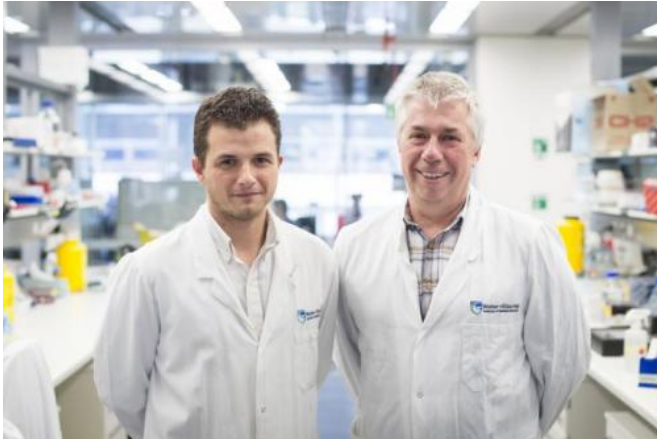


More than skin deep: New layer to the body's fight against infection

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Credit: Walter and Eliza Hall Institute of Medical Research

The layers of skin that form the first line of defence in the body's fight against infection have revealed a unanticipated secret.

The single cell type that was thought to be behind the skin's immune defence has been found to have a doppelganger, with researchers from the Walter and Eliza Hall Institute showing the cells, despite appearing identical, are actually two different types.

Institute scientists Dr Michael Chopin, Dr Stephen Nutt and colleagues have been investigating Langerhans cells, the [immune cells](#) that provide the first line of defence against attacks through the skin.

Until recently, scientists believed that, because they looked identical, all Langerhans cells were also genetically identical and had the same function. However Dr Nutt said the research team, with collaborators from the National Institutes of Health, US, have shown this is not the case.

"Langerhans cells are produced and found in the skin and are quite unique among immune cells because they do not have a definite lifespan, they can last for a lifetime," Dr Nutt said. "They are only replaced when necessary, such as when the skin is damaged by a burn or a cut. When that happens, new Langerhans cells have to be produced by the [bone marrow](#). These cells look the same, so it was always thought that they were genetically the same and their function was the same. We have shown that this isn't the case."

This surprise finding, published today in the *Journal of Experimental Medicine*, could have repercussions for developing and refining therapies for skin infections and skin cancers.

Although Langerhans cells were discovered nearly 150 years ago, Dr Chopin said there were still a lot of gaps in our knowledge about how they develop and their role in responding to foreign invaders. Dr Chopin said the research team was initially trying to understand the role of Langerhans cells. "Not everything that makes contact with the skin is harmful, so it is important the immune system doesn't overreact," he said. "We were trying to find out whether Langerhans cells were there to activate an [immune response](#) to invaders, or to suppress the immune system to prevent it from overreacting.

"While designing the experiment, we found that the genes that define the Langerhans cells that are produced in the skin were different to those of Langerhans cells that came from bone marrow. In essence we now know that there are two different types of Langerhans cells where we thought there was one. We now need to find out if they behave differently as well."

Dr Nutt said the research could explain why some promising new drugs have not had the desired effect in the clinic. "Some clinical trials of drugs that were designed to help boost Langerhans [cells](#) in response to infections have not responded as the

researchers expected," Dr Nutt said. "Our finding may help explain why these drugs didn't work outside the laboratory and our current research may provide guidance in developing therapeutics to treat [skin infections](#) or [skin cancer](#)."

Provided by Walter and Eliza Hall Institute

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