VIRUSES & FUNGI

Fungi

- Mycology: study of fungi.
- Fungi: group of heterotrophic eukaryotic cells.

Obtain their carbon from organic material

Complete cell (nucleated cell)

- Fungi called saprophytes because they obtain their nutrients from dead organic material.

Classification of fungi:

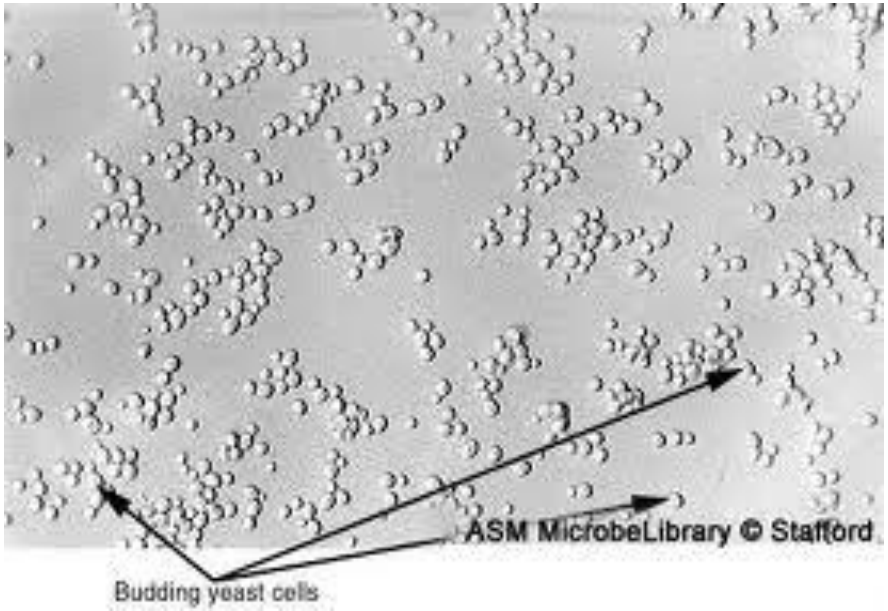
1) yeast:

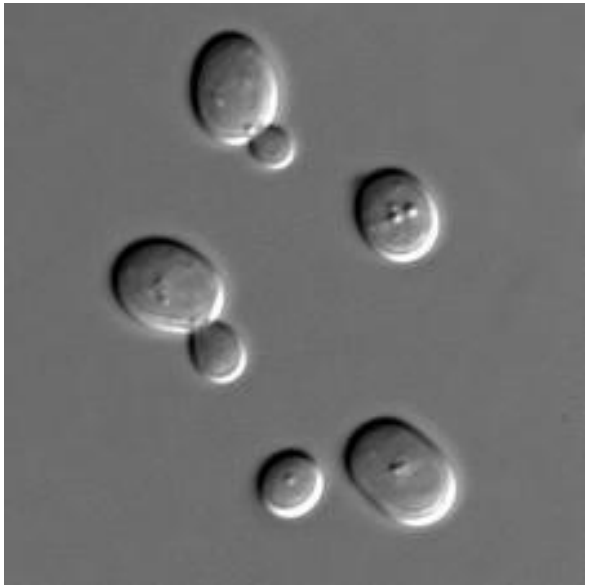
- Oval or spherical in shape.
- Single cell (unicellular), one nucleus.
- Multiply by asexual reproduction (Budding).

2) Mold :

