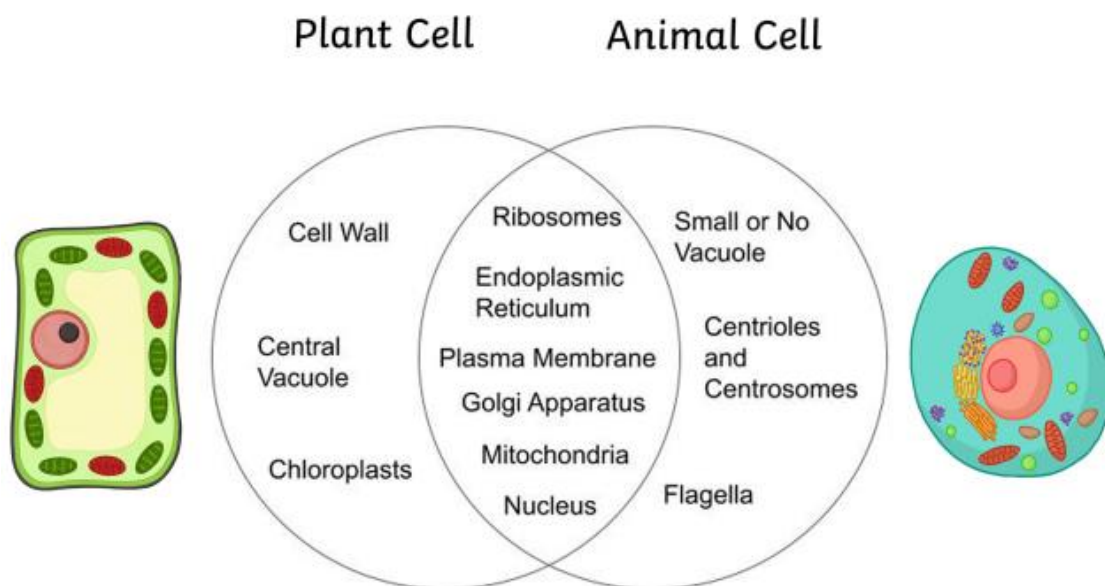




Q1. Make the comparison and write down the ways in which plant cells are different from animal cells.

Answer: Comparison between plant and animal cells.

Plant cells	Animal cells
1. Plant cells are rectangular and larger than animal cells.	1. Animal cells are mostly round/oval and smaller than plant cells.
2. Cellulose cell wall makes the outer most boundary.	2. Animal cells lack cell wall .
3. A mature plant cell has single, large, well developed vacuole .	3. Mostly absent , if present, they are small and scattered.
4. Golgi bodies components are diffused all over the cell and make dictyosomes .	4. Well-developed Golgi bodies are present near the nucleus.
5. Centrioles and centrosomes are absent ; rather polar caps are present.	5. Centrioles and centrosomes are present.
6. Plant cells have plastids .	6. Plastids are absent .
7. Starch or oil serve as storage food material.	7. Glycogen serves as storage food material.

