

The Objectives

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Objectives

By the end this session the students will be able to:

- **Identify the cell.**
- **Identify the types of the cell.**
- **Describe the character prokaryotic and eukaryotic cell**
- **Describe the prokaryotic and euakaryotic cell organelles.**
- **Explain the function for organells**

The Cell "fundamental unit of life"

Types of cells

→ Prokaryotic

☐ Single celled

☐ No nucleus

☐ No organelles

DNA = single, circular molecule
e.g., bacteria

→ Eukaryotic

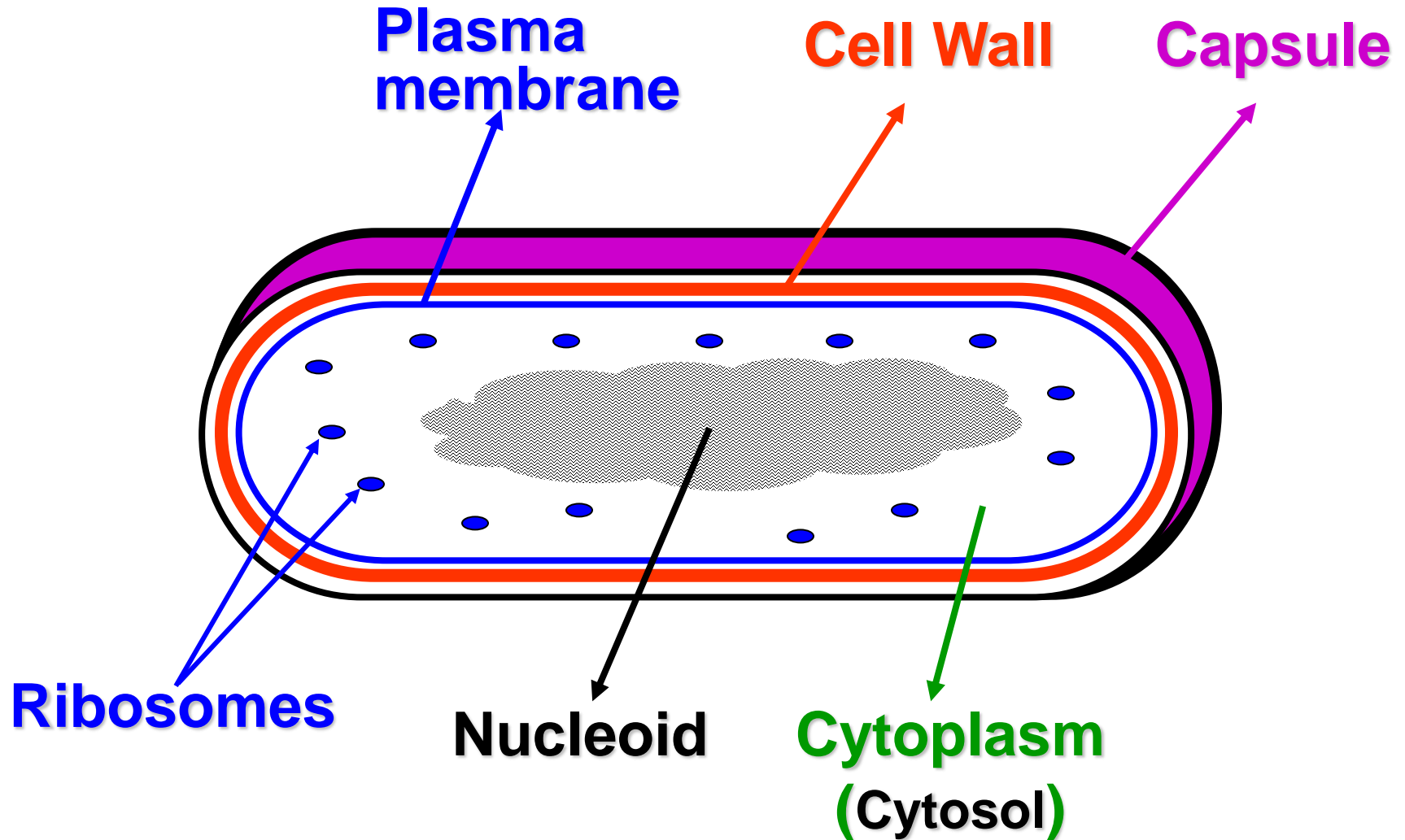
