Capturing replication strategies used by SARS viruses in their bid to spread

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Just over five years ago, an outbreak of severe acute respiratory syndrome (SARS)-coronavirus killed over 750 people. SARS (corona)virus, a positive-stranded RNA virus, replicates in the cytoplasm of host cells, attaching its replication complex to intracellular membranes that it has modified for this purpose.

In a study published this week in *PLoS Biology*, biologist Eric Snijder and colleagues report how they have used virus-infected cell cultures and developed a sophisticated method to preserve and visualize the fragile replication structures of SARS-coronavirus, both in whole cells (by light microscopy) and in sections of cells (by electron microscopy).

The viral replication complexes are made up largely of viral proteins and enzymes that we know very little about. The authors develop their system as a way to study these proteins and to work out how they interplay with the modified host membranes to ensure viral replication and spread.

Snijder and colleagues use electron microscopy and tomography to study these modifications, providing the striking images found below, which capture for the human eye the viral reorganization of the cellular infrastructure. The authors have begun to tease apart the complicated process of replication by these viruses by analyzing the effects of disrupting specific host cell components in the culture dish. Their results demonstrate the dependence of viral replication on protection by (or support from) the modified membranes, and open the door wider for the

development of new antiviral strategies.

Citation:Knoops K, Kikkert M, van den Worm SHE, Zevenhoven-Dobbe JC, van der Meer Y, et al. (2008) SARS-coronavirus replication is supported by a reticulovesicular network of modified endoplasmic reticulum. PLoS Biol 6(9): e226. doi:10.1371/journal.pbio.0060226 dx.plos.org/10.1371/journal.pbio.0060226

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