

Lec (2)

Cell History and Cell Theory

Cell history

Cell definition

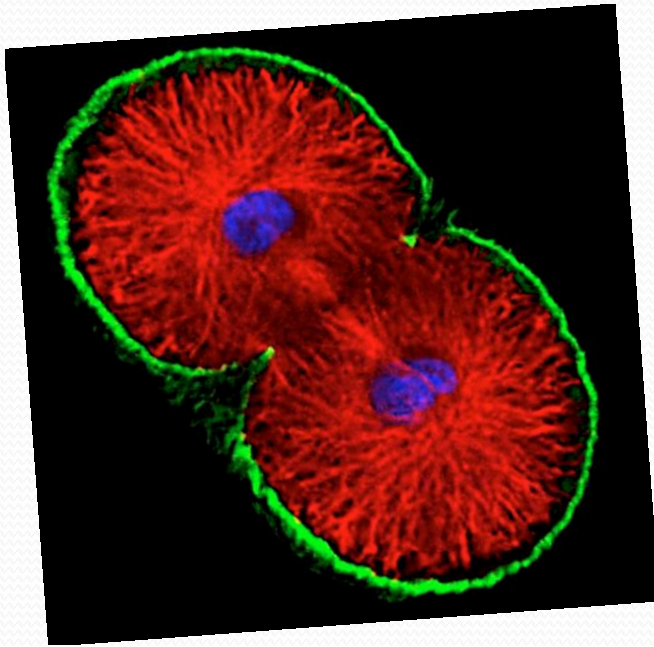
- The structural and functional unit of all living organisms.
- ❖ **Robert Hooke** was the first scientist who discovered cell in 1665 and he gave name cellula (Latin for small room).
- It is the smallest unit of life.



cell theory

- ❖ 1665 -1675 Anton van **Leeuwenhoek**, developed the microscope lens to see greater magnification. First person to observe bacteria,
- ❖ 1838-1839 German scientists **Schleiden and Schwann** ,all living organisms are made of cells. This forms the basic of the **Cell Theory of Biology**.

❖ **Rudolph Virchow**, Proposed that all cells result from the division of previously existing living cells. This idea became a key piece of the modern cell theory.



3.1 Cell Theory

- The cell theory grew out of the work of many scientists and improvements in the microscope.

HOOE



LEEUWENHOEK



SCHLEIDEN



SCHWANN



VIRCHOW



First to identify cells and name them. Looked at cork.

Made more powerful microscopes and first to describe living cells.

All three of these scientists contributed to the cell theory.

Modern Cell Theory

- All living organisms (animals, plants and microbes) are made up of one or more cells and cell products.
- A cell is the basic structural and functional unit of living organisms.
- Cells arise by division of preexisting cells
- All metabolic reactions in unicellular and multicellular organisms take place in cells.

❖ Microscopes are required to visualize cells.

1-Lightmicroscopes can resolve structures that are 200nm apart.



2- Electron microscopes can resolve structures that are 0.2nm apart.





All cells have certain structures in common.

1. genetic material – in a nucleoid or nucleus
2. cytoplasm – a semifluid matrix
3. plasma membrane – a phospholipid bilayer
4. ribosomes

Types of Cells

1-Prokaryotes

2- Eukaryotes

Prokaryotic Cells

❖ Pro = before; karyon = nucleus.