☐ single or multicellular

☐ nucleus with nuclear membrane

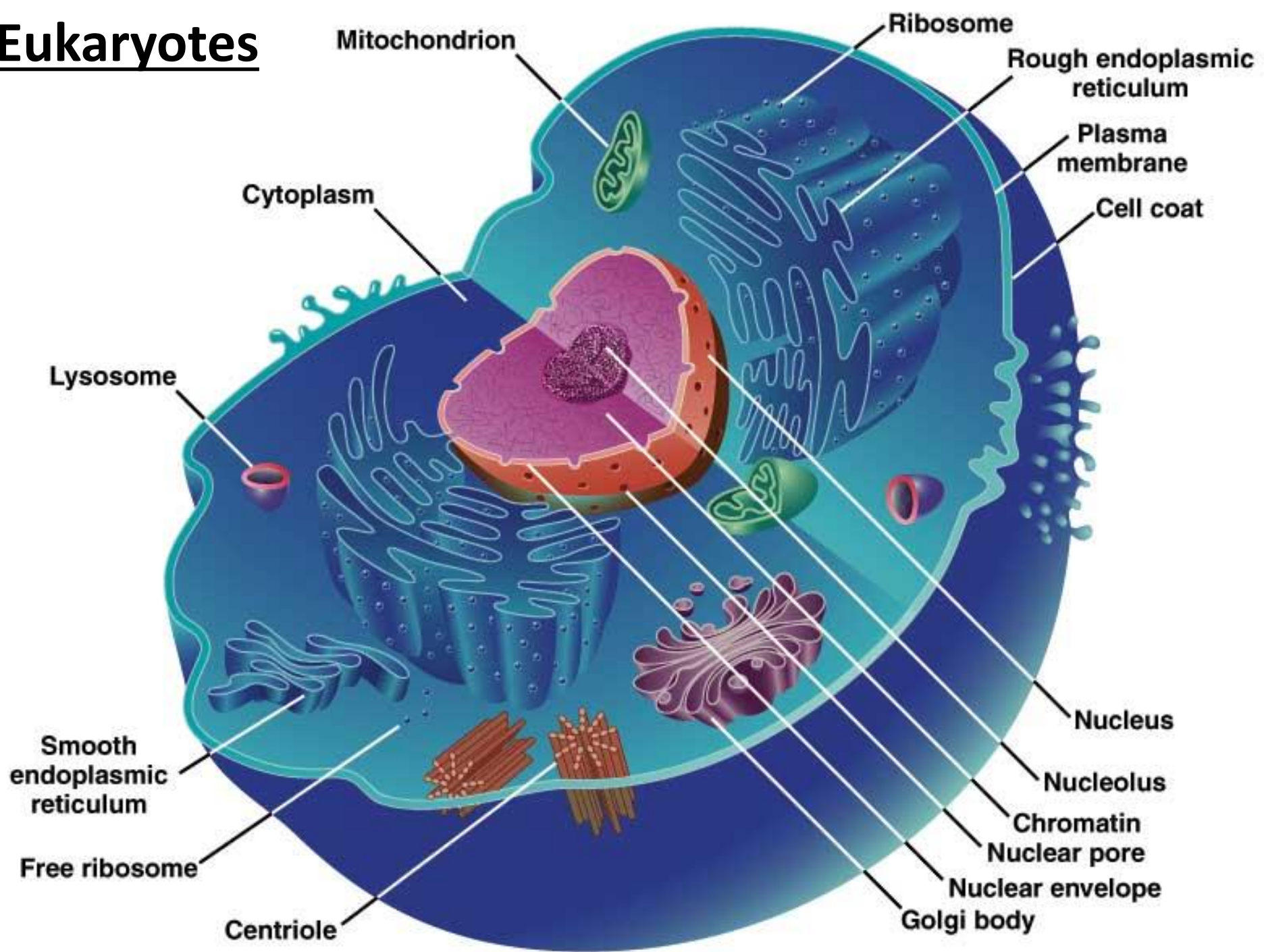
☐ DNA packaged into chromosomes

☐ Organelles present

Prokaryotic Cell



Eukaryotes



1. The nucleus:

Contains the cell's genetic library

- The nucleus contains most of the genes in an eukaryotic cell.
- The nucleus is separated from the cytoplasm by a double membrane called nuclear membrane.
- The nuclear membrane contains **pores** that allow large macromolecules and particles to pass through.
- The nuclear membrane is maintaining the shape of the nucleus

