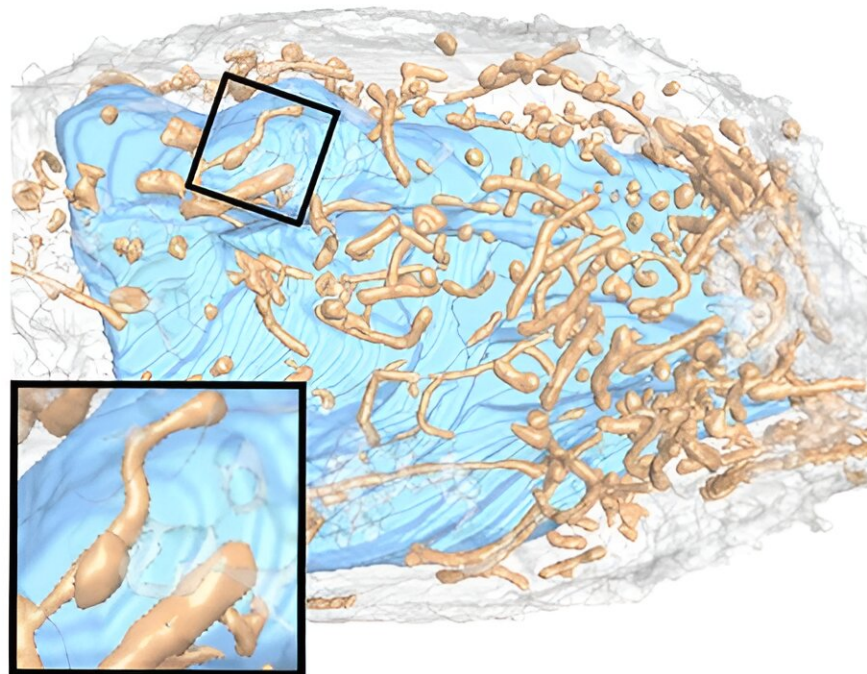


Study: Progression of herpesvirus infection remodels mitochondrial organization and metabolism

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Cryo-soft X-ray tomography 3D reconstructions of segmented mitochondria (brown) in the cytoplasm around the nucleus (blue) in herpes simplex virus type 1 infected cell. Credit: Maija Vihinen-Ranta

Researchers at the University of Jyväskylä have found that herpesvirus infection modifies the structure and normal function of the mitochondria

in the host cell. The new information could help to understand the interaction between herpesvirus and host cells and develop new viral treatments.

Herpesviruses cause significant diseases but are also promising candidates for oncolytic therapy. HSV-1 [infection](#) depends on nuclear DNA replication, transcription machinery, and mitochondrial metabolism of the [host cell](#). In the Department of Biological and Environmental Science of the University of Jyväskylä, docent Maija Vihinen-Ranta, with her research team, investigated time-dependent mitochondrial changes as HSV-1 infection proceeds from early to late infection.

The recent research, [published](#) in *PLOS Pathogens*, shows that the infection leads to significant transcriptional modification of genes encoding proteins involved in the mitochondrial network, such as the respiratory chain, apoptosis, and the structural organization of mitochondria.

The findings indicate that the infection leads to significant alterations in mitochondrial structure and function, including changes in mitochondrial morphology and distribution, thickening and shortening of cristae, an increase in the number and area of contact sites between mitochondria and the [endoplasmic reticulum](#), as well as a rise in mitochondrial calcium ion content and proton leak.

"Our results show how the progression of infection shifts the balance from healthy to diseased cells and leads to profound perturbations in mitochondrial homeostasis. This can yield further knowledge about the interaction between herpesvirus and host cells," states docent Maija Vihinen-Ranta from the University of Jyväskylä.

More information: Simon Leclerc et al, Progression of herpesvirus

infection remodels mitochondrial organization and metabolism, *PLOS Pathogens* (2024). [DOI: 10.1371/journal.ppat.1011829](https://doi.org/10.1371/journal.ppat.1011829)

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