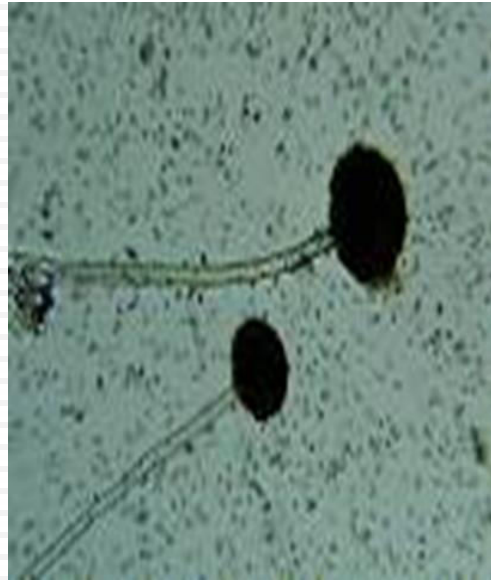
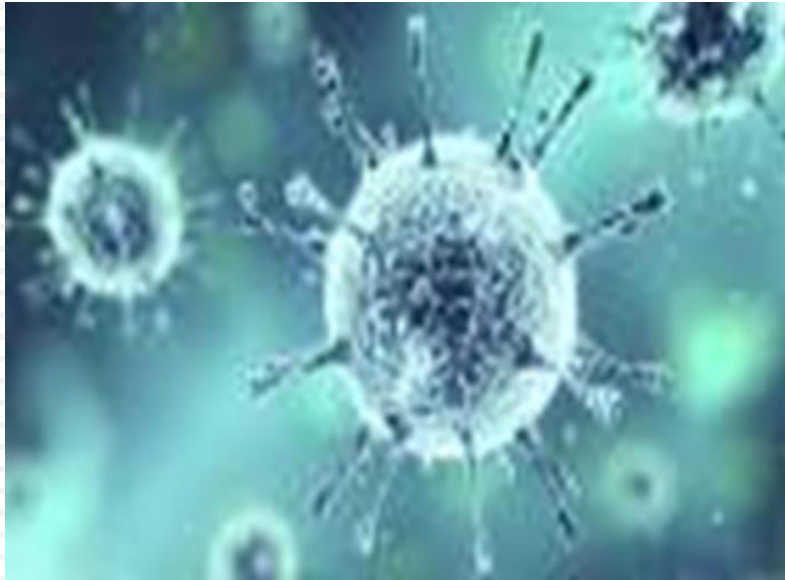