Nucleus

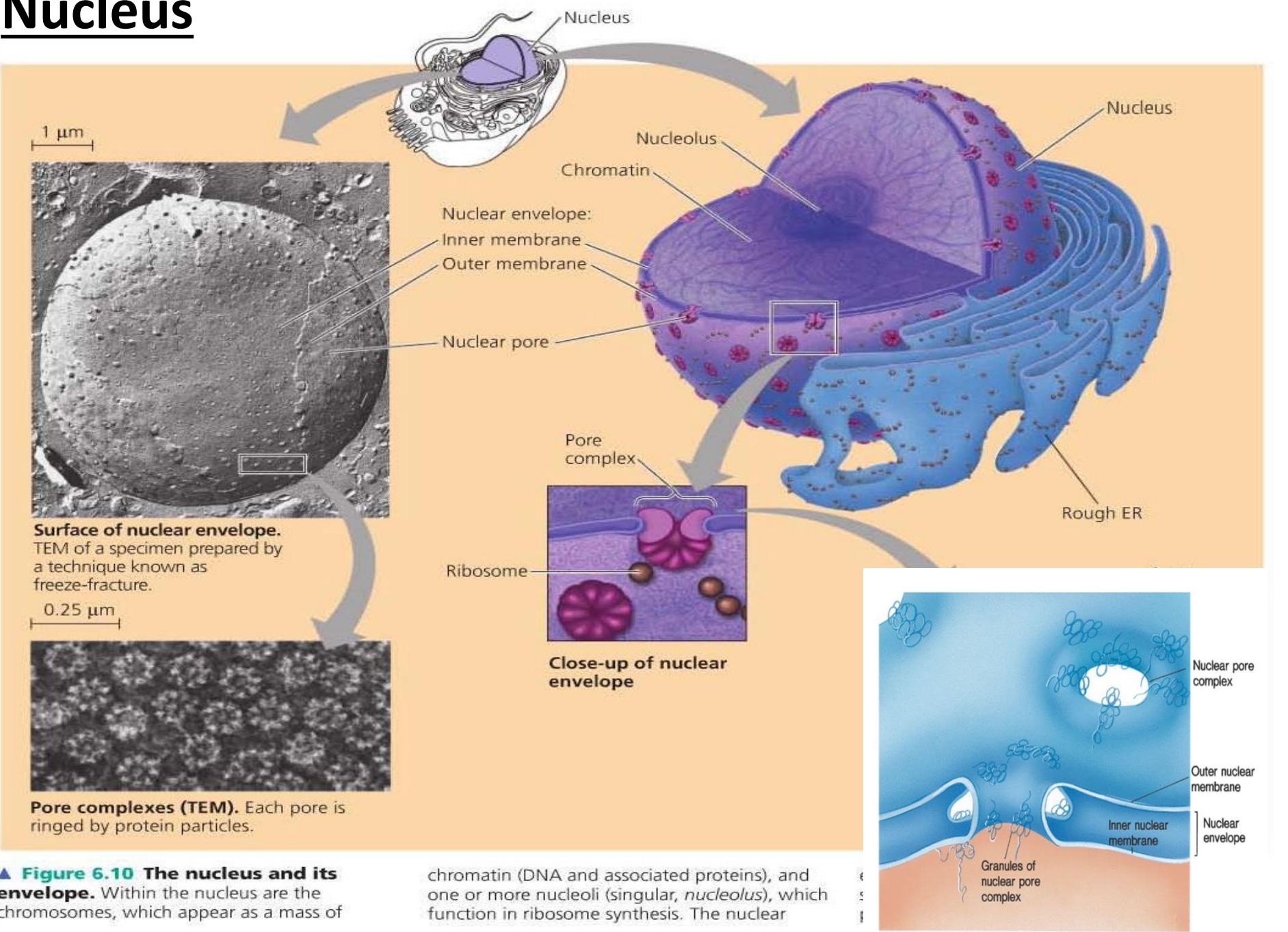


Figure 6.10 The nucleus and its envelope. Within the nucleus are the chromosomes, which appear as a mass of

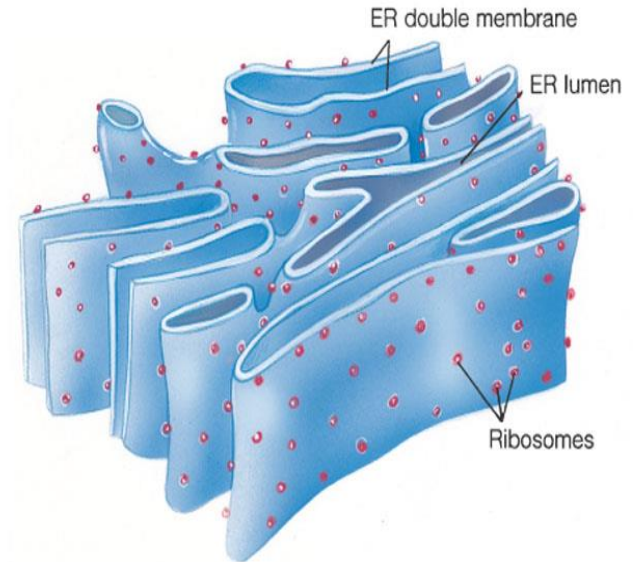
chromatin (DNA and associated proteins), and one or more nucleoli (singular, *nucleolus*), which function in ribosome synthesis. The nuclear

2-Endoplasmic Reticulum–set of interconnected membranes.

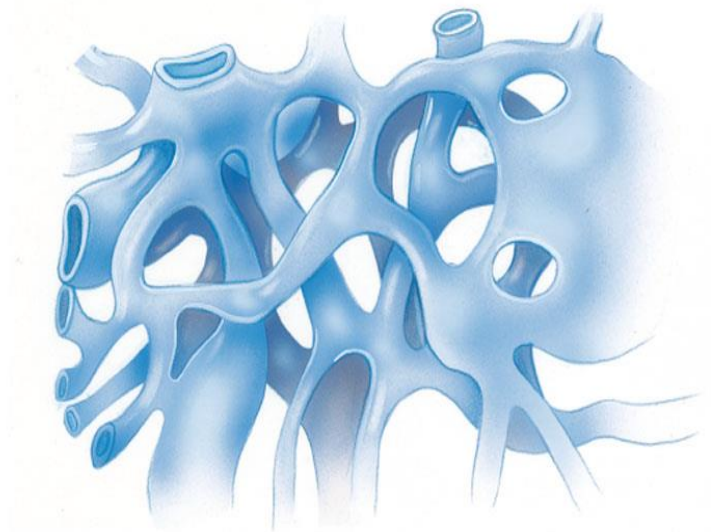
two types:

