**Viruses**

[**https://www.youtube.com/watch?v=7KXHwhTghWI**](https://www.youtube.com/watch?v=7KXHwhTghWI)

The name “virus” comes from the LATIN word for POISON

1. **What is a Virus?** 
   1. Structure of a virus:
      1. Protective coat made of PROTEIN called a CAPSID.
      2. Core of NUCLEIC ACID (DNA or RNA but not both).
   2. Viruses vary in size from approximately 20 to 400 nm.
   3. Viruses display “specificity,” meaning: EACH VIRUS ATTACKS A SPECIFIC CELL TYPE/SPECIES
2. **Life Cycle of a Lytic Virus**
   1. **Attachment**
      1. In order to reproduce, viruses must INVADE (aka INFECT) a LIVING host cell.
   2. **Entry/Infection:** 
      1. Virus activated by CHANCE CONTACT with right host cell
      2. Tail attaches to the SURFACE of the bacterium
      3. DNA/RNA ENTERS the bacterium
   3. **Growth/Replication:** 
      1. Virus uses materials of the HOST CELLS to make thousands of copies of its own protein coat and DNA
      2. Host cell becomes filled with COPIES of viral DNA molecules.
   4. **Assembly:** 
      1. New VIRUS particles are assembled
   5. **Release:**
      1. Infected cell LYSES (bursts), hence the name “Lytic virus”
      2. 100s of new virus particles are RELEASED and may now infect OTHER CELLS



1. **Lysogenic Infections** 
   1. **Attachment**
   2. **Entry/Infection**
   3. **Prophage**
      1. Viral DNA enters cells and is INSTERED into the DNA of the host cell
      2. May remain in host DNA for MANY GENERATIONS
   4. **Prophage activity** 
      1. Does not stay in PROPHAGE form for ever; eventually DNA becomes ACTIVE, and removes itself from host DNA
      2. Factors that can activate the virus:
         1. CHANGE IN TEMPERATURE
         2. AVAILABILITY OF NUTRIENTS
   5. **Growth/Replication**
   6. **Assembly**
   7. **Release**



1. **Retroviruses:** 
   1. Contain RNA as their genetic material
   2. When infecting a host, make a DNA copy of their RNA genes
   3. This DNA acts like that of a lysogenic virus and is INSERTED into the host DNA
   4. Name means “BACKWARD” and comes from their genes being copied from RNA to DNA
   5. Example: HIV



[**https://www.youtube.com/watch?v=odRyv7V8LAE**](https://www.youtube.com/watch?v=odRyv7V8LAE)

1. **Viruses and Living Cells** 
   1. Viruses are parasites, meaning: THEY DEPEND ON ANOTHER ORGANISM COMPLETELY IN A WAY THAT IS HARMFUL
   2. Are viruses living or non-living?
      1. Evidence for “non-living”: CAN’T REPRODUCE INDEPENDENDTLY
      2. Evidence for “living”: INFECT, GROW, REPRODUCE, GENE REGULATION, EVOLVE