Microbiology Lec1

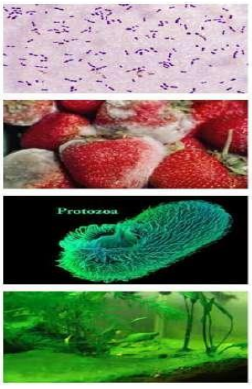
By : Asst.lec. Zainab Falah **Freshmen class**

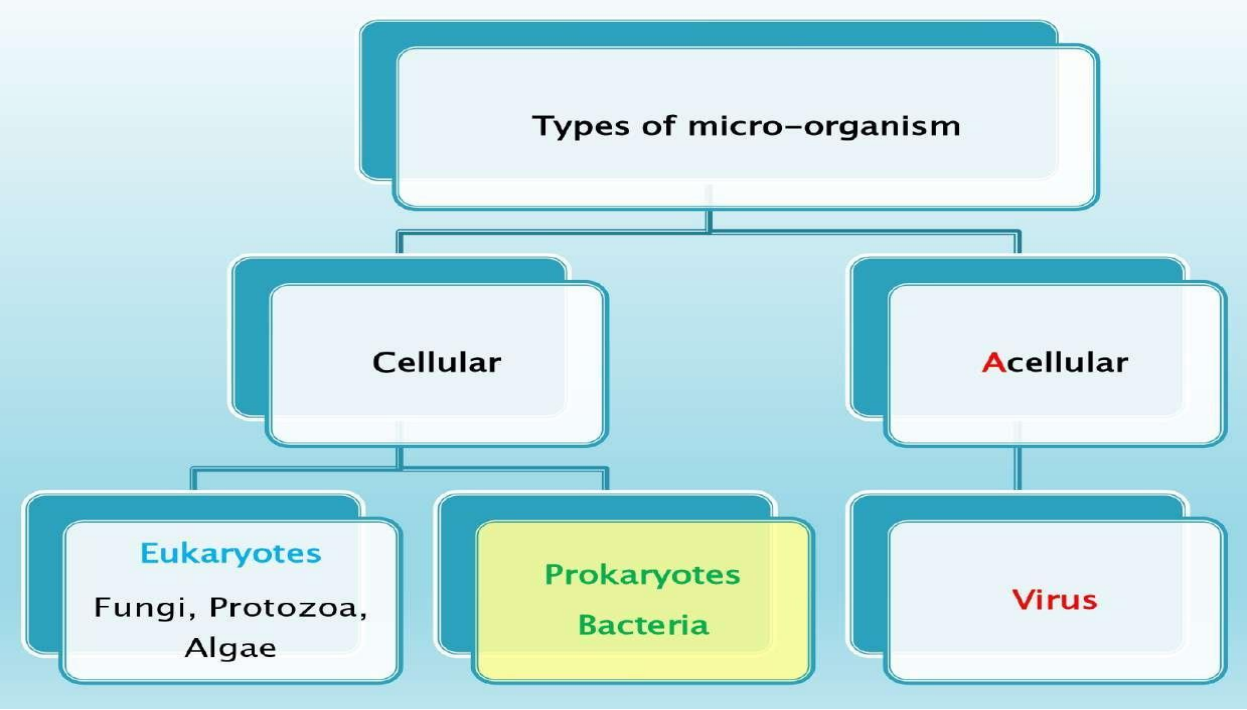
Micro-organism

- Micro-organism: Living organism too small to be seen with naked eye but visible under a microscope.
- Found in air, soil, water & bodies of other organisms.
- Can be either cellular (prokaryotes or eukaryotes) or acellular (virus).
- Can be unicellular (1 cell) or multicellular (> 1 cell)
- Can be useful or harmful.
- Less than 1% of known microorganisms cause disease that is called pathogen.

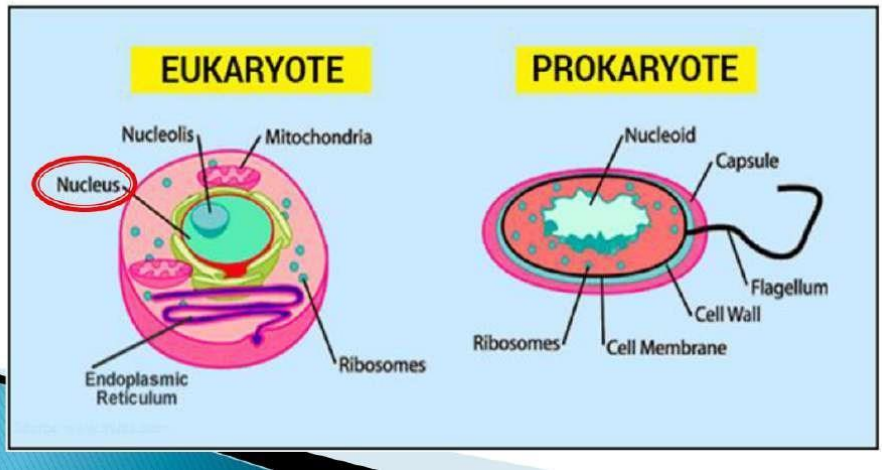
Groups of Micro-organism

- 5 groups/types of microorganisms (small → big)
  - Viruses (acellular = NO cell)
  - Bacteria (prokaryote)
  - Fungi
  - Protozoa
  - Algae





- **Eukaryote**: unicellular or multicellular organism that has a **nucleus** & other membrane-bound organelle.
- **Prokaryote**: unicellular organism that has **NO nucleus** or any other membrane-bound organelle.