# Viruses & Fungi



# 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.

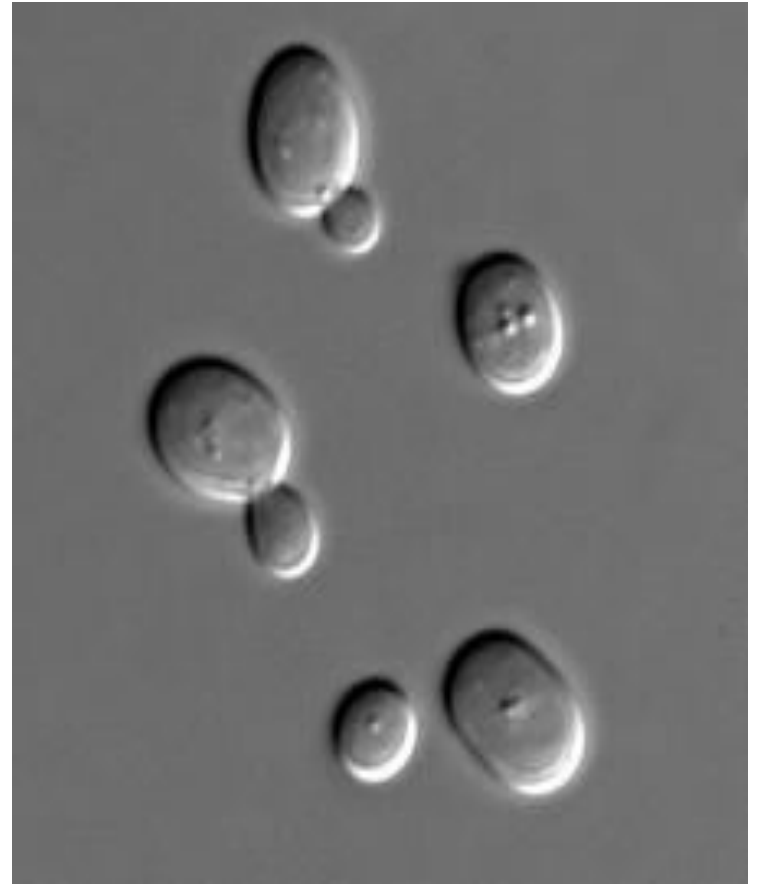
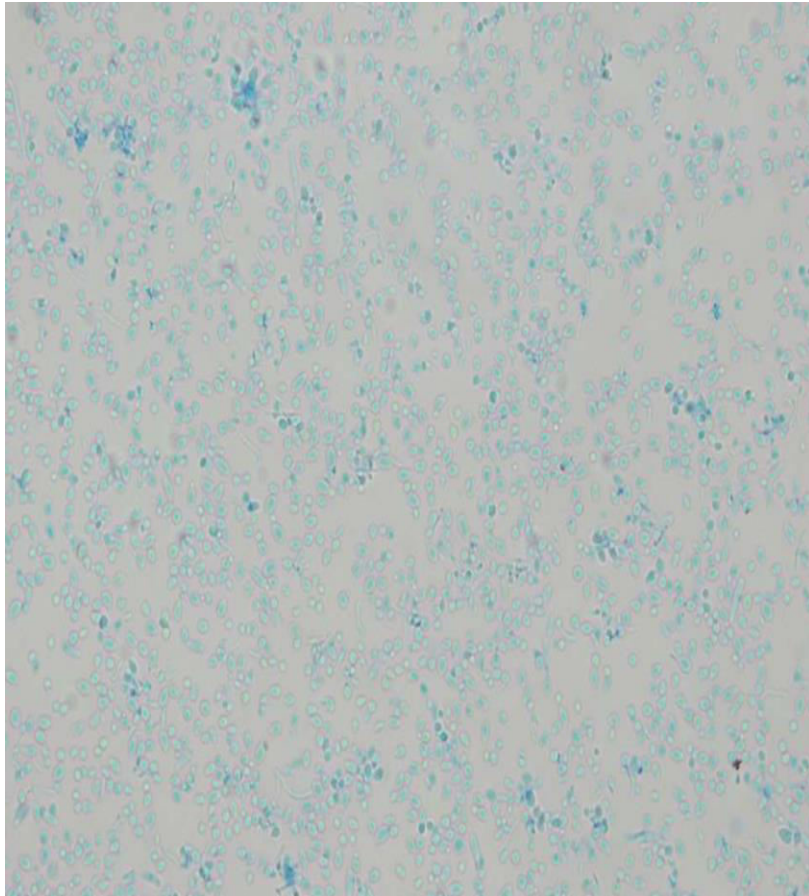
# Classification of fungi:

---

## 1) yeast:

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

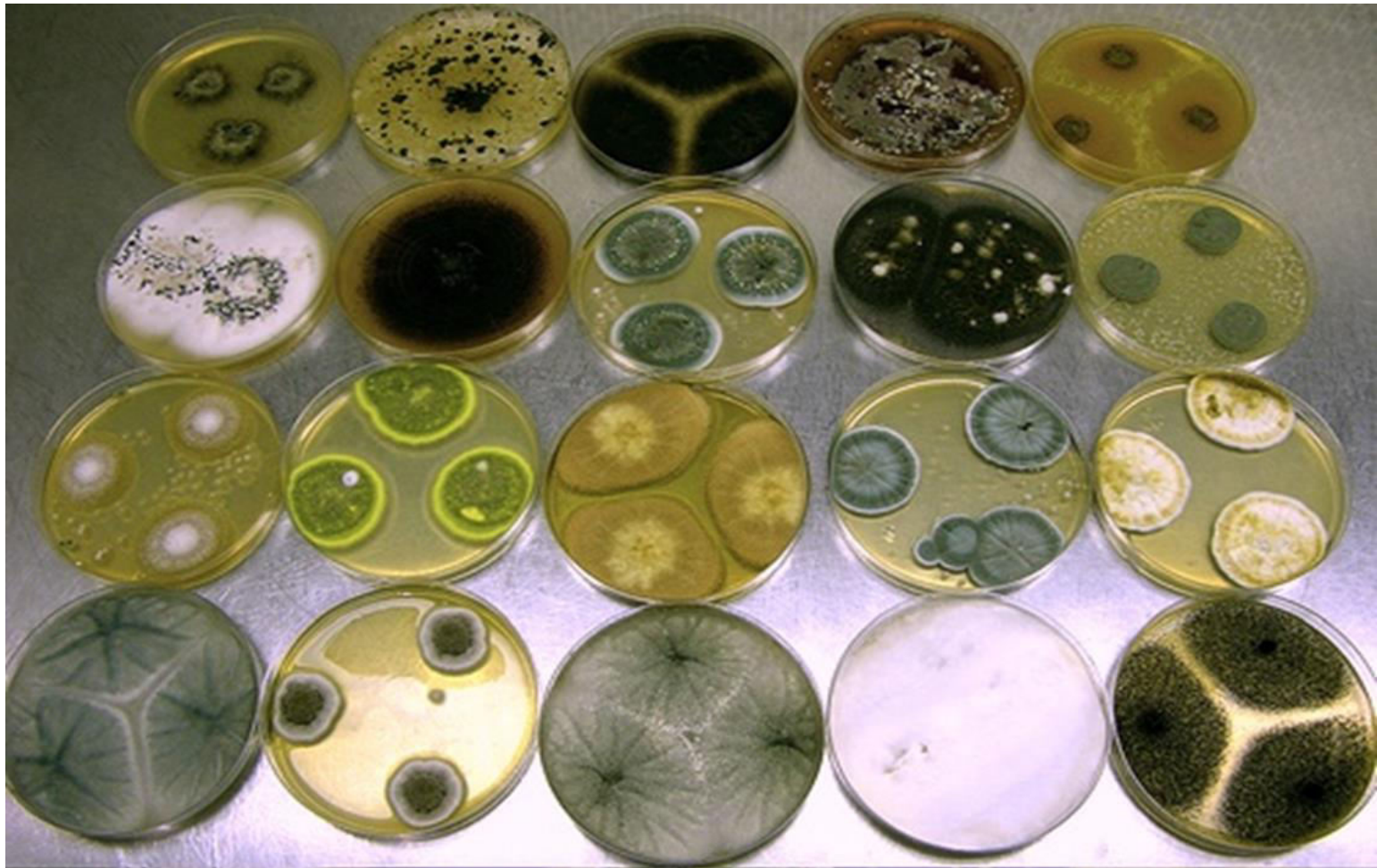
# yeast



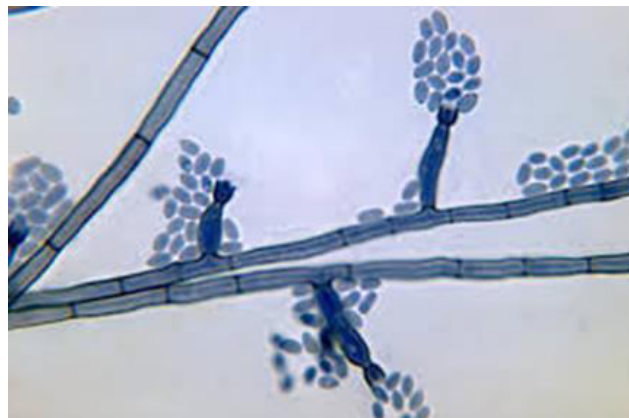
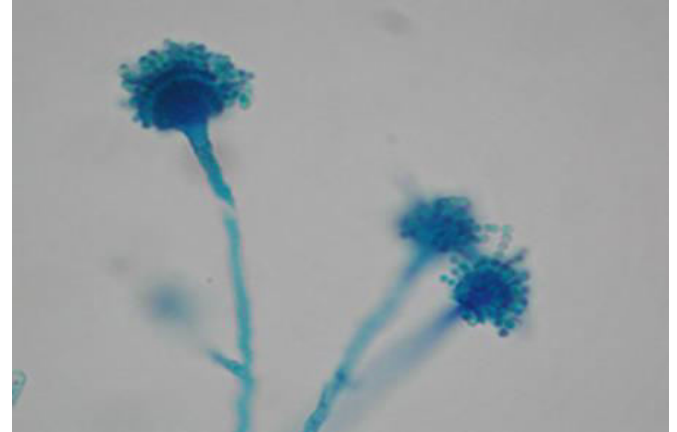
## 2) Mold :

