

Structure of salt lake archaeal virus solved in Finland

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Researchers at the Finnish Centre of Excellence in Virus Research at University of Helsinki's Institute of Biotechnology have solved the structure of archaeal virus SH1 to the resolution of one nanometer. The results that shed new light on the evolution of viruses will be published this week in the online Early Edition of the *Proceedings of the National Academy of Sciences (PNAS)*.

Only highly specialized life forms such as SH1 and its host *Haloarcula hispanica* can survive in the extreme conditions of their salt lake habitat. As they are cut off from the rest of the biosphere in a relatively unchanging environment, they can be seen as living fossils, and thus the study of the SH1 structure helps us to understand the evolution of viruses and virus-host interaction.

The research group led by Professor Sarah Butcher used electron-cryomicroscopy and computerized three-dimensional modelling techniques to solve the SH1 structure. The resolution of the virus reconstruction is higher than that of any previously published structure of an archaeal virus, allowing for detailed structural analysis of the biological membrane, genomic matter and protein coat of this unique virus.

The interesting observation from the point of view of evolutionary biology is that it appears possible that a viral protein similar to the SH1 coat protein has been the ancestor of a common viral structural protein type that is found for example in adenoviruses.

Source: University of Helsinki

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