Kingdom of Bahrain
Ministry of Education

Pakistan School
Kingdom of Bahrain

CHAPTER 4

CELLS AND TISSUES

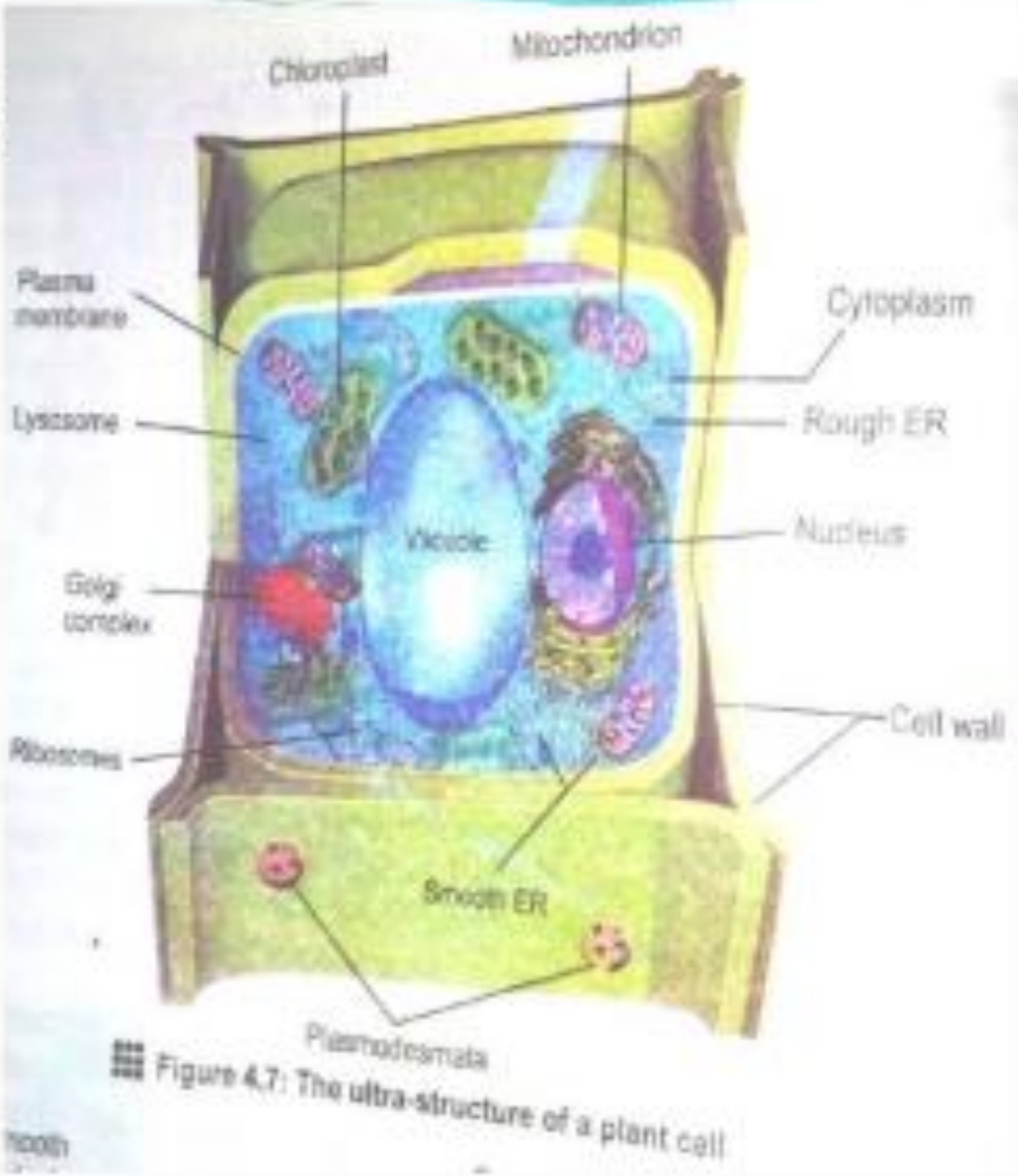
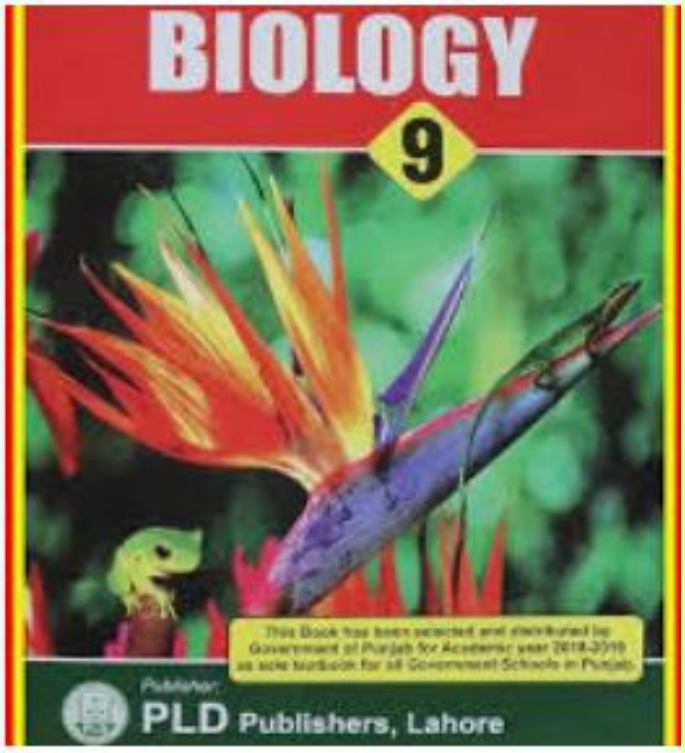


