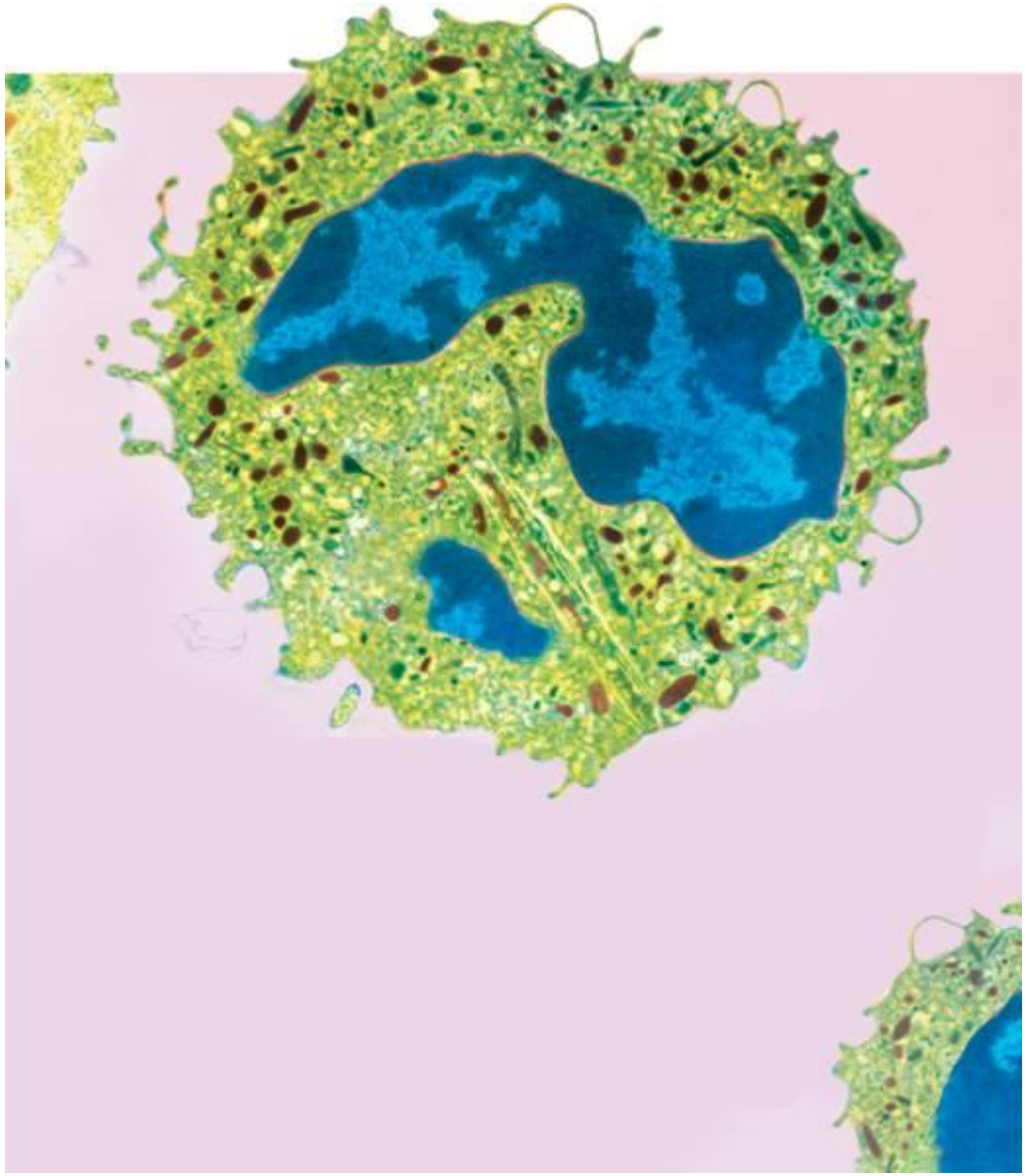
7-2 Eukaryotic Cell Structure



Eukaryotic Cell Structures

Structures within a cell that perform important cellular functions →**organelles**.

Eukaryotic cell →two major parts: the nucleus and the cytoplasm.

The **cytoplasm** is outside the nucleus.

