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Investigating the Phage Genome Packaging Strategy of AJGECKO

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During assembly of new virions, bacteriophages must package their genomes in the capsid. The various packaging strategies employed may be grouped broadly into three categories: 1)cohesive (COS) end (2) headful and 3) direct terminal repeat packaging. Our goal was to investigate the packaging strategy of a Gordonia phage isolated in our BYU Phage Hunters course, AJGecko. The method employed was restriction enzyme mapping of purified phage DNA. This method can distinguish between headful and direct terminal repeat packaging, both of which result in apparently circular phage DNA upon genome assembly. When proper restriction digest is utilized based on the predicted fragmentation of a bacteriophage genome, headful packaging will result in a novel fragment at submolar quantities which contains the "pac" site. In contrast, direct terminal repeats will result in novel restriction fragment sizes due to the extra DNA. Herein we present our restriction fragment analysis of the AJGecko genome, including difficulties in determining the packaging strategy.