1-Rough ER (studded with Ribosomes) – involved in production and modification of proteins

2-Smooth ER– (no ribosomes) – involved in production of lipids, detoxification of molecules, and calcium storage in muscle cells
–*Ribosomes formed in nucleolus*



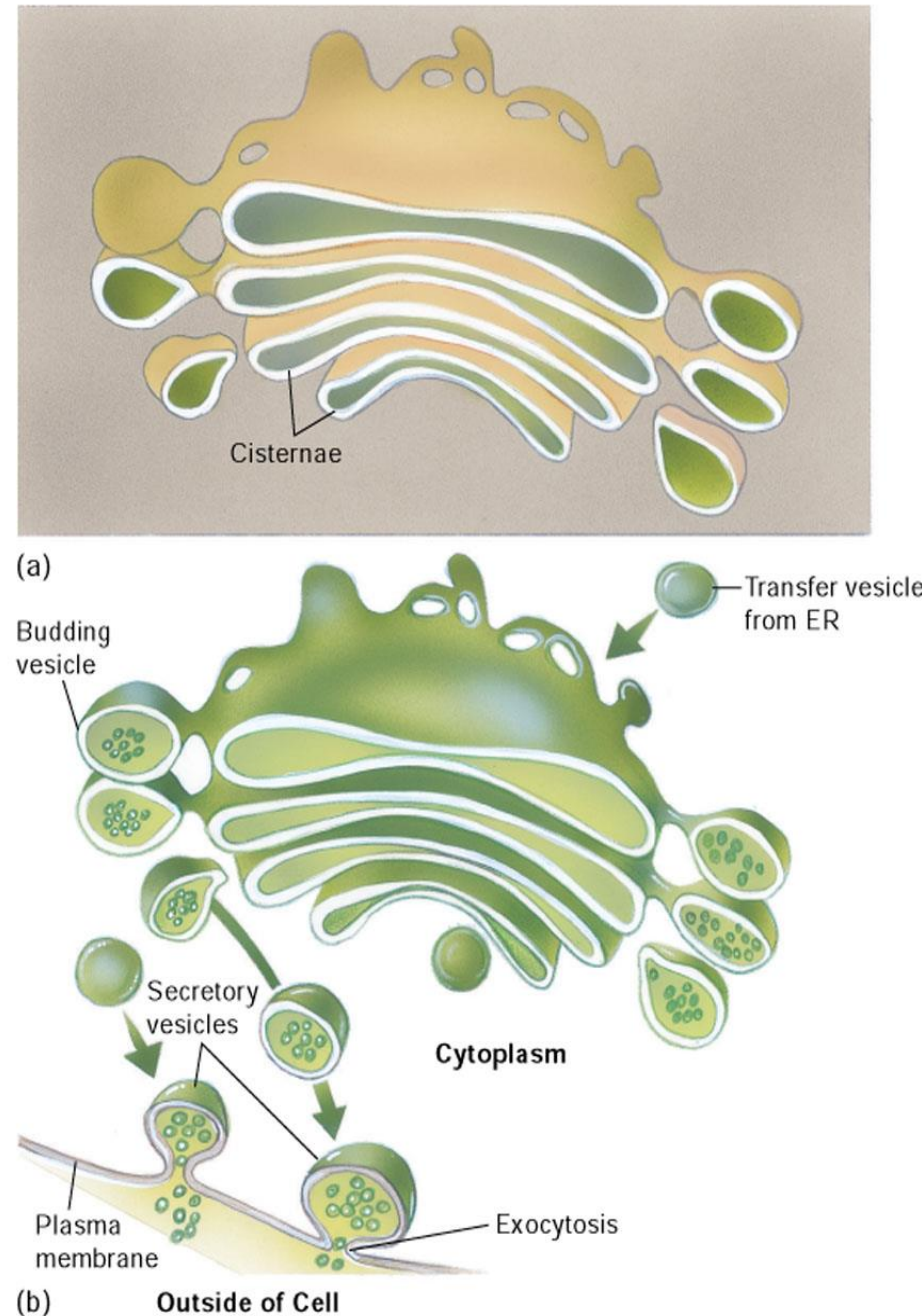
(a) Rough endoplasmic reticulum



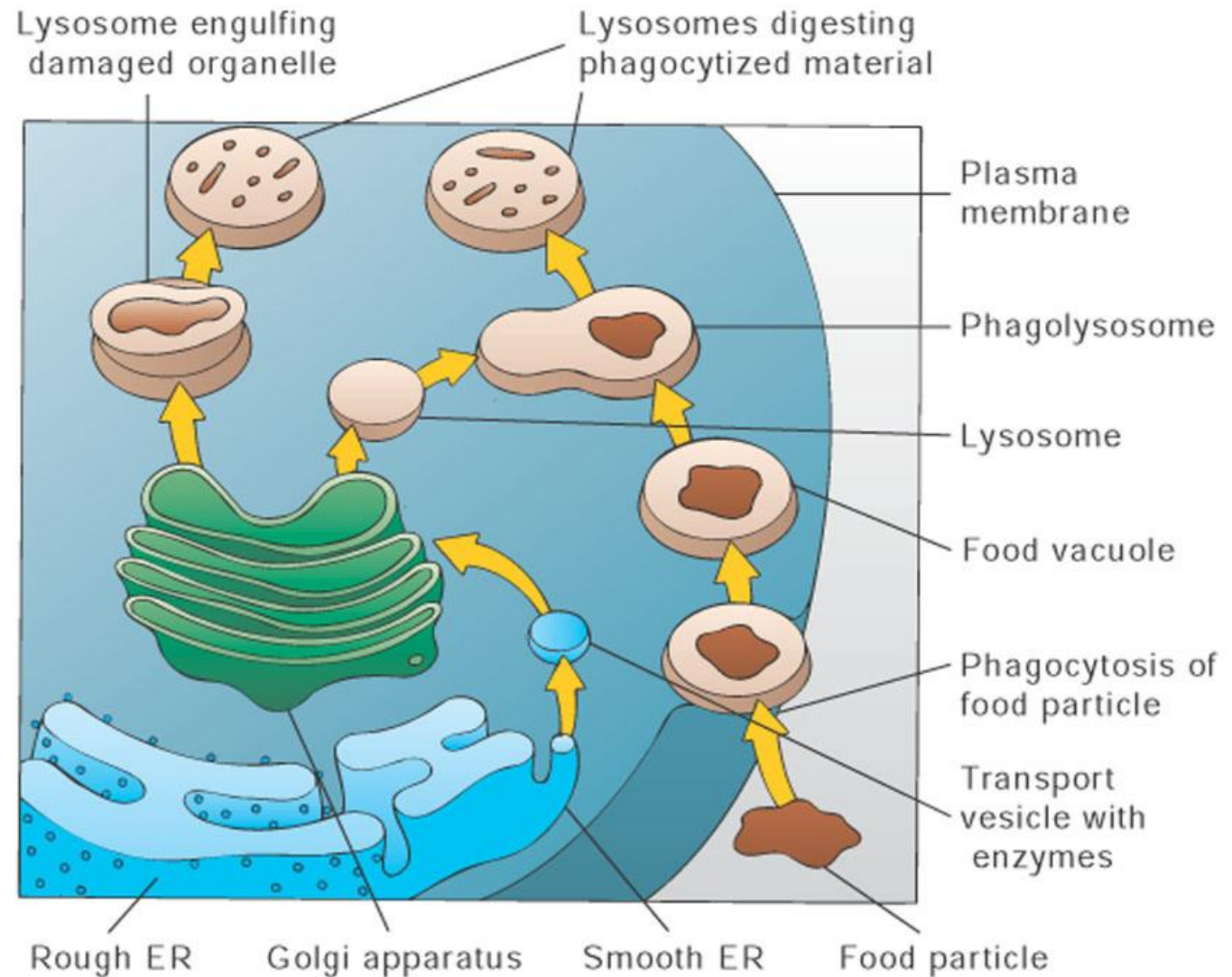
(b) Smooth endoplasmic reticulum

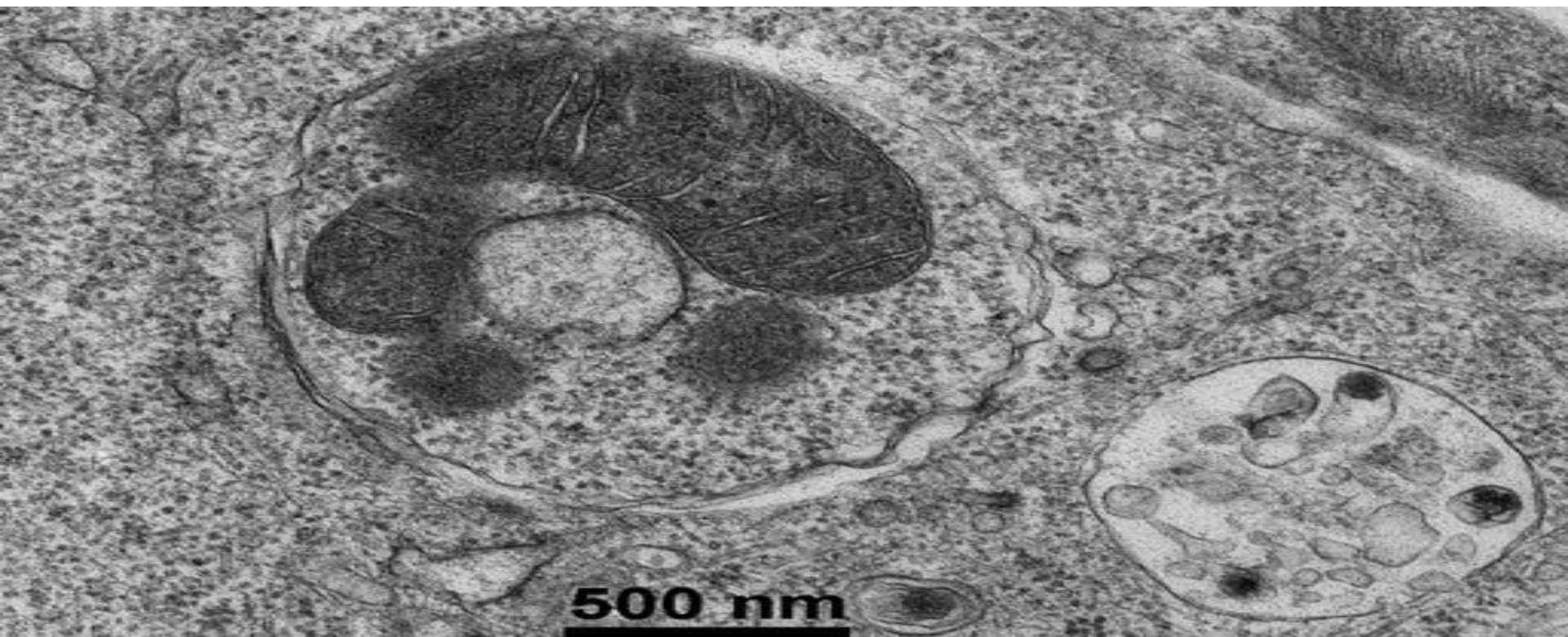