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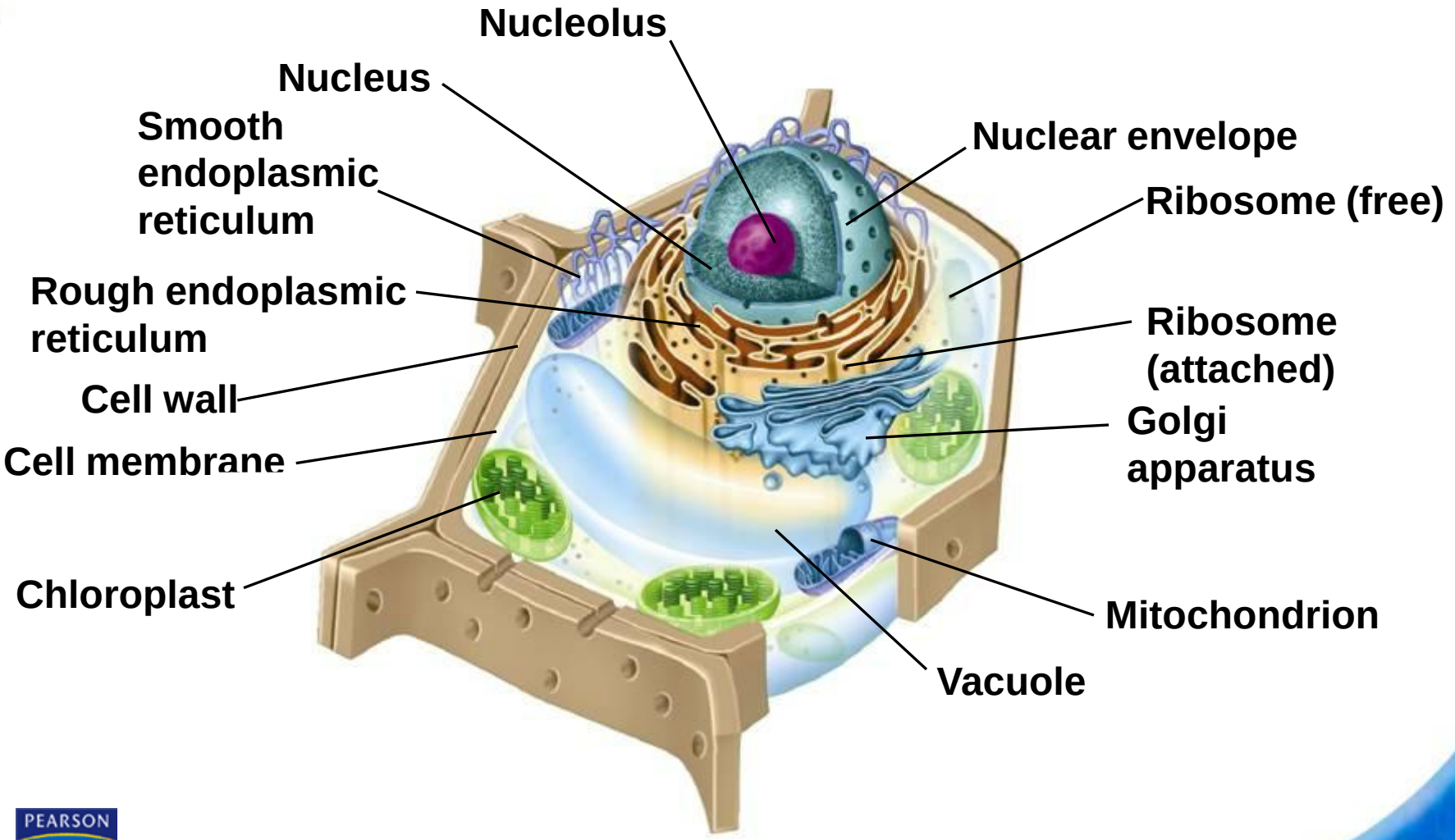
Plant Cell