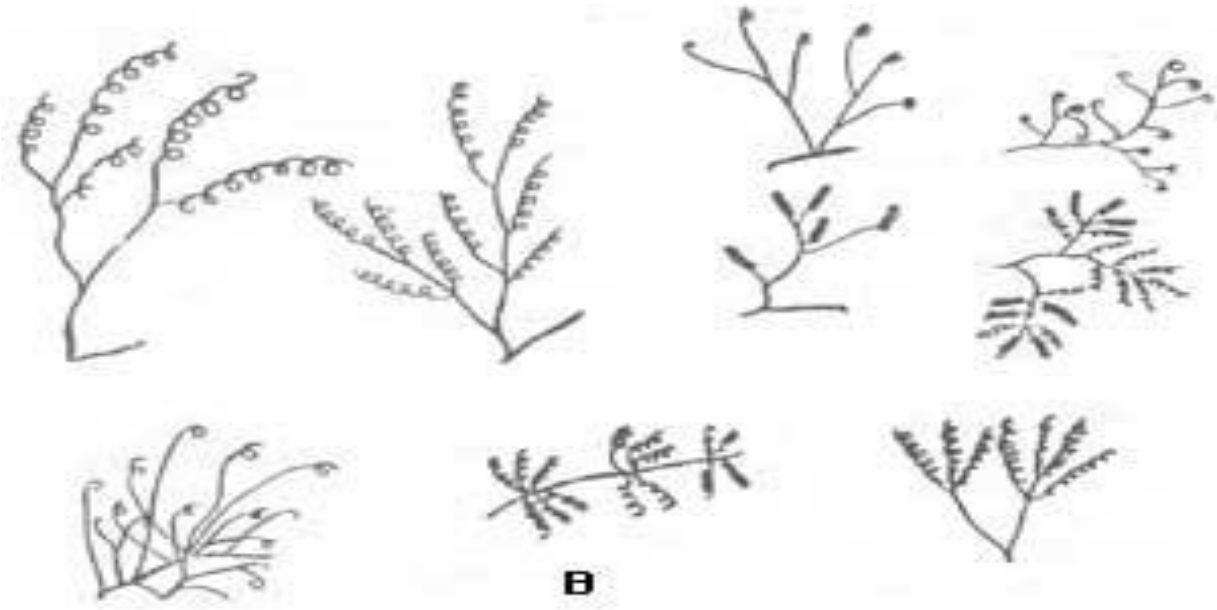
- Multicellular (multinucleated cell).
- Consists of branching hyphae forming Mycelium.
- Multiply both sexually and asexually.

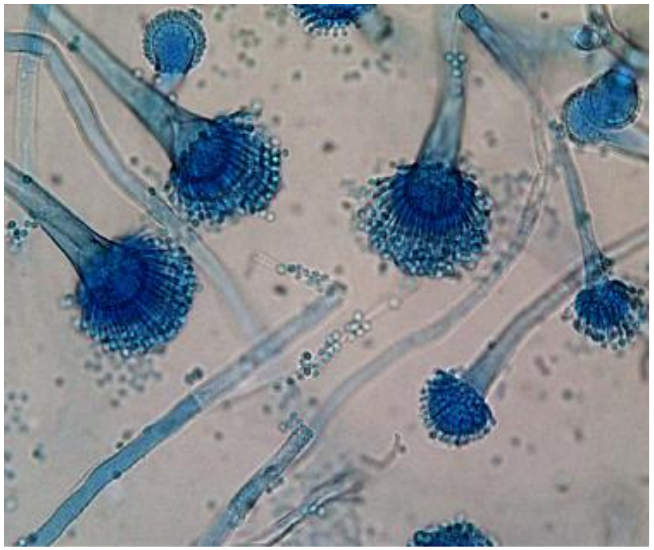
yeast

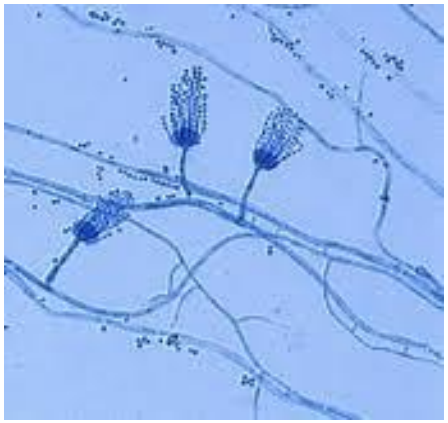


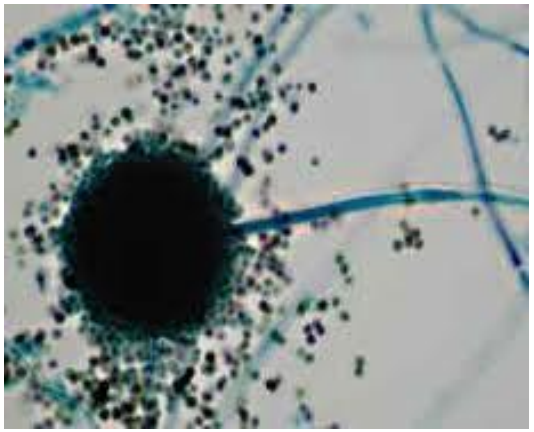


mold









What are the best condition to grow fungi ?

