

# Scavenger cells accomplices to viruses

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Mucosal epithelia do not have any receptors on the outer membrane for the absorption of viruses like hepatitis C, herpes, the adenovirus or polio, and are thus well-protected against pathogenic germs. However, certain viruses, such as the human immunodeficiency virus HIV, still manage to enter the body via the mucous membrane. Just how this infiltration occurs on a molecular level has been a mystery. Three hypotheses were discussed: firstly, that it's caused by mechanical damage to the mucous membrane; secondly, the presence of previously unknown receptors on the mucous membrane cells; and, thirdly, that the viruses are smuggled in via a kind of Trojan horse. Now, for the first time, cell biologists from the University of Zurich have succeeded in identifying the infection mechanism for adenoviruses.

In the recently published online magazine *Nature Communications*, Verena Lütschg and cell biologists from the Institute of Molecular Biology headed by Urs Greber reveal how type-5 adenoviruses in the lung epithelia utilize an immune response triggered by the infection for the progression of the infection: Adenoviruses use scavenger cells and their subsequent production of antiviral cytokines as a door-opener for the infection of the lung epithelial cells.

## **Exposure of shielded receptors**

Antiviral cytokines play a key role in immunological reactions and trigger inflammatory responses, for instance. They induce the epithelial cells to expose certain receptors that are shielded under normal conditions and thus activate immune cells in defense. For healthy people,

an infection of the lung with type-5 adenoviruses is harmless as they merely cause a cold. Under very stressful situations or in the case of chronic respiratory diseases, however, adenoviruses can cause severe, acute infections that can sometimes be fatal.

The recently identified infection mechanism can serve as a model for how the pathogens penetrate the mucosal epithelial cells and enter the body. However, it is also crucial from a therapeutic point of view. Type-5 adenoviruses are already used very often as transport vehicles in cancer-gene therapy today. Knowing the transport route will help develop both this gene therapy and specifically acting cancer treatment further.

Provided by University of Zurich

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