# Uukuniemi virus helps to explain infection mechanism of bunyaviruses

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The Uukuniemi virus is the first bunyavirus whose structure researchers have been able to determine. Together with more detailed studies of the viral membrane proteins, knowledge of the Uukuniemi virus may provide a basis for development of drugs for treating bunyavirus diseases, such as hemorrhagic fever and encephalitis.

A researcher group comprising Juha Huiskonen from the University of Helsinki and structural biologists from the Karolinska Institutet in Stockholm and the Max Planck Biochemistry Institute in Münich has solved the three-dimensional structure of the Uukuniemi virus. The Uukuniemi virus is the first bunyavirus whose structure researchers have been able to determine. Together with more detailed studies of the viral membrane proteins, knowledge of the Uukuniemi virus may provide a basis for development of drugs for treating bunyavirus diseases, such as hemorrhagic fever and encephalitis.

The findings were published in *PNAS* on 12 February, 2008.

The researchers solved the three-dimensional structure of the virus particle, which is only 0.0001 mm in diameter, using electron tomography and computational methods. The newly determined virus structure also serves as a model for the other bunyaviruses. Recent research surprisingly revealed that the viral membrane proteins protruding as spikes from the Uukuniemi virus surface changed their shape in an acidic environment. This phenomenon is reminiscent of the mechanism whereby influenza and dengue viruses enter their host cells.

The observation helps to explain how bunyaviruses infect their host cells.

The Uukuniemi virus was first isolated in the village of Uukuniemi, Finland in the early '60s. Since then, it has proven to be an excellent model virus. Not being a human pathogen, the Uukuniemi virus is safe to work with, and yet it is very similar to many pathogenic bunyaviruses.

The Bunyaviridae viral family comprises more than 300 members and they are found worldwide. Many members of the family cause serious disease, such as hemorrhagic fever and encephalitis, for which no vaccines are available yet. Most of the bunyaviruses are transmitted by mosquitoes and ticks. The exception is hantaviruses, which belong to the Bunyaviridae family, and which are spread by voles and other rodents.

Source: University of Helsinki