- **Media**: Sabouraud Dextrose Agar (SDA).
- **PH**: wide range of PH especially acidic.
- **Moisture**.
- **Temperature:**

Room temp: causing superficial infection.

37 C: cause systemic infection.

Called pathogenic fungi

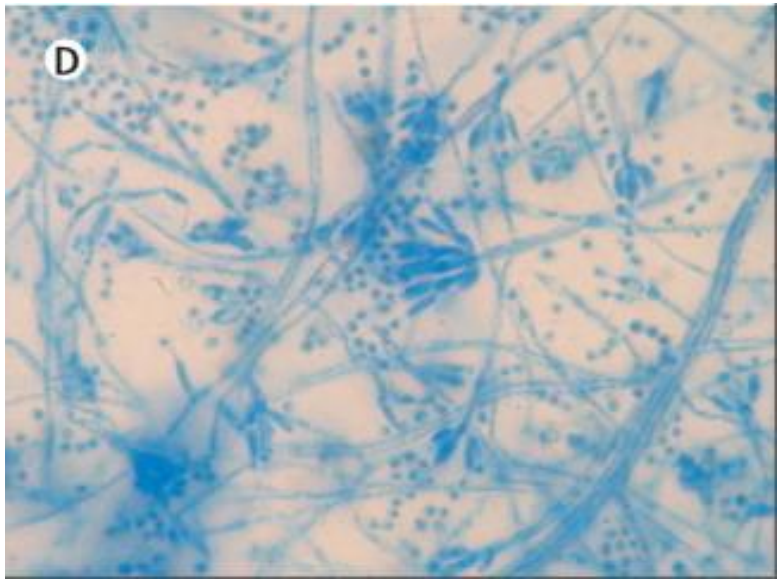
Cold temp: cause spoilage of food.

Yeast /Molds on SDA

LPCB

- Lacto Phenol Cotton blue :

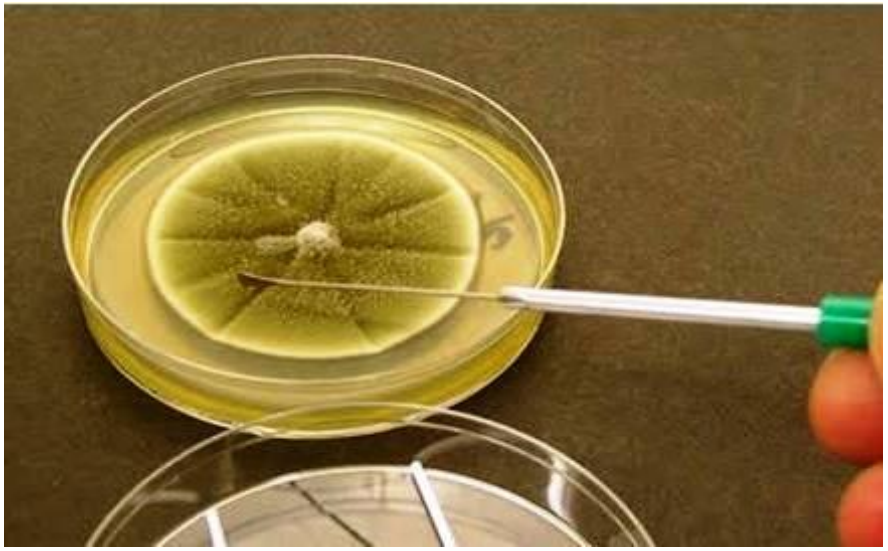
Reagent used to stain fungi for microscopic examination.



Tools used for fungi

- **Iron needles:**

made from iron because fungi dig into the agar.



Benefits of fungi:

1) Baking by using yeast.
2) Brewing.
3) Breaking down of dead organic material.
4) Antibiotics.

   ex: penicillin extracted from penicillium.

Harmful effects:

cause a lot of diseases in skin, hair, nail and systemic diseases.

viruses

- **Virology**: study of viruses.
- Viruses are obligate intracellular agents (they can multiply only in living cell).
- They have single type of nucleic acid (DNA or RNA)

enclosed by protein coat called capsid.

- Some viruses have envelop other are naked (non enveloped).