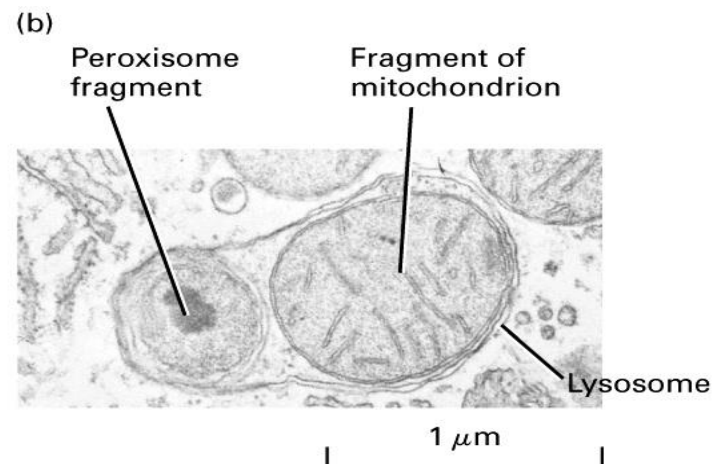
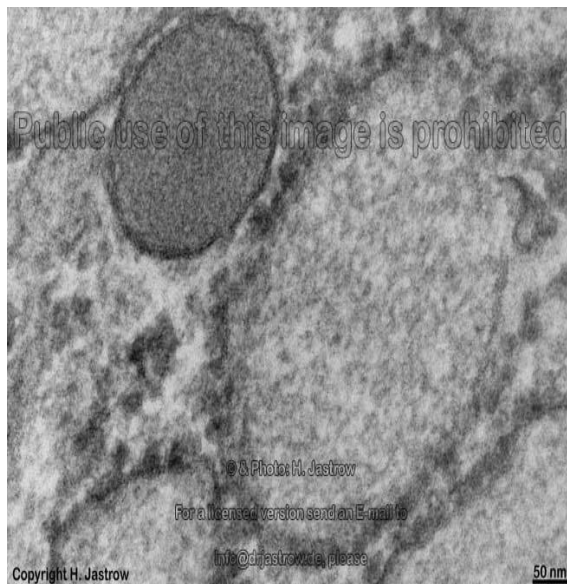
3-Golgi Apparatus

After proteins and lipids are made by the Endoplasmic Reticulum they may be modified further and/or stored by the Golgi Apparatus.



