

How autoimmune disease is prevented—mechanism discovered

1 November 2016

A previously unknown safety mechanism in our immune system keeps the body free from autoimmune diseases. Researchers from Karolinska Institutet have discovered that a cell in our inherited immune system can prevent our adaptive (learned) immune system from reacting to the body's native cells, which can otherwise lead to autoimmune diseases such as SLE. The study is published in the academic journal *Nature Immunology*.

Autoimmune diseases and allergies, in which the immune system triggers an immunological reaction in sufferers, are becoming increasingly common. In some cases, such as the rheumatic disease SLE, the immune system reacts to the body's own cells. One of the most important components of our learned (adaptive) immune system is the [white blood cells](#) called B [lymphocytes](#), which are one of the main causal factors of many autoimmune diseases, including SLE, since it is these cells that start to react to the body's native structures, giving rise to the symptoms.

"Our research group has been interested in B lymphocytes and what goes wrong in the regulation of different types of autoimmune disease," says Professor Mikael Karlsson at the Department of Microbiology, Cell and Tumour Biology.

It has long been known that a certain type of cell in the inherited immune system called a neutrophil plays an important part in wound healing and the early stages of the [immune response](#). Through their studies on laboratory mice, the team from KI has now discovered that neutrophils have another crucial function in their interaction with B lymphocytes. What they found was a safety mechanism that prevents B lymphocytes from reacting to endogenous antigens.

"We have discovered a previously unknown mechanism in the immune system that prevents

autoimmune disease and that could be lacking, we think, in people with autoimmune diseases such as SLE," says Professor Karlsson.

When an inflammation occurs in the body, the neutrophils cause the B lymphocytes in the spleen to start producing antibodies that retard an infection. At the same time, however, the neutrophils also communicate with a kind of immune cell called an NKT cell, instructing it to regulate the response to prevent over-reaction.

It is known that SLE patients do not have as many NKT cells as other people, which could be a contributing factor to the failure of the body to regulate B lymphocytes.

"Apart from our discovery being interesting in general terms of how the immune system works, it can also be very important for people with other [autoimmune diseases](#)," says Professor Karlsson. "We think that this mechanism could be used to regulate B lymphocytes in different morbid conditions and that it could be a way forward for stopping SLE."

More information: Thomas Hägglöf et al. Neutrophils license iNKT cells to regulate self-reactive mouse B cell responses, *Nature Immunology* (2016). [DOI: 10.1038/ni.3583](https://doi.org/10.1038/ni.3583)

Provided by Karolinska Institutet

APA citation: How autoimmune disease is prevented—mechanism discovered (2016, November 1) retrieved 20 November 2019 from <https://medicalxpress.com/news/2016-11-autoimmune-disease-preventedmechanism.html>

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