Nucleocapsid

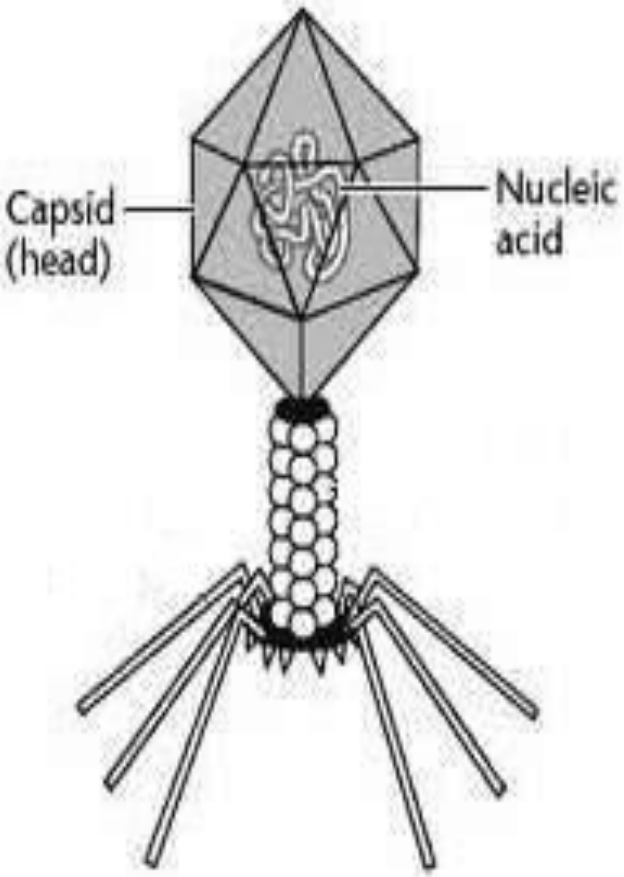
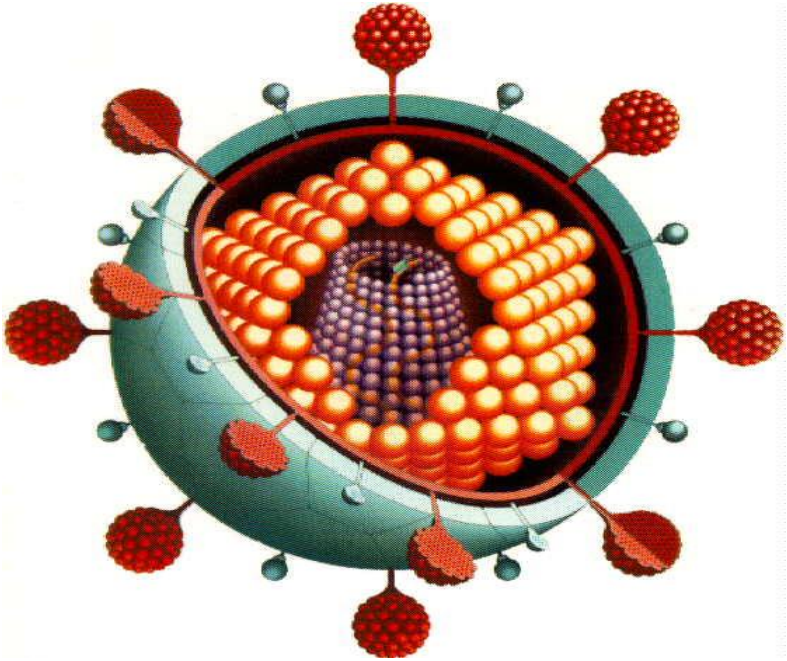
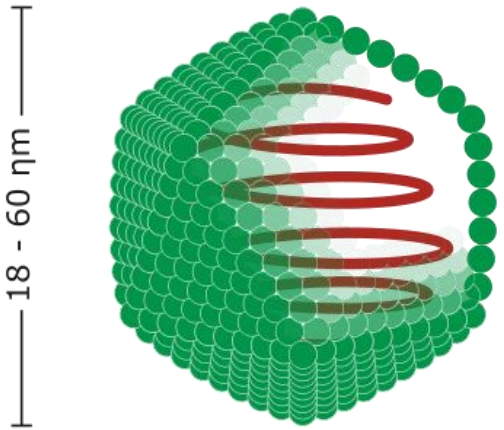


