SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai

Approved by Pharmacy Council of India, New Delhi.

Coimbatore -641035

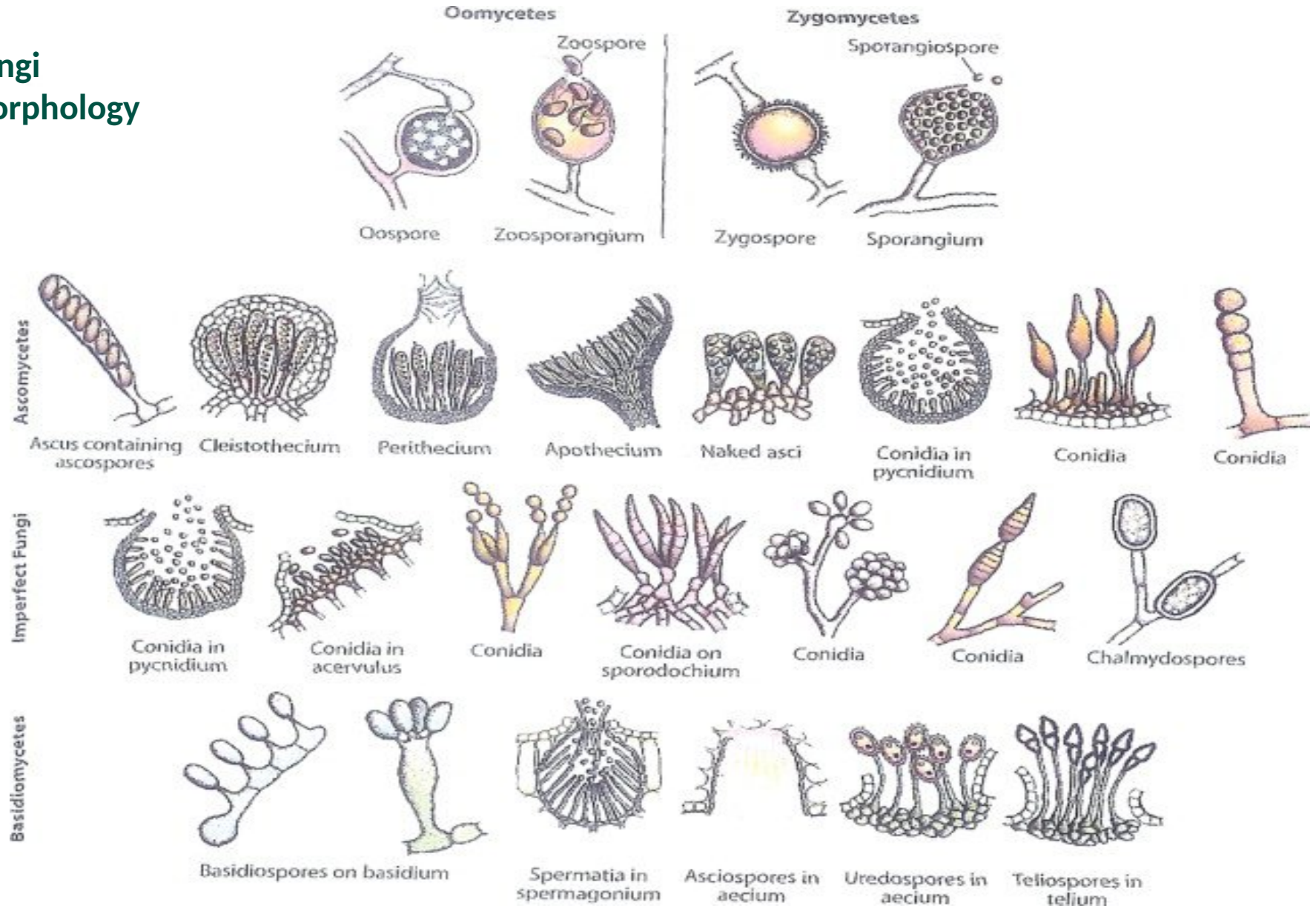
COURSE NAME : PHARMACEUTICAL MICROBIOLOGY - BP303 T

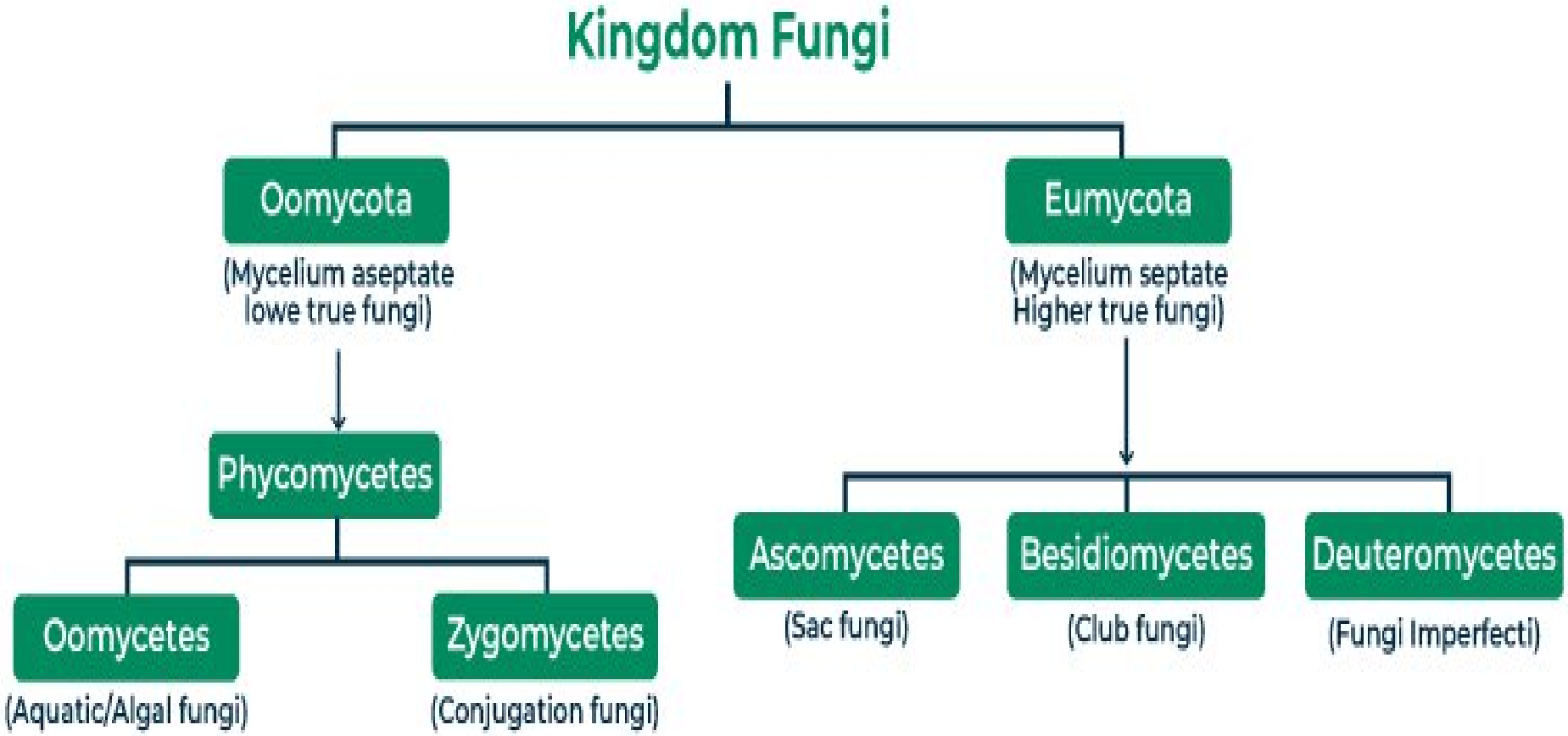
B.PHARM II YEAR / III SEM

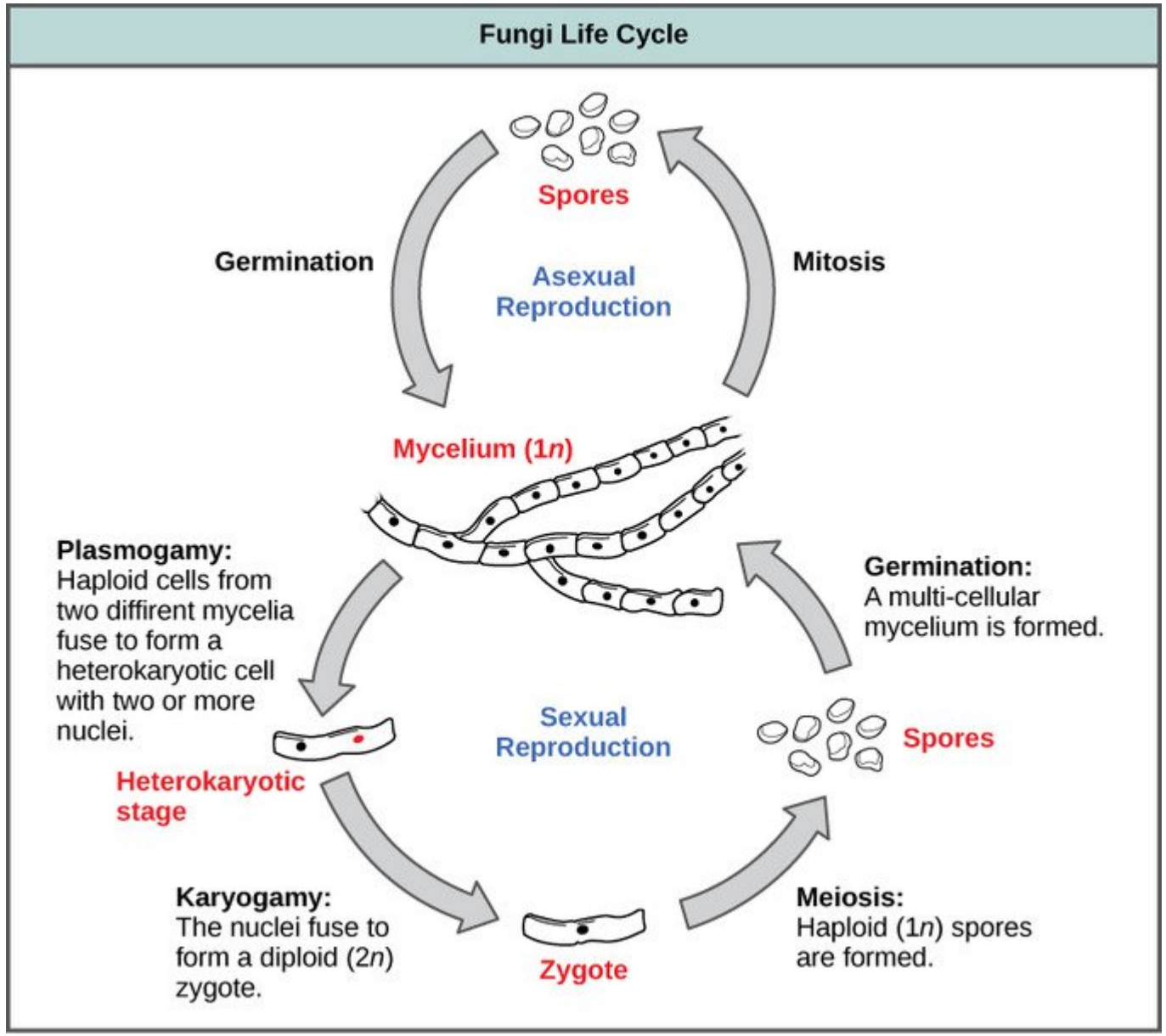
UNIT 3

SUB TOPIC :MORPHOLOGY, CLASSIFICATION, REPRODUCTION/REPLICATION AND CULTIVATION OF FUNGI AND VIRUSES

Fungi morphology



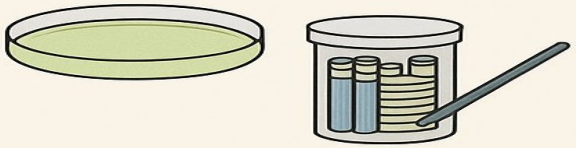

Kingdom Fungi
Oomycota
(Mycelium aseptate lowe true fungi)
Eumycota
(Mycelium septate Higher true fungi)
Phycomycetes
Oomycetes
(Aquatic/Algal fungi)
Zygomycetes
(Conjugation fungi)
Ascomycetes
(Sac fungi)
Besidiomycetes
(Club fungi)
Deuteromycetes
(Fungi Imperfecti)