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

# mold

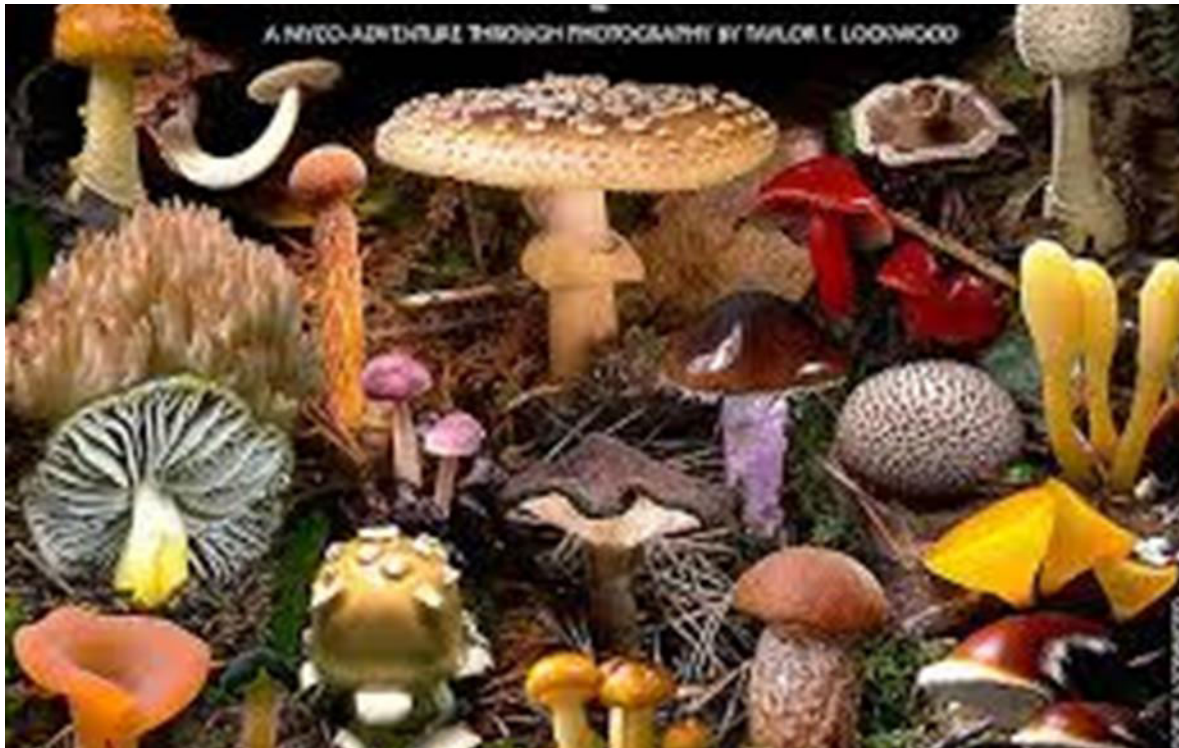






### 3) Fleshy Fungi:

large fungi (not microorganisms), ex: Mushrooms





# 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.

# Stains

- Lacto Phenol Cotton blue :

Reagent used to stain fungi for microscopic examination.

- Use iron needle for culturing of fungi.

# Effect of Fungi

## Benefits of fungi:

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

ex: penicillin extracted from penicillium.

# viruses

## □ Virology:

study of viruses.

## □ General characteristics of viruses:

1. Viruses are obligate intracellular agents (they can multiply only in living cell).
2. Viruses size vary from 20-300 nm.  
we can see it by electron microscope.
3. Viruses infect human, plants, animals and bacteria.
4. Viruses that infected bacteria are called:  
bacteriophage.

# Viral Structure



## 1. Genome:

they have single type of nucleic acid (DNA or RNA)