FIGURE 9.2. Parts of a Virus

Enveloped virus



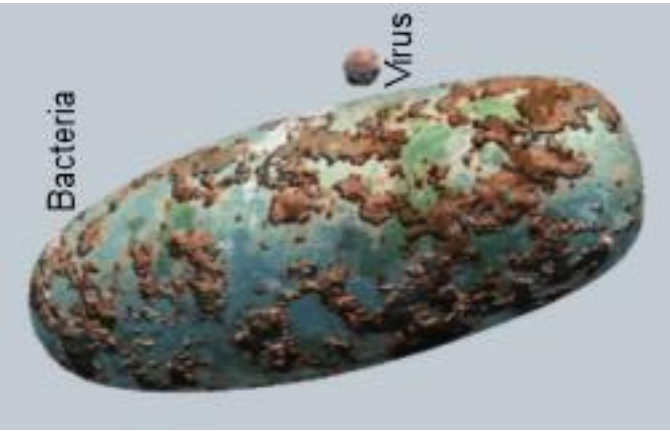
Non Enveloped virus



- Viruses size vary from 20-300 nm.

we can see it by electron microscope.

- Viruses infect human, plants, animals and bacteria.
- Viruses that infected bacteria are called: bacterioph

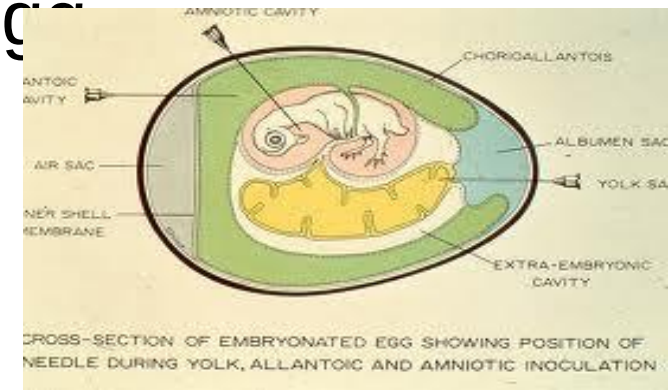


Cultivation of viruses:

1) Inoculation of lab animals

(ex: mice, hamster).

2) Inoculation of embryonated eg



3) Tissue cultured cells:

tissue taken from animals to see the effect of virus on the cell.

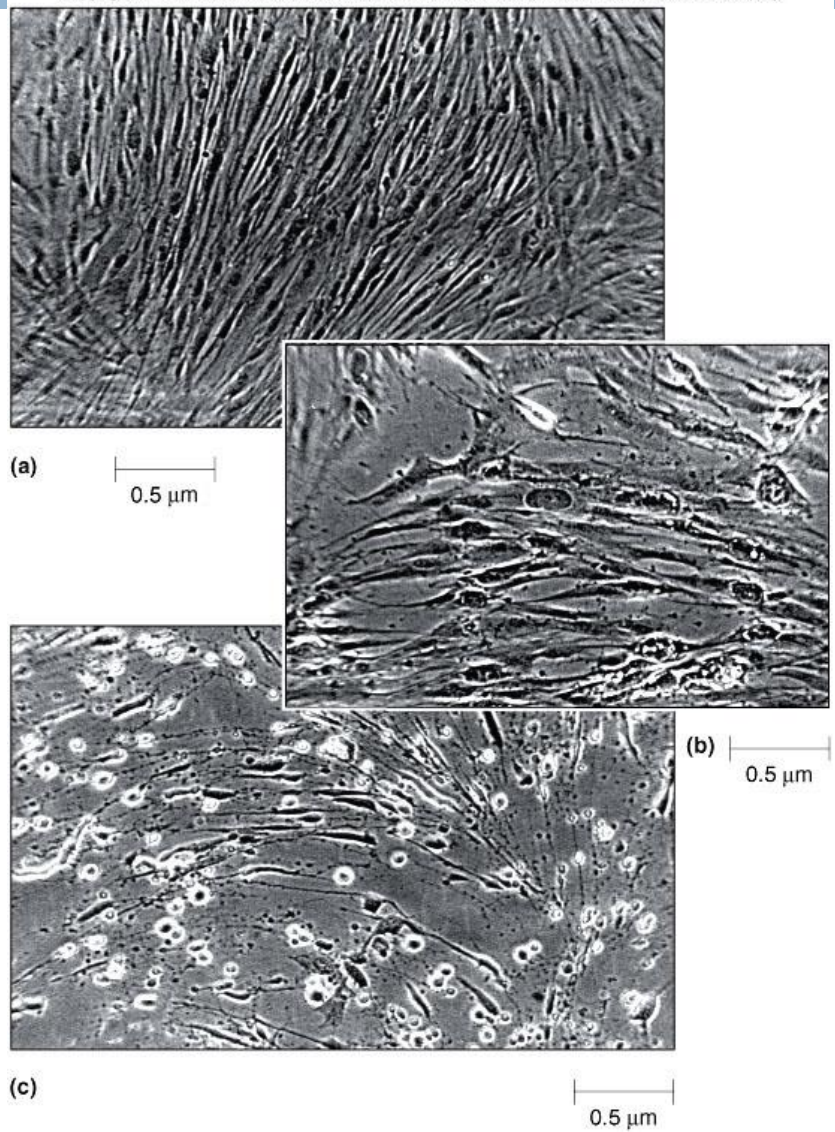
cytopathic effect: it is morphological changes in the cell caused by viruses when they multiply inside the cell.