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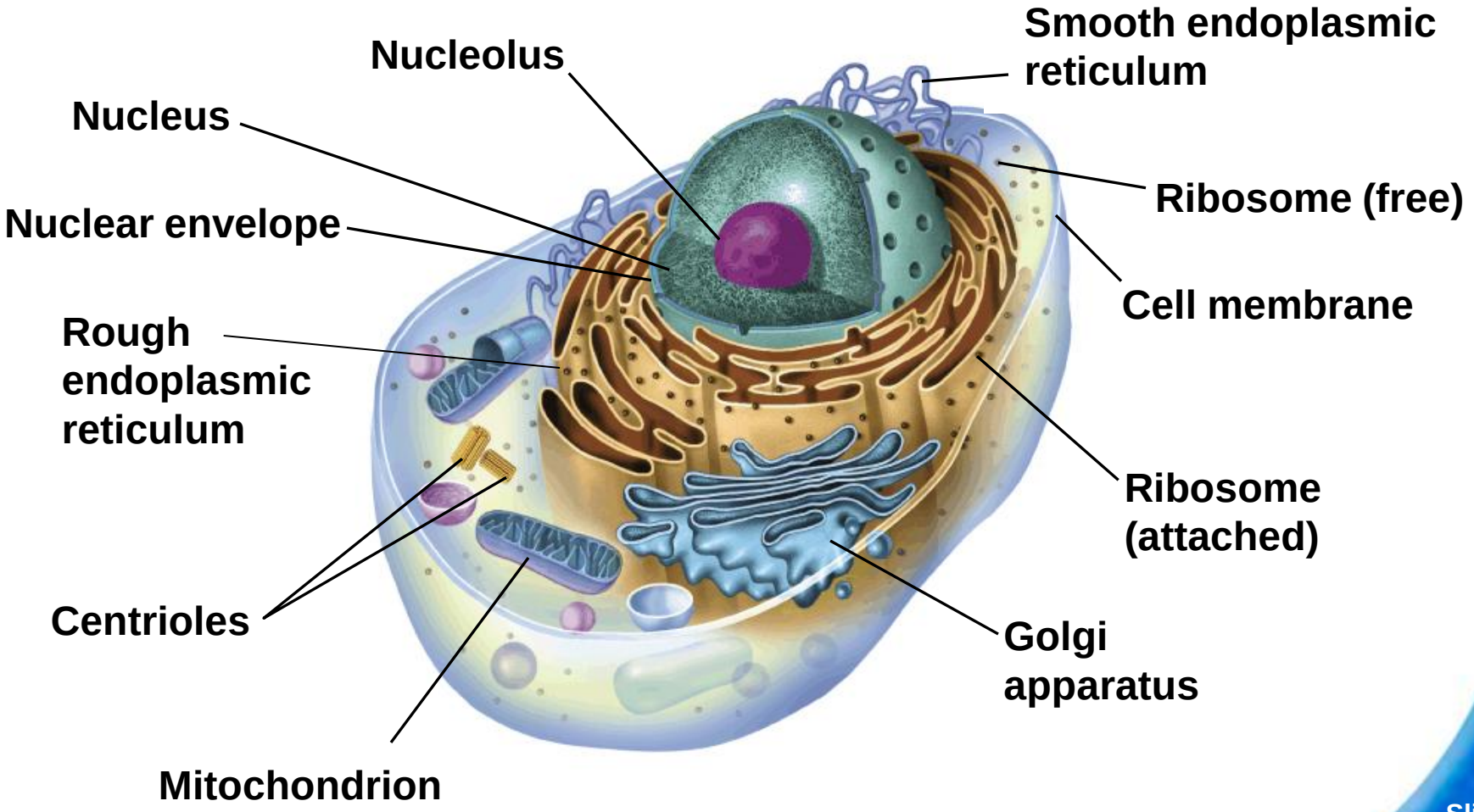
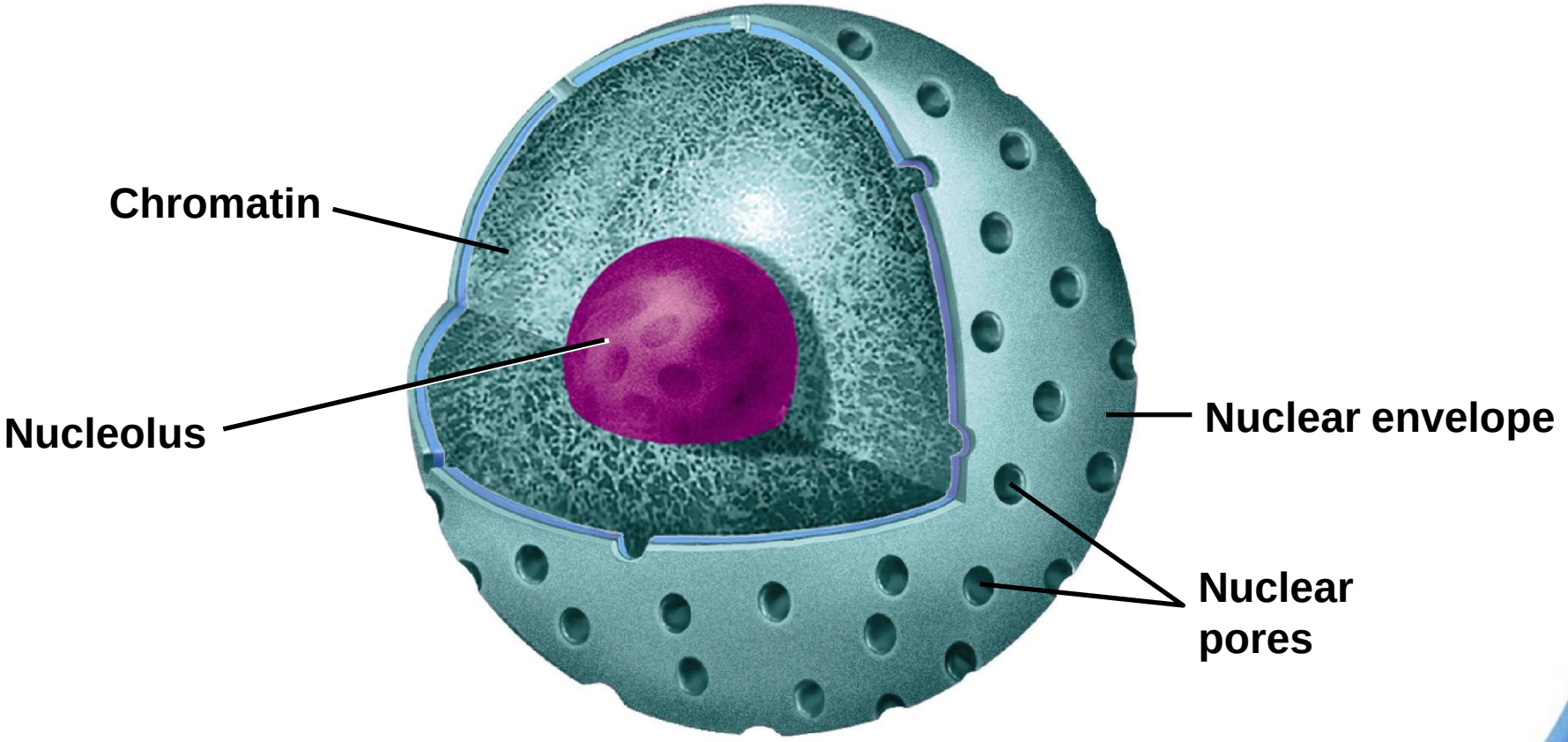
Animal Cell