## 2. Capsid:

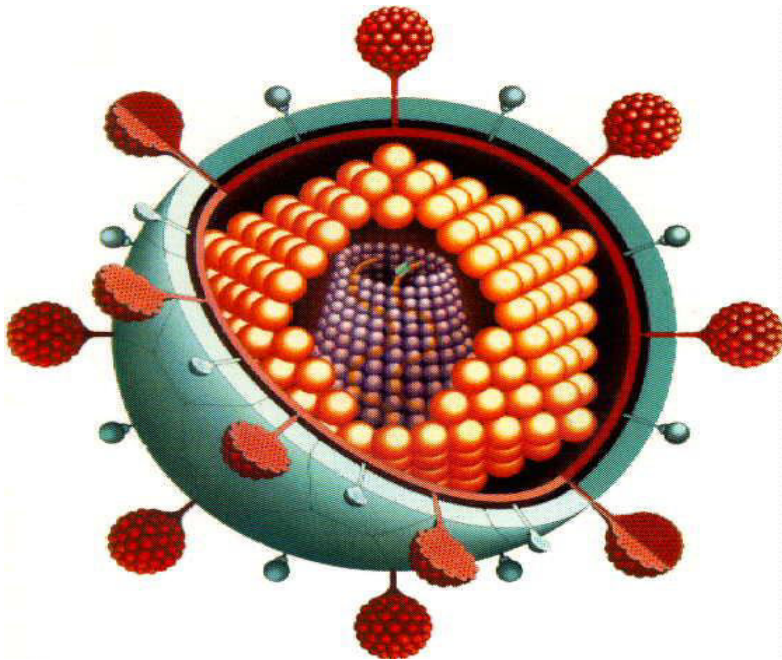
Protein coat surrounding the genome.

## 3. Envelope:

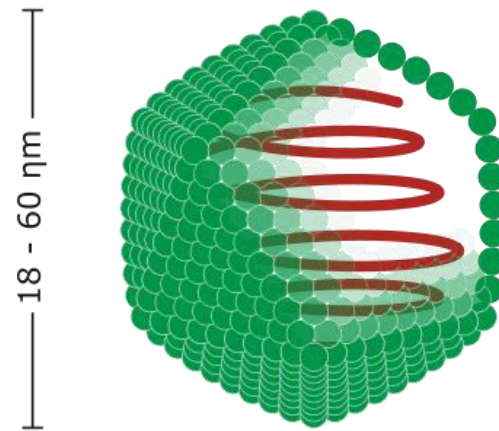
A lipid bilayer membrane found in some viruses.



## Enveloped virus



## Non Enveloped virus



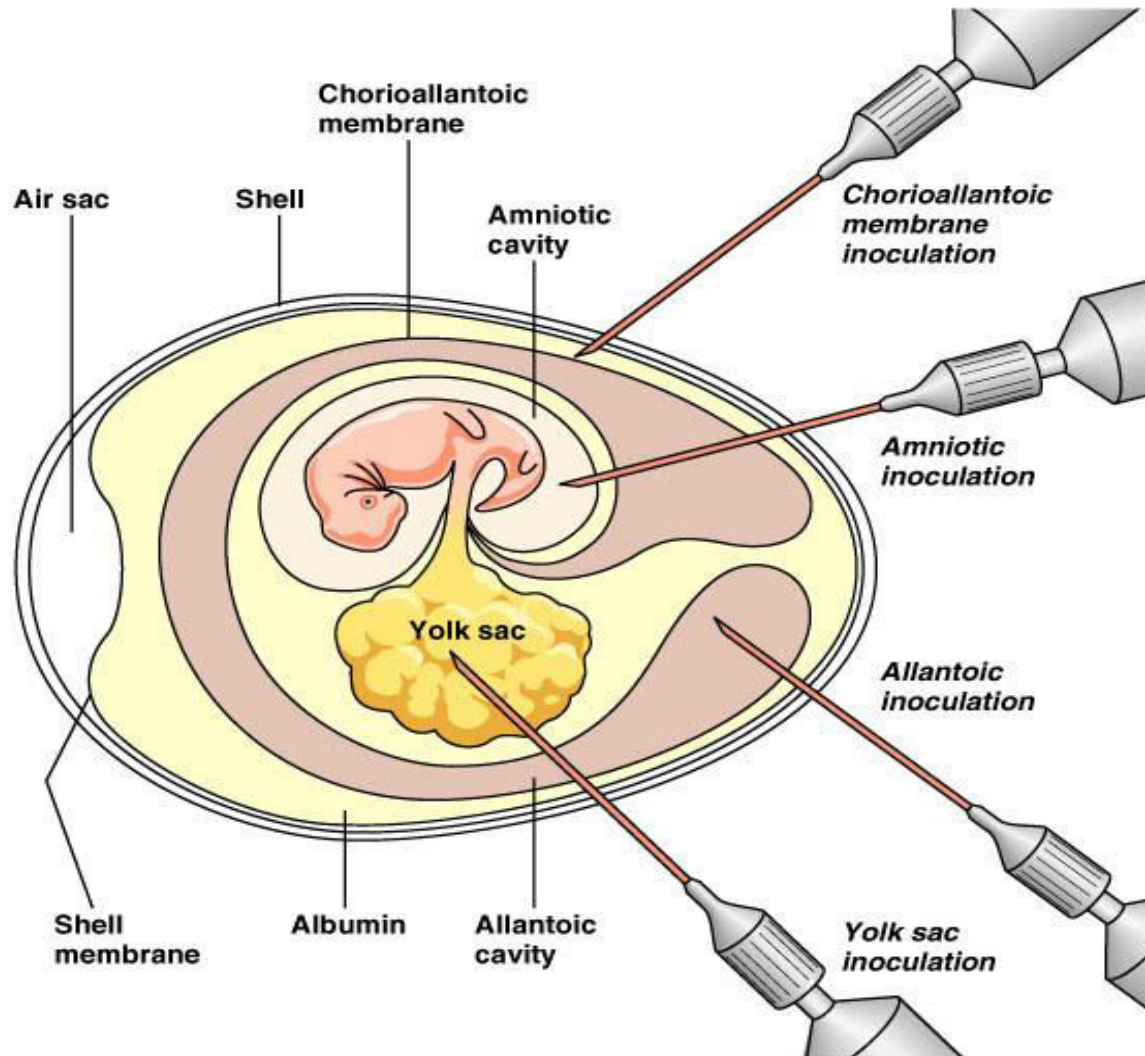
# Cultivation of viruses:

