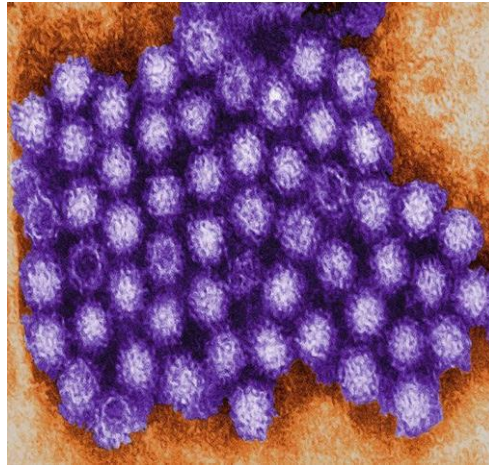
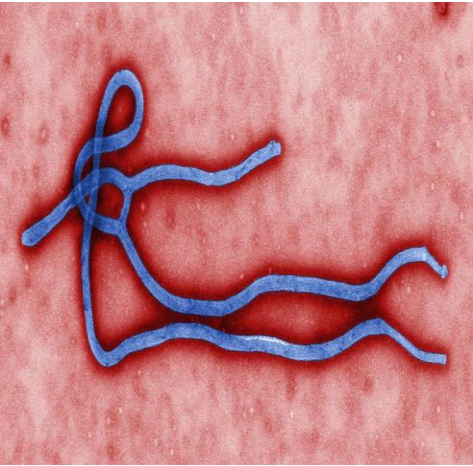
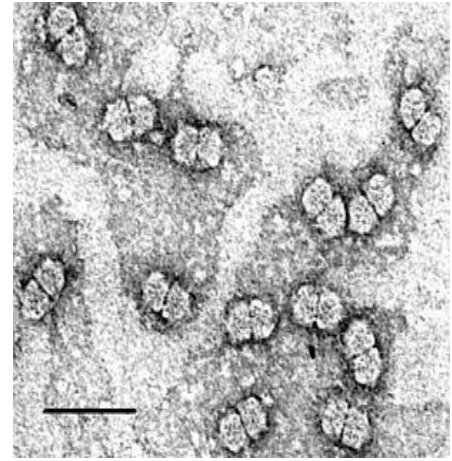
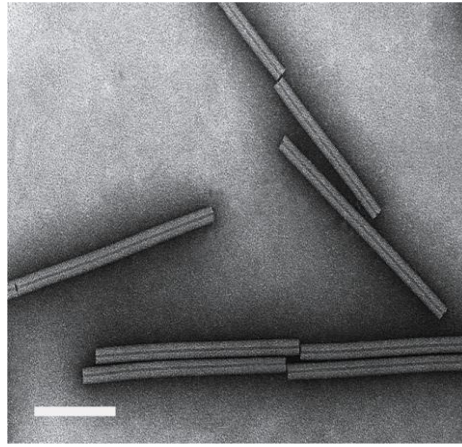


Virus Introduction



Virus Definition

An infective agent that typically consists of a nucleic acid molecule in a protein coat, is too small to be seen by light microscopy, and is able to multiply only within the living cells of a host.

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a piece of code which is capable of copying itself and typically has a detrimental effect, such as corrupting the system or destroying data.

