

Lecture 3

Cells

The living organism have two types of cells

- 1- Prokaryotic cells
- 2- Eukaryotic cells

Prokaryotic cells

Organisms that have prokaryotic cells are unicellular. They are called “prokaryotes.” **The prokaryotic cell has several elements that allow it to function as a living organism.** First, prokaryotes are covered in a cell membrane. This membrane allows them to create a specific environment within the cytosol that allows biochemical reactions to take place. Second, these cells house both loose DNA and ribosomes. Though ribosomes are organelles, they are not bound by a plasma membrane. Together, the DNA and ribosomes work to produce the proteins that the cells need to gather nutrients, reproduce, and even defend themselves in the face of predators or environmental changes!

Prokaryotic are much smaller than the smallest eukaryotic cells. In general, a prokaryotic cell is smaller because it has less DNA to create the proteins needed to make an ultra-efficient membrane. So, the cells reach a size where they can no longer import the number of nutrients they need for the volume of cytosol they contain. This is known as a **surface-area-to-volume ratio limit** **حدود نسبة مساحة السطح الى الحجم**. However, bacteria are much larger than viruses because they are actively carrying out the biochemical reactions of life within their cells.

How do Prokaryotic Cells Divide?

Prokaryotic cells divide through the process of binary fission. **Unlike mitosis, this process does not involve the condensation of DNA or the duplication of organelles.** Prokaryotic cells have only a small amount of DNA, which is not stored in complex chromosomes. Further, there are no organelles so there is nothing to divide.

When a prokaryote grows to a large size, the process of binary fission takes place. This process duplicates the DNA, then separates each new strand of DNA into individual cells. This process is simpler than mitosis. This means that bacteria can reproduce much faster than most eukaryotic organisms.

