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ONLINE SEMINAR

Piotr Gerlach

# BUNYAVIRAL POLYMERASE - REPLICATION, TRANSCRIPTION AND BEYOND

**November 3rd, 2021, 2 pm (CET)**  
**Online seminar via ZOOM**

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# Bunyaviral polymerase

## - replication, transcription and beyond



SPEAKER

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### ABSTRACT:

Three among eight RNA viruses, listed by WHO as potential causes of future epidemics, belong to the Bunyavirales order. Some of these neglected and emerging viruses lead to severe hemorrhagic fevers or central nervous system diseases. Being mostly transmitted by insects they continue to expand worldwide due to the climate change, while we are lacking specific countermeasures like antiviral drugs or vaccines.

Bunyaviruses have a segmented, negative-sense genome. Each of the three segments is attached to the viral multifunctional RNA-dependent RNA polymerase (L) and shielded by a necklace of nucleoproteins (N). Upon infecting the cell, viral polymerase performs the primer-dependent transcription, employing a unique host 5'-cap-snatching mechanism. Viral messages are subsequently translated into viral proteins by the hijacked cellular ribosomes. In the latter phase of infection viral polymerase switches to the de novo initiated replication mode, producing genomic copies that will be packaged in progeny virions.

The first, atomic X-ray structure of La Crosse bunyavirus polymerase revealed how it accommodates conserved ends of the viral genomic RNA. It revealed as well striking structural similarity with the closely related Influenza virus polymerase. Subsequent cryo-EM snapshots of the different replication and transcription stages provided unprecedented level of details regarding its mechanism of action and conformational changes.

Interestingly, bunyaviral transcription needs to be coupled with ongoing translation to avoid premature termination. This intriguing and understudied phenomenon remains to date the only known example of such coupling in eukaryotic cell environment.

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