www.google.com/search

Characteristics of Viruses

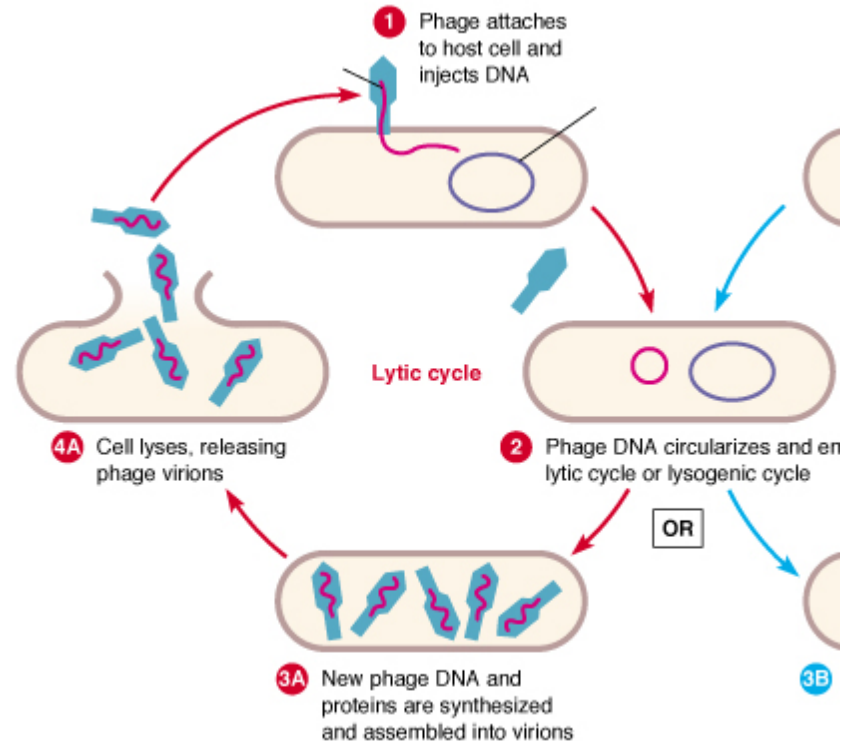
1. **Viruses** are infectious agents with both living and nonliving characteristics.
2. Living characteristics: ability to reproduce in hosts
3. Non Living characteristics:
4. They are acellular, that is, they contain no cytoplasm or cellular organelles
5. They carry out no **metabolism** on their own and must replicate using the host **cell's** metabolic machinery. In other words, viruses don't grow and divide
6. Obligate intracellular parasites
7. Structure: genome enclosed in a protein coat/capsid. Sometimes lipid envelop
8. The vast majority of viruses possess either **DNA** or RNA but not both.
9. They mutate
10. These include a process called **antigenic drift** where individual bases in the DNA or RNA (point mutation) **mutate** to other bases. **Antigenic shift** occurs when there is a major change in the genome of the virus. This can be a result of **recombination** or **reassortment**. Eg influenza virus pandemic

Viruses on border of living and non living

- Viruses have one major characteristic in common: they are obligate intracellular parasites.
- Virology; the study of viruses
- Viruses are UNABLE to grow and reproduce outside of a living cell.
- No virus is able to produce its own energy (ATP) to drive macromolecular synthesis. However, in many other respects, they are a highly diverse group

