

Researchers find new rhinovirus infection insights

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Infection with the common cold virus: scientists reveal new insights.

(Medical Xpress)—On average, each of us catches a cold two to three times a year. However, how the common cold virus actually infects us is only partly understood. Researchers from the Max F. Perutz Laboratories of the Medical University of Vienna and the University of Vienna, in collaboration with two Spanish groups, have now provided new insights into this process.

The common [cold virus](#) (rhinovirus) is a tiny, almost round particle, containing the tightly packed genetic material surrounded by a protein shell (the virus capsid). Details on how the RNA is prepped to exit the capsid and effectively infect us have now been provided by scientists from the Max F. Perutz Laboratories in collaboration with groups at the Universities of Barcelona and Madrid. The study has been published in the prestigious journal *PNAS*.

The researchers investigated how the structure of one of the [common cold](#) virus types changes upon

infection with the [host cell](#), leading to the release of the RNA and its duplication. Dieter Blaas from the Max F. Perutz Laboratories says: "Interestingly we found that the conformation of the RNA, and in turn its interaction with the inner side of the virus capsid changes. This seems to be crucial to 'avoid knots' when the long thread-like RNA molecule is unfolded in order to exit the capsid."

The studies' findings are also relevant for viruses causing poliomyelitis and hepatitis A amongst many others

As rhinoviruses belong to the family of picornaviruses, the findings of the study are also relevant for other viral diseases, for example polio or hepatitis A, and could give cues for new types of therapy.

However, many questions regarding infections with the [common cold virus](#) remain unclear. That's why the researchers at the Max F. Perutz Laboratories, led by Dieter Blaas, will now investigate another step of the infection process: They want to know how the RNA "knows" which one of the 30 pores that open in the virus capsid has become positioned on top of a cellular membrane. This is crucial, as the virus RNA has to first penetrate such a membrane to get to the cytoplasm of the host cell, where it can then replicate and produce more [virus particles](#).

More information: "Uncoating of common cold virus is preceded by RNA switching as determined by X-ray and cryo-EM analyses of the subviral A-particle." Angela Pickl-Herk, Daniel Luque, Laia Vives-Adrián, Jordi Querol-Audí, Damià Garriga, Benes L. Trus, Nuria Verdaguer, Dieter Blaas and José R. Castón. *PNAS* 2013. www.pnas.org/content/early/2013/12/31/1312128110.abstract

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