❖ Characteristics of Prokaryotic Cells

- 1- Lack a membrane-bound nucleus.
- 2-Genetic material in the nucleoid region.
- 3-Genome is one circular chromosome
- 4-Cytoplasm
- 5-Plasma membrane



6-Cell wall made of peptidoglycan

7-Ribosomes

8-No membrane-bound organelles

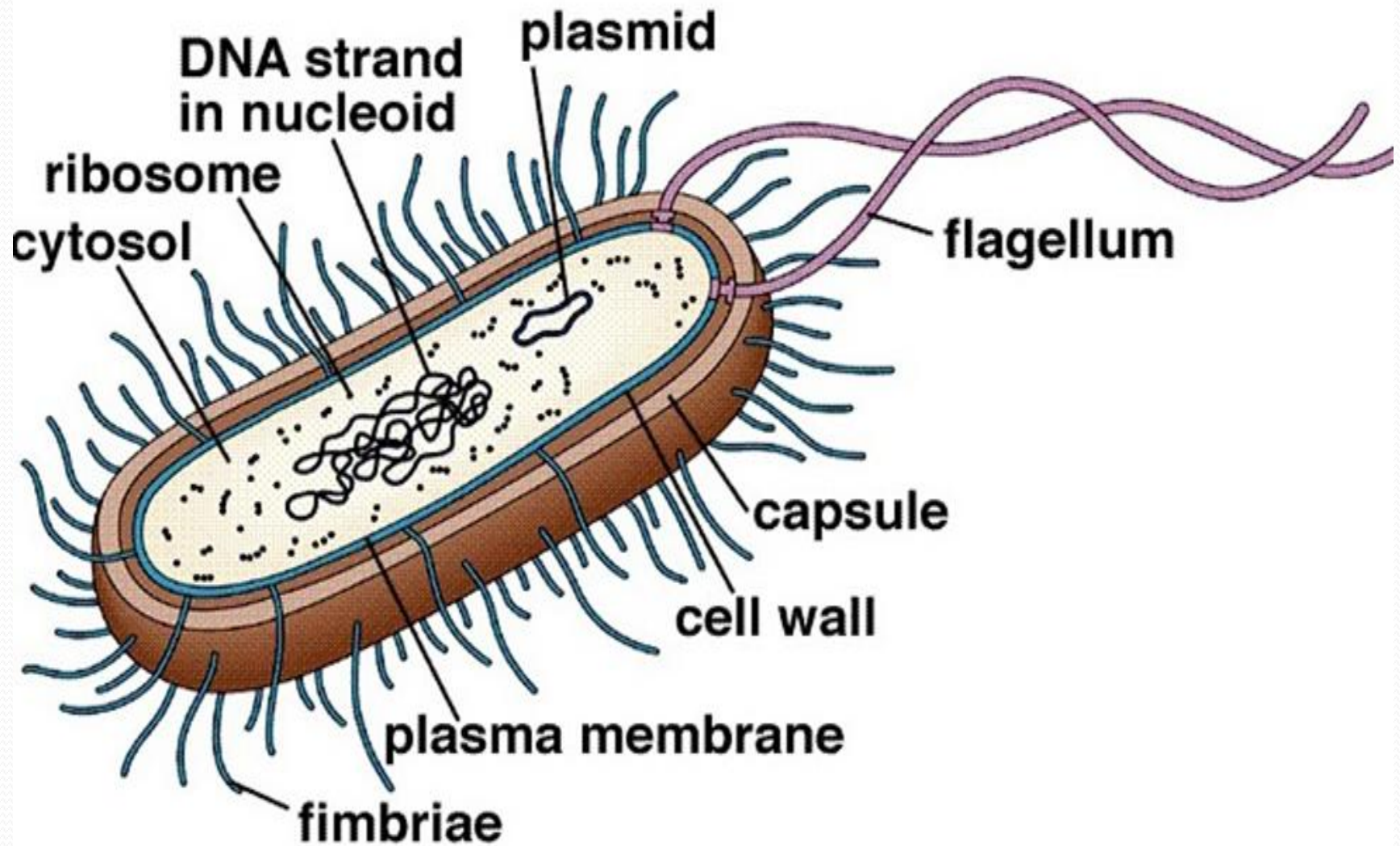
9- Divided by binary fission.

Generally smaller and less complex than **eukaryotes**.

