

Part-II

Section-I

Qno.3 a) why cells form organelles?
Discuss mitochondria in human cell?

Answer

→ Why cells form Organelles:

Cells

forms organelles due to the following reasons:

1. Cells forms organelles to achieve compartmentalization and specialization of functions, which enhances efficiency.
2. Each organelle has a specific role to play. For instance, Nucleus stores genetic material, Mitochondria produces energy, and Golgi Apparatus modifies and transports proteins.
3. Organelles protects contents from harmful substances and regulates cellular metabolism.
4. This internal division of labor prevents interference between incompatible biochemical reactions and maintain suitable conditions for each process.

5. Evolutionarily, mitochondria and chloroplasts are originated through endosymbiosis giving rise to more complex eukaryotic cells.

→ Thus, the formation of organelles is a major step in cellular organization which enhances stability, efficiency, and adaptability to life processes.

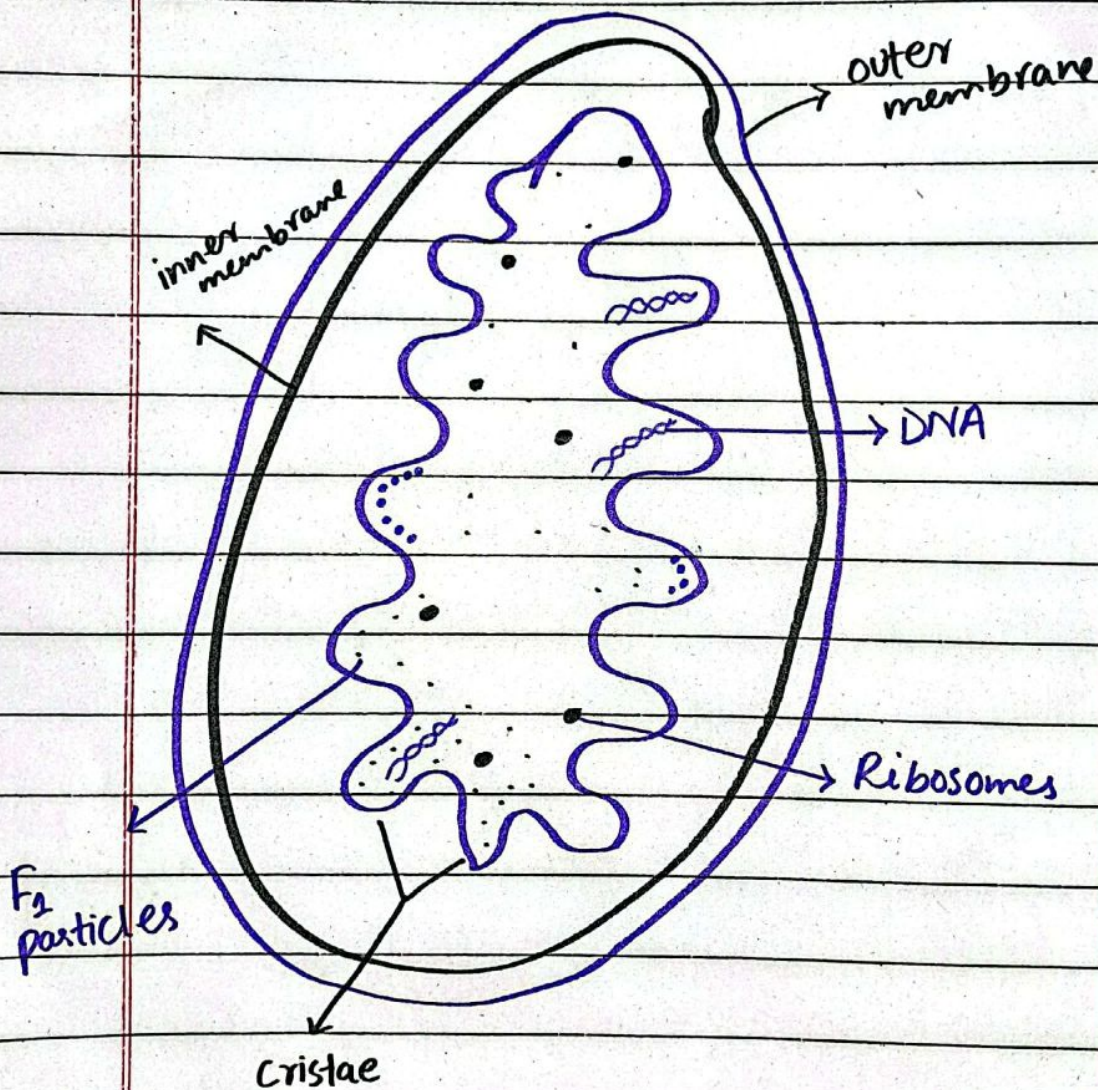
→ Mitochondria:

Mitochondria are very important organelles found in only Eukaryotic cells. They are involved in manufacturing and providing energy to cells. Therefore, called as the "Power house of cells". The size and number of mitochondria is different in different cells.

→ Structure:

The structure of mitochondria maybe a rod or a filament like structure. It consists of two membranes. The outer membrane is smooth. The inner membrane consists of many infolding,

called Cristae. The inner surface of cristae contains many small particles known as F_1 particles. These particles are suspended inside the matrix.



Mitochondria

→ Chemical Composition:

Mitochondria have similar composition to other cells membranes. They are composed of :

- ✓ lipids
- ✓ proteins
- ✓ enzymes
- ✓ co-enzymes
- ✓ DNA & Ribosomes means capable of making their own proteins.

→ Formation of New Mitochondria :

They are self replicating means in order for new mitochondria to form the old mitochondria has to divide.

→ Function :

Following are the functions mitochondria performs :

- 1) Provides energy to cells.
- 2) Metabolic processes like, Kerbs cycle, fatty acid metabolism, aerobic respirations takes place inside mitochondria.

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M T W T F S

3) Energy is released from organic food during these metabolic processes.

4) This energy is transformed into energy rich compound ATP.

ATP provides energy to cells on demand and ATP is broken into ADP.

5) ADP gets absorbed by mitochondria and again becomes ATP.