

# Unconventional membrane biogenesis of large DNA viruses revealed by electron tomography

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Within eukaryotic cells membrane compartment are closed entities maintained by controlled fusion and fission reactions. As obligatory intracellular parasites, viruses acquire their membrane from the host using cellular processes of membrane dynamics. Some time ago, however, we showed that the large DNA virus Vaccinia Virus (VACV) a member of the poxviruses, uses an unconventional membrane assembly pathway. By combining several EM techniques, including cryo-EM and electron tomography (ET), we showed that VACV assembles from a single open membrane derived from open membrane intermediates and we postulated that these are the result of rupture of ER elements (Chlanda et al., 2009; Krijnse Locker et al., 2013). In our continued effort to understand the molecular mechanisms underlying this membrane assembly process, we showed that other members of the nucleocytoplasmic large DNA viruses, to which VACV belongs, assemble their membrane in a similar way using open intermediates. I will present some of these data and show how we use complementary EM techniques and imaging methods to address complex questions related to membrane biogenesis. Finally, we have collected preliminary data that point to a possible molecule involved in virus-induced rupture.

References:

Chlanda et al., 2009: Cell, Host & Microbe vol. 6 pp. 81-90.

Krijnse Locker et al., 2013: Cell. Micro. Vol. 15, pp 190-199.