. [DOI: 10.1126/science.1225152](#) (2012).

Provided by NIH/National Institute of Allergy and Infectious Diseases

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