Cultivation of fungi

1. MEDIUM PREPARATION & STERILIZATION

Use fungi-spific media (PDA or Sabouraud"s SDA)

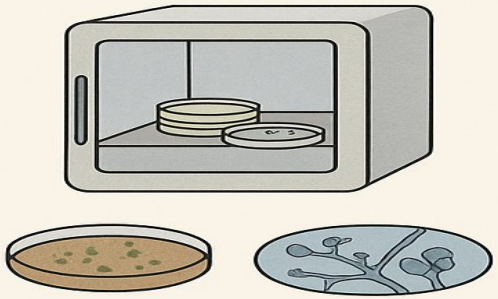


Sterilize: Autoclave media in tubes or plates to eliminate contaminants

2. INOCULATION (INTRODUCING THE FUNGUS)

From Spores/Mycelium: Scrape a sample from an existing culture or prepare a spore suspension, transferring to the new plate using a sterile loop or footpick

From Soil/Samples: Create serial dilutions of soil samples and spread onto plates, or use specialized techniques like slide cultures



3. INCUBATION

Temperature: Place inoculated plates/tubes in an incubator, typically at 25–30 °C for several days to weeks, depending on the fungus

Atmosphere: Keep plates plugged with cotton (for air exchange) or covered

4. OBSERVATION & IDENTIFICATION

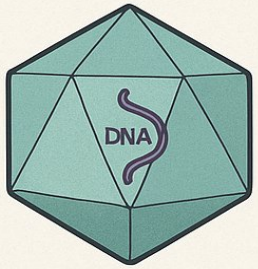
Macroscopic: Observe colony appearance (color, texture, size)

MICROSCOPIC

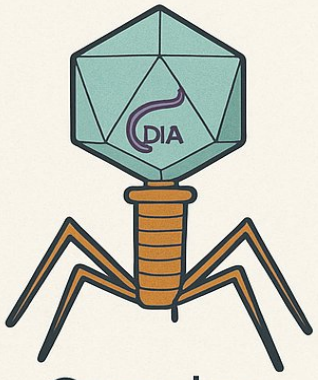
Prepare wet mounts with stains like Lactophenol Cotton Blue (LCB) to view hyphae, spores, and yeast budding under a microscope

