

## MITOCHONDRIA

In 1850, Kolliker for the first time recognized the structure now known as mitochondria. However, the credit for the discovery of mitochondria is given to W. Flemming and R. Altman. While Flemming described some thread-like structure in 1882, Altman described granules in 1890. These cell inclusions were later called mitochondria (mitos = thread, chondrion = granules) by C. Benda in 1897. These evidences for the presence of mitochondria were available only in the animal cells. The first evidence for the presence of mitochondria in plant cells (Nymphaea) was given by F. Meves in 1904. Since then, mitochondria have been shown in all kinds of plant and animal cells. However, an important advancement in the study of mitochondria for the first time by Bensley and Hoerr in 1934. The mitochondria of a cell are collectively designated as chondriome.

Morphology: The mitochondria can be more easily examined in cultured cells rather than under in vivo condition (living organisms). They can be conveniently studied with the help of a phase contrast microscope. To facilitate further examination, the mitochondria may be stained with Janus green which stains

The organelle with a greenish blue stain due to oxidation of dye by cytochrome oxidase. In cell extracts due to differential centrifugation, mitochondria sediment at 5000 to 24000g, while in living cells by ultracentrifugation (200,000 to 400,000g), mitochondria are deposited intact at the centrifugal pole.

In a light microscope, the mitochondria appear as rod-shaped, filamentous or granular structure in majority of the cells. They appear as granular in spermatozoa and oocytes and club-shaped in liver cells of different materials showing size differences in mitochondria (1957). The morphology of mitochondria varies not only from one cell to another, but also within the same cell. Depending upon certain functions also, they may change their shape and may take the shape of a club or tennis racket. The mitochondria normally vary in size from  $0.5\mu$  to  $2.0\mu$  and are therefore not easy to detect in light microscope. However, their length may sometimes reach upto  $7.0\mu$ . The number of mitochondria per cell varies according to the function and volume of cells. There may be 50-5000 mitochondria in a cell. The number may reach upto 500,000 in some kind of protosoa. Rarely mitochondria may also be branched. (Fig).

