

Cell Structures Notes Guide: General Biology

You are responsible not only for the material in this guide but the diagrams and pictures on the notes. The notes can be found on Mr. Walkers website: www.walkersclass.com.

This set of notes covers Unit 1: Objective 4: Describe the characteristics of a prokaryotic and eukaryotic cell.

Two Types of Cells

- Prokaryotic cells (No membrane bound structures) _____ NUCLEUS
 - Single celled organisms (Bacteria)
 - Much smaller in size than eukaryotic cells
- Eukaryotic cells (With membrane bound structures) HAS NUCLEUS
 - Can be single or multicellular. Examples:
 - Protists
 - Fungi
 - Plants
 - Animals
 - _____ in size than prokaryotic cells

Prokaryotic Cells

- Have a nucleoid region which has DNA but is not _____ bound
- Structures in a prokaryotic cell:
 - Cell wall
 - Cell membrane
 - Ribosomes
 - DNA
- Can have cilia or flagellum
 - Cilia are short hair like structures outside of the cell wall which can help the bacteria move
 - Flagellum are long whip like structures which can help the bacteria move
- Always unicellular
- Examples: _____

Eukaryotic cells have organelles

- What is an organelle?
 - In the cytoplasm of eukaryotic cells are organized structures called organelles.
- Examples include: nucleus, mitochondria, ribosomes..etc.
- Organelles (little organs) have membranes around them and specific functions.
- Found in Eukaryotic cells. Prokaryotic cells don't have membrane bound organelles.

Eukaryotic Cells Examples: Animal Cell and Plant Cell

Cell Membrane

- **Structure:** Made/composed of proteins and lipid (fat) molecules.
 - Phospholipid _____
 - Fluid Mosaic Model
- **Function:**
 - 1) acts as a _____ layer to contain the cytoplasm (fluid in cell)
 - 2) Regulates interactions between the cell and the environment.

Cytoplasm

- **Structure:** a gelatin-like substance which flows inside the cell membrane. Within the cytoplasm is a framework called the cytoskeleton.
- **Function:** Keeps _____ of organelles and cell membrane.

Cell Wall

- **Structure:** Made of a carbohydrate called cellulose.
- **Function:** Protect the cell and give it _____.

Not every cell has a cell wall. Cells of plants, algae, fungi, and most bacterial have a cell wall.
Animal cells do not have a cell wall!

Nucleus

- **Structure:** Surrounded by a membrane. Materials enter and leave the nucleus through openings in the membrane.
- **Function:** Directs all cell activities. It contains all instructions for everything that the cell does. The instructions are found on long, threadlike, hereditary material made of _____.
 - DNA is the chemical that contains the code for the cell's structure and activities.

Chloroplasts

- **Structure:** Green organelles in cytoplasm. They contain the pigment chlorophyll.
- **Function:** Make _____ for the cell. Chlorophyll captures light energy that is used to make a sugar called glucose. It is the site of photosynthesis.
- Carbon Dioxide + Water -----> _____ + Oxygen (food)
- Animals cells do not have chloroplasts!

Mitochondria (THE POWERHOUSE)

- **Structure:** Made/composed of double unit membrane (protein, lipid).
 - inner membrane enfolded to form cristae
- **Function:** Site of cellular respiration ie. the release of chemical _____ from food
- Glucose + Oxygen -----> Carbon dioxide + Water + Energy (ATP)

Ribosomes

- Structure: Not membrane bound. Spherical bodies composed of RNA (ribonucleic acid) and protein enzymes
- Function: Produce _____ and other small structures.

Endoplasmic Reticulum (ER)

- Structure: A series of folded membrane.
- Function: Allows materials to be processed and _____ around inside the cell.
 - Two types of ER:
 - Smooth and Rough

Smooth ER has no attached ribosomes. Smooth ER processes other cellular substances such as lipids (fat).

Rough ER is bumpy because it has ribosomes. Ribosomes make proteins.

Golgi Bodies

- Structure: Stacked, flattened membranes
- Function: _____ proteins and other cellular substances and package them into membrane-bound structures called vesicles.

Lysosome

- Structure: Spherical, membrane bound organelles.
- Function: Contain digestive chemicals that help _____ down food molecules, cell wastes, and worn-out cell parts.

Vacuole

- Structure: a single layer of unit membrane enclosing fluid in a sack
- Function: produces pressure against cell wall for support.
 - _____ water and various chemicals
 - may store insoluble wastes