Virus Notes

Are viruses alive? It depends on your definition of 'alive.' They do not have all the characteristics of life. They do not eat food. They cannot duplicate themselves. They trick cells into making copies of them. The virus invades a cell, tricking it into copying viral DNA. The hijacked cell also transcribes and translates viral proteins.

**Made of 2 parts**
1. Nucleic acid core (DNA or RNA)
2. Capsid – protein coat around nucleic acid

**Shapes of Viruses**
- **Bacteriophage:** infects bacteria
- **Helical:** infects plants (tobacco mosaic virus)
- **Spherical:** infects animals

Viruses cause diseases such as: Malaria, Measles, Mumps, Flu, Cold, Rabies, Polio, AIDS

Viruses usually infect specific types of cells. A certain virus may only infect plants or only infect animals. However, viruses can mutate and begin to infect many species (Ex: bird flu)

**Viral Transmission**
Viruses are transmitted through body fluids such as mucus, water droplets, blood, semen

Treatments for Viruses

Cannot be treated with antibiotics because viruses are not living

Vaccines: a weakened or killed virus injected into the body to prevent infection

Viral Infection & Replication
**Lytic Cycle:**
1. Attachment: the cell membrane is tricked by the viral proteins and allows it to attach
2. DNA Injection: the virus injects its DNA or RNA into the cell
3. Replication: The cell makes many copies of the viral DNA
4. Protein Synthesis: the host cell makes many capsids for the virus
5. Assembly: viral DNA is packed inside the capsids (protein coats)
6. Lysis: the cell bursts and hundreds of viruses are released to infect other cells

**Lysogenic Cycle:**
This cycle is very similar to the lytic cycle EXCEPT the viral DNA inserts itself into the host DNA. This is called a prophage. A prophage can remain dormant.
1. Attachment: (same as lytic cycle)
2. Injection: (same as lytic cycle)
3. Prophage Formation: the viral DNA becomes part of the host cell DNA, this is called a prophage
4. Cell Division: the prophage (viral DNA) is inactive & is replicated each time the host cell replicates
5. Activation: the prophage becomes activated and the cell begins to copy DNA and make capsids
6. Assembly (same as lytic cycle)
7. Lysis: many cells break open and release viruses