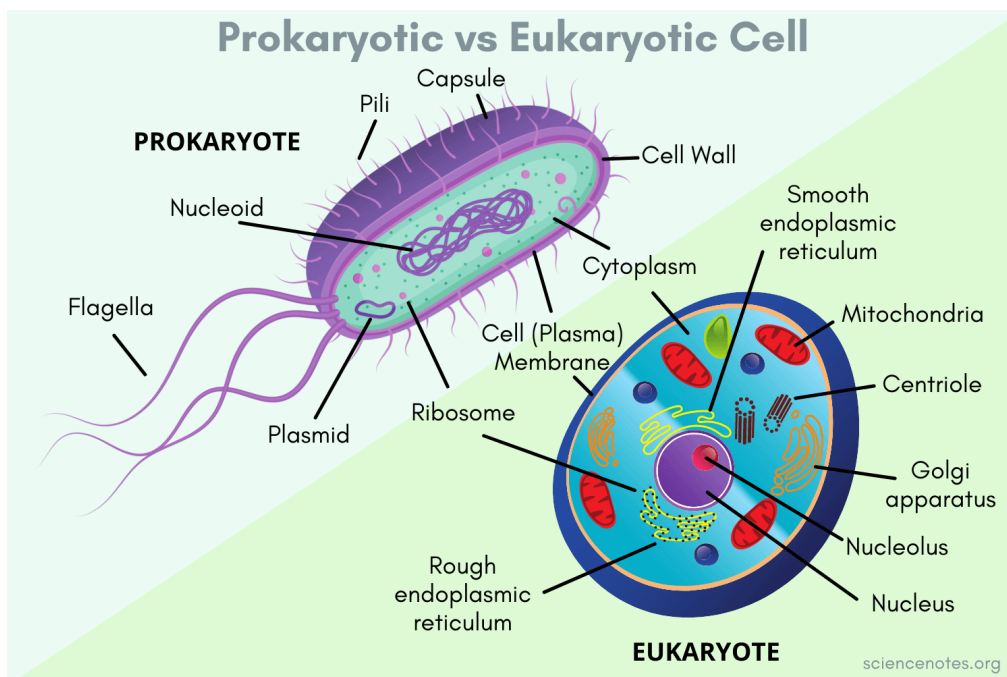




Q2. How is prokaryotic cell different from eukaryotic cell?

Answer:

Prokaryotic cells	Eukaryotic cells
This cells are always unicellular	Eukaryotic cells are present as either unicellular or multicellular .
In prokaryotic cells, the cell wall is present and it is very complex in nature .	Eukaryotic cells have cell walls very rarely , if present they have simple chemical nature .
In this cells true nucleus absent , instead nucleotide is present	True nucleus is present .
DNA is arranged in circular shape	DNA is linear in shape
In prokaryotic cells, cytoplasm is present, but it is lacking in most cell organelles .	In eukaryotic cells, it consists of both cytoplasm and organelles , both are present .
Mitochondria is absent	Mitochondria is present and it is a powerhouse of cells.
In this cells only asexual reproduction occurs.	Both sexual and asexual reproduction occurs.
Bacteria and Archaea are examples.	Plant and animal cells are examples.





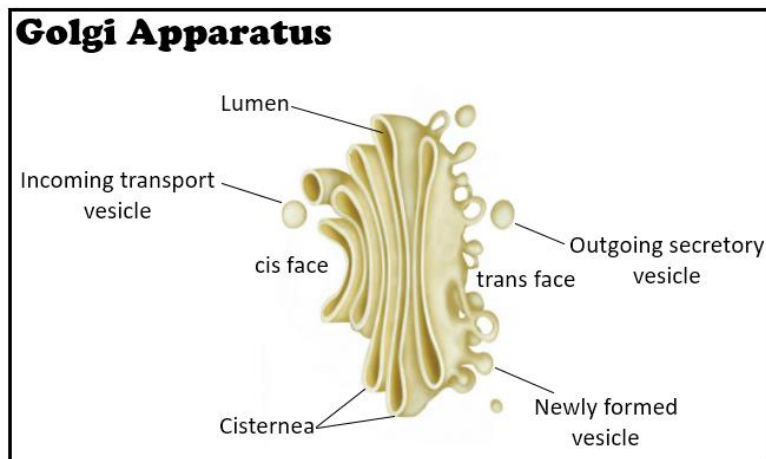
Q3. What would happen if plasma membrane ruptures or breaks down?

Answer: Rupture of plasma membrane:

- If the plasma membrane ruptures, the cell will leak all its cellular constituents leading to cell death.
- It may lead to the bursting of lysosomes, resulting in the digestion of cell organelles.
- Once the plasma membrane ruptures, solutes from the exterior can harm the cell organelles which will lead to cell death.

Q4. What would happen to the life of the cell if there is no Golgi apparatus?

Answer:



Consequences of absence of Golgi apparatus:

The **proteins in cells would float randomly if there were no Golgi bodies**. Without the substances that the Golgi body typically distributes, other cells and organs in the body would not operate as they should.

Lysosomes would not be generated in the absence of the Golgi apparatus, and the cell would eventually die as a result of the build-up of dead and damaged molecules and organelles.

Materials would no longer be packaged or transported if the Golgi apparatus were absent. The **cell's secretory functions would also stop**.

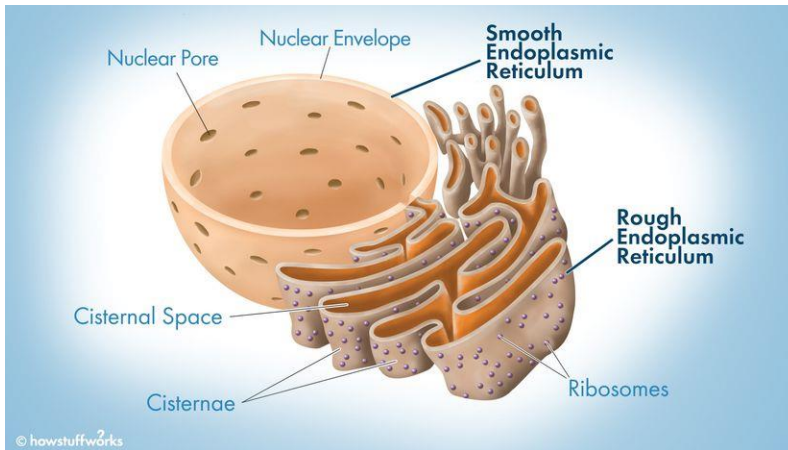
Q5. Which organelle is known as power house of cell? Why?

