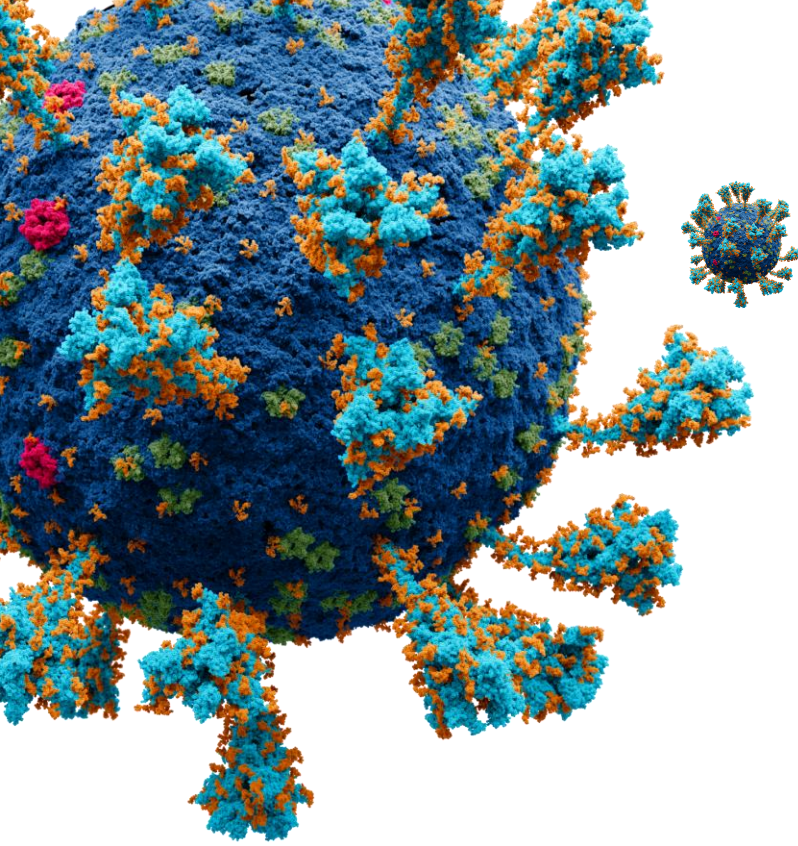
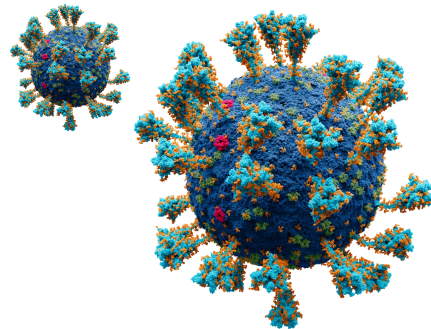
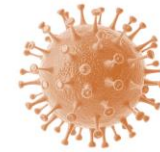


