شرح تراكيب وعضيات الخلية – الدرس الرابع من الوحدة الثانية

تم تحميل هذا الملف من موقع المناهج الإماراتية	
موقع المناهج ⇦ المناهج الإماراتية ⇦ الصف العاشر ⇦ أحياء ⇦ الفصل الأول ⇦ ملفات متنوعة ⇦ الملف	
تاريخ إضافة الملف على موقع المناهج: 2026-11-10 08:48:27	
المزيد من مادة أحياء:	ملفات ا كتب للمعلم ا كتب للطالب ا اختبارات الكترونية ا اختبارات ا حلول ا عروض بوربوينت ا أوراق عمل منهج انجليزي ا ملخصات وتقارير ا مذكرات وبنوك ا الامتحان النهائي ا للمدرس

التواصل الاجتماعي بحسب الصف العاشر					
صفحة المناهج الإماراتية على فيسبوك					

المزيد من الملفات بحسب الصف العاشر والمادة أحياء في الفصل الأول	
1	شرح النقل الخلوي – الوحدة الثانية الدرس الثالث
2	شرح تركيب ووظائف الغشاء البلازمي
3	شرح درس اكتشاف الخلية ونظرية الخلية

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Unit 2 - Lesson 4

Structures and Organelles

Structures and Organelles of the Cell

- 1- Cell shape and Movement
  - (Cytoplasm, Cytoskeleton, Cell appendages, Cell wall)
- 2- Controlling cell activities
  - (The nucleus)
- 3- Processing energy
  - (Mitochondria and chloroplasts)
- 4- Manufacturing proteins
  - (Ribosomes)
- 5- Processing, transporting and storing molecules

1- Cell Shape and Movement

A- Cytoplasm

- The environment enclosed by the plasma membrane is a semifluid material called cytoplasm.
- In prokaryotes, all the chemical processes of the cell take place directly in the cytoplasm.
- In eukaryotes, these processes take place within organelles in the cytoplasm.

B- Cytoskeleton

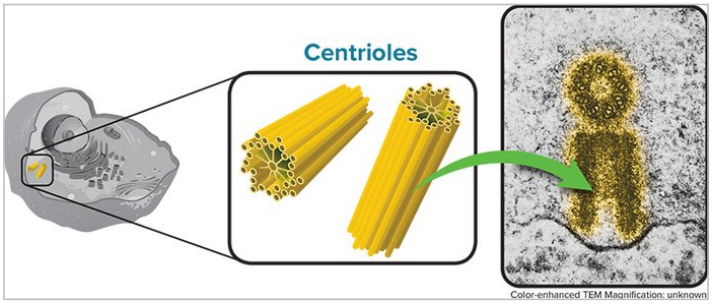
- The cytoskeleton is a supporting network of long, thin protein fibers that form a framework for the cell.
- It is composed of: A- Microtubules and B- Microfilaments
- A- Microtubules are long, hollow protein cylinders that form a rigid skeleton for the cell and help move substances within the cell.
- Centrioles- which are made of microtubules, function during cell division.

Unit 2 - Lesson 4

Structures and Organelles

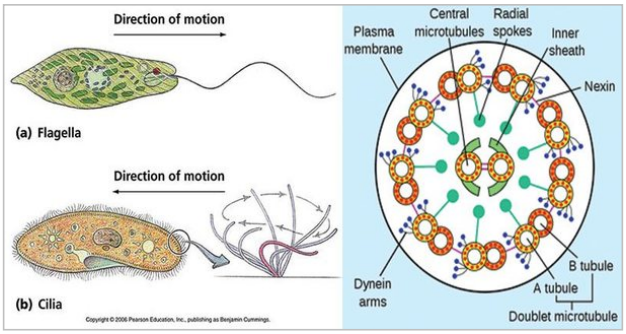
1- Cell Shape and Movement

- B- **Microfilaments** are thin protein threads that help give the cell shape and enable it to move.



C- Cell Appendages (Cilia and Flagella)

- Some eukaryotic cell surfaces have structures called **cilia** and **flagella** that project outside the plasma membrane.
- Cilia and flagella are made of microtubules.
- 1- **Cilia** are short, numerous projections that look like hair and that move in tandem, like oars in a rowboat.
- 2- **Flagella** are longer and less numerous than cilia. They move with a whip-like motion.
- Cilia and flagella are composed of microtubules arranged in a **9 + 2 configuration,** in which nine pairs of microtubules surround two single microtubules. Cells with flagella typically have one or two flagella.

