

## **SEMI-AUTONOMOUS NATURE OF MITOCHONDRIA**

1. Cell organelles which contain their own DNA and replicate independently of the nucleus are said to be **semi-autonomous**.
2. Mitochondria have their own DNA which can replicate independently. The organelles possess their own ribosomes, called mitoribosomes. The **mitochondrial DNA** produces its own **mRNA, tRNA and rRNA**.
3. Mitochondria are partly independent or semi-autonomous as they can **MANUFACTURE** some of the proteins required for their functioning (**e.g. crucial components of the oxidative phosphorylation machinery - Succinate dehydrogenase**) with the help of their DNA, RNAs, enzymes, and ribosomes and **IMPORT** the others from the cytoplasm formed under the control of the nuclear DNA. However, most of the **mitochondrial proteins are synthesized under instructions from cell nucleus**.
4. Mitochondria contain about 1000 (yeast) to 1500 (human) different proteins. Of these, about 1 % are synthesized on ribosomes in the matrix also known as **BIOGENESIS OF MITOCHONDRIAL PROTEIN** and the remainder are synthesized on ribosomes in the cytosol.