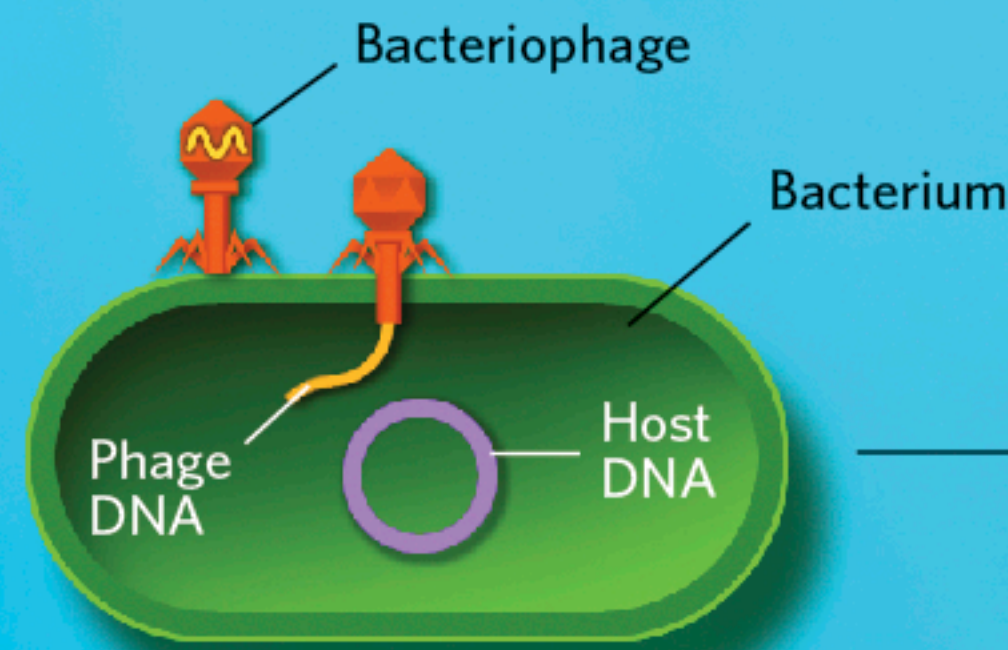
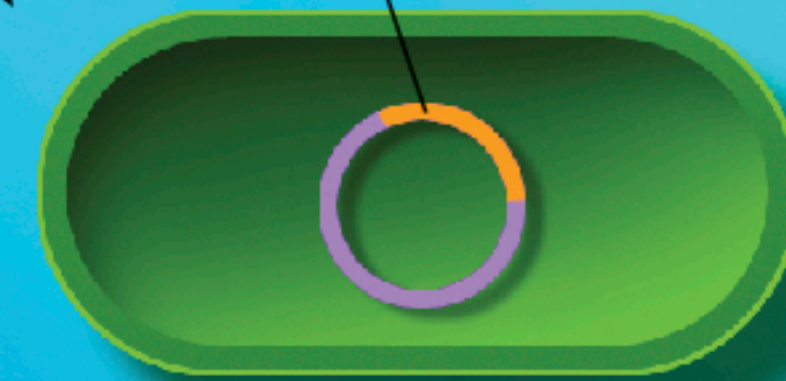


Phage attaches to the cell surface of a bacterium and injects its DNA into the cell.



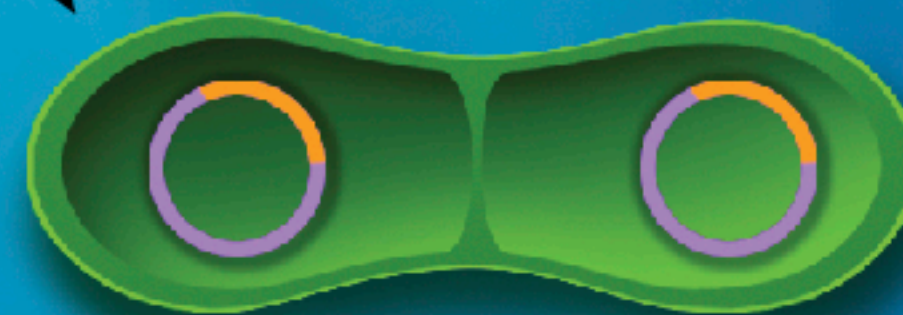
Phage DNA can be integrated into bacterial DNA.



Phage DNA is replicated along with the bacterial DNA.

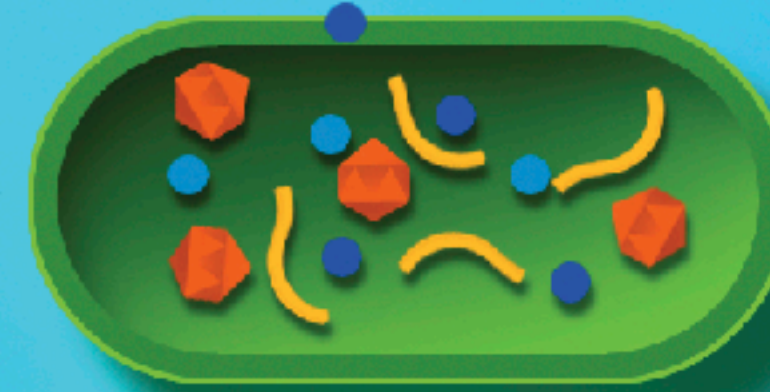


LYSOGENY



Bacterium reproduces, copying the prophage and transmitting it to daughter cells.

Carbon and other organic materials



Upon infection, the virus causes the cell to reallocate molecular machinery and raw materials, such as carbon and other nutrients, toward DNA replication and production of viral structural proteins. In some instances there may be greater uptake of nutrients and/or additional production of host machinery involved in carbon fixation.



Occasionally a prophage exits the bacterial chromosome, initiating a lytic cycle.



During the lysogeny cycle, the virus is usually relatively benign, though it may alter the expression of host regulatory proteins, cause the expression of virus-encoded toxin genes, or interact with host physiology in other ways.

LYSIS/  
VIRAL  
PRIMING



Bacterial cell lyses, releasing viral offspring as well as carbon and other organic nutrients that can be taken up by surrounding microbes.

**VIRAL DISRUPTION:** Viruses in the ocean can affect the marine ecosystem in a number of ways. First and foremost, viral killing of microbes could be as important in reducing the abundance of targeted lineages as are grazers, like protists and zooplankton. Furthermore, during the infection process, a virus can alter the host cell's metabolism by increasing the rate of photosynthesis, for example, thereby changing the rate of carbon fixation. And when a virus causes host lysis, not only are new viral particles released, but so are the carbon and other organic nutrients that were trapped inside the cell. These materials then become available for utilization by nearby microbes, a potentially beneficial process known as viral priming. Finally, under certain conditions, a virus may become a long-term resident in its host cell, integrating its genomic material into that of its host to form a "lysogen."