Medical Virology Terminology

Summer Term
Lecture no.2



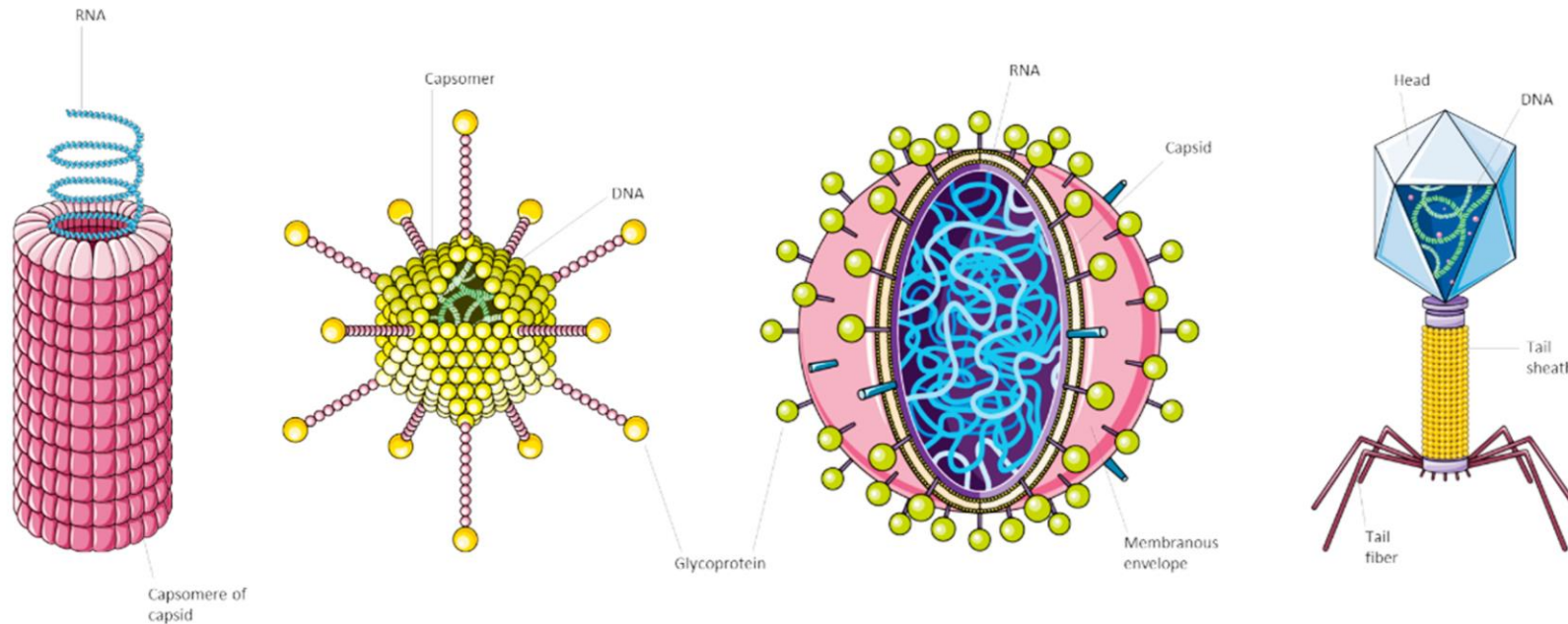
Asst. Prof. Dr. Tola A. Faraj

- **Medical virology** is the study of viruses that cause human diseases, focusing on their **[structures, how they multiply, and how they interact]** with the immune system.
- Core **terms** and their basic definitions describe viral structure, replication, and disease mechanisms.



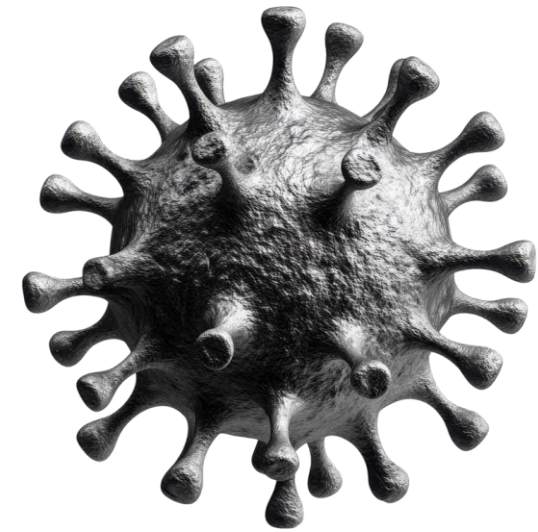
Viral Structure

- **Virion:** A whole, single virus particle outside a cell. It can infect a new host.
- **Capsid:** The outer shell made of **protein**. It protects the inner genetic code.
- **Capsomere:** Individual protein subunits that aggregate to form the protective capsid.



