

HBS1HBA Human Biosciences

Lesson Notes

Get Ready for A & P

➤ Biology

Prokaryotes and Eukaryotes

All cells share at least 3 common characteristics:

1. Cells are enclosed in an **outer cell membrane** which separates a cell's internal environment from its external environment
2. Cells are filled with **cytoplasm** which is a mixture of substances and structures in a liquid
3. Cells contain **deoxyribonucleic acid (DNA)** which is the cell's genetic material

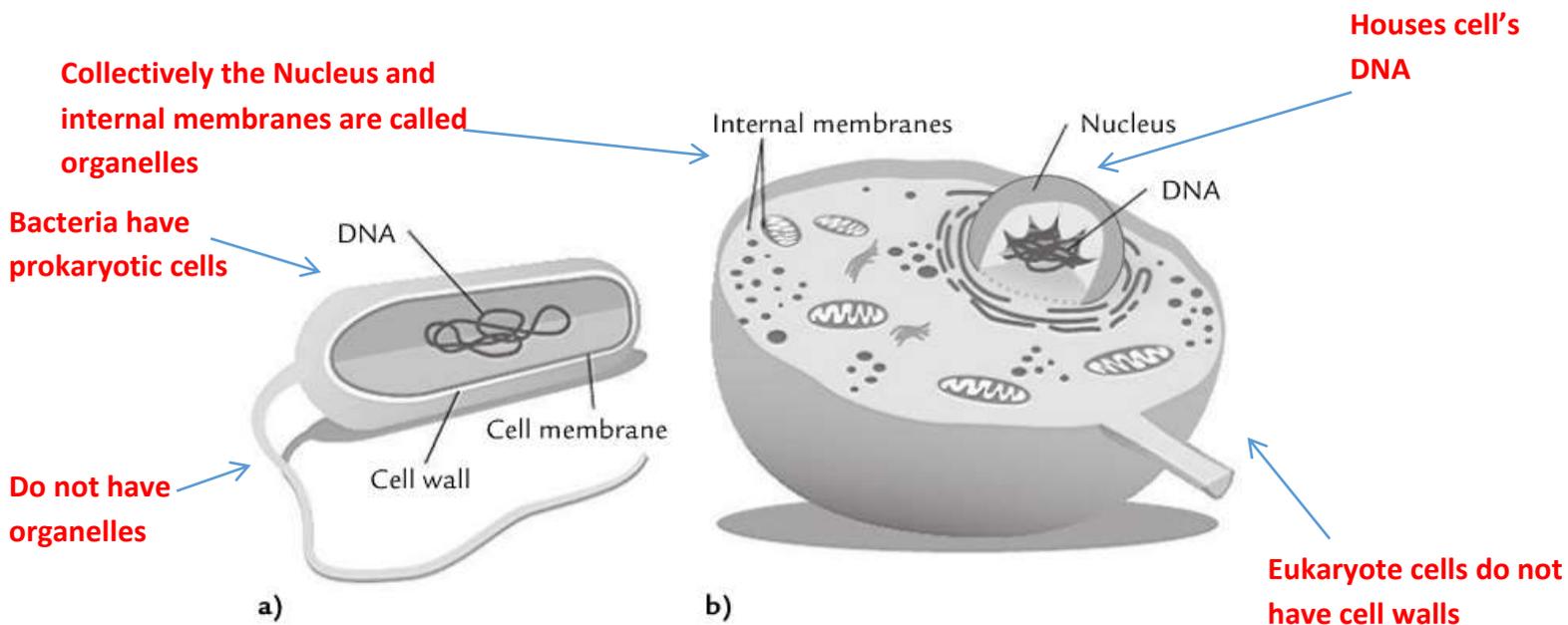
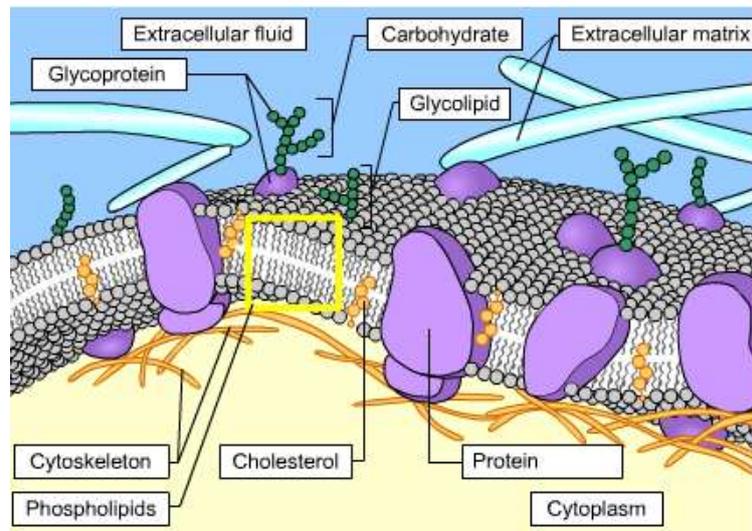


FIGURE 6.3 Cells are classified as either prokaryotic or eukaryotic.

- a) Prokaryotes lack internal membranes and have no nucleus.
b) Eukaryotes have both.

The cells of the human body are all Eukaryotic cells!

