

# Double duty: Versatile immune cells play dual roles in human skin

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A new study helps to resolve an ongoing controversy about whether Langerhans cells (LCs) in human skin function to suppress the immune response and promote tolerance to normal human skin and its "friendly" microbial flora or mobilize a lethal attack against harmful foreign invaders. The research, published online May 3rd in the journal *Immunity* by Cell Press, reveals that, depending on the situation, these versatile immune cells can perform either function.

Adult [human skin](#) contains billions of resident [immune cells](#) called T [cells](#) that provide protection from invading pathogens. Skin also contains LCs, which reside in the outermost layer of skin, the epidermis. LCs are known to interact with T cells and are traditionally considered to be the first line of defense against invading pathogens. However, previous studies have provided conflicting results about the specific function of LCs. Also, until now, it has been difficult to characterize the role of LCs in human skin, primarily because much of the research has been done using mouse models and there appear to be significant differences between LCs in mouse and human skin.

"There is substantial controversy surrounding the role of LCs with regards to whether they serve to stimulate the [immune response](#) upon encountering an invading pathogen or whether they play a more immunomodulatory role and induce tolerance in normal skin," explains senior study author, Dr. Thomas S. Kupper from Brigham and Women's Hospital and the Harvard Skin Disease Research Center. Taking advantage of a significant technical advance in the ability extract large

numbers of specific immune cells from human skin, Dr. Kupper and colleagues examined the function of LCs under normal conditions and in the presence of a pathogen.

Interestingly, the researchers found that LCs interact with two different types of skin resident T cells. Under normal conditions, LCs induced proliferation of "regulatory" T cells that helped to prevent the immune system from attacking normal skin. In the presence of a pathogen, the LCs stimulated another type of T cell that mediates protective immunity. "Essentially, this means that LCs can apply the brakes to the immune response and maintain tolerance under normal conditions, but also have the capacity to push the gas and activate protective skin-resident T cells to mount an immune response when confronted with potentially harmful invaders," concludes Dr. Kupper. "This context-specific response is perfectly suited to a cell like the LC which is at the interface of the body and the environment."

Provided by Cell Press

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