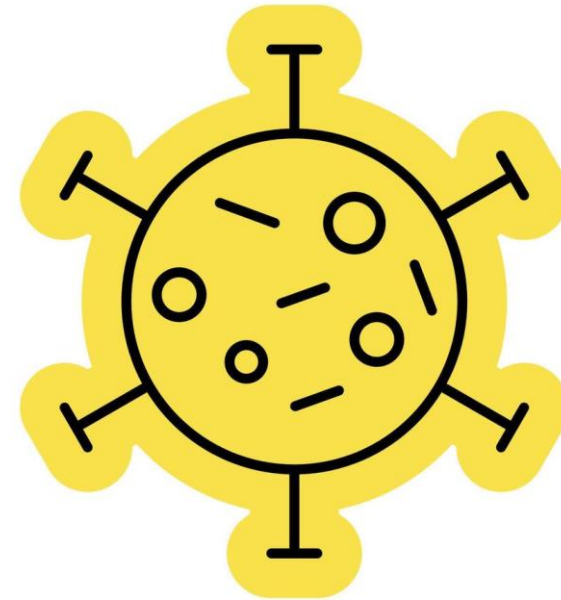
Viral **Structure**

- **Nucleocapsid:** The core unit containing the viral genetic material (DNA or RNA) joined with the protein capsid.
- **Envelope:** An outer **fatty** (lipid) membrane that covers some viruses. The virus steals this layer from the host cell.
- **Spikes [Peplomer]:** Protein bumps on the outside of a virus. They help the virus stick to and enter host cells.



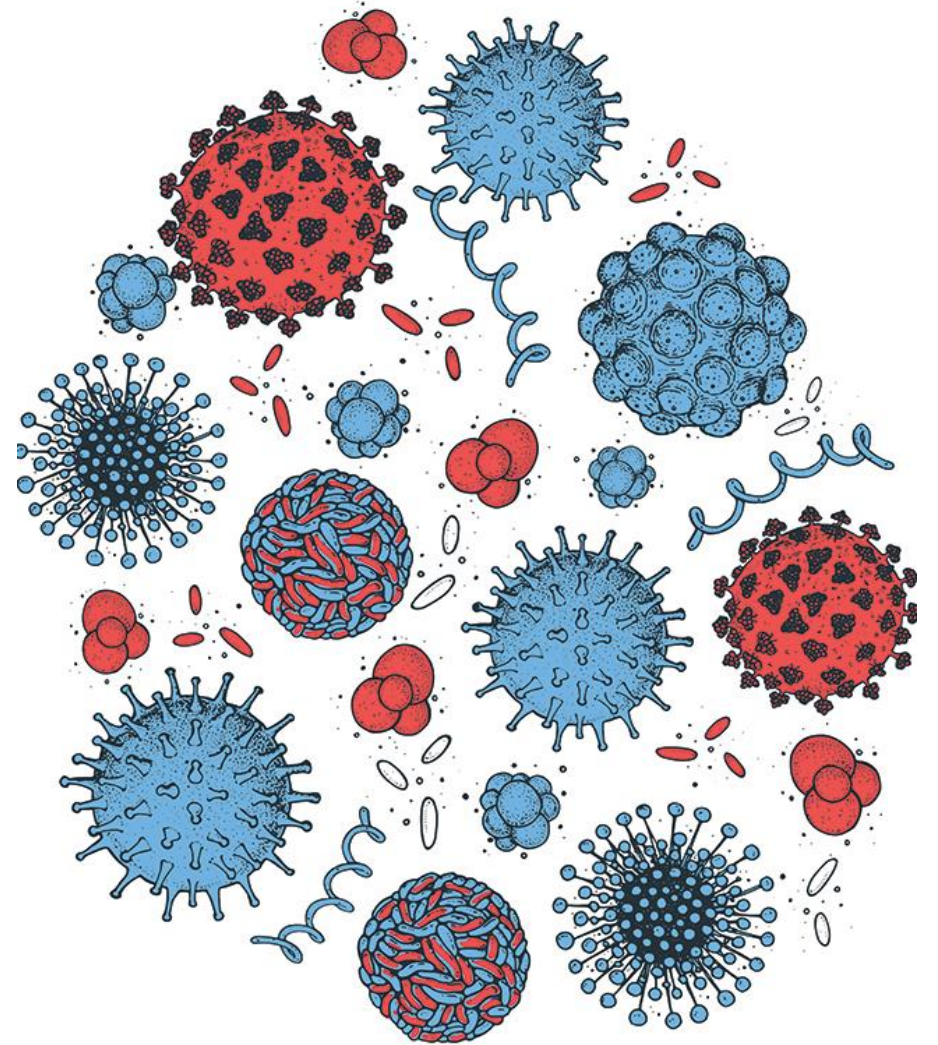
Infection and Growth

- **Obligate Intracellular Parasite:** An infectious agent that cannot grow on its own. It must live and multiply inside a living host cell.
- **Host Tropism:** The specific type of host, organ, or cell a virus prefers to infect.



