Dr. Anupma Kumari
Department of Zoology
H. D. Jain college, Ara

ULTRASTRUCTURE AND FUNCTION OF MITOCHONDRIA

Definition: Mitochondria (sing. Mitochondrion) is one of the important cell organelle which is double membrane-bound and performs the vital function of energy generation inside the cell. Due to this particular function of energy generation this is also called as **POWER HOUSE OF THE CELL**.

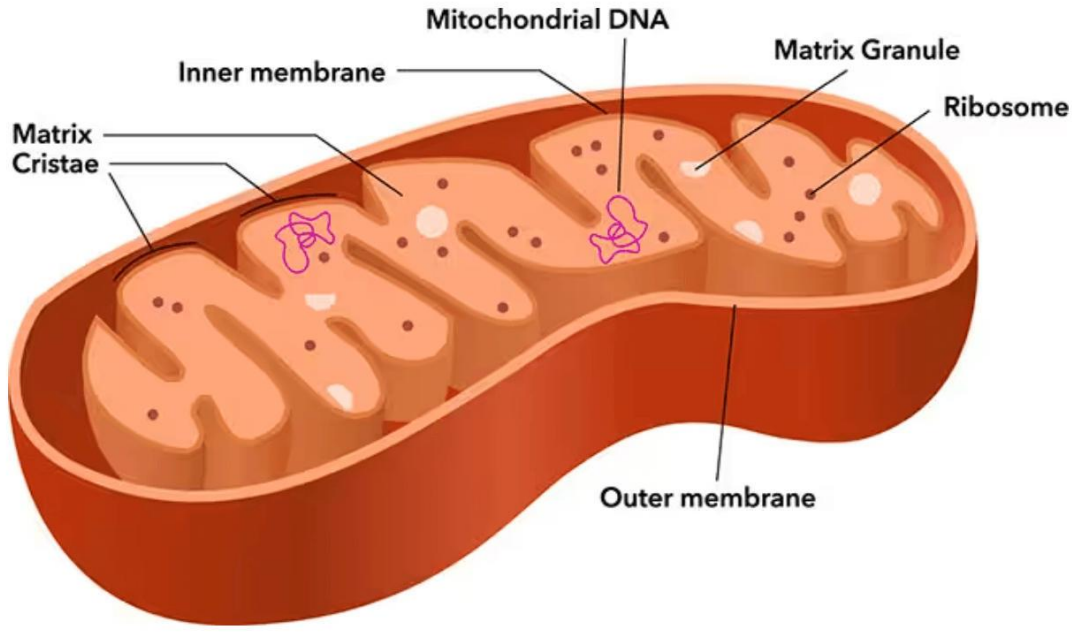
Introduction:

Mitochondria are present nearly in all eukaryotic cells in the form of **cylindrical** structures.

These are not visible under microscope easily unless specifically stained.

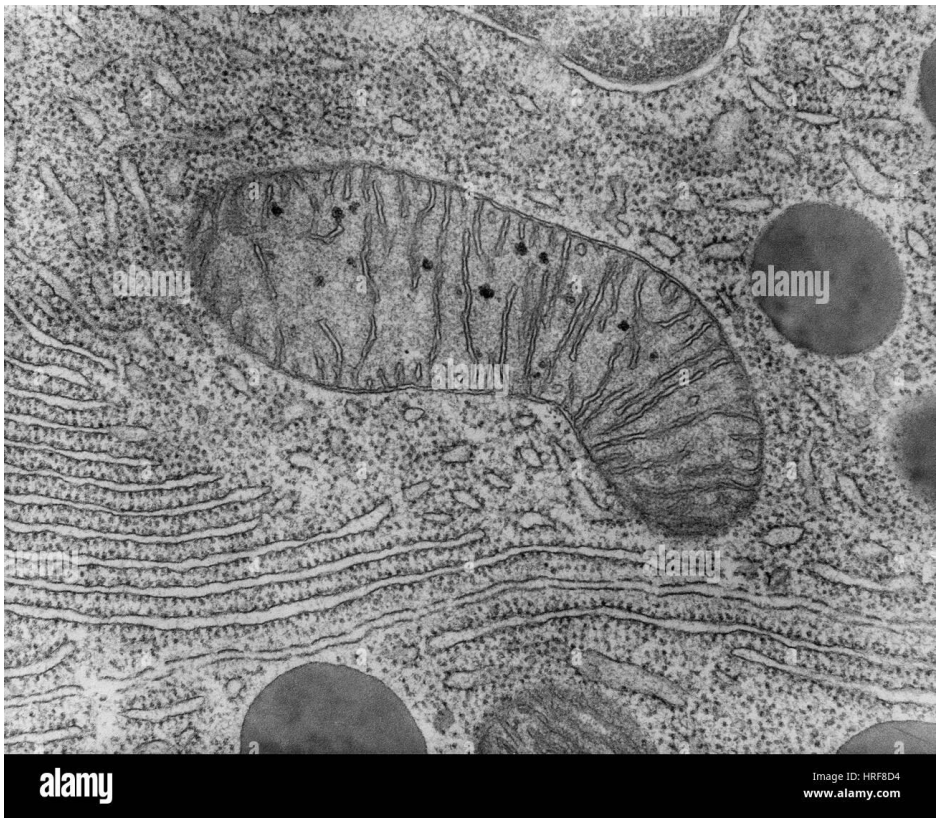
The number of mitochondria per cell is variable depending upon the physiological activity of the cell.

Structure:



Structure of mitochondrion (Longitudinal section)

Dr. Anupma Kumari
Department of Zoology
H. D. Jain college, Ara



Electron micrograph of mitochondria

Typically it is sausage-shaped or cylindrical having **length of 1.0 to 4.1 µm** and **less than 1 µm in diameter.**

These consists of double membrane namely the outer membrane and the inner membrane. These two membranes divide its lumen into two distinct aqueous compartments, i. e., the **outer compartment** and the **inner compartment**.

The outer membrane forms the continuous limiting boundary of the organelle.

The inner compartment is filled with dense homogenous substance called **matrix**.

The inner membrane is folded into the **cristae or crests** towards the matrix. These cristae particularly subdivide the inner chamber of mitochondria. The cristae increase the surface area and their inner surface is covered with mushroom like projections that are related to phosphorylation.

Dr. Anupma Kumari
Department of Zoology
H. D. Jain college, Ara

The two membranes have their own specific enzymes associated with the mitochondrial function.

Further mitochondria have their own genetic system (mitochondrial DNA) as **single circular DNA** molecule. Additionally, a few RNA molecules , ribosomes (70s) and the components required for synthesis of proteins are also present in it.

Functions

Aerobic respiration occurs in the mitochondria. They produce cellular energy in form of ATP.

Within the matrix of the mitochondria, are numerous soluble enzymes that are involved in the Kreb's cycle (the first step in the aerobic utilization of energy from nutrients).

Through the various steps of aerobic respiration, mitochondria produce enegy and provide it to the cell for further use of it.

****