Figure 4.7: The ultra-structure of a plant cell


BIOLOGY
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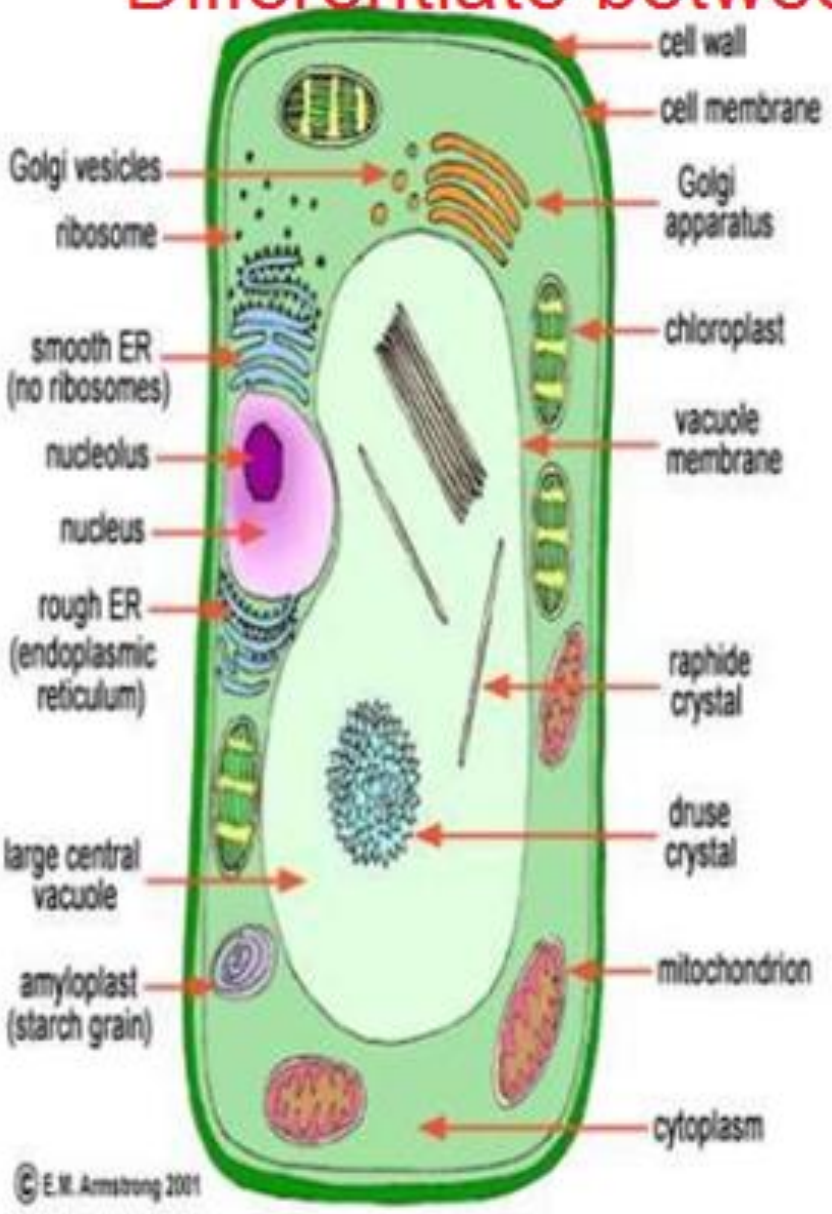
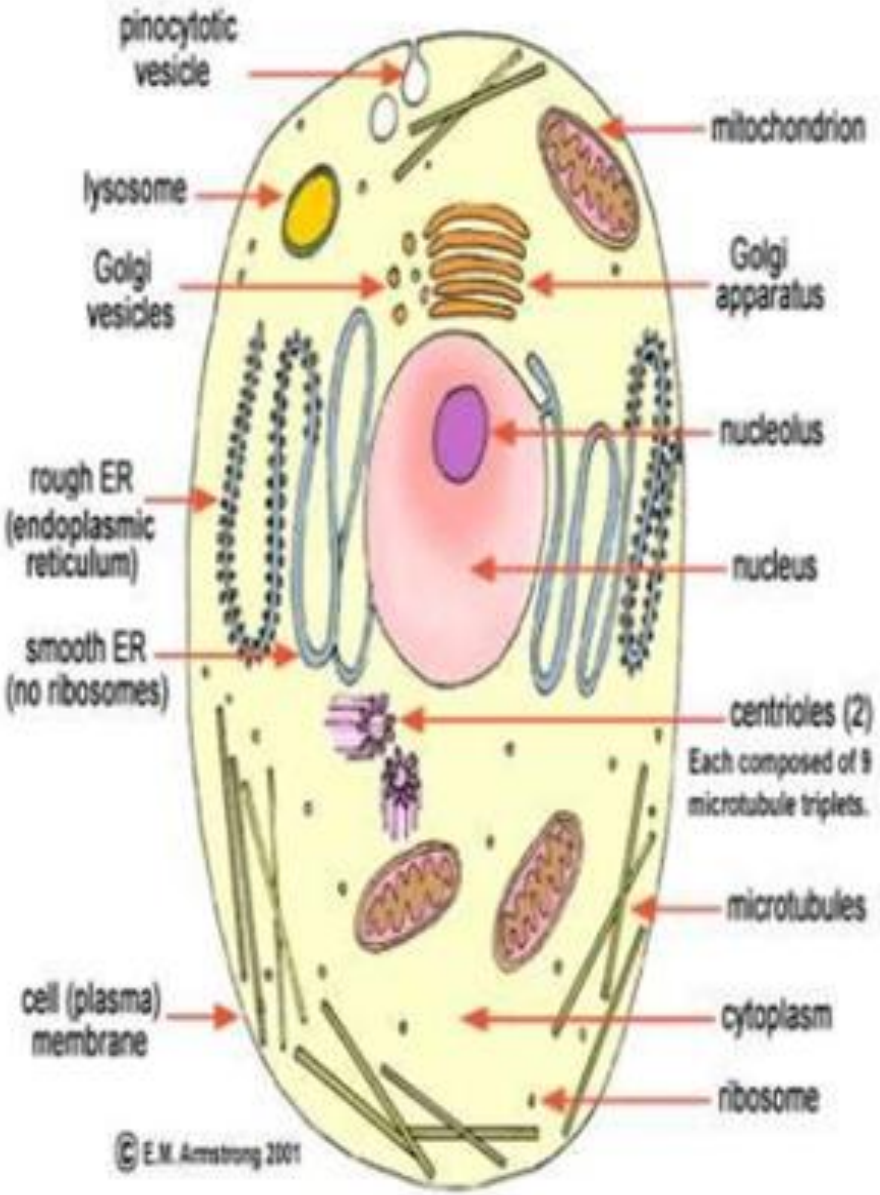
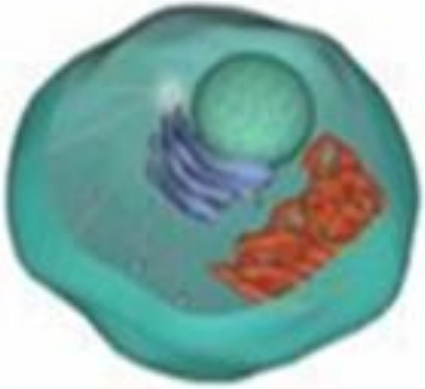
ENGAGING STARTER