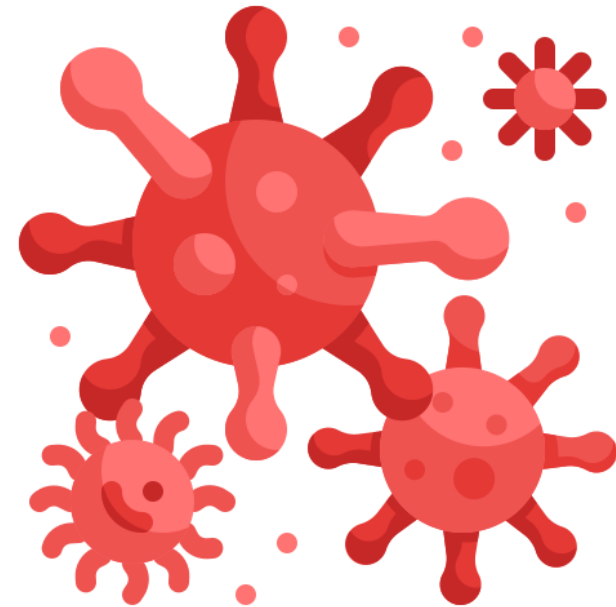
Infection and Growth

- **Uncoating:** The step where the virus removes its protein coat inside the host cell. This sets the genetic code free to make copies.
- **Cytopathic Effect (CPE):** Visible damage or changes to host cells caused by a viral infection. Cells may change shape or die.
- **Latency:** A resting or hidden state. The virus stays inside the host cell without making new virus parts for a long time.



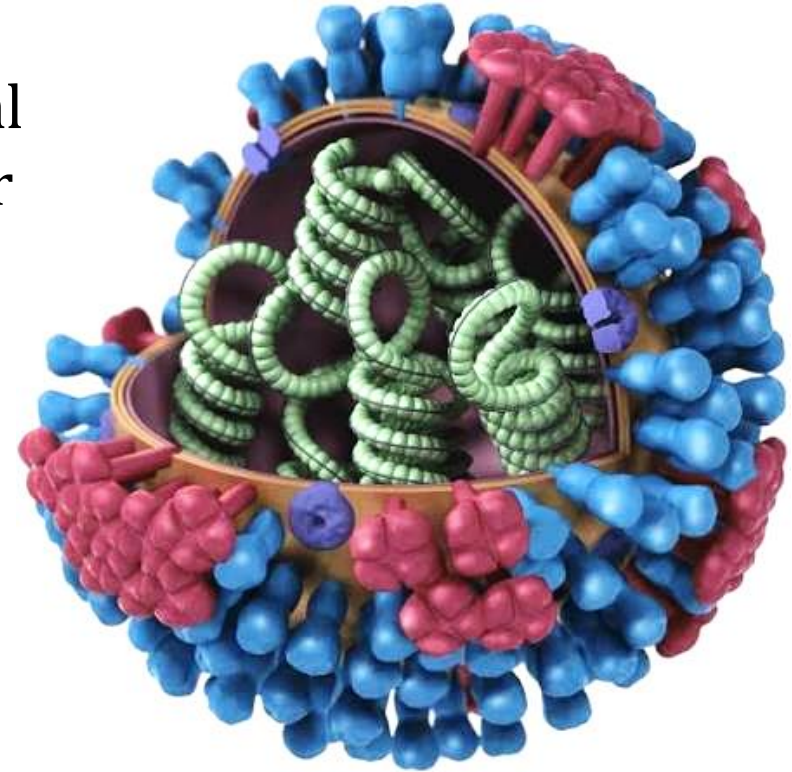
Infection & Replication Cycle

- **Attachment:** The binding of a virion to specific surface receptors on a susceptible host cell.
- **Uncoating:** The separation of the viral capsid from its genome, making the nucleic acid available for transcription [copy].