VIRAL MORPHOLOGY

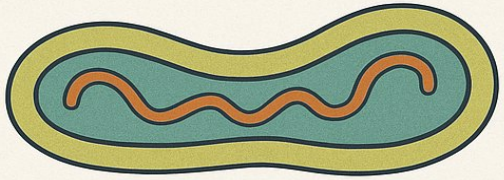
Helical



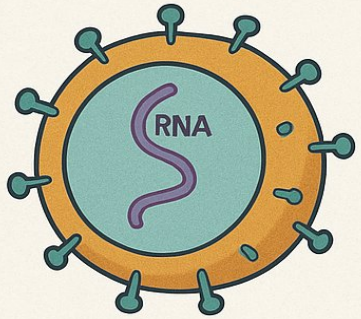
Icosahedral



Complex

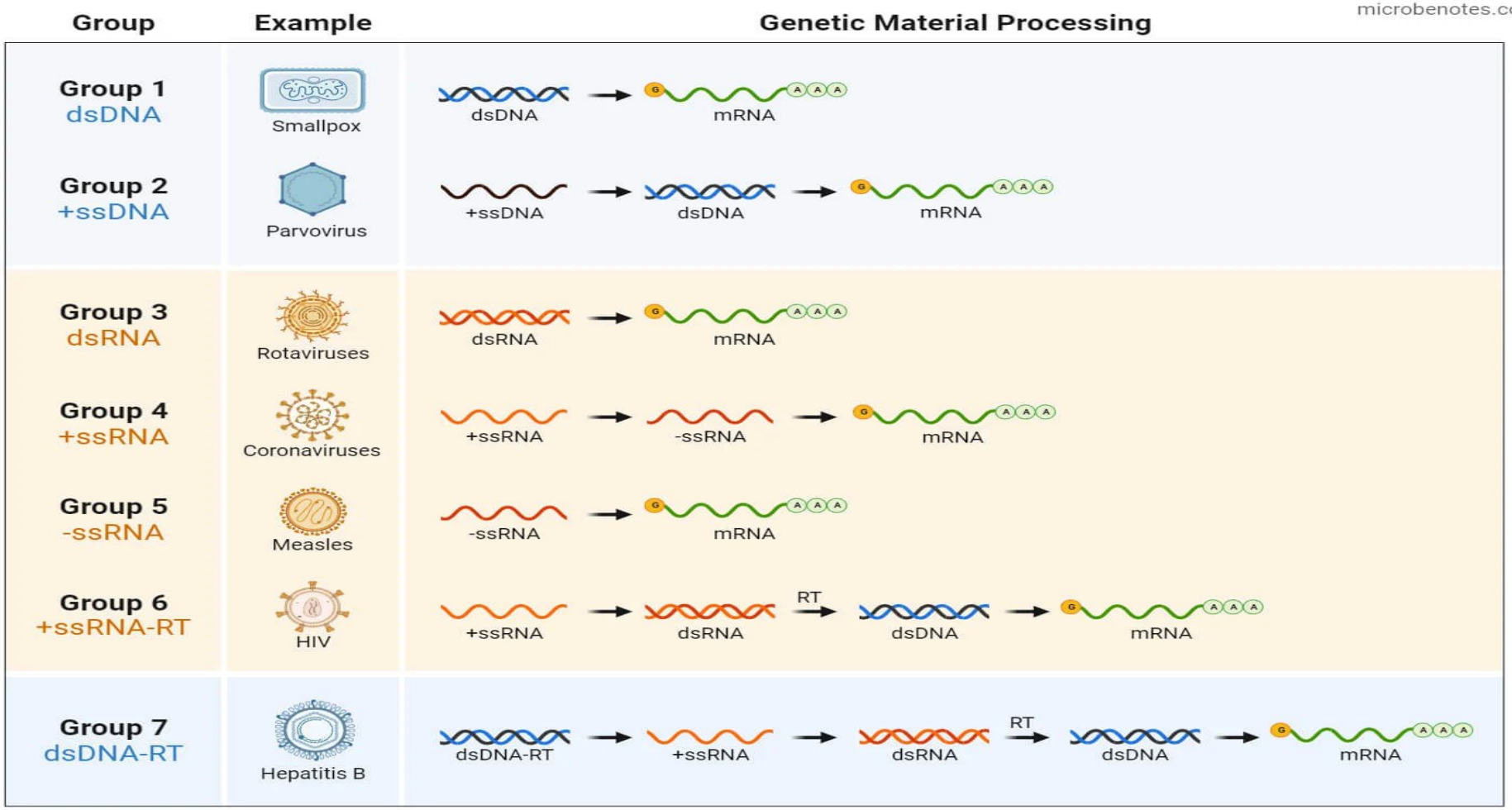


Filamentous

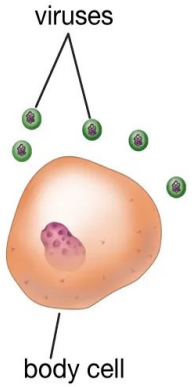


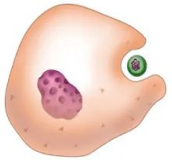
Pleomorphic

Baltimore Classification of Viruses

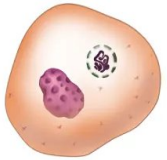


How a virus invades a cell

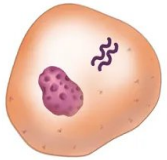




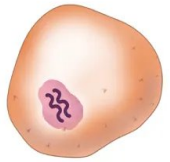
1. A virus enters a cell.



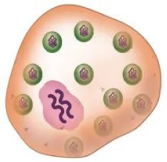
2. Substances in the cell begin to strip off the virus's outer coat of protein.



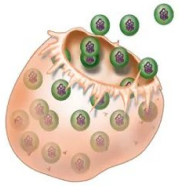
3. The nucleic acid in the center of the virus is released.



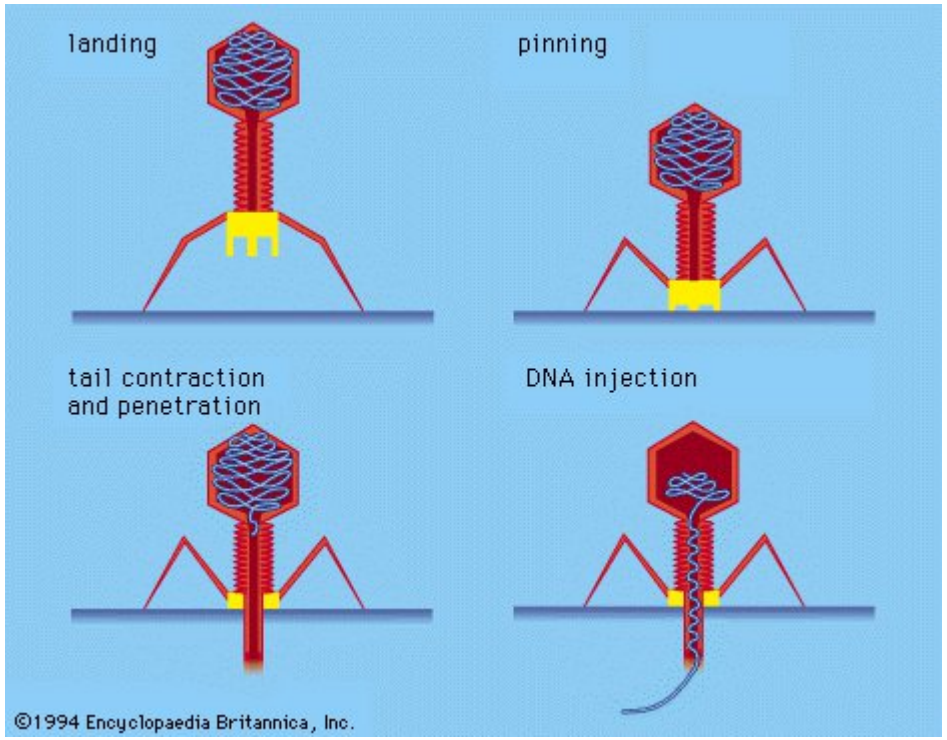
4. The nucleic acid gets into the cell's chemical manufacturing system.