Differentiate between Plant and Animal cell







Learning Objectives:

At the end of the lesson, students will be able to;

1. Describe the structure and function of the major cell organelles.
2. Differentiate between Prokaryotic and Euokaryotic cell organelles.

Chapter 4. CELLS AND TISSUES

Topic: Cell and Organelles

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4.2.5 Cell Organelles

Organelles are small structures within cells that perform dedicated functions. There are about a dozen types of organelles commonly found in eukaryotic cells. We will go through the basic facts about important cell organelles.

4.2.6 Nucleus

A prominent nucleus occurs in eukaryotic cells. In animal cells it is present in the centre while in mature plant cells, due to the formation of large central vacuole, it is pushed to side. Nucleus is bounded by a double membrane known as **nuclear envelope.** Nuclear envelope contains many small pores that enable it to act as a semi-permeable membrane. Inside nuclear envelope, a granular fluid i.e. **nucleoplasm** is present. Nucleoplasm contains one or two nucleoli (singular; nucleolus) and chromosomes (Figure 4.11).

Nucleolus is a dark spot and it is the site where ribosomal RNA are formed and assembled as ribosomes. **Chromosomes** are visible only during cell division while during interphase (non-dividing phase) of cell they are in the form of fine thread-like structures known as **chromatin**. Chromosomes are composed of Deoxyribonucleic acid (DNA) and proteins.

The prokaryotic cells do not contain prominent nucleus. Their chromosome is made of DNA only and is submerged in cytoplasm.