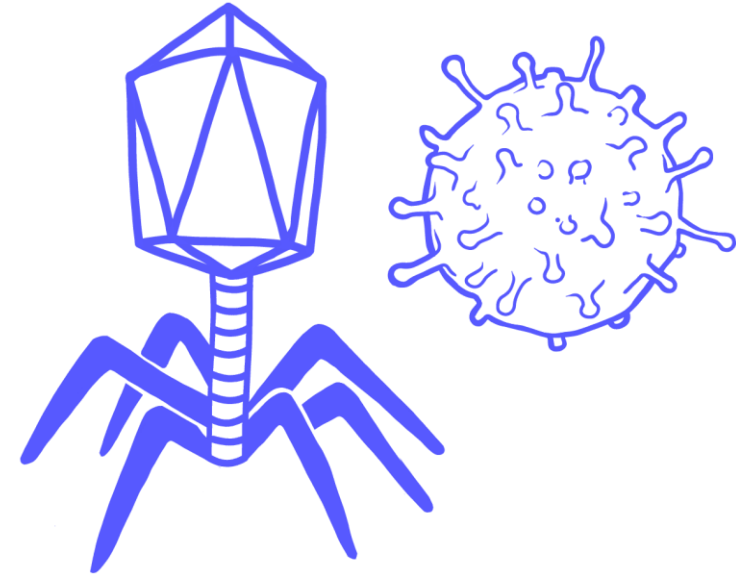
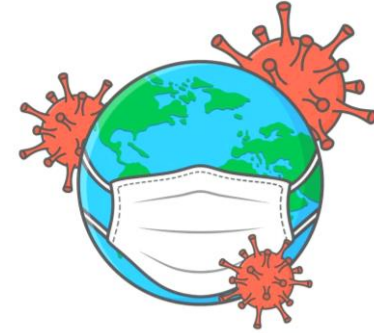
Infection & Replication Cycle

- **Eclipse Period:** The time between initial viral entry and the first appearance of intracellular infectious progeny.
- **Budding:** The process where enveloped viruses exit the host cell by wrapping themselves in the host's membrane.
- **Lysis:** The bursting and destruction of a host cell, releasing newly formed non-enveloped virions.



Disease and Spread

- **Virulence:** How strong a virus is at causing severe disease in a host.
- **Viremia:** The presence of active virus particles flowing through the bloodstream.
- **Antigenic Drift:** Slow, **small** changes in virus surface proteins caused by random genetic mutations over time.



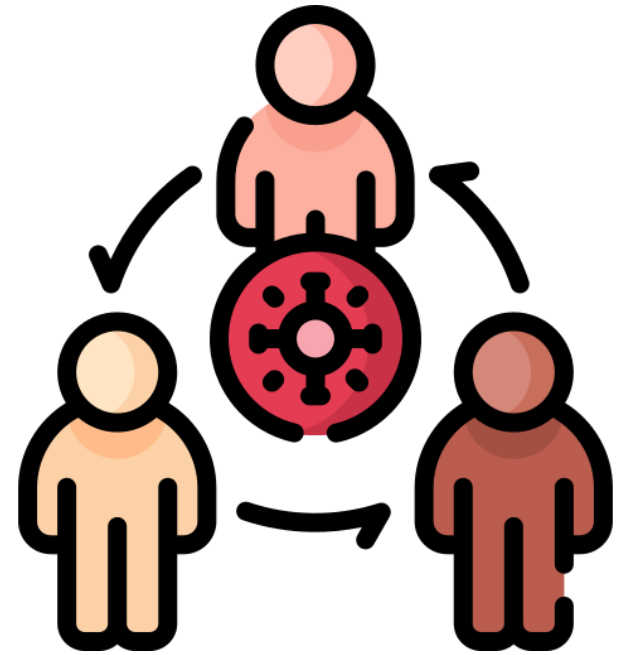
Disease and Spread

- **Antigenic Shift:** A sudden, **major** change in virus traits. This happens when two different virus strains mix genes inside a host cell to create a new type.
- **Fomite:** An inanimate [non-living] object (like a door handle, phone, or clothing) that carries infectious virus particles and can pass them to a person.



Pathogenesis & Clinical Course

- **Acute Infection:** A rapid onset of viral disease with brief duration, followed by rapid clearance or death.
- **Latent Infection:** A persistent [continuous] infection where the virus remains completely dormant inside host cells without replicating.