Types of prokaryotes:

- Domain Archaea

- Domain Bacteria



Eukaryotic Cells

❖ Eu = true; karyon = nucleus

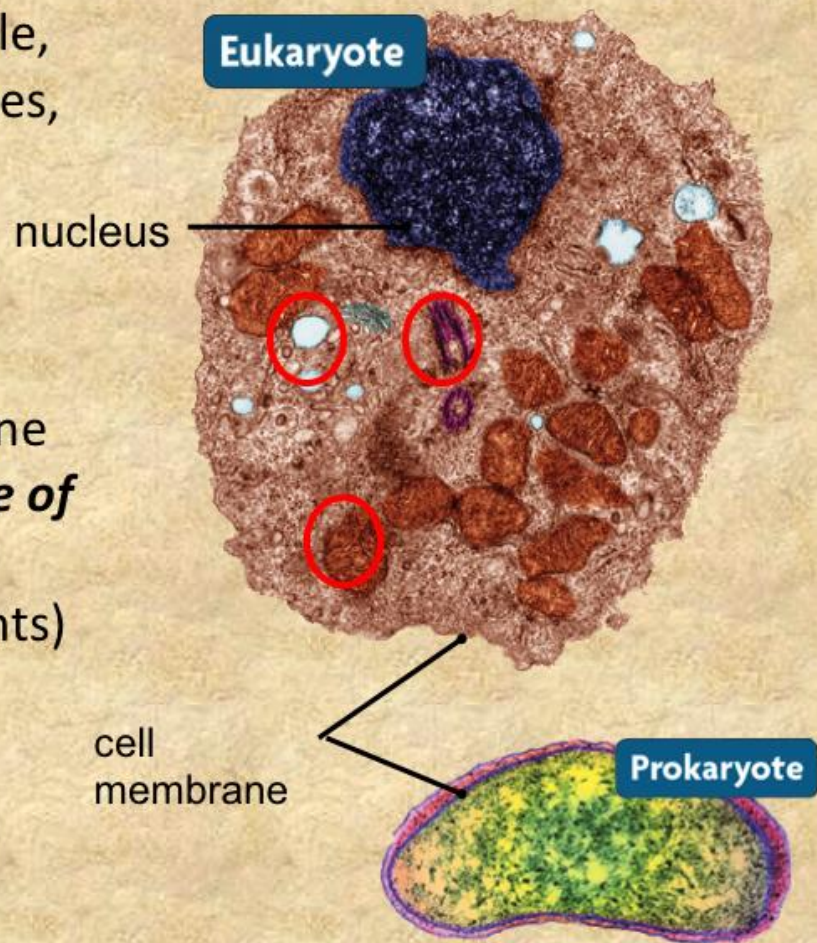
❖ **Characteristics of Eukaryotic Cells**

1-Have the nucleus enclosed within the nuclear membrane.

2-numerous membrane-bound organelles (including the endoplasmic reticulum, Golgi apparatus, chloroplasts, and mitochondria).

- **Eukaryotic cells** have a nucleus

- Have many membrane-bound organelles (mitochondria, vacuole, endoplasmic reticulum, ribosomes, lysosomes, ***plastids in plants***).
- DNA contained in “linear chromosomes”.
- Cytoplasm present.
- Outer boundary is cell membrane except in ***plant cells – wall made of cellulose***
- Cell membrane inside wall (plants)
- Some have flagella/cilia for movement.
- Larger, more complex
- Examples: protozoans, algae, fungi, plants, animals



What is the difference between an animal cell and a plant cell?

Animal cell

- 1-Animal cells are generally small in size
- 2.Cell wall is absent.
3. absent plastids.
4. Vacuoles are many and small.
- 5.Single highly complex Golgi apparatus.
- 6.present centrosome and centrioles.

Plant cell

1. Plant cells are larger than animal cells.
2. Rigid cell wall of cellulose
3. present plastids.
4. Vacuoles are few and large
5. many simpler units of Golgi apparatus, called dictyosomes.
6. Absent centrosome and centrioles.