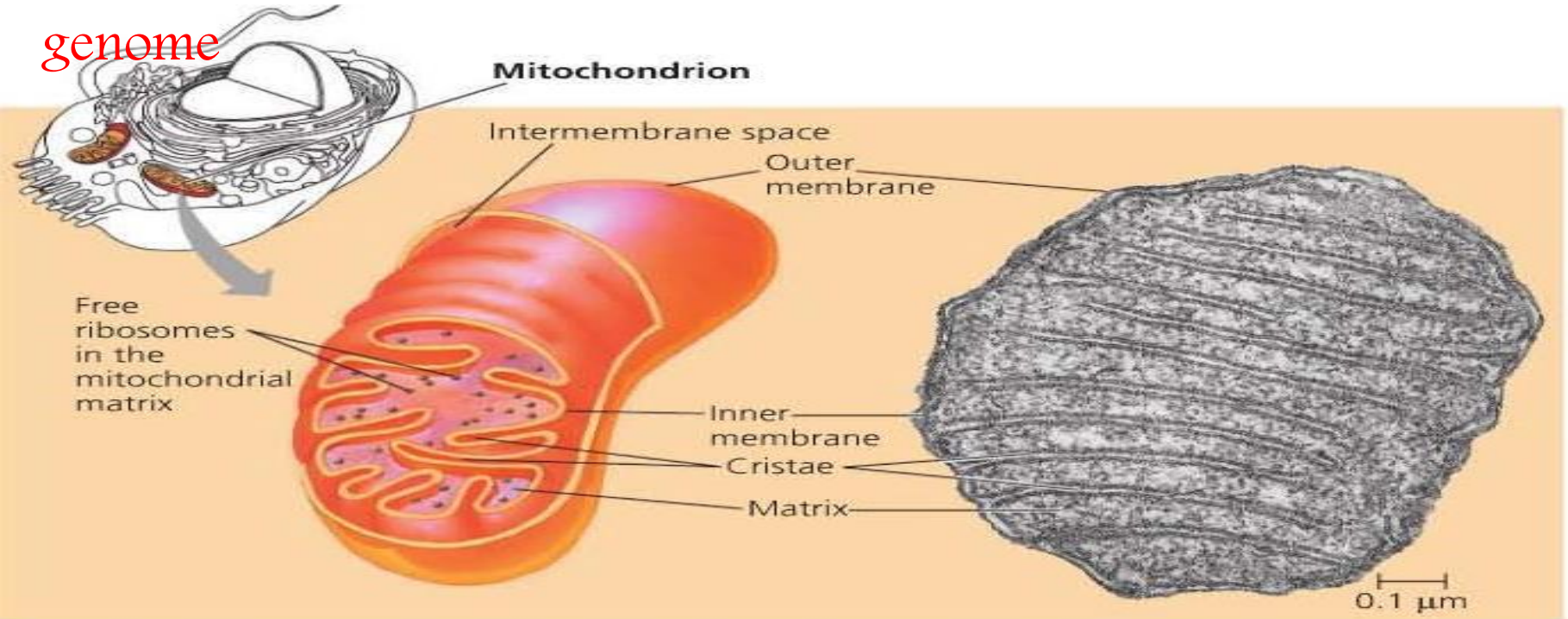
4- Lysosome – formed by GA, contain enzymes that break down cellular debris and foreign substances brought into the cell .(acidic medium PH=5.2)