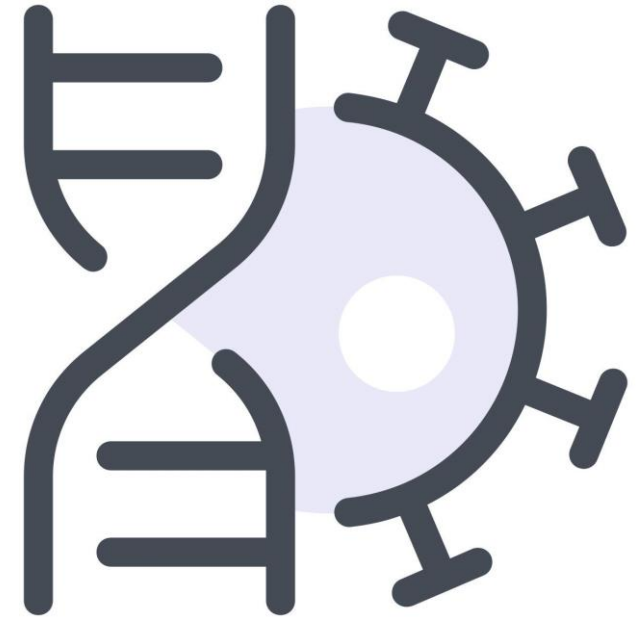


Pathogenesis & Clinical Course

- **Chronic Infection:** A long-term infection where viral progeny are continuously produced and shed over a prolonged period.
- **Viremia:** The presence of infectious viral particles circulating in the bloodstream.
- **Neurotropism:** The ability of a virus to infect, invade, and cause disease within the nervous system.
- **Teratogen:** A virus capable of crossing the placenta to cause congenital defects or malformations in a developing fetus.

Genetics & Evolution

- **Antigenic Drift:** Minor genetic mutations over time that cause small changes in viral surface proteins, leading to seasonal epidemics.
- **Antigenic Shift:** A sudden, major genetic reassortment resulting in a novel viral subtype, often triggering global pandemics.



Genetics & Evolution

- **Reassortment:** The changing of entire gene segments between two different strains of a segmented virus infecting the same cell.
- **Provirus:** Viral DNA that has integrated directly into the host cell's chromosome (e.g., HIV).