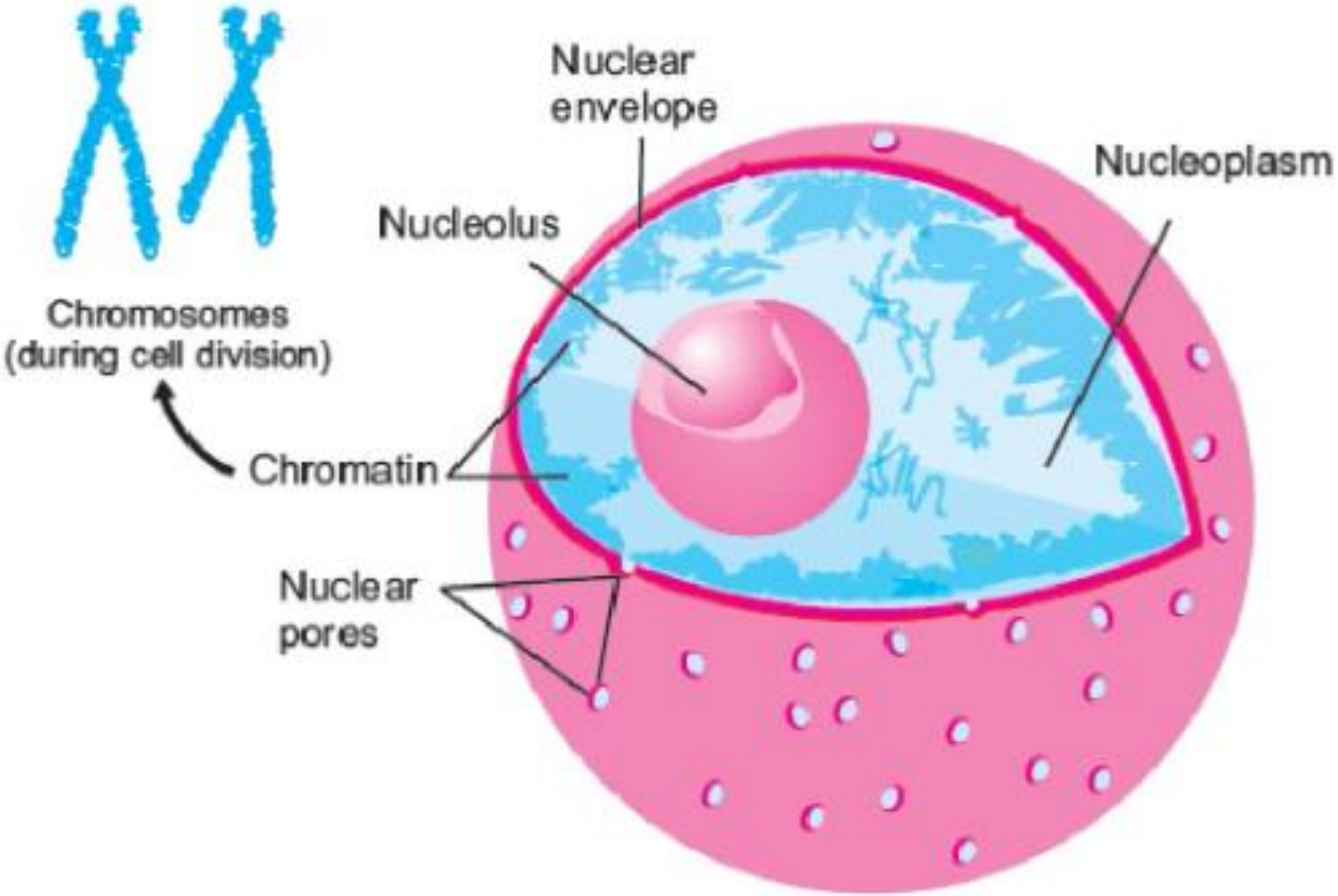


Figure 4.11: Structure of Nucleus

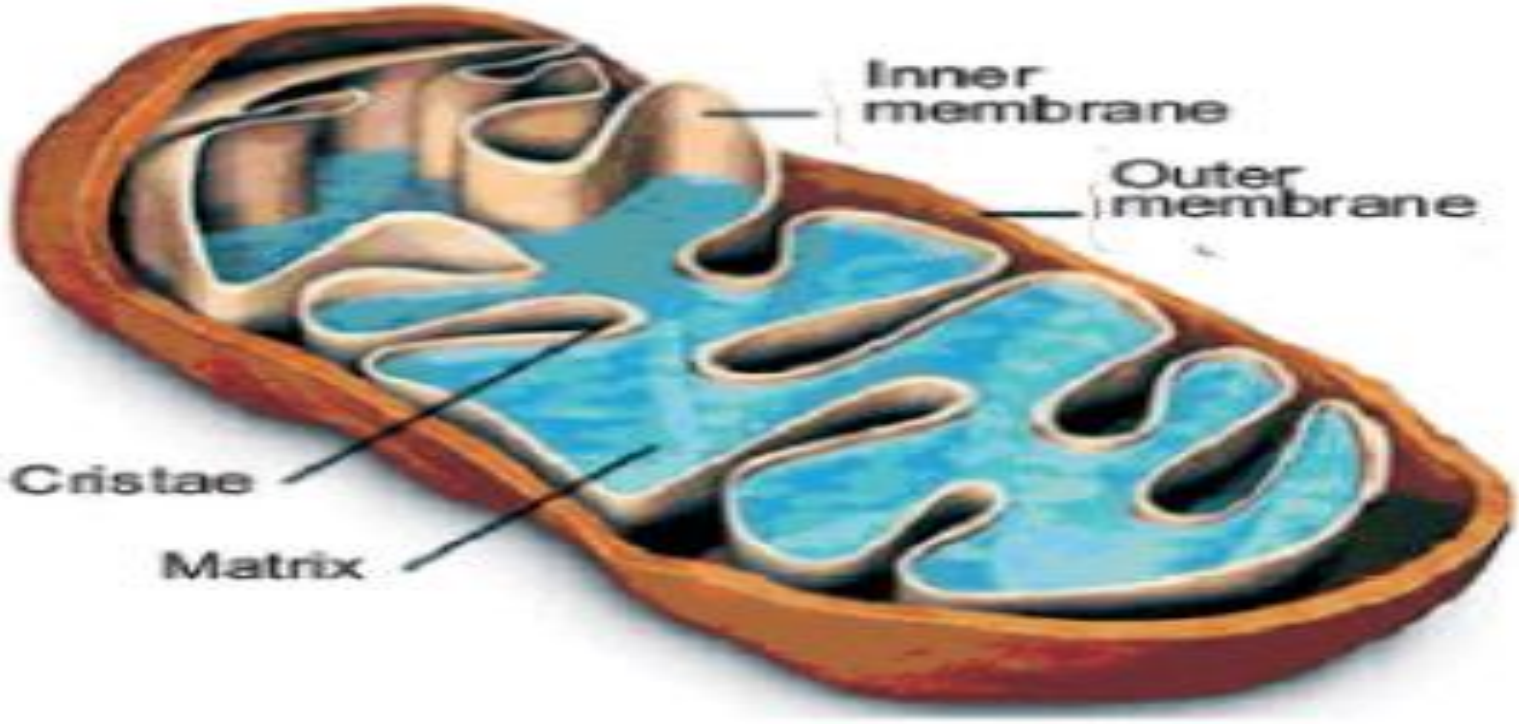
Ribosomes

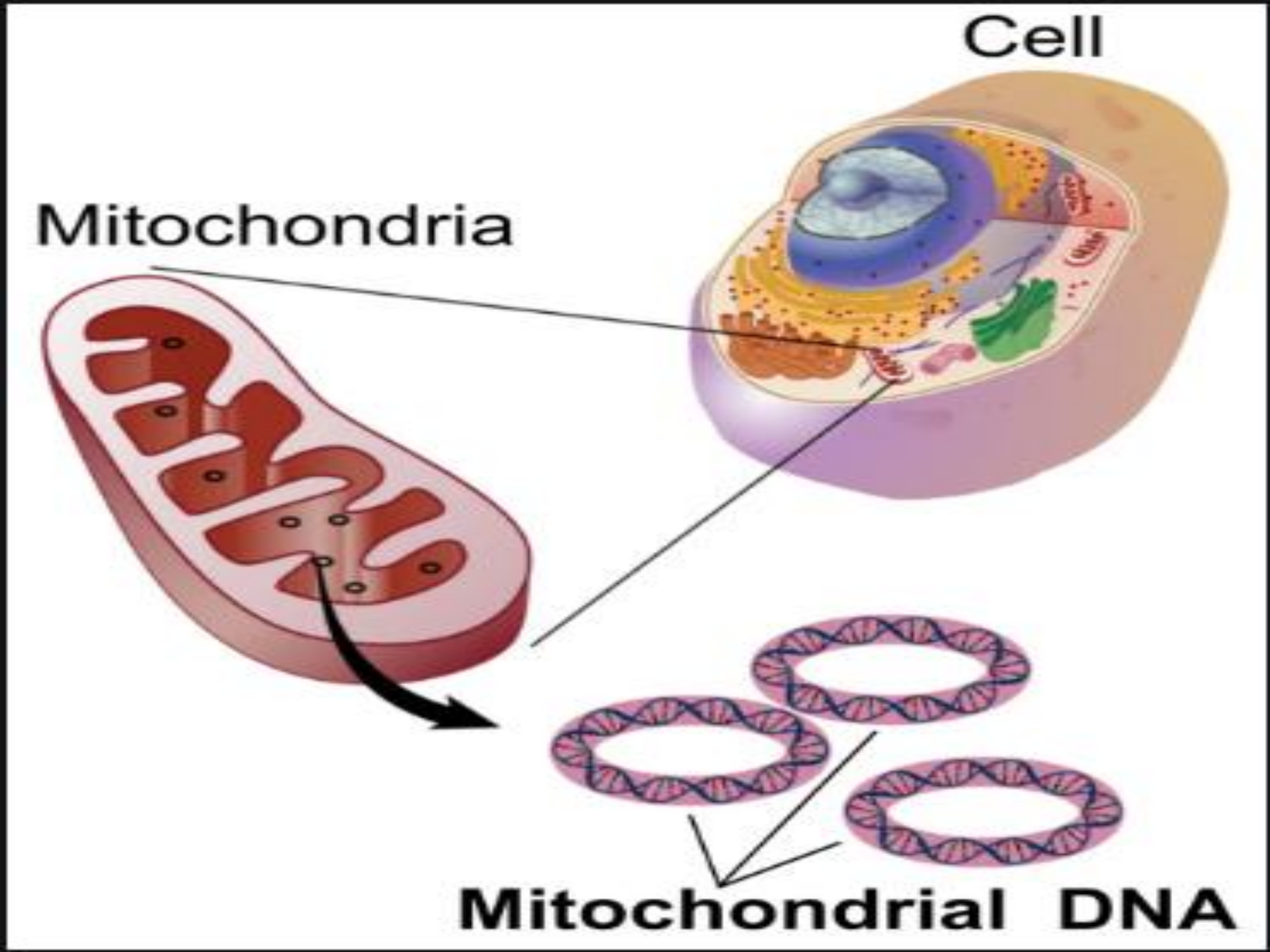
Ribosomes are tiny granular structures that are either floating freely in cytoplasm or are bound to endoplasmic reticulum (ER). Each ribosome is made up of almost equal amounts of proteins and ribosomal RNA (rRNA). Ribosomes are not bound by membranes and so are also found in prokaryotes. Eukaryotic ribosomes are slightly larger than prokaryotic ones.

Ribosomes are the sites of protein synthesis. Protein synthesis is extremely important to cells, and so large numbers of ribosomes are found throughout cells. When a ribosome is not working, it disassembles into two smaller units (Figure 4.12) .