Nucleus

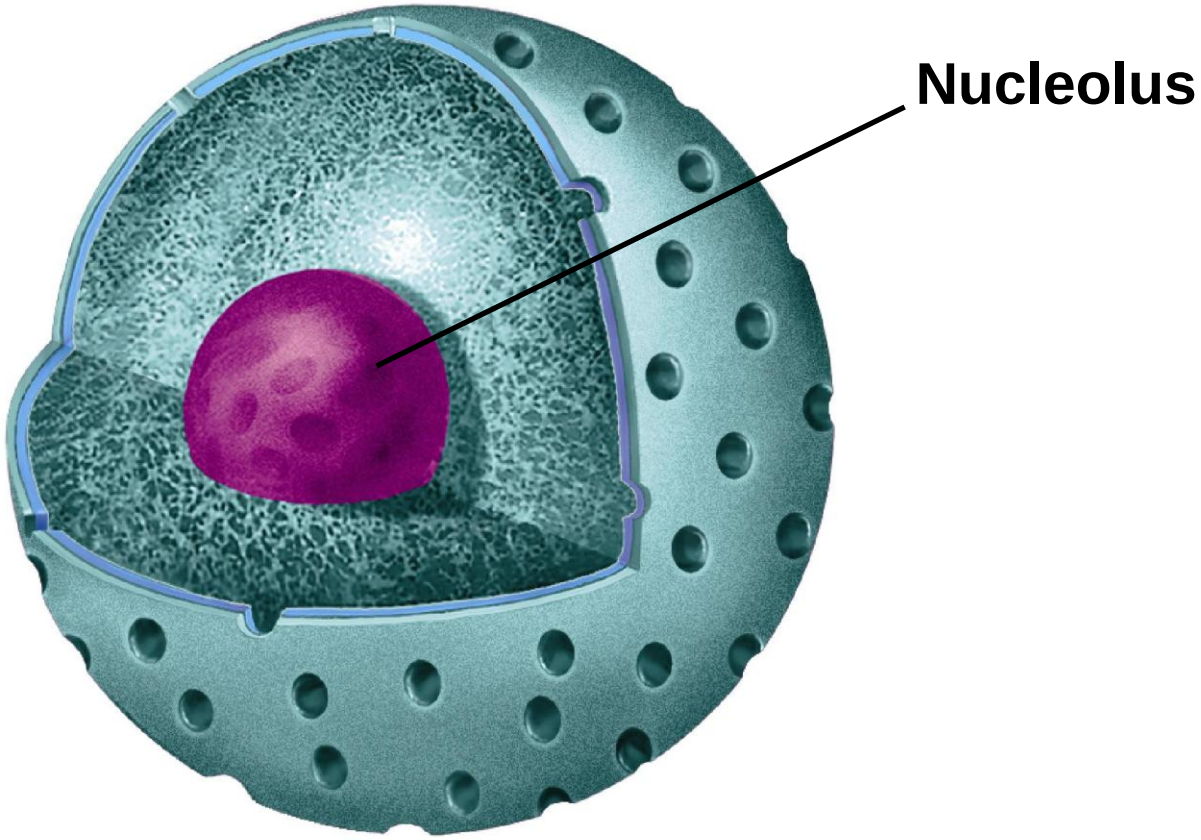
The nucleus contains nearly all the cell's DNA and with it the coded instructions for making proteins and other important molecules.