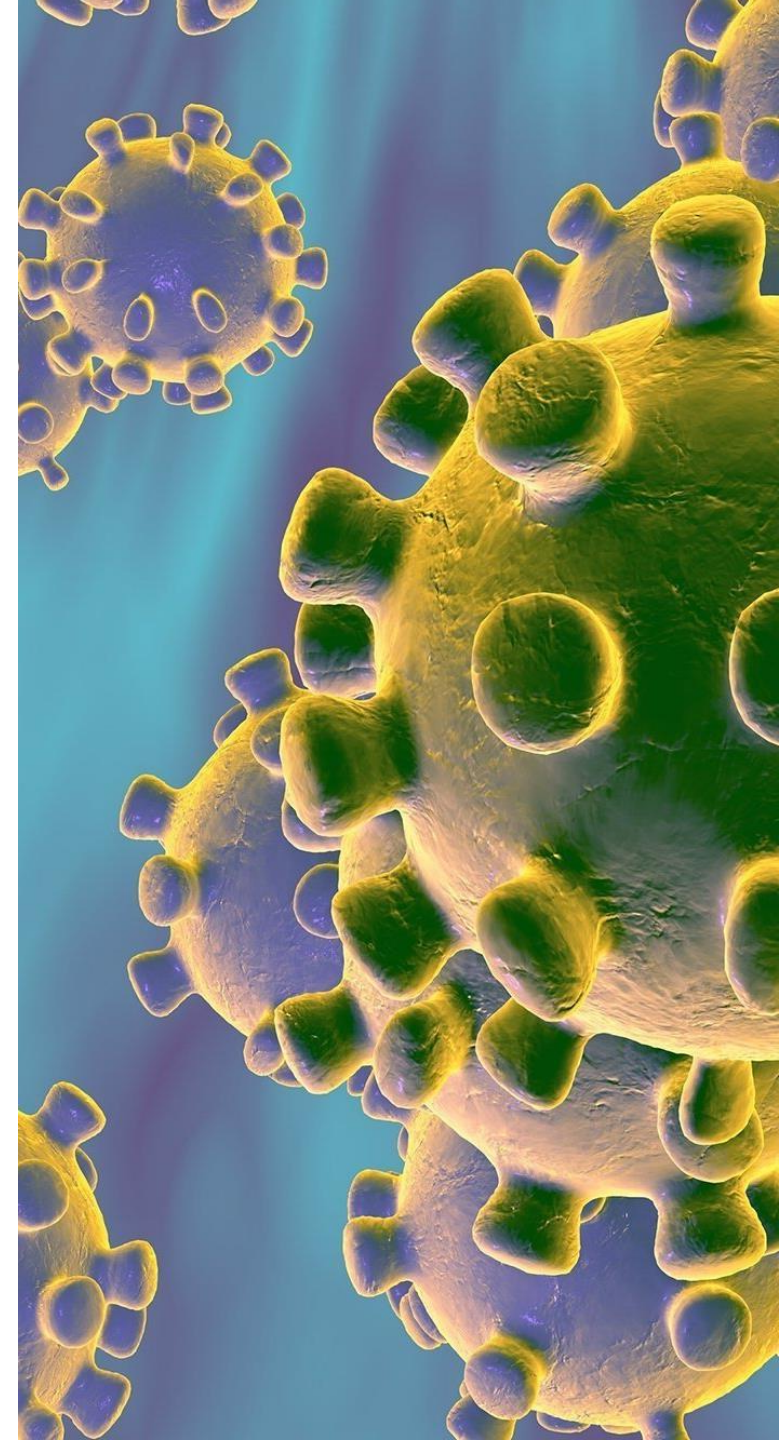
Diagnostics & Immunology

- **Cytopathic Effect (CPE):** Structural changes or damage in host cells caused by viral invasion, visible under a microscope.
- **Syncytium:** A large, multinucleated cell formed by the fusion of several virus-infected neighboring cells.



Diagnostics & Immunology

- **Seroconversion:** The transition from a antibody-negative to an antibody-positive status in the blood following an infection.
- **Neutralizing Antibody:** An antibody that binds to a virus and directly blocks its ability to infect a host cell.
- **Titer:** A laboratory measurement of the concentration or activity of a virus or specific antibodies in a fluid sample.



Assessment

1. What is a virion?

- A. A viral protein subunit
- B. A complete virus particle outside a cell
- C. Viral DNA integrated into a chromosome
- D. A host cell infected by a virus

2. What is the primary function of the viral capsid?

- A. To produce viral RNA
- B. To destroy the host cell
- C. To protect the viral genetic material
- D. To integrate viral DNA into the host chromosome

3. Capsomeres are best described as:

- A. Lipid membranes surrounding viruses
- B. Individual protein subunits forming the capsid
- C. Viral nucleic acids
- D. Host-cell receptors

4. What does the term “nucleocapsid” refer to?

- A. Viral envelope and spikes
- B. Viral genome joined with the protein capsid
- C. Host-cell membrane and receptor
- D. Viral genome alone

5. Which viral structure is composed of a lipid membrane obtained from the host cell?

- A. Capsid
- B. Capsomere
- C. Envelope
- D. Nucleocapsid

6. What is the main role of viral spikes (peplomers)?

- A. To replicate viral DNA
- B. To help the virus attach to and enter host cells
- C. To destroy the viral capsid
- D. To produce antibodies

7. An obligate intracellular parasite is an infectious agent that:

- A. Can multiply independently outside cells
- B. Can only infect bacteria
- C. Must live and multiply inside a living host cell
- D. Cannot replicate inside cells

8. Host tropism refers to:

- A. The ability of a virus to mutate
- B. The specific host, organ, or cell a virus prefers to infect
- C. The destruction of infected cells
- D. The release of viral particles

9. What occurs during viral uncoating?

- A. Viral particles are released by cell lysis
- B. The viral capsid separates from the genome
- C. Viral genes undergo reassortment
- D. Antibodies bind to viral particles

10. The eclipse period is the time between:

- A. Viral attachment and host-cell death
- B. Viral entry and the first appearance of intracellular infectious progeny
- C. Viral replication and antibody production
- D. Budding and cell lysis