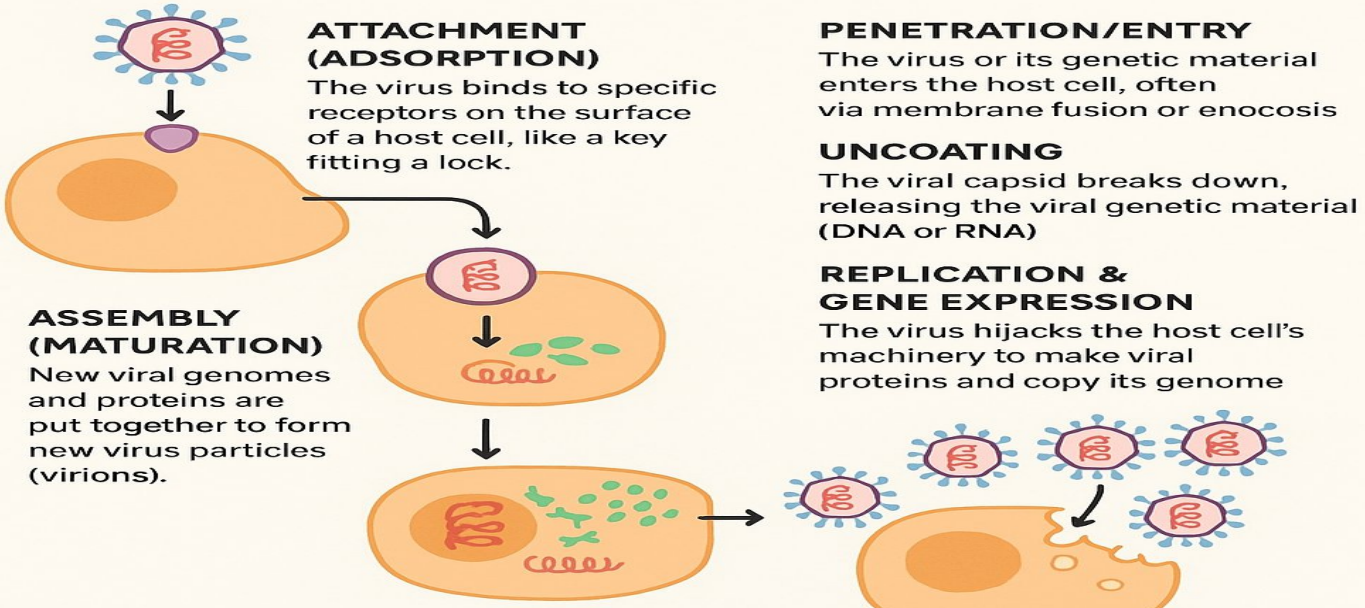
5. The cell "ignores" its own chemical needs and switches to making new viruses.



6. The cell is sometimes destroyed in the process. Many of the new viruses are released to infect other cells.



KEY STAGES OF THE VIRUS LIFE CYCLE



ATTACHMENT (ADSORPTION)
The virus binds to specific receptors on the surface of a host cell, like a key fitting a lock.

PENETRATION/ENTRY
The virus or its genetic material enters the host cell, often via membrane fusion or enocosis

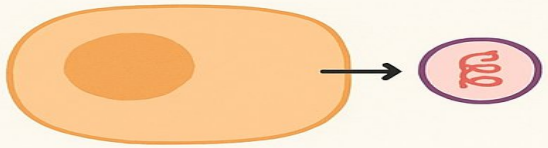
UNCOATING
The viral capsid breaks down, releasing the viral genetic material (DNA or RNA)

REPLICATION & GENE EXPRESSION
The virus hijacks the host cell's machinery to make viral proteins and copy its genome

ASSEMBLY (MATURATION)
New viral genomes and proteins are put together to form new virus particles (virions).

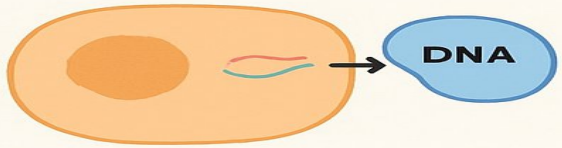
TWO MAIN REPLICATION PATHWAYS:

LYTIC CYCLE



The virus rapidly replicates, assembling many coples, and then lyses (bursts) the hot cell, killing it and releasing the new viruses

LYSOGENEC CYCLE



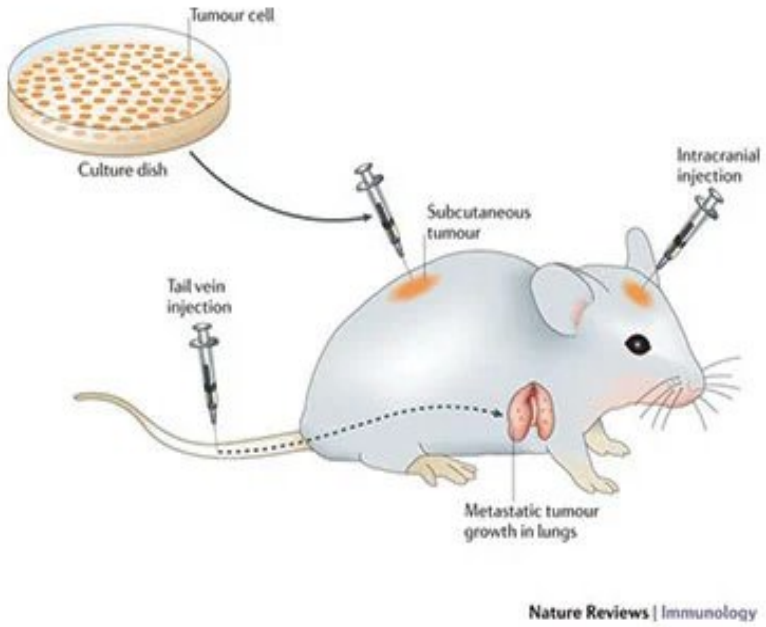
The viral DNA integrates into the host cell's genome, remaining dormant (latent) and replicating along with the host cell for a perciod before potentially entering the lyix cyle

