CONSIDER FOR TALK

2021 SEA Faculty Meeting Abstract

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Rhodobacter capsulatus bacteriophage Xuper isolated from a freshwater source readily adapts to an alternative marine host

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Although bacteriophage Xuper was isolated from a freshwater source in Illinois, like the majority of the phages in the IWU *Rhodobacter capsulatus* phage collection, it readily stands out as one of the more unique phages. It has an elongated prolate capsid where most others have icosahedral shape, its genome is nearly 50% larger than the next largest, and it is replete with tRNAs when none of the 30+ other members have any. While it shares a few genes with several Rhodobacter phage clusters it notably shares many more genes with four phages isolated on marine Roseobacters. The similarities between these phages and Xuper prompted us to examine its ability to infect the marine Roseobacter, *Ruegeria pomeroyi*. Initially only highly concentrated aliquots of Xuper could form plaques on *R. pomeroyi*, but with further experimentation a selection protocol was developed to obtain isolates that could be cultivated on this alternative host. In order to determine genomic changes involved in this transition from one host to another, the genomes of several of these newly adapted strains of Xuper were then sequenced and compared to that of the original Xuper isolate. This analysis highlighted three genes that are likely to be involved in this host-range shift and may help inform our understanding of host-range plasticity more broadly.