- 1) Inoculation of lab animals (ex: mice, hamster).
  - 2) Inoculation of embryonated egg.
  - 3) Tissue cultured cells: tissue taken from animals to see the effect of virus on the cell (cheaper and easier)
- cytopathic effect:** it is morphological changes in the cell caused by viruses when they multiply inside the cell.

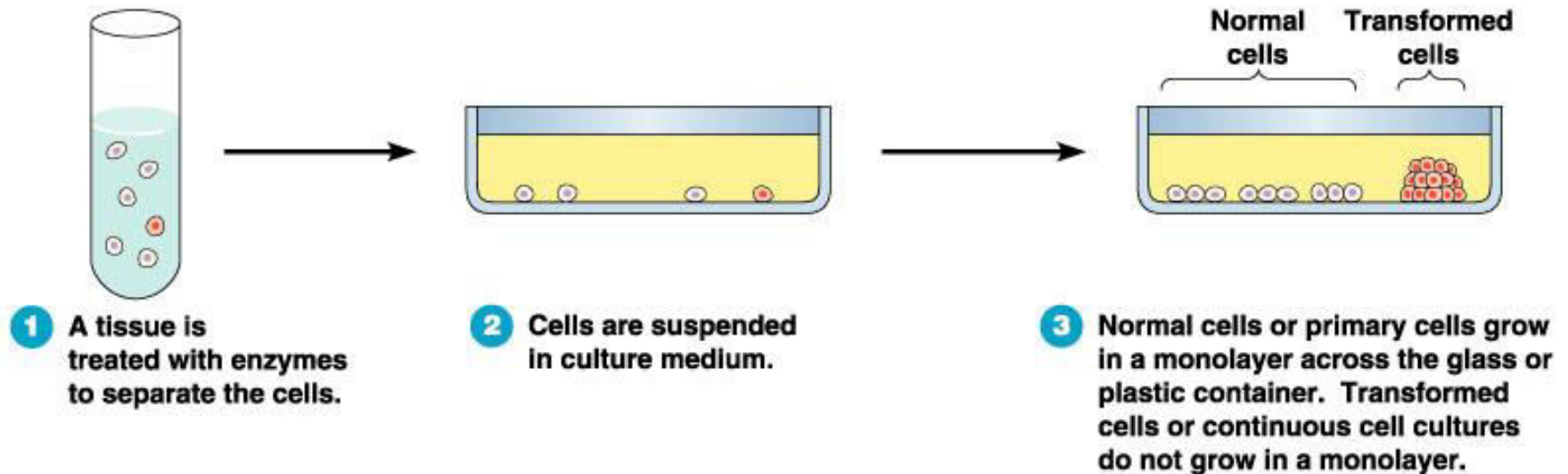
## Why we do cultivation:

- a. Diagnosis.
- b. research.
- c. production of vaccines.

# Inoculation of embryonated egg.



# Cytopathic effect



# Virus life cycle (Replication):

---

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