

# Cologne Evolution Colloquium

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## **Living apart together: The costs and benefits of a multipartite genome organization in viruses**

Many viral genomes consist of different segments, but some viruses individually package these segments into separate virus particles. For these so-called multipartite viruses to propagate, each genome segment must be transmitted between hosts, as the incomplete virus can no longer replicate. This apparently inefficient genome organization is common among plant viruses, raising the question of whether it confers any benefits. We first used a combination of theoretical and experimental work to consider whether the predicted cost to infection associated with multipartitism is real. Next, we explore hypotheses on the benefits associated with multipartitism, finding support for the hypothesis that rapid change in the frequency of viral genome segments is adaptive. Finally, there is a growing awareness that some animal viruses with segmented genomes produce virus particles missing genome segments. We show that these incomplete virus particles can cooperatively spread infection, and consider the implications for infectivity and virus evolution. These results highlight that the concepts developed to understand multipartite plant viruses may have broader relevance.

Wednesday, March 01, 2023, 17:00

Institute for Biological Physics, Zùlpicher Str. 77a

Seminar Room 0.02, Ground Floor

Hosted by Joachim Krug