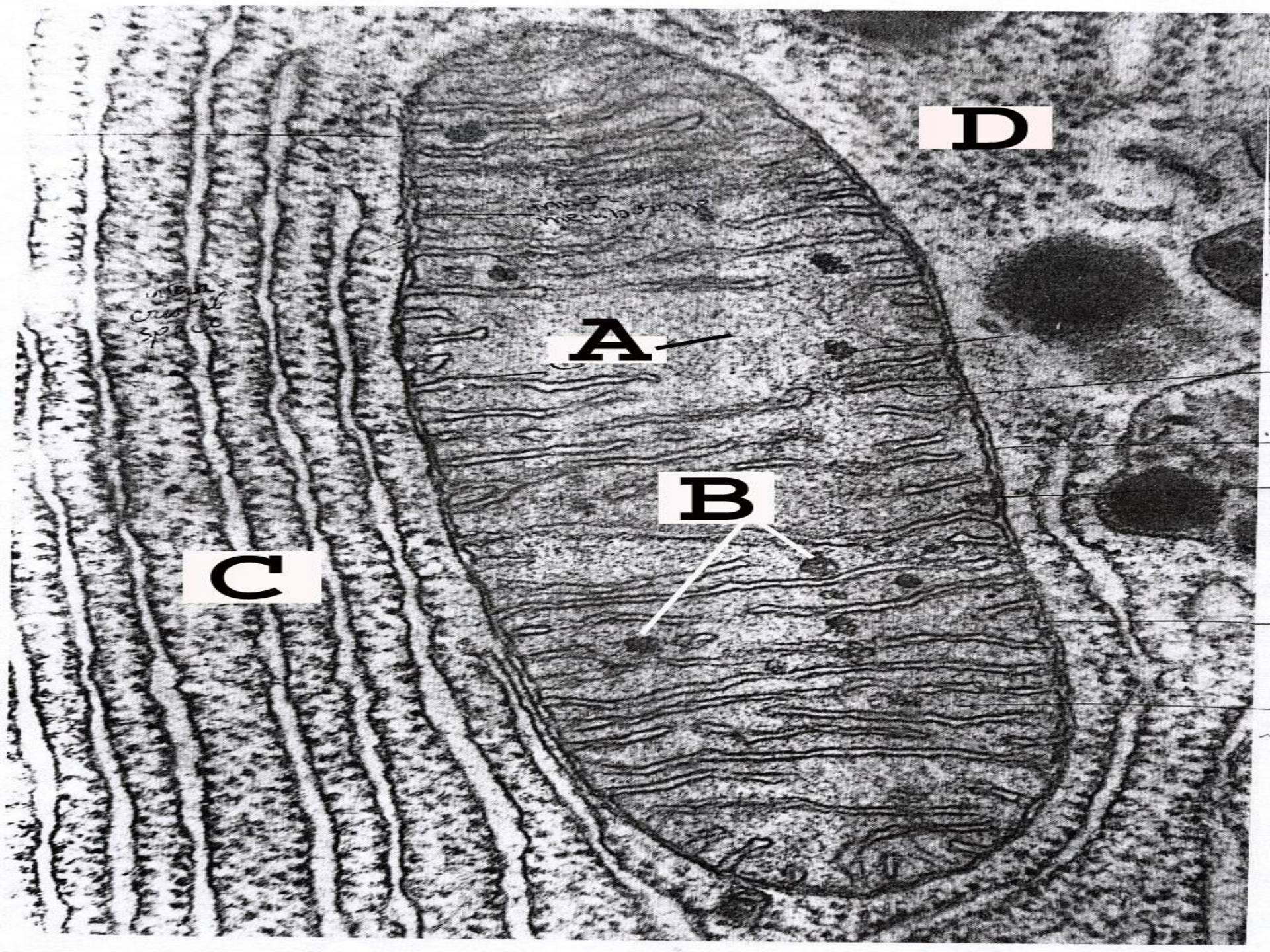




5-The mitochondrion, site of cellular respiration ,produces ATP

- The **inner and outer membranes** of the mitochondrion are evident .
- **The cristae** are infoldings of the inner membrane, which increase its surface area.
- Many respiratory enzymes are found in the inner membrane and the matrix.
- Free ribosomes are also present in **the matrix**.
- **The DNA in the mitochondrion is a circular molecule, Has own genome**





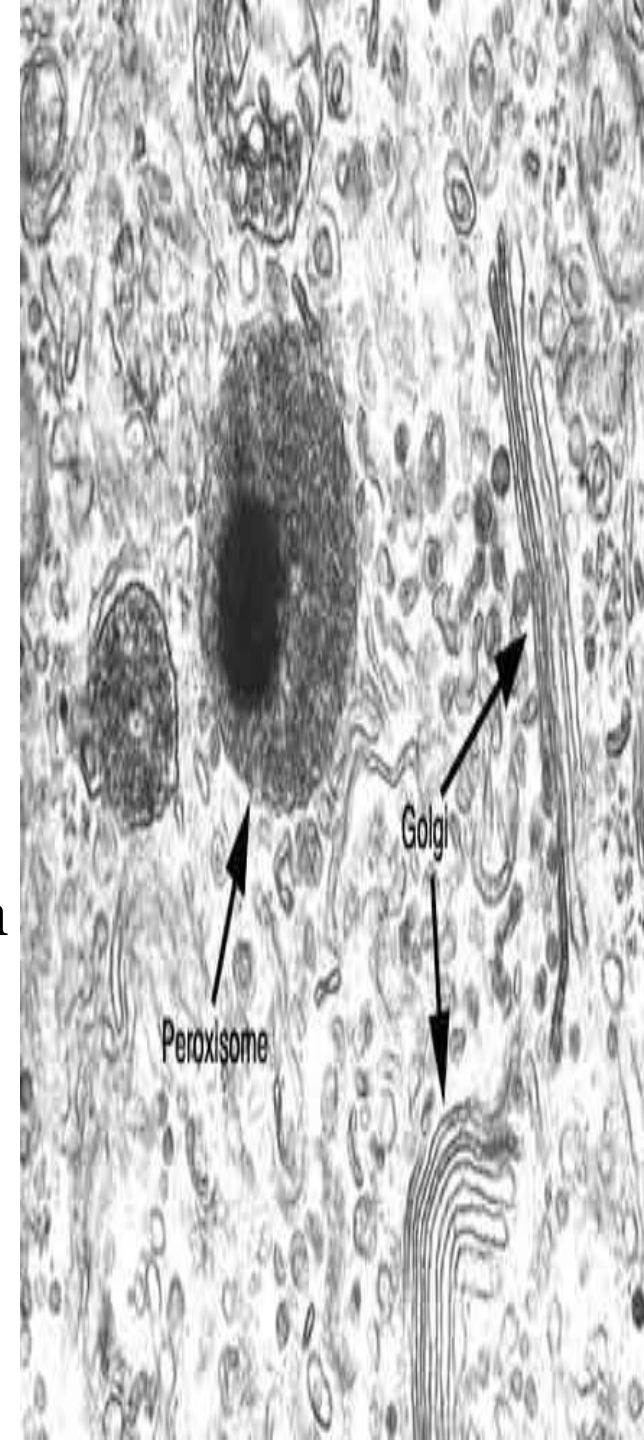
6- Peroxisomes

Functions of peroxisomes

1- Hydrogen peroxide (H_2O_2) is a poison, but the peroxisome has enzyme that converts H_2O_2 to water.

H_2O_2 peroxisomes $\text{H}_2\text{O} + \text{O}_2$

2- Some peroxisomes break fatty acids down to smaller molecules that are transported to mitochondria for fuel



Relationships among organelles of the endomembrane system.
The red arrows show some of the migration pathways for membranes and the materials they enclose.

