New discovery: This is why we do not constantly get ill despite viruses and bacteria

1 December 2015, by Mette Louise Ohana

The immune system protects the body against viruses through an early response, which has been completely unknown until now.

New research breaks with existing knowledge about how our immune system works. Experiments at Aarhus University have shown how the body mobilises a hitherto unknown defence against viruses and bacteria. This also explains why we do not constantly get ill despite the viruses around us.

Fever, sore muscles and other influenza-like symptoms are typical signs that your immune system is fighting against viruses and bacteria. The unpleasant condition is, among other things, due to the body forming a substance called interferon, which must defeat the virus. For many years researchers and doctors have assumed that this was the body's earliest response when attacked by various infections.

But new research shows that the body's very first defence mechanism is not interferon, but rather a hitherto unknown mechanism, which begins

working even earlier.

The newly discovered immune reaction is activated when the body's mucous membranes are disrupted, as they are when viruses and bacteria attempt to establish an infection. The immune system recognises the virus and produces a substance that neutralises the uninvited guest. The process goes on continuously without us being aware of it. If this first immune reaction is not sufficient to suppress the virus, the infection establishes itself in the body. This in turn triggers the next reaction involving interferon, which not only helps to fight the virus, but also means we become ill.

The discovery has just been published in the scientific journal *Nature Immunology*.

Alters our understanding of the immune system

The discovery alters the way in which researchers and doctors previously understood the immune system.

"Our study fundamentally alters our understanding of how the body begins its defence against viruses. This can help to explain how we can be constantly exposed to the viruses and bacteria that always surround us, without activating the entire immune system every time, something that would lead to more frequent influenza-like symptoms," says Soren Riis Paludan, professor at the Department of Biomedicine at Aarhus University.

He has headed the research project in Aarhus, while also collaborating with researchers from the University of Copenhagen as well as from universities in the USA and Germany.

May explain serious diseases

Experiments on mice have shown that mice, lacking this first defence mechanism, become ill if they are exposed to herpes virus, while normal mice remain healthy.

"We do not yet know the precise significance of this mechanism, but it may explain why some people become more ill from viral infections such as influenza than others. The same may apply to other viral infections that are initiated on mucous membranes such as HIV and herpes. We will now begin to map out the molecules that are involved. Once we have done this, it will be possible to identify people with defects in the mechanism, just as there is a potential to develop new forms of treatment. At the same time, the mechanism may turn out to have significance also for non-viral diseases, so continued research into this area shows great potential," says Soren Riis Paludan.

More information: Marie B Iversen et al. An innate antiviral pathway acting before interferons at epithelial surfaces, *Nature Immunology* (2015). DOI: 10.1038/ni.3319

Provided by Aarhus University

APA citation: New discovery: This is why we do not constantly get ill despite viruses and bacteria (2015, December 1) retrieved 11 August 2022 from https://medicalxpress.com/news/2015-12-discovery-constantly-ill-viruses-bacteria.html