The Nucleus



Most nuclei also contain a **nucleolus**.

The nucleolus is where the assembly of ribosomes begins.



Ribosomes

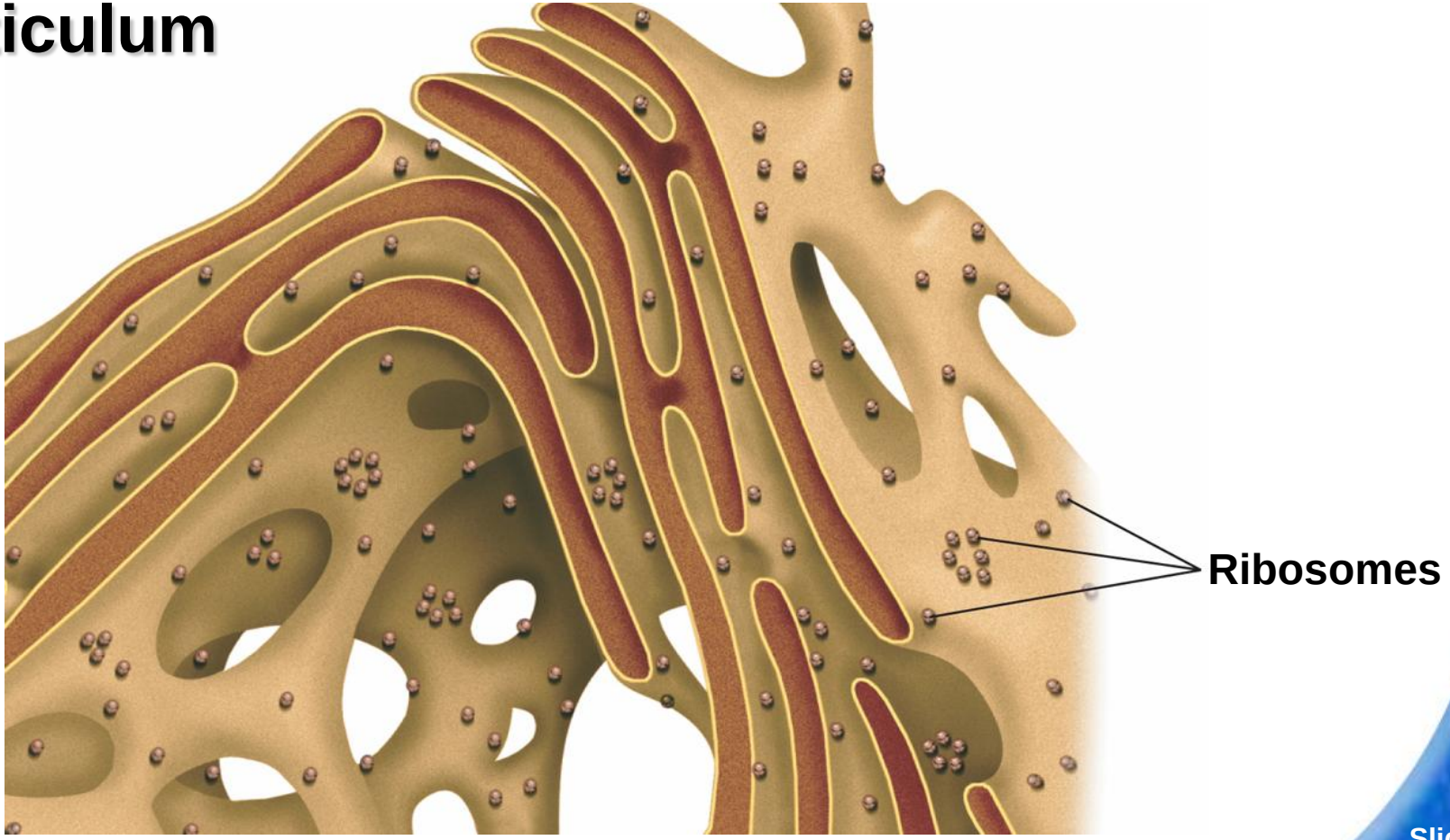
Proteins are assembled on ribosomes.

Ribosomes are small particles of RNA and protein found throughout the cytoplasm.

Endoplasmic Reticulum

The endoplasmic reticulum is where lipid components of the cell membrane are assembled, along with proteins and other materials that are exported from the cell.

Endoplasmic Reticulum



Two types of ER—rough and smooth.

Rough endoplasmic reticulum→ involved in protein synthesis.

Ribosomes are found on the surface of rough ER.

Abundant in cells that produce large amounts of protein for export.

Smooth ER does not have ribosomes on its surface.

Smooth ER contains collections of enzymes that perform specialized tasks, such as synthesis of membrane lipids and detoxification of drugs.

