

CHARACTERIZATION OF A BROAD RANGE VIRAL RESISTANCE IN SULFOLOBUS ISLANDICUS.

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Viruses play important ecological and evolutionary roles that impact all domains of life. The study of their parasitic nature has been a major tool for the understanding of not only transcription and translation, but also microbial diversity and evolution. The archaeal domain contains properties of both the bacterial and eukaryotic systems and therefore the studies of their virus-host interactions will likely play a role in understanding how these domains diverged. Here we examine the interactions of the crenarchaeon *Sulfolobus islandicus* and a virulent spindle-shaped virus 9 (SSV9), both isolated in Russia. From an experimentally derived *S. islandicus* strain that was isolated in the presence of SSV9, a broad-range virus-resistant strain containing a 6kb chromosomal deletion was isolated. Initial characterization demonstrated that while the virus neither replicates in the resistant strain nor produces virulent virions, viral attachment is not inhibited and therefore the deletion does not appear to have impacted a surface attachment structure. Through complementation of the deletion on a vector, a single gene from the deleted locus, M164_2742 or M164_2746, can revert the host from resistant to susceptible upon challenge by SSV9 infection. Through characterization of the mechanism of resistance conferred by this deletion strain, we hope to expand our knowledge of common and divergent mechanisms of archaeal/eukaryotic virus-host interactions, which may provide insight into fundamental differences or similarities between the archaeal and eukaryotic domains.