11. Which process allows an enveloped virus to leave a host cell by acquiring part of the host-cell membrane?

- A. Lysis
- B. Uncoating
- C. Budding
- D. Attachment

12. Lysis refers to:

- A. Fusion of infected cells
- B. Integration of viral DNA into a chromosome
- C. Bursting and destruction of the host cell
- D. Viral attachment to a receptor

13. Which term describes the severity or strength of a virus in causing disease?

- A. Tropism
- B. Virulence
- C. Viremia
- D. Latency

14. Viremia is defined as:

- A. The presence of virus in the nervous system
- B. The presence of infectious virus particles in the bloodstream
- C. Viral replication inside the nucleus
- D. The absence of detectable antibodies

15. Which process involves small genetic changes in viral surface proteins over time?

- A. Antigenic shift
- B. Reassortment
- C. Antigenic drift
- D. Budding

16. Antigenic shift is best described as:

- A. A minor mutation occurring gradually
- B. A sudden, major genetic reassortment producing a novel viral subtype
- C. Viral integration into a host chromosome
- D. Loss of the viral envelope

17. What is reassortment?

- A. Exchange of entire gene segments between different strains of a segmented virus
- B. Exchange of antibodies between infected cells
- C. Destruction of the viral capsid
- D. Integration of viral DNA into host DNA

18. A provirus is:

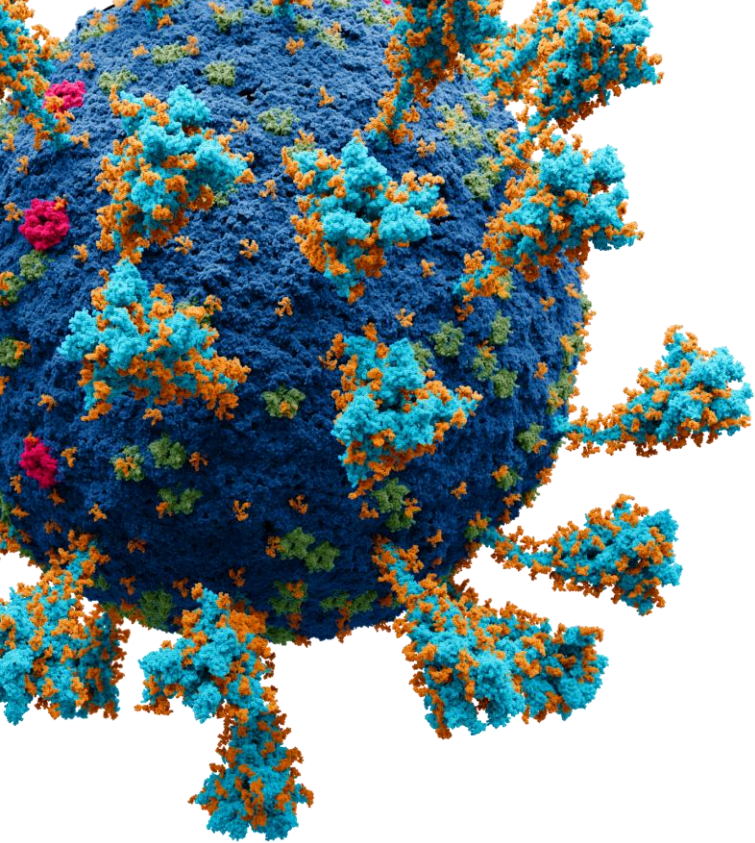
- A. Viral RNA circulating in the bloodstream
- B. Viral DNA integrated into the host cell's chromosome
- C. A viral capsid without genetic material
- D. A newly formed viral particle outside a cell

19. What is seroconversion?

- A. The conversion of viral RNA into DNA
- B. The transition from antibody-negative to antibody-positive status in blood
- C. The destruction of infected cells by lysis
- D. The formation of viral capsids

20. What is a neutralizing antibody?

- A. An antibody that increases viral replication
- B. An antibody that integrates viral DNA into host chromosomes
- C. An antibody that binds to a virus and blocks its ability to infect a host cell
- D. An antibody that causes antigenic drift



Thank You!

