

Study provides new knowledge about the body's fight against HIV

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A study of the body's reactions to the HIV virus by Danish researchers has led to new understanding of the immune system's fight against HIV. The discovery is an important step on the road towards the future development of new methods for treating HIV.

When a person is infected with HIV the virus infects the cells of the [immune system](#). From here the virus spreads around the body, while at the same time breaking down important parts of the body's defence system. HIV's ability to avoid being eliminated by the body's immune system - as opposed to many other types of virus - is one of the main problems associated with this widespread virus. But Danish researchers have now found out how the body's own defence system is activated when the HIV virus infects a cell, and how this helps to protect against uncontrolled virus growth. The new knowledge can potentially be used to help the immune system defend itself more effectively against HIV.

The body defends itself against HIV

Studies of people infected by HIV have registered a degree of "excessive activation" of the immune system, which contributes to the development of AIDS. But until now what has been missing is knowledge about how the immune system is able to trace the HIV virus and, more precisely which positive and negative reactions this leads to in the immune system. It is here that the study contributes with fundamental new knowledge.

"We have succeeded in finding the protein in the cells that recognises the HIV infection, as well as the part of the virus that is discovered. At the same time, we can demonstrate how the recognition activates the first defensive responses in the body, thereby inhibiting the virus in developing the cell into an uncontrolled [virus](#) production machine. This knowledge extends our understanding of the mechanisms of HIV infection and paves the way for a number of new studies, which can bring us closer to improved treatment," says associate professor at Aarhus University, Martin Roelsgaard Jakobsen.

Assisting the immune system

Researchers around the world have spent many years working to develop medicine that inhibits the [body](#)'s production of viruses. The new study is crucial because it is one of the first in the area, which focuses on the so-called innate immune system. This part of the immune system is inborn and is the first, which is activated when we are attacked by an infection. The second part of the immune system - the adaptive - is first activated at a later stage. This is also the system which may be influenced by vaccines. HIV research has therefore been almost exclusively focused on the adaptive immune in the attempt to develop an HIV vaccine.

However, the new findings suggest that part of the solution to better treatment must be found in the innate immune system.

"If we can come to understand [the immune system](#)'s protective as well as harmful activities during a HIV infection, we can potentially utilise this knowledge to curb the harmful functions and stimulate the protective activities. The more knowledge we have, the better we are equipped to be able to develop new anti-viral treatments. the results from this study are certainly a step in the right direction, says Martin Roelsgaard Jakobsen.

The study is published in the scientific journal *PNAS*.

Provided by Aarhus University

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