Answer: Mitochondria are known as the powerhouse of cells. It is because the mitochondrion is the site of cellular respiration where energy in the form of ATP (Adenosine triphosphate) is generated as a result of oxidation of food constituents. This energy is required for various chemical activities needed for life.



Q6. Where do lipids and proteins constituting the cell membrane get synthesized?

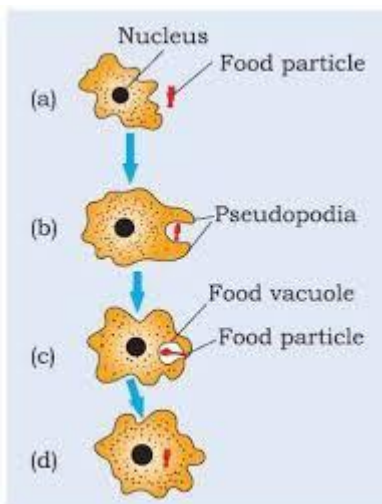
Answer: The *synthesis of proteins and lipids* takes place in the *endoplasmic reticulum*.



- It is of two types- **smooth endoplasmic reticulum (SER)** and **rough endoplasmic reticulum (RER)**.
- The **lipid synthesis** occurs in the **smooth endoplasmic reticulum (SER)**.

- **Rough endoplasmic reticulum (RER)** has ribosomes attached to its membrane.
- Ribosomes are the factory of **all protein being synthesised** in the cell.
- Therefore, **membrane proteins** are also synthesised by **rough endoplasmic reticulum (RER)**.

Q7. How does Amoeba obtain its food?



Answer: An amoeba takes in food using temporary extensions called "**pseudopods**" on the cell surface which **envelop the food particle** completely, **forming a "food-vacuole"**.

Inside the food vacuole, **complex substances** are broken down into **simpler ones**.

The **simpler substances** then find their way to the **cytoplasm** through **diffusion**.

The remaining **undigested material** is moved to the **surface of the cell** and **thrown out**.

Q8. What is osmosis?

Answer: "**Osmosis is a process by which the molecules of a solvent pass from a solution of low concentration to a solution of high concentration through a semi-permeable membrane.**" Osmosis plays an important role in the transportation of nutrients and the release of metabolic waste products within a living cell.



Q10. Which type of cell division is required for growth and repair of the body and which type is involved in formation of gametes?

Answer: Mitosis is the type of cell division that is involved in the growth and repair of body whereas meiosis is a type of cell division which results in the formation of gametes.

Q9. Carry out the following osmosis experiment:

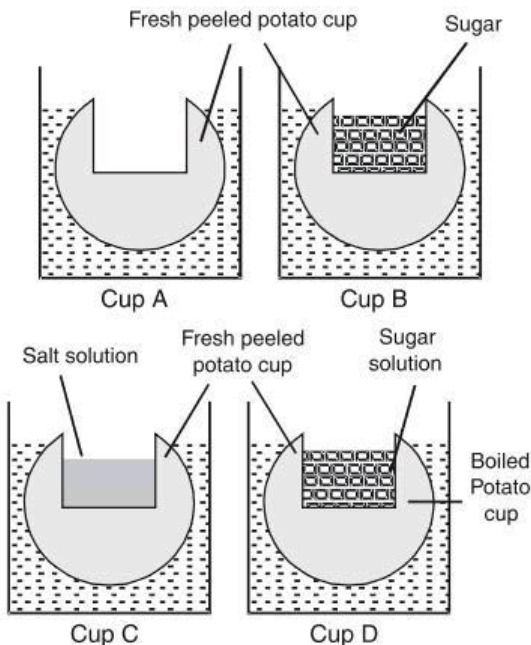
Take four peeled potato halves and scoop each one out to make potato cups. One of these potato cups should be made from a boiled potato. Put each potato cup in a trough containing water. Now,

- (a) Keep cup A empty
- (b) Put one teaspoon sugar in cup B
- (c) Put one teaspoon salt in cup C
- (d) Put one teaspoon sugar in the boiled potato cup D.