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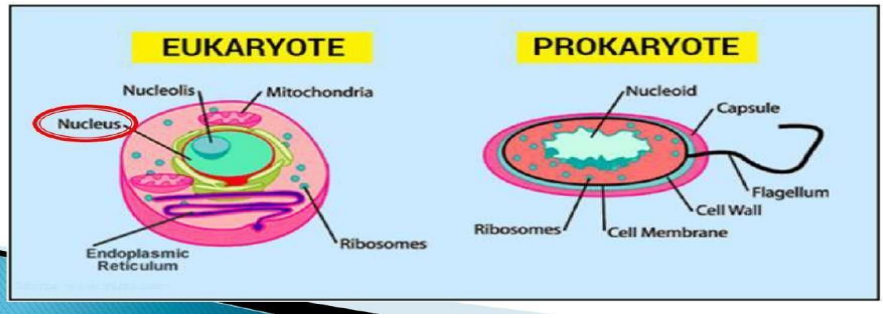
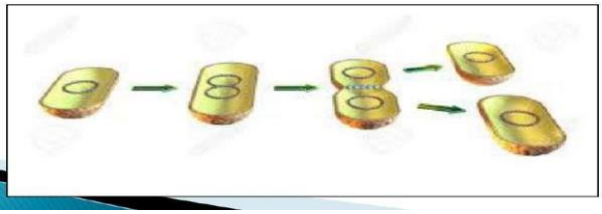
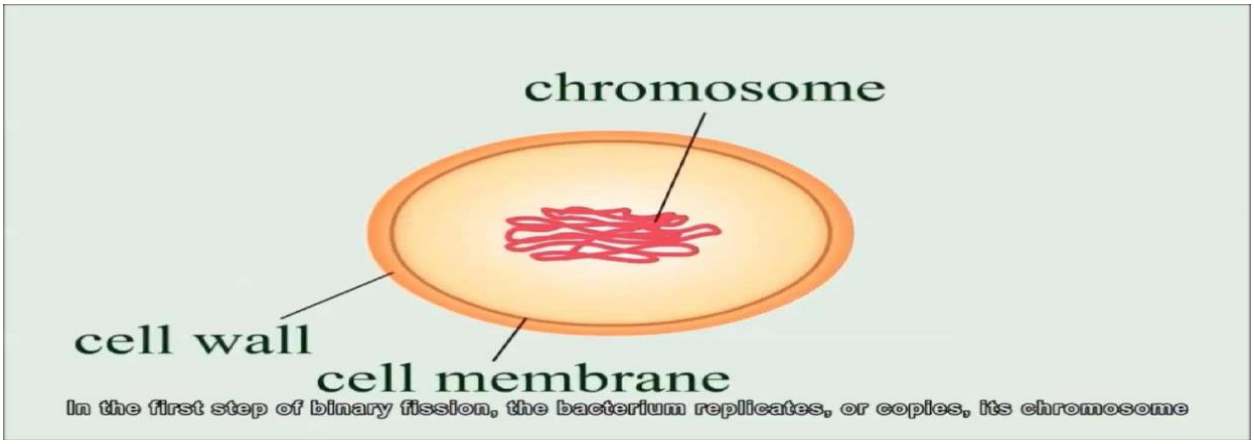


Reproduction of Bacteria

- Most bacteria multiply by a process called **Binary fission**
  1. Parent cell makes a copy of its DNA.
  2. Grows in size by doubling its cellular content.
  3. Doubled contents are pushed out to either end.
  4. A small fissure emerges at the center.
  5. Splitting into two identical "daughter" cells.





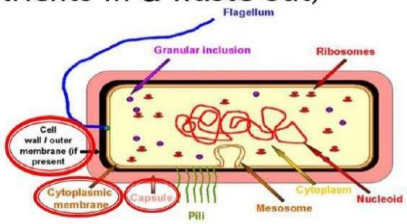
Structure of Bacteria
Prokaryotic cell structure

1. Cell envelope (external layers) consists of 3 layers:
   - Capsule
   - Cell wall (thick) → shape
   - Cytoplasmic membrane = Cell membrane (thin)

   → Regulate transport (nutrients in & waste out)

   → enzyme secretion

   → Energy reactions



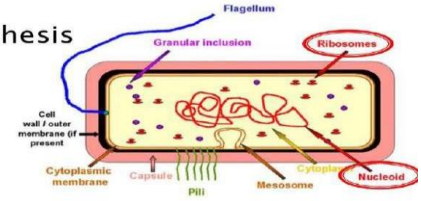
Structure of Bacteria

2. Cytoplasm

80% water – 20% lipids, carbohydrates, ions, enzymes

Bacteria do not have a nucleus

- Nucleoid (chromosome) → single circular DNA without nuclear membrane.
- Ribosome → protein synthesis



Structure of Bacteria

3. Filaments
   - Flagella → long filaments for movement
   - Pili → short like hair for adhesion to host cells