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# Poster #5: The impact of chronic viral infection on archaeal cell morphology

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Archaeal viruses represent a distinct and diverse group of infectious agents that challenge current models of virus–host interactions. Unlike viruses infecting other domains of life, archaeal viruses exhibit remarkable morphological and genetic diversity. To date, the number of archaeal viruses that have been isolated and characterized is relatively limited, which hinders the study of their infection cycles. As the cell envelope of archaea differs fundamentally from that of bacteria, viral mechanisms of entry and egress are likely to be different. In contrast to the predominantly lytic lifestyle observed in many bacterial and eukaryotic viruses, several halophilic archaeal viruses, including His1 and His2, establish chronic infections and continuously release progeny without apparent host cell lysis. His1, a spindle-shaped virus, is classified among the *Halspiviridae* [1]. In contrast, His2 belongs to the recently proposed *Pleolipoviridae* family, comprising pleomorphic viruses with minimalistic virion architecture [2]. It has been demonstrated that both viruses infect the halophilic euryarchaeon *Haloarcula hispanica*, a species characterized by its growth phase-dependent morphological changes [3].

The impact of chronic viruses on host cell function and morphology remain poorly understood. Consequently, we employed time-resolved infection assays with His1 or His2 and observed that this led to reduced motility of the cells. Closer inspection with light and electron microscopy revealed that infected cultures exhibited a substantial accumulation of cell clusters, surrounded by a thickened cell wall. Our findings offer insight into the impact of chronic infection on archaeal cell morphology, thus aiding the exploration of this enigmatic viruses.

## Reference #1

Bath, C. and M.L. Dyall-Smith, His1, an archaeal virus of the Fuselloviridae family that infects Haloarcul

## Reference #2

Demina, T.A. and H.M. Oksanen, Pleomorphic archaeal viruses: the family Pleolipoviridae is expanding by se

## Reference #3

Schwarzer, S., et al., Growth phase dependent cell shape of Haloarcula. Microorganisms, 2021. 9(2): p. 231

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