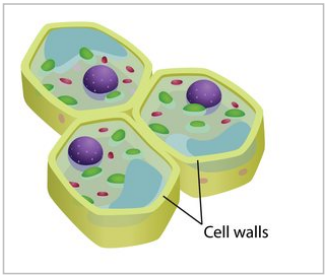


Unit 2 - Lesson 4

Structures and Organelles

1- Cell Shape and Movement

D- Cell Wall



- The cell wall of a plant is a thick, rigid mesh of fibers that surrounds the outside of the plasma membrane.
- Allows the plants to stand at different heights, it is inflexible.
- The cell wall: protects the cell and gives it structure
  - Is made from a carbohydrate called cellulose
- The cell wall of a prokaryote functions similarly to a plant cell wall.
  - Protects the cell, helps to maintain the shape and gives the cell support.
  - Is made from peptidoglycan (protein and carbohydrates), which is a combination of disaccharides and peptide fragments. All prokaryotes have peptidoglycan in their cell wall.
- Compare the cell walls of prokaryotic and eukaryotic cells (plant cells).

2- Controlling Cell Activities

A- The Nucleus

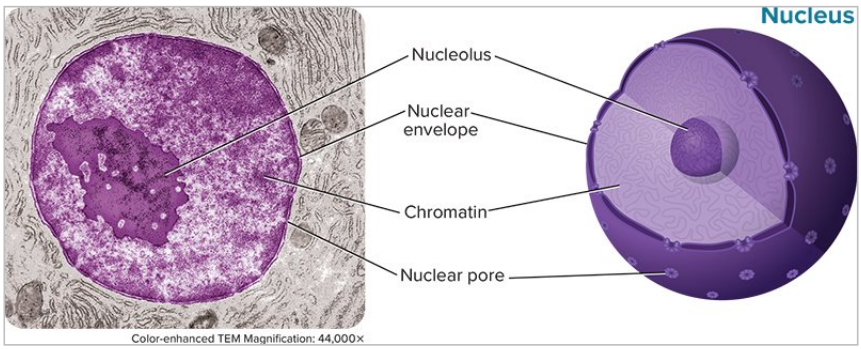
- The nucleus controls cell activities.
- The nucleus of a cell contains most of the cell's DNA, which stores information used to make proteins that determine a cell's growth, function, and reproduction.
- The nucleus is surrounded by a double membrane called a nuclear envelope.

Unit 2 - Lesson 4

Structures and Organelles

2- Controlling Cell Activities

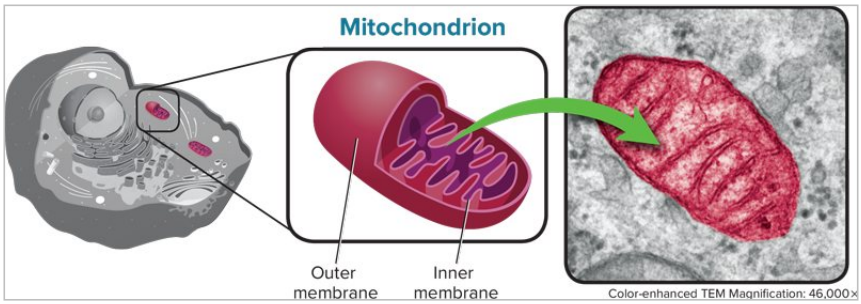
- The nuclear envelope is similar to the plasma membrane, except the nuclear membrane has nuclear pores that allow larger-sized substances to move in and out of the nucleus.
- Chromatin, which is complex DNA attached to protein is spread throughout the nucleus.



3- Processing Energy

A- Mitochondria

- Function: Processing Energy
- Mitochondria (singular: mitochondrion) convert fuel particles into usable energy.
- They have an outer membrane and a highly folded inner membrane that provides surface area for breaking the bonds in sugar molecules.



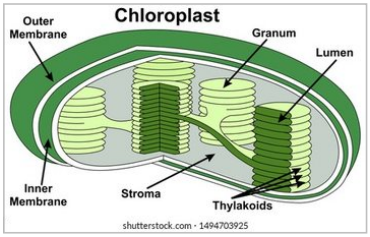
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Structures and Organelles

3- Processing Energy

B- Chloroplasts



- Plant cells and some other eukaryotes also contain chloroplasts, which capture light and convert it into chemical energy in a process called photosynthesis.
- Chloroplasts are composed of multiple small disks called thylakoids, which contain the light-capturing pigment called chlorophyll.