Why we do cultivation:

a. Diagnosis. b. research.

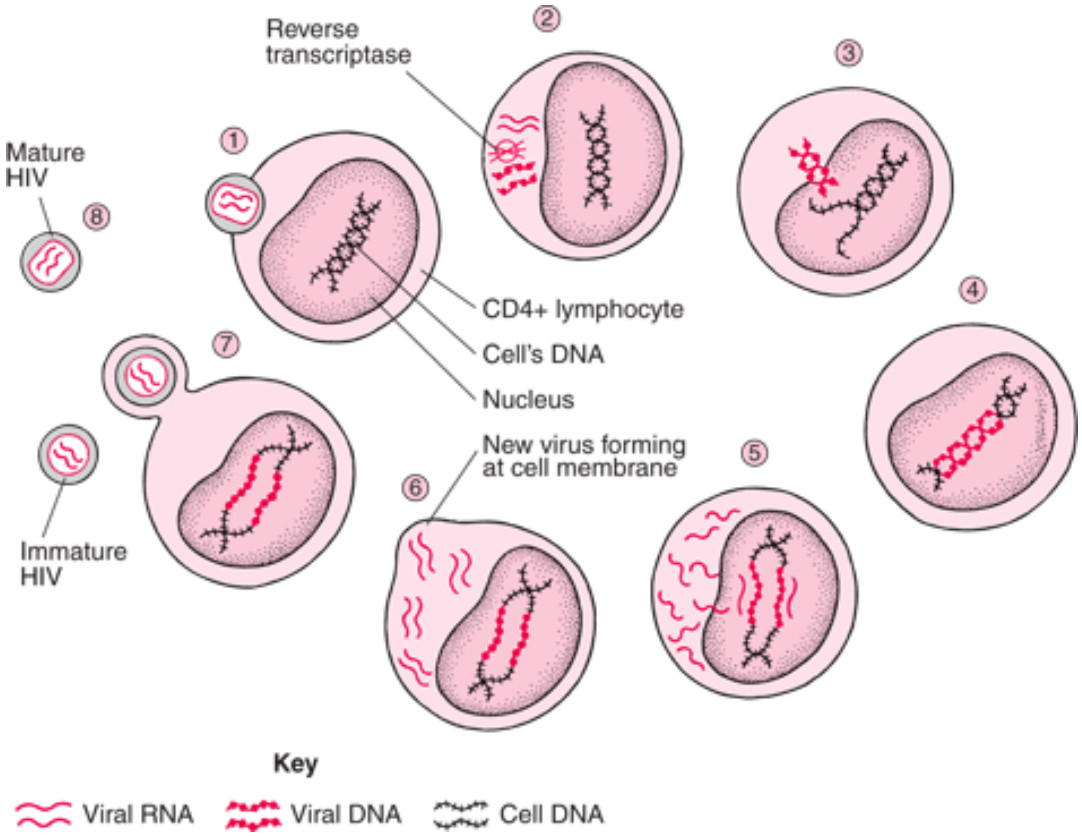
c. production of vaccines.

Cytopathic effect



Virus life cycle:

1. Adsorption to the cell.
2. Penetration.
3. Multiplication.
4. Budding out side the cell.


Reverse transcriptase
2
3
Mature HIV
1
8
CD4+ lymphocyte
Cell's DNA
Nucleus
4
7
New virus forming at cell membrane
5
6
Immature HIV
Key
Viral RNA
Viral DNA
Cell DNA