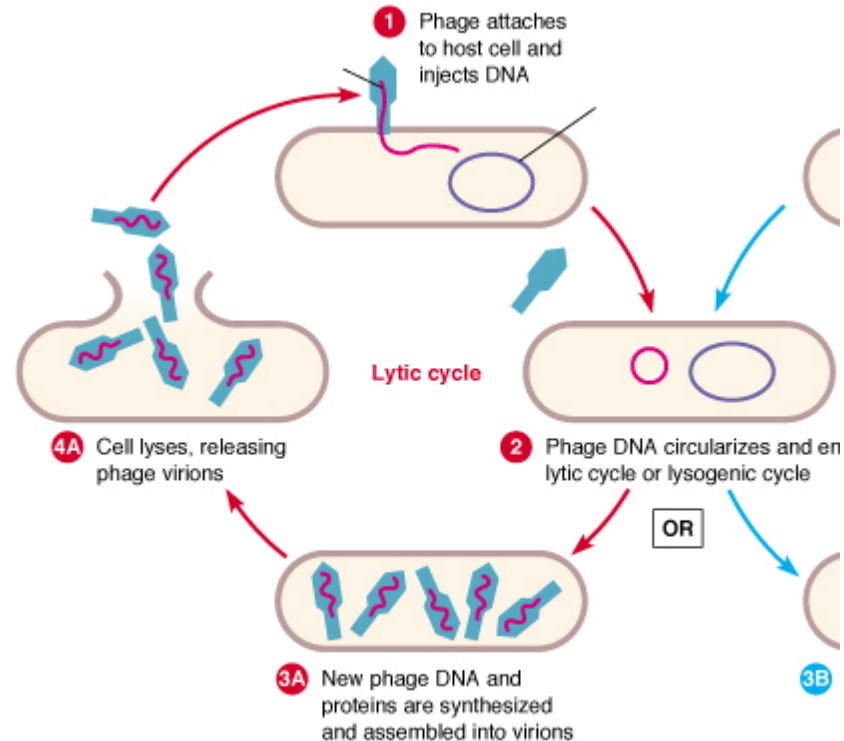
Bacteriophage Life Cycle

- Lytic cycle
 - Attachment
 - Penetration
 - Biosynthesis
 - Maturation
 - Release



Bacteriophage Life Cycle

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Virus genome size (Wikipedia)

-Genome sizes of bacteriophages and viruses range from about **2 kb** to over 1 Mb. The smallest—the ssDNA circoviruses, family *Circoviridae*—code for only two proteins and have a genome size of only two kilobases; the largest—the pandoraviruses—have genome sizes of around two megabases which code for about 2500 proteins. Virus genes rarely have introns and often are arranged in the genome so that they overlap

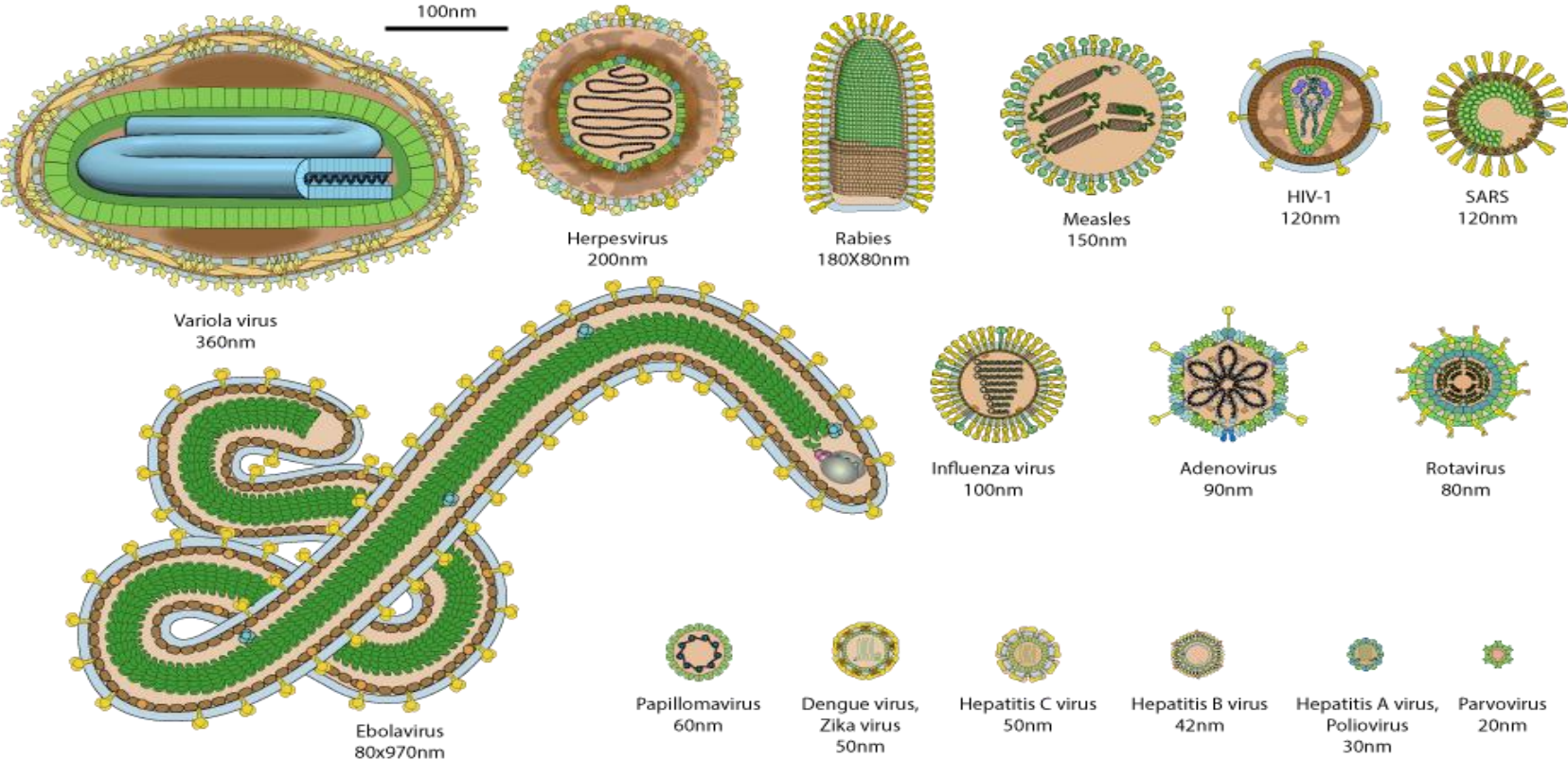
-Prokaryotic genomes range from about **500 kb** to about 12 Mb.