Plastids

- Chloroplasts belong to a group of plant organelles called plastids
- Some of which are used for storage. Some plastids store starches or lipids.
- chromoplasts, contain red, orange, or yellow pigments that trap light energy and give color to plant structures such as flowers and leaves.

Chloroplast		• Contain **chlorophyll** (green pigment) that absorbs sunlight in **photosynthesis** • Produce and store glucose
Chromoplast		• Contain carotenoids (red, orange, and yellow pigments) • Found in flowers and fruit
Leucoplast		• Contain no pigment • Used to store starch

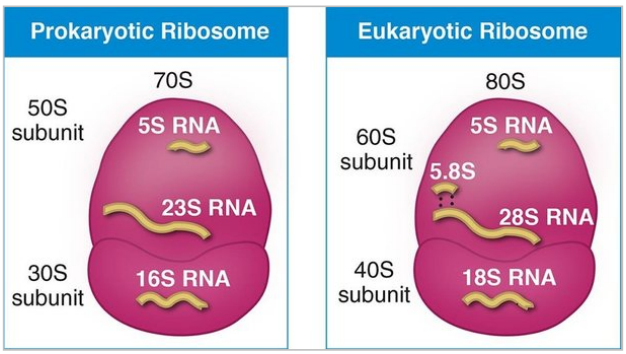
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Structures and Organelles

4- Manufacturing Proteins

A- Ribosomes

- **Ribosomes** are organelles that manufacture proteins. They are made of two components- RNA and protein.
- Unlike other organelles, ribosomes are **not membrane-bound.**
- Ribosomes are produced inside the nucleus in the **nucleolus.**
- **S:** unit used to measure how fast molecules move in a centrifuge.



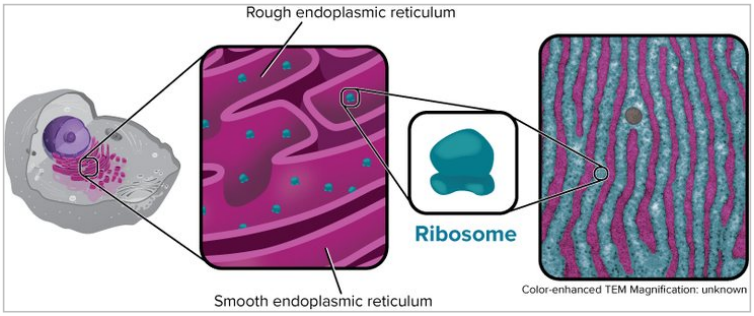
B- Endoplasmic Reticulum (ER)

- The **endoplasmic reticulum (ER)** is a membrane system of folded sacs and interconnected channels that serves as the site for protein and lipid synthesis.
- There are two types of endoplasmic reticulum: Rough and Smooth
  - **Rough:** ribosomes are attached, produce proteins.
  - **Smooth:** No ribosomes are attached.

Unit 2 - Lesson 4

Structures and Organelles

4- Manufacturing Proteins



- The smooth ER provides a membrane surface where a variety of complex carbohydrates and lipids, including phospholipids, are synthesized.
- Smooth ER in the liver detoxifies harmful substances.

5- Processing, Transporting, and Storing Molecules

- 1- The Golgi apparatus is a flattened stack of membranes that modifies, sorts, and packages proteins.
  - Proteins are packaged into sacs called vesicles, which can fuse to the plasma membrane and release the proteins to the environment.
- 2- A vacuole is a membrane-bound sac used for temporary storage.
  - Vacuoles store food, enzymes, or waste.
  - Vacuoles are found only in plant cells.
- 3- Lysosomes are vesicles that contain substances that digest excess or worn-out organelles and food particles.
  - They also digest bacteria or viruses that invade the cell.



Unit 2 - Lesson 4

Structures and Organelles

Comparing Cells

- Plant cells have: Chloroplasts/chlorophyll, Vacuoles, Cell walls
- Animal cells generally do not have these features and have: Centrioles, Cilia, Flagella
- There are many structures found in both plant and animal cells. For example, 1-the nucleus controls the activities of both plant and animal cells. 2-The plasma membