

# Viruses

Alive? Or Not?

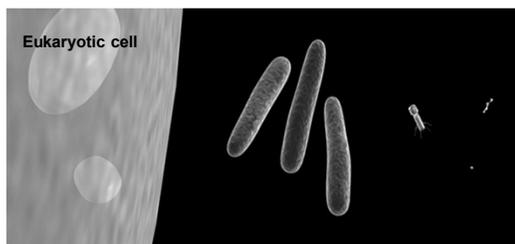
<https://www.youtube.com/watch?v=UEKS4w9bfJg>

## What is a virus?

- Pathogen: any living organism or particle that causes disease
- Viruses are particles that cause disease made only of a strand of DNA or RNA enclosed in a protein coat (capsid)

## Other particles that cause disease:

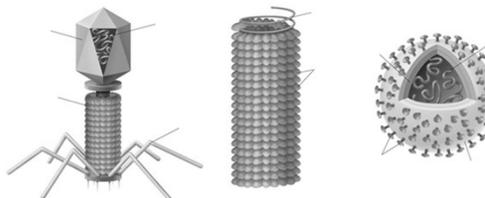
- Retrovirus: viruses that contain RNA and produce their own DNA (some types of cancer & HIV)
- Viroid: particle that causes disease in plants
- Prion: particle that causes disease by causing proteins in the infected organism to fold incorrectly; only made of protein (mad cow disease); always fatal



## Are viruses alive?

Virus	Living Cell
No life functions: no growth/development, no use of energy, no response to environment, etc.	Carries out all life functions
Reproduction requires a host cell to carry out	Reproduction does not require the use of a host cell
Structurally, only made up of a capsid surrounding a nucleic acid	Cellular structure with parts of a cell

## Viruses come in a variety of sizes and shapes



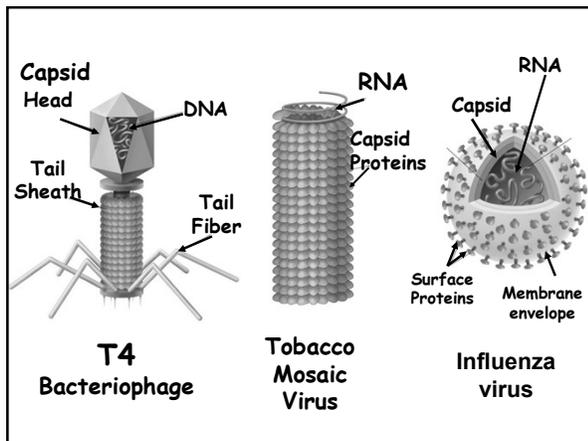
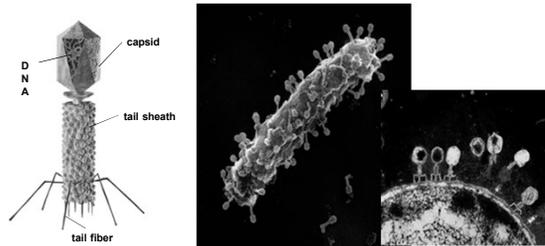
A typical virus is composed of a core of either DNA or RNA, surrounded by a protein coat, or capsid

**What do different viruses have in common?**

1. Viruses are very, very small
2. Structurally, viruses are made up of a protein covering called a CAPSID, surrounding a NUCLEIC ACID of DNA or RNA

\*The structure & shape of a virus determines what kind of host it infects and how it infects that host. (host = cell that is infected)

- Viruses that infect bacteria are known as **bacteriophages** and enter a bacteria cell by injecting their genetic material into the cell



**How do viruses enter our bodies?**

- Cuts/scrapes
- Mouth, nose, genital area, eyes, ears

Some viral diseases can spread quickly causing an **epidemic**: rapid outbreak of infection that affects many people

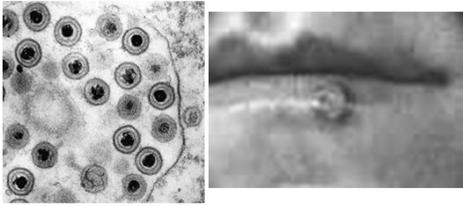
**How are virus-caused illnesses prevented?**

**Vaccines**

A preparation of weakened or killed virus or viral proteins that stimulate the immune system to recognize and destroy viruses



Viruses in plants can be very costly and destructive.