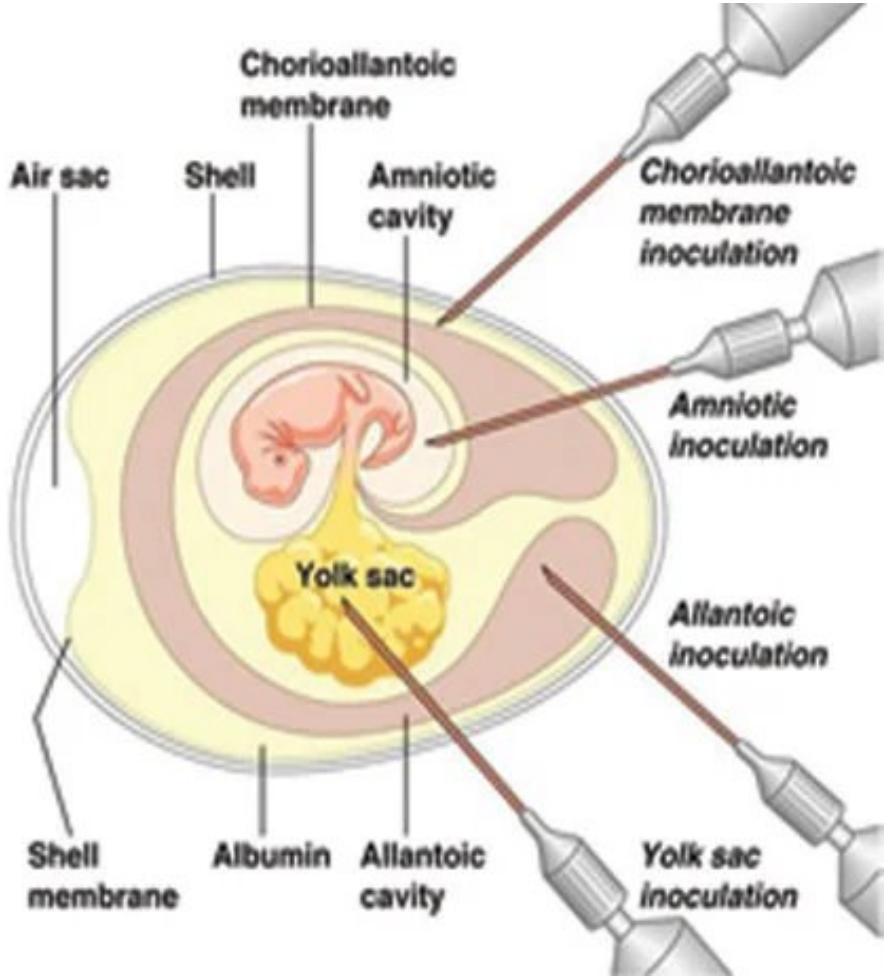
TWO MAIN REPLICATION PATHWAYS:

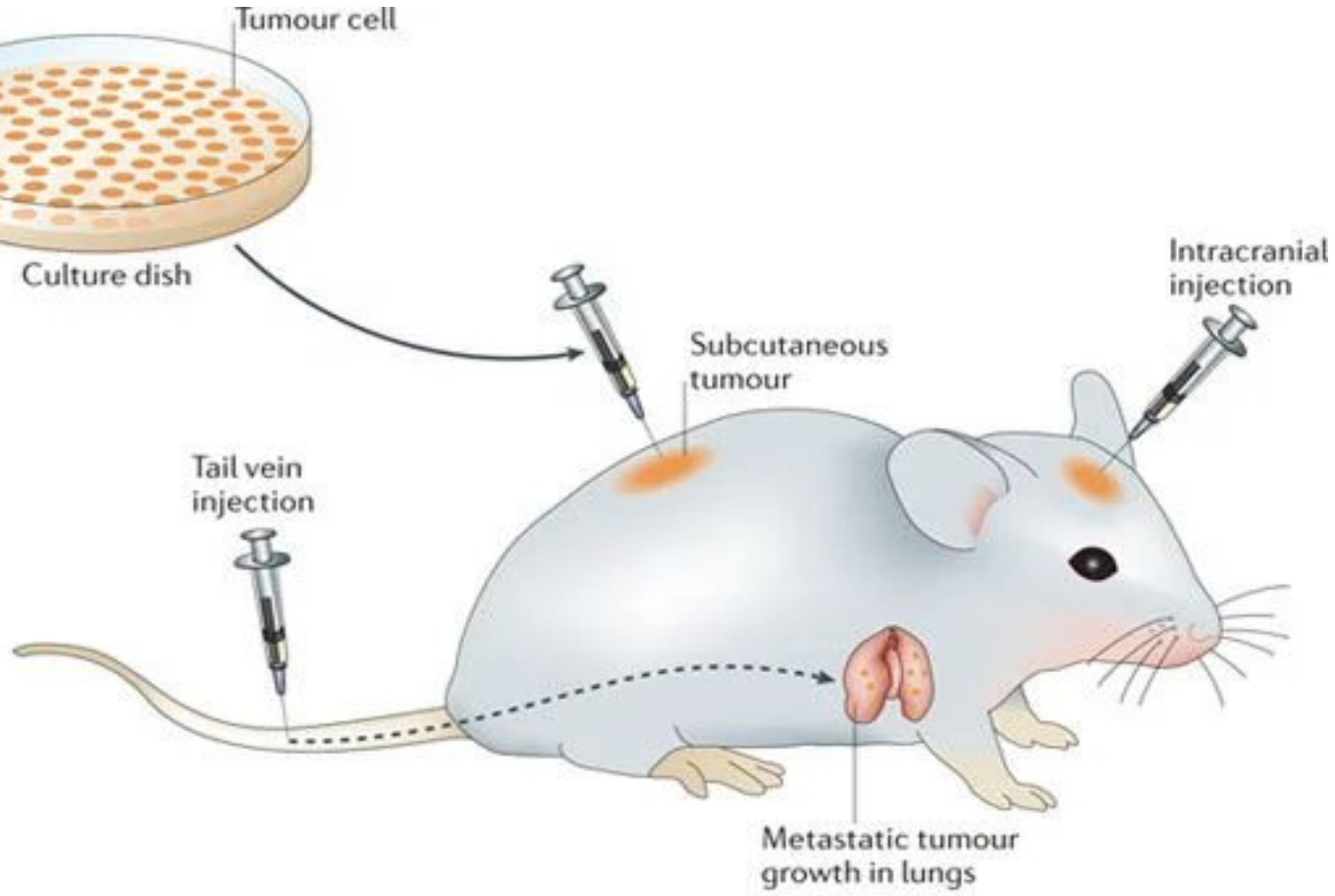
LYTIC CYCLE **LYSOGENIC CYCLE**

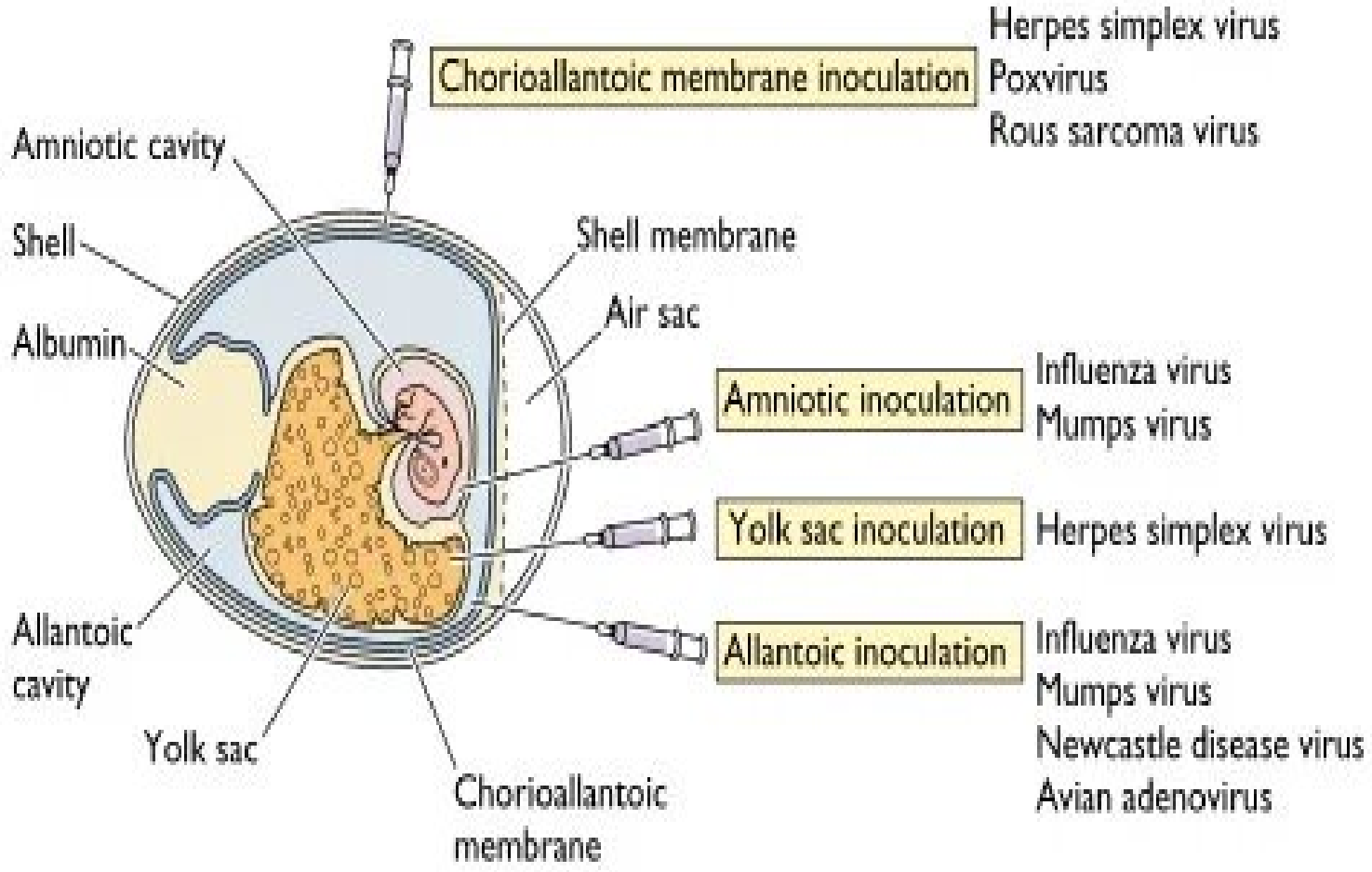
Virus Cultivation

Purposes and Methods






Tumour cell
Culture dish
Intracranial injection
Subcutaneous tumour
Tail vein injection
Metastatic tumour growth in lungs

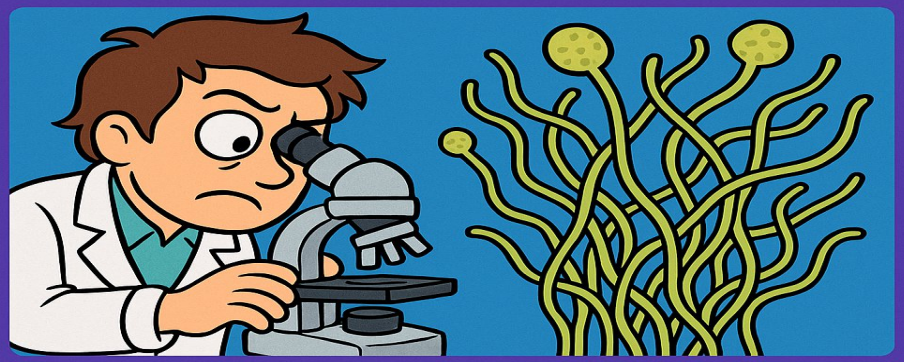

Chorioallantoic membrane inoculation
Herpes simplex virus
Poxvirus
Rous sarcoma virus
Amniotic cavity
Shell
Albumin
Shell membrane
Air sac
Amniotic inoculation
Influenza virus
Mumps virus
Yolk sac inoculation
Herpes simplex virus
Allantoic cavity
Allantoic inoculation
Influenza virus
Mumps virus
Newcastle disease virus
Avian adenovirus
Yolk sac
Chorioallantoic membrane

ASSESSMENT QUESTIONS

www.snsgroups.com

The “Hairy Monster” Question (Fungal Morphology)

You look under the microscope and see something that looks like your roommate’s unwashed beard—long, tangled threads everywhere. What fungal structure are you ACTUALLY looking at?