-Eukaryotic genomes are diverse in size, ranging from ~10 Mb in some fungi to >100 000 Mb in certain plants, salamanders, and lungfishes.

UNIQUE ABOUT VIRAL GENOME

Viral genomes consist of DNA or RNA only, never both. DNA and RNA molecules can be double stranded or single stranded, linear or circular , segmented (composed of multiple pieces of nucleic acid) or nonsegmented.

Size of Viruses (nanometer....??)



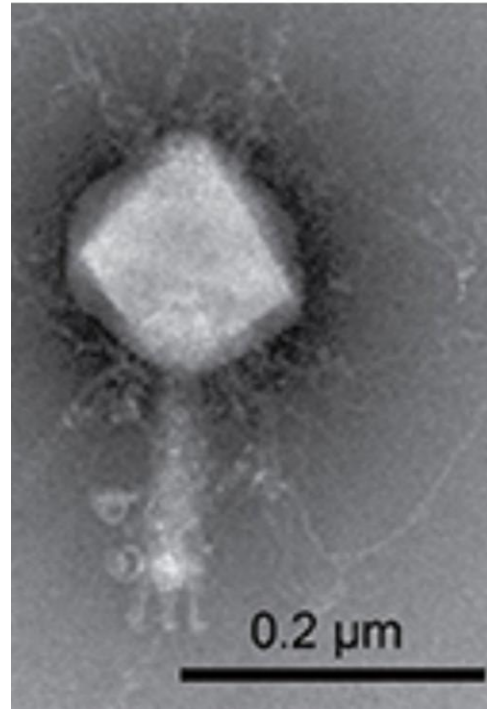
GAINT OR JUMBOPHAGES

Giant or jumbo phages are terms used to describe prokaryotic viruses with genomes >200 kb.



frontiers

in Microbiology



**Larger Than Life:
Isolation and Genomic
Characterization of a
Jumbo Phage That
Infects the Bacterial
Plant Pathogen,
*Agrobacterium
tumefaciens***

 Hedieh Attai¹,  Maarten Boon²,
 Kenya Phillips¹,  Jean-Paul
Noben³,  Rob Lavigne² and  Pamela J. B. Brown^{1*}

¹Division of Biological Sciences, University of Missouri, Columbia, MO, United States

²Laboratory of Gene Technology, KU Leuven, Leuven, Belgium