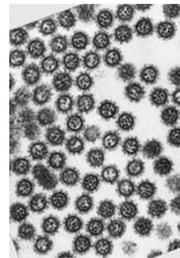


Cold Sores

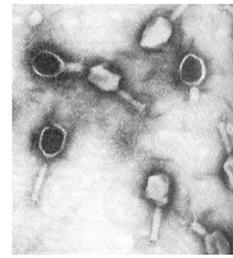
Smallpox



Rabies



Flu Virus



Tobacco Leaf Mosaic virus

AIDS



Chickenpox



Polio

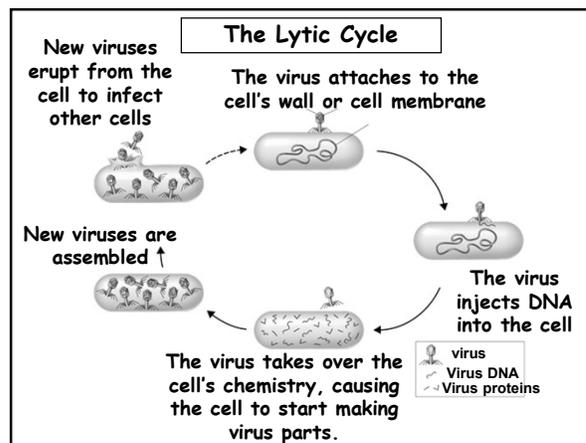


How do viruses infect a cell?

1. LYTIC infection cycle
2. LYSOGENIC infection cycle

In a LYTIC infection what 3 things happen?

1. A virus enters a cell
2. Makes copies of itself
3. Causes the cell to burst



In a Lysogenic infection cycle, what happens?

In a lysogenic infection, the viral DNA enters a host cell and inserts itself into the host's DNA

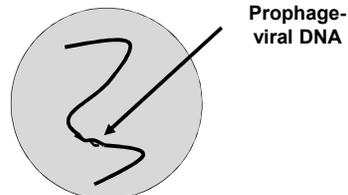
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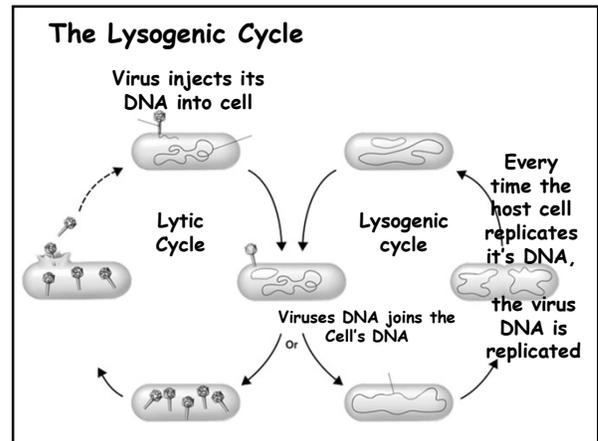
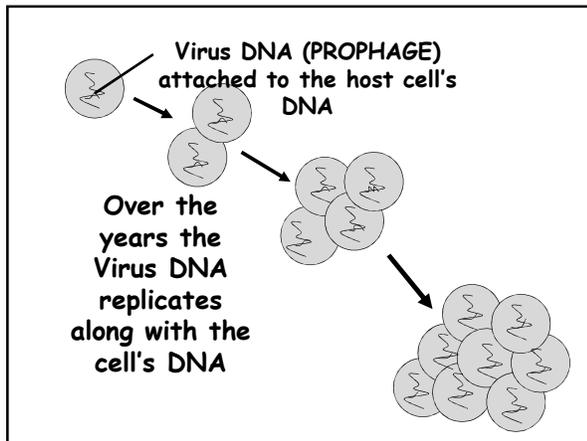
Just sits there until a "trigger" makes it go into the lytic cycle.

This may take years  
 So, every time the cell divides, the virus DNA divides.

The viral DNA that is embedded in the host's DNA is called a

**Prophage**





REVIEW VIDEOS:

<https://www.youtube.com/watch?v=oqGuJhOeMek>

<https://www.youtube.com/watch?v=Rpj0emEGShQ>