a) Hyphae

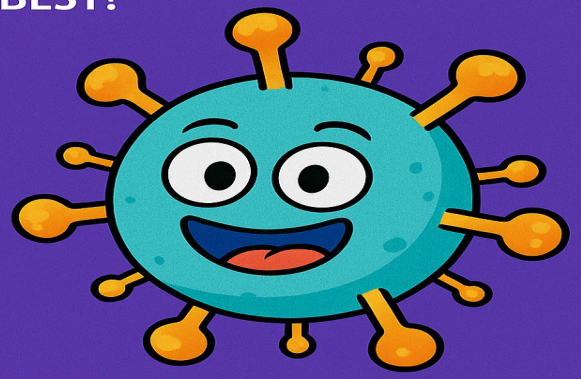
b) Mycelium

c) Beard-filaments of Doom

d) Spaghetti gone wrong

Viral Classification Comedy

Viruses are classified mainly by their genetic material. Which option explains this BEST?



a) DNA or RNA

b) Whether they prefer pizza or burgers

c) Size of their evil laugh

d) Number of followers on "Infectagram"

The Virus Break-In Scenario
(Replication)

A virus attaches to your cell, sneaks in like a ninja, and drops its genetic material inside.

What happens next?

a) The cell asks for rent

b) Virus removes its coat → Uncoating

c) Virus takes a nap

Fungal Reproduction Drama

Bread mold makes tiny black balls that burst open like popcorn with attitude, releasing spores everywhere.

What are these “angry popcorn balls” actually called?

a) Conidiophores

b) Sporangia

c) Mini Death Stars

d) Mushroom grenades

VIRUS CULTIVATION CIRCUS

The influenza virus refuses to grow on agar plates like bacteria.

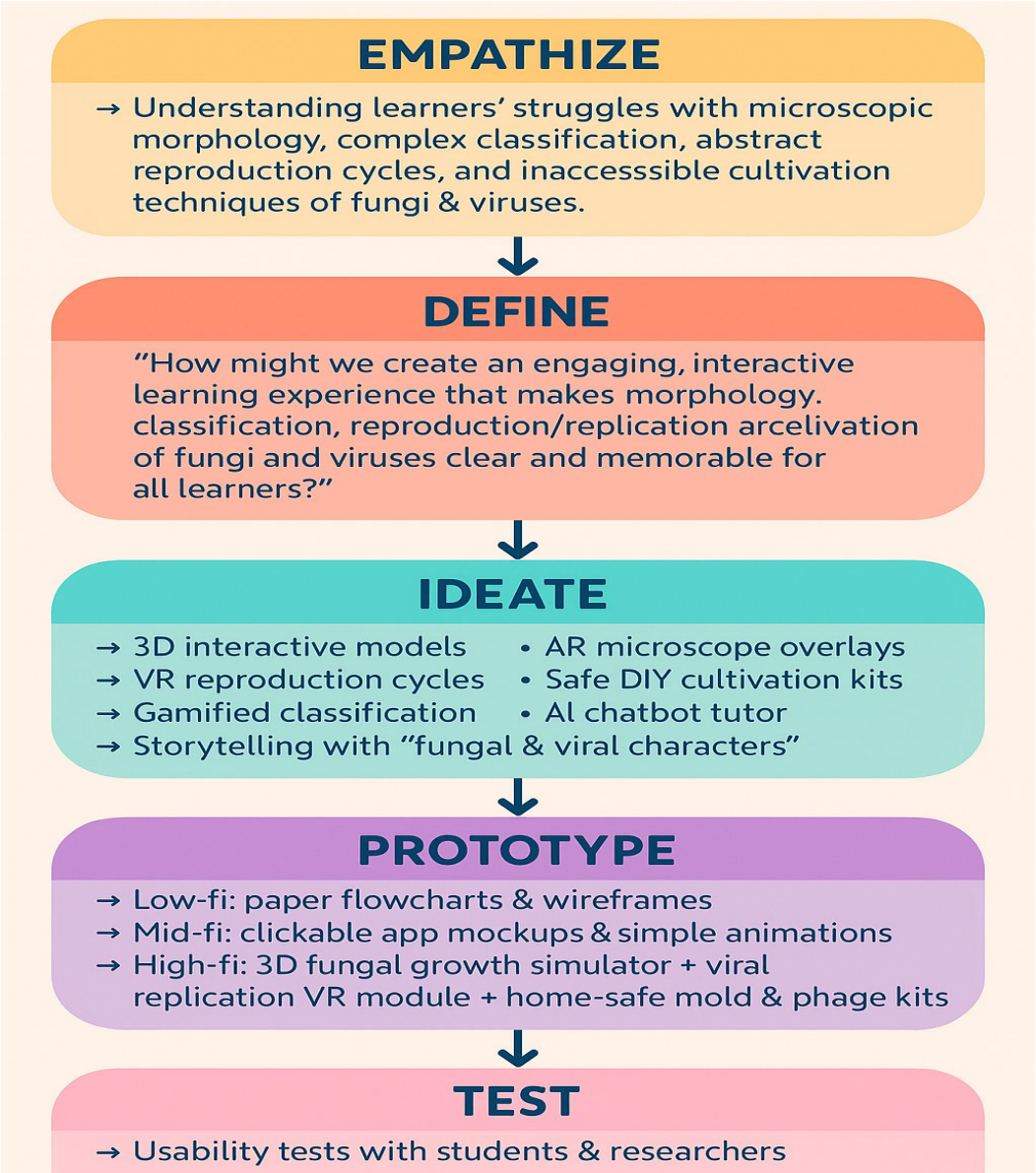
Where does it prefer to chill instead?

a) Five-star nutrient agar hotel

b) Embryonated chicken egg spa

c) Your refrigerator

d) On top of your biochemistry



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2. Prescott and Dunn., Industrial Microbiology, 4th edition, CBS Publishers & Distributors, Delhi.

3. Ananthanarayan : Text Book of Microbiology, Orient-Longman, Chennai


THANK YOU