Cell Membrane Structures

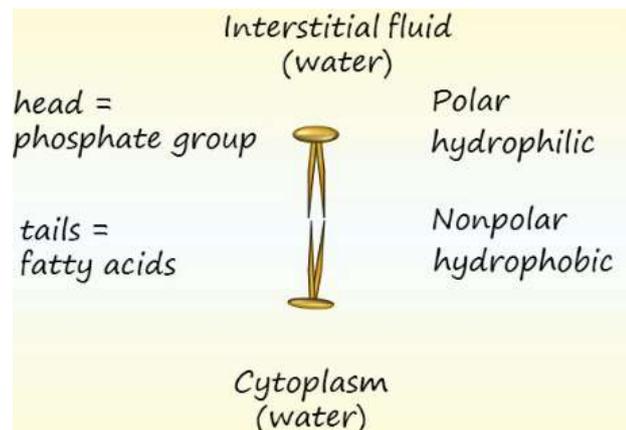


What are some functions of the cell membrane?

- Protecting the cell through the *intracellular membrane* and *extracellular membrane*
- Controls what substances pass through the cell. Some substances are *permeable* others are *impermeable*.
- Cell membranes are considered *semipermeable*

What is the structure of the cell membrane?

- Consists of a *bilayer of phospholipid* molecules



Cell membranes are ever changing! This is referred to as the fluid mosaic model

How are the cell membranes structure and function related?

- Responsive
- Regulates entry and exit from the cell
- Maintains cell position
- Communicates with other cells

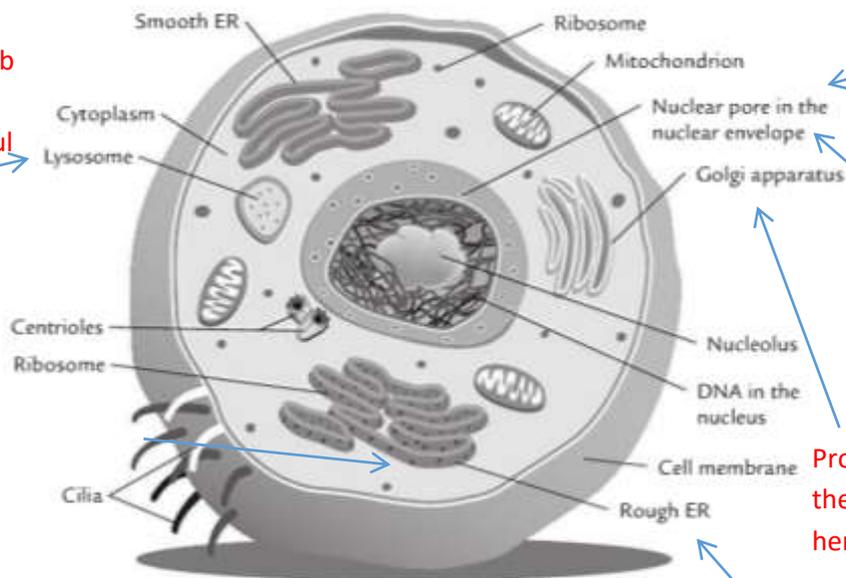
ER is an extensive network of membranous tubes and channels inside the cell. It is a system of movers who are always moving materials from one part of the cell to another.

The **Ribosome** is responsible for assembling the protein during protein synthesis. They float freely in the **cytoplasm** or are attached to an **ER**

Cell Organelles

Smooth ER lacks ribosome's and is involved in making other materials

Are the cells janitors . Main job is to break own materials. Destroy old, foreign or harmful cells parts to keep the cell's interior clean



The **nucleus** is the largest organelle and has one specific task: to house the DNA that contains your genes

The nucleus is enclosed in **nuclear envelope** made of a double membrane

Products that have been made in the **ER** or **ribosome** are finished here

Part of a **rough ER's** job is protein synthesis due to the presence of ribosome's

FIGURE 6.6 A composite eukaryotic cell showing the major organelles.

Genes are instructions for how to make a specific protein in your body !
DNA is your genetic material and determines what proteins your cells make!

1. The **nucleus** houses a cell's DNA that has instructions for how to build protein
2. Proteins are built at the **ribosome** part of which is already made in the **nucleolus** in the **nucleus**
3. Many **ribosome** are attached to rough **ER**. The partially completed protein is sent to the **golgi apparatus** where it is processed, packaged and shipped

Mitochondria

The cell's powerhouse. Store ATP. Contain their own genetic information and can reproduce.

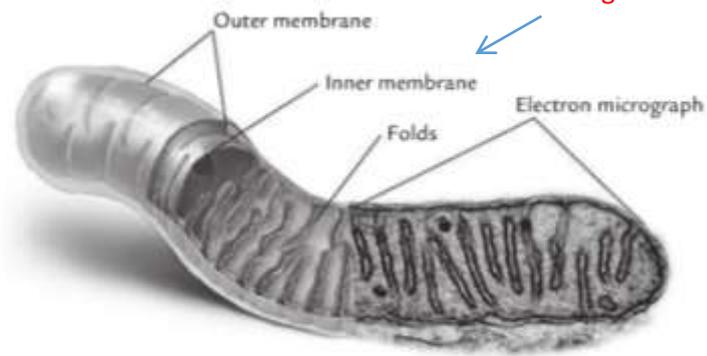


FIGURE 6.7 A mitochondrion. This illustration includes a drawing (left) blended into an actual electron micrograph (right).