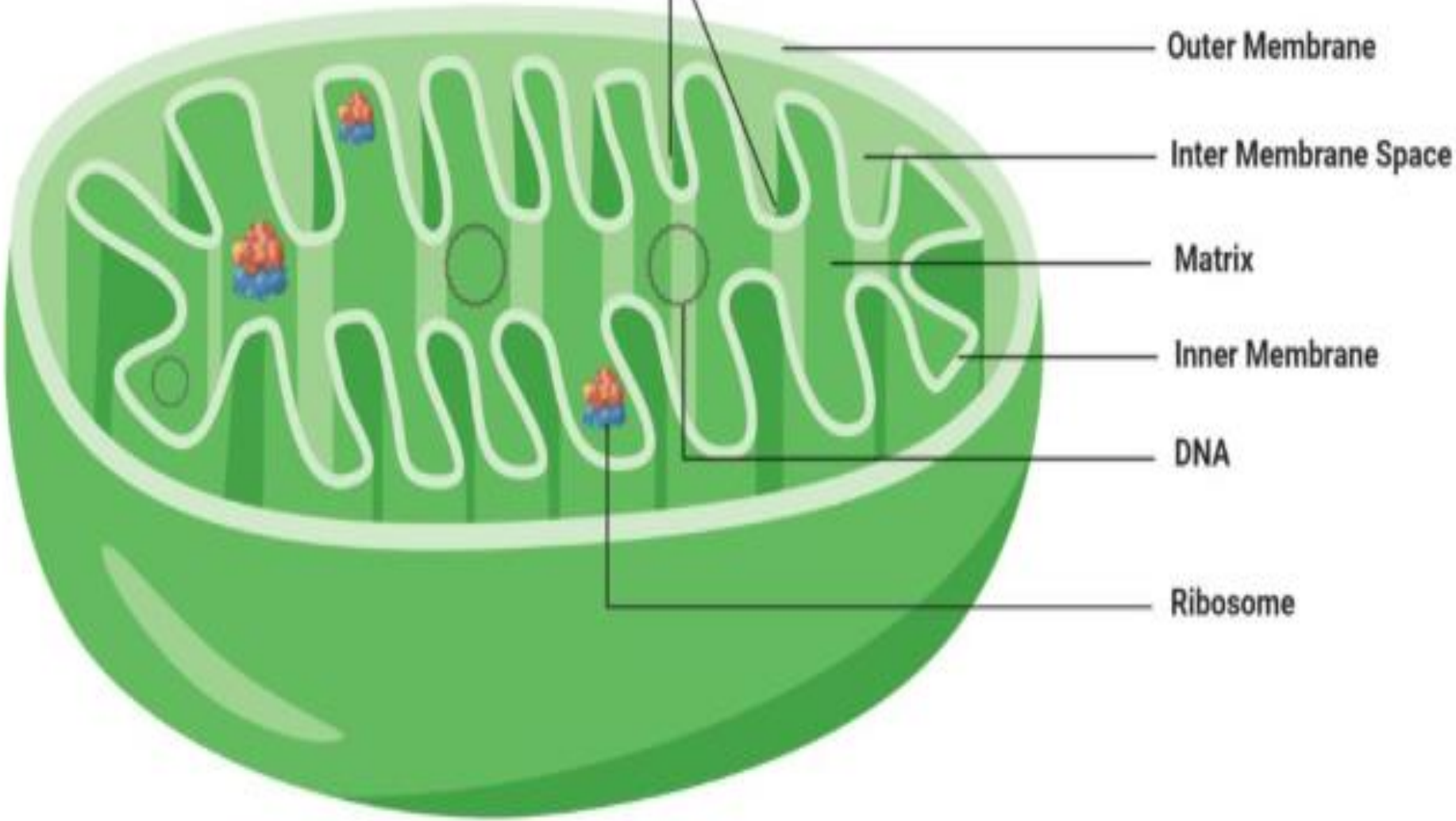
Mitochondria

Mitochondria (singular: mitochondrion) are double membrane-bounded structures found only in eukaryotes. These are the sites of aerobic respiration, and are the major energy production centres. The outer membrane of a mitochondrion is smooth but the inner membrane forms many infoldings, called **cristae** (singular crista) in the inner mitochondrial matrix. This serves to increase the surface area of inner membrane on which membrane-bound reactions can take place (Figure 4.13). Mitochondria have their own DNA and ribosomes. The ribosomes of mitochondria are more similar to bacterial ribosomes than to eukaryotic ribosomes.




Cell
Mitochondria
Mitochondrial DNA

Mitochondria



Worksheet:01

Q1. What are organelles?

Q2. Define nuclear envelope.

Q3. Define chromatin.

Q4. What are ribosomes?

Q5.State the function of ribosomes.

Q6. What do you know about mitochondria?

PLENARY ACTIVITY

- Today we have done the topic_____.

- What did we learn today? Share your knowledge one by one.

HOME WORK

- Assess the capabilities of prokaryotic and eukaryotic cell types owing to the presence or absence of nucleus and mitochondria.

OR

- Label the diagram of cell given in exercise of this chapter.


Any
Questions?


Thank You!
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