Golgi Apparatus

Proteins produced in the rough ER move into the **Golgi apparatus**.

The Golgi apparatus appears as a stack of closely apposed membranes.

The Golgi apparatus modifies, sorts, and packages proteins and other materials from the endoplasmic reticulum for storage in the cell or secretion outside the cell.

Lysosomes

Lysosomes → small organelles filled with enzymes.

Lysosomes break down lipids, carbohydrates, and proteins

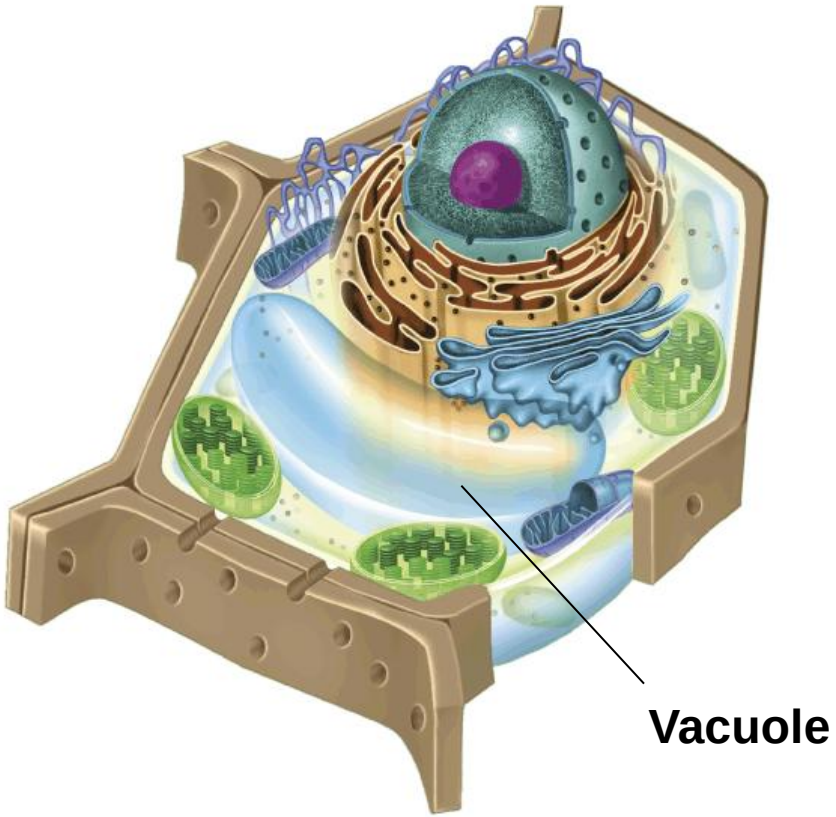
Lysosomes break down organelles that have outlived their usefulness.

Vacuoles

Some cells contain saclike structures called **vacuoles** that store materials such as water, salts, proteins, and carbohydrates.

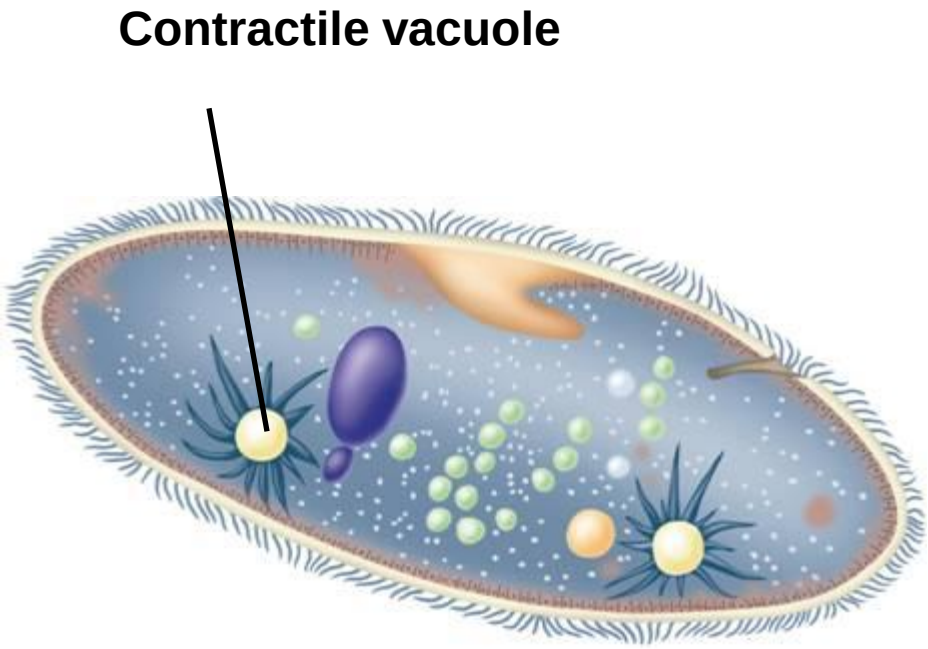
In many plant cells there is a single, large central vacuole filled with liquid.

