

## BIOC20: Principles of Virology

### Lecture 1 (Chapter 1)

#### The Nature of Viruses:

##### Basics:

- The Virion (fully intact infectious virus - has all the components to infect) consists of:
  - A nucleic acid **genome** (RNA or DNA)
  - An enclosed protective protein coat (**capsid**)
    - Every virus has a capsid - a shell
  - Some viruses contain a **lipid envelope** - outermost layer (outer-coat+ lipid bilayer taken from the host cell, which also takes protein from the host)
- Capsid could be spherical or rod-like



##### Dependence on hosts:

- Viruses are dependent on host cells
- Viruses are obligate **intracellular parasites** (needs to be inside a cell, and is a parasite as it steals resources from the hosts to survive)
  - Can only replicate within a living cell
- Viruses lack many essential functions, therefore cannot survive on their own
  - Synthesis of basic biological building blocks (unable to make the basic building blocks of life)
    - i.e. nucleotides, amino acids, CHO's, lipids (they can't make it but have to steal it from the host to survive)
  - Generation of useable chemical energy (ATP)
  - Protein synthesis machinery
    - i.e. ribosomes, tRNAs
  - Without these, a virus is just a package of genes!

##### Replication:

- Virus particles **break down** (disintegrate) and release their **genomes** inside the cell, (Uncoating) before it can replicate inside the host. Important for the particle to uncoat, because the genome inside is responsible for the transmission and infection of the virus.
  - Released from the protective protein shell
- Once uncoated, the genome can be used a template for mRNA synthesis ⇒ protein production
  - using the cell resources as a virus factory!
- Viral proteins work together to replicate virus particle
  - Newly made structural proteins (viral) encapsidate the new genomes to form progeny virions

Q ⇒ How is this process in contrast to unicellular organisms, like bacteria?

- Glycosaminoglycan
- Immature virus
- Internal core
- Lateral bodies
- Mature virus
- Microvilli

- Pock
- Vaccination
- Variolation
- Viroplasm

# Jimma University Virology Lecture Notes

**Liyong Dong**



## **Jimma University Virology Lecture Notes:**

The Top Books of the Year Jimma University Virology Lecture Notes The year 2023 has witnessed a remarkable surge in literary brilliance, with numerous captivating novels enthralling the hearts of readers worldwide. Lets delve into the realm of top-selling books, exploring the captivating narratives that have enthralled audiences this year. Jimma University Virology Lecture Notes : Colleen Hoover "It Ends with Us" This heartfelt tale of love, loss, and resilience has gripped readers with its raw and emotional exploration of domestic abuse. Hoover skillfully weaves a story of hope and healing, reminding us that even in the darkest of times, the human spirit can succeed. Uncover the Best : Taylor Jenkins Reids "The Seven Husbands of Evelyn Hugo" This intriguing historical fiction novel unravels the life of Evelyn Hugo, a Hollywood icon who defies expectations and societal norms to pursue her dreams. Reids compelling storytelling and compelling characters transport readers to a bygone era, immersing them in a world of glamour, ambition, and self-discovery. Jimma University Virology Lecture Notes : Delia Owens "Where the Crawdads Sing" This evocative coming-of-age story follows Kya Clark, a young woman who grows up alone in the marshes of North Carolina. Owens crafts a tale of resilience, survival, and the transformative power of nature, entrancing readers with its evocative prose and mesmerizing setting. These bestselling novels represent just a fraction of the literary treasures that have emerged in 2023. Whether you seek tales of romance, adventure, or personal growth, the world of literature offers an abundance of compelling stories waiting to be discovered. The novel begins with Richard Papen, a bright but troubled young man, arriving at Hampden College. Richard is immediately drawn to the group of students who call themselves the Classics Club. The club is led by Henry Winter, a brilliant and charismatic young man. Henry is obsessed with Greek mythology and philosophy, and he quickly draws Richard into his world. The other members of the Classics Club are equally as fascinating. Bunny Corcoran is a wealthy and spoiled young man who is always looking for a good time. Charles Tavis is a quiet and reserved young man who is deeply in love with Henry. Camilla Macaulay is a beautiful and intelligent young woman who is drawn to the power and danger of the Classics Club. The students are all deeply in love with Morrow, and they are willing to do anything to please him. Morrow is a complex and mysterious figure, and he seems to be manipulating the students for his own purposes. As the students become more involved with Morrow, they begin to commit increasingly dangerous acts. The Secret History is a masterful and suspenseful novel that will keep you speculating until the very end. The novel is a warning tale about the dangers of obsession and the power of evil.

<https://staging.conocer.cide.edu/book/publication/default.aspx/lifetime%20guarantee%20making%20your%20christian%20life%20work%20and%20what%20to%20do%20when%20it%20doesnt.pdf>

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