Keep these for two hours. Then observe the four potato cups and answer the following:

- (i) Explain why water gathers in the hollowed portion of B and C.
- (ii) Why is potato A necessary for this experiment?
- (iii) Explain why water does not gather in the hollowed-out portions of A and D.

Answer:



(i) Water accumulates in the hollowed portions of B and C as a difference in the water concentration

is observed. Thereby, endosmosis occurs as the cells act as a semipermeable membrane.

(ii) Potato A is essential in this experiment as it is significant to compare different scenarios seen in

potato cups B, C and D. Potato A in this experiment clearly shows that the potato cavity on its

own cannot bring about water movement.

(iii) Cup in A does not show any change in the water flow concentration for osmosis to occur, which

requires concentration to be higher than the other. Cells

in cup D are dead; thus, there is no

existence of a semipermeable membrane for water flow. Consequently, osmosis does not occur.



Q1. Who discovered cells, and how?

Answer: In 1665, Robert Hooke discovered cells while examining a thin slice of cork through a self-designed microscope. He observed that the cork resembled the structure of a honeycomb consisting of numerous tiny compartments. The minuscule boxes are referred to as cells.

Q2. Why the cell is called the structural and functional unit of life?

Answer: Cells form the structure of an entity. A group of cells form a tissue, further an organ and ultimately an organ system. They perform fundamental functions and life processes such as respiration, digestion, excretion etc., in both unicellular and multicellular entities. They perform all the activities independently. Hence, cells are referred to as structural and fundamental units of life.

Q3. How do substances like CO₂ and water move in and out of the cell? Discuss.

Answer: CO₂ moves by diffusion. The cellular waste accumulates in high concentrations in the cell, whereas the concentration of CO₂ in the external surroundings is comparatively lower. This difference in the concentration level inside and outside of the cell causes the CO₂ to diffuse from a region of higher (within the cell) to a lower concentration.

H₂O diffuses by osmosis through the cell membrane. It moves from a region of higher concentration to a lower concentrated region through a selectively permeable membrane until equilibrium is reached.

Q4. Why the plasma membrane is called a selectively permeable membrane?

Answer: The plasma membrane is called as a selectively permeable membrane as it permits the movement of only certain molecules in and out of the cells. Not all molecules are free to diffuse.

Q5. Fill in the gaps in the following table, illustrating the differences between prokaryotic and eukaryotic cells.

Prokaryotic Cell	Eukaryotic Cell
1. Size: Generally small (1-10 μm) 1 μm = 10 ⁻⁶ m 2. Nuclear region: _____ _____ and known as _____ 3. Chromosome: single 4. Membrane-bound cell organelles absent.	1. Size: Generally large (5-100 μm) 2. Nuclear region: well-defined and surrounded by a nuclear membrane. 3. More than one chromosome. 4. _____ _____ _____

Answer:



Prokaryotic Cell	Eukaryotic Cell
<p>1. Size: Generally small (1-10 μm) 1 μm = 10^{-6}m</p> <p>2. The nuclear region is poorly defined due to the absence of a nuclear membrane and is known as the nucleoid.</p> <p>3. There is a single chromosome.</p> <p>4. Membrane-bound cell organelles absent.</p>	<p>1. Size: Generally large (5-100 μm)</p> <p>2. Nuclear region: well-defined and surrounded by a nuclear membrane.</p> <p>3. There is more than one chromosome.</p> <p>4. Membrane-bound cell organelles present.</p>

Q6. Can you name the two organelles we have studied that contain their own genetic material?

Answer: The two organelles which have their own genetic material are

1. Mitochondria
2. Plastids

Q7. If the organisation of a cell is destroyed due to some physical or chemical influence, what will happen?

Answer: In the event of any damage to cells and when the revival of cells is not possible, Lysosomes burst, and enzymes digest such cells. This is why lysosomes are often referred to as 'suicide bags'.

Q8. Why are lysosomes known as suicide bags?

Solution: When there is damage to the cell and when revival is not possible, lysosomes may burst, and the enzymes digest their own cell. Consequently, lysosomes are known as suicide bags.

Q9. Where are proteins synthesised inside the cell?

Solution: Protein synthesis in cells takes place in ribosomes. Hence, ribosomes are also referred to as protein factories. Ribosomes are particles that are found attached to the rough endoplasmic reticulum.