The pressure of the central vacuole allows plants to support heavy structures such as leaves and flowers.



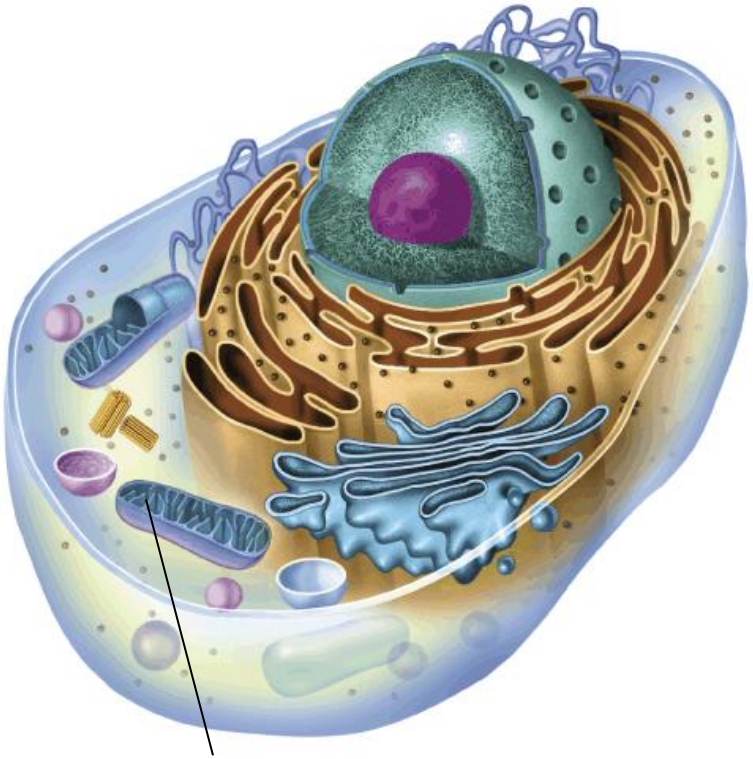
Vacuoles are also found in some unicellular organisms and in some animals.

The paramecium contains a contractile vacuole that pumps excess water out of the cell.



Mitochondria

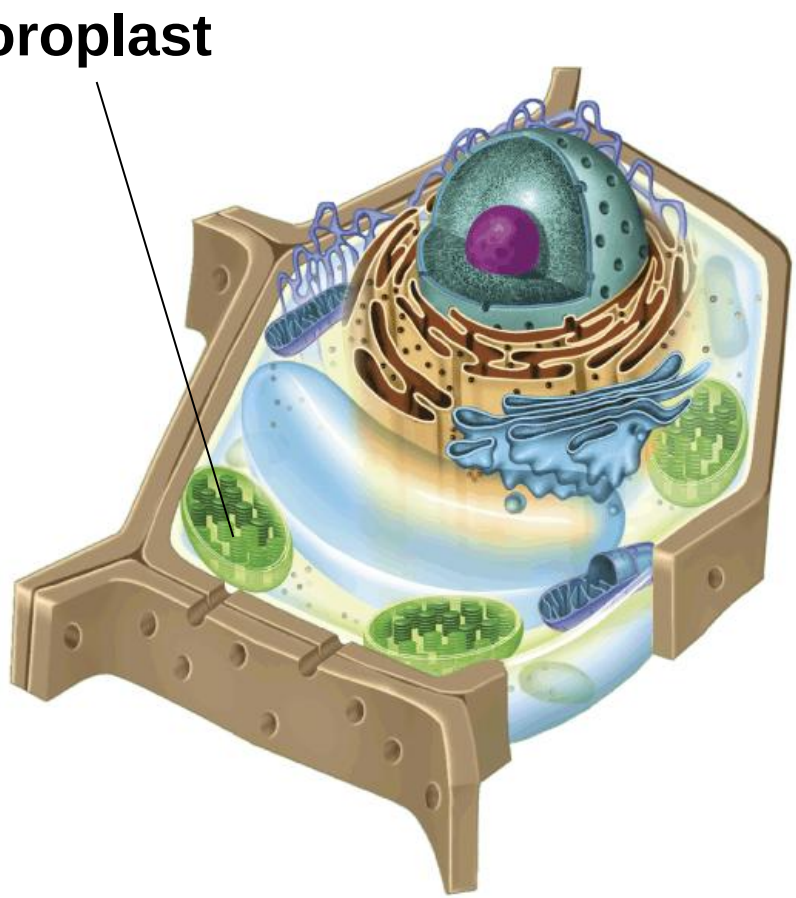
Mitochondria convert the chemical energy stored in food into compounds that are more convenient for the cell to use.



Mitochondrion

Chloroplasts

Chloroplasts capture energy from sunlight and convert it into chemical energy in a process called photosynthesis.

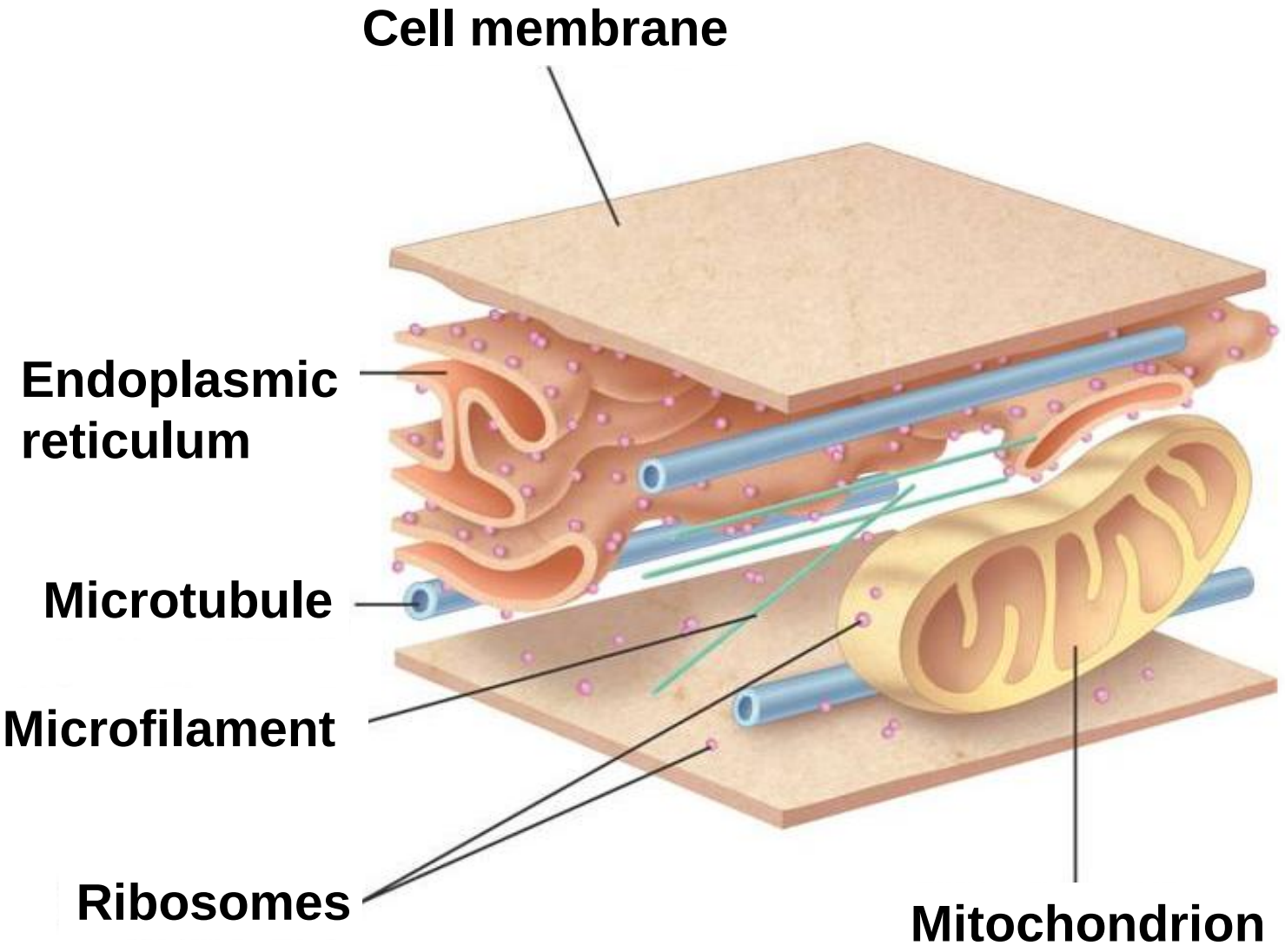


Cytoskeleton

Eukaryotic cells are given their shape and internal organization by the **cytoskeleton**.

The cytoskeleton is a network of protein filaments that helps the cell to maintain its shape. The cytoskeleton is also involved in movement.

Cytoskeleton



Microfilaments

- are threadlike structures made up of the protein actin.
- form extensive networks in some cells.
- produce a tough, flexible framework that supports the cell.
- help some cells move.

Microtubules

- maintain cell shape.
- are important in cell division.
- build projections from the cell surface—cilia and flagella—that enable some cells to swim rapidly through liquids.

In animal cells, structures known as centrioles are formed from tubulin.

Centrioles are located near the nucleus and help to organize cell division.

END OF SECTION