

GENERAL VIROLOGY

Course Outline

I. The Science of Virology

- A. General properties of viruses
- B. History of virology
- C. Origin and Evolution of viruses

II. Methods in Virus Research

- A. Virus cultivation
- B. Virus purification
- C. Virus assay
- D. Virus characterization

III. Viral Structure, Components and Functions + Chapters 8 and 10 of Brock

- A. Virion symmetry
- B. Viral genomes
- C. Viral proteins
- D. Viral envelope

IV. Virus Classification and Nomenclature

- A. Virus classification and nomenclature
- B. Baltimore classification
- C. Groupings of viruses based on epidemiologic criteria

V. Viral Growth Cycle

- A. The one-step growth curve
- B. Generalized virus replication cycle
- C. Outcomes of virus infection
- D. Virus genome replication strategies

VI. Viruses of Bacteria and Archaea

- A. Bacteriophages
- B. Classification of bacteriophages
- C. Archaeal viruses
- D. Replication of lytic viruses
- E. Lysogenic and temperate phages
- F. Lysogenic conversion
- G. Phage genetics

VII. Animal Viruses

- A. Families of DNA viruses

- B. Families of RNA viruses
- C. Families of reverse-transcribing viruses

VIII. Oncogenic Viruses

- A. Mechanism of virus-induced cancer
- B. DNA and RNA tumor viruses

IX. Plant Viruses

- A. General characteristics of plant viruses
- B. Infection, transmission and control of plant viruses
- C. Symptoms induced by virus infection

X. Viruses Infecting Algae, Fungi, and Protozoa

- A. Viruses of algae
- B. Viruses of fungi
- C. Viruses of protists

XI. Subviral Agents

- A. Satellites
- B. Viroids
- C. Gene transfer agents
- D. Prions
- E. Virophages

XII. Pathogenesis and Control of Viral Diseases

- A. Mechanism of infection and spread
- B. Virus transmission
- C. Immune responses
- D. Prevention and control of virus infection

XIII. Diagnostic Virology

- A. Diagnostic methods
- B. Diagnosis of specific viral infection

XIV. Antiviral Chemotherapy

- A. Antiviral chemotherapeutic agents
- B. Anti-HIV therapy
- C. Interferons

XV. Viral Applications

Major reference: MADIGAN, MT, BENDER, KS, BUCKLEY, DH, SATTLEY, WM and STAHL, DA.
2021. Brock Biology of Microorganisms. 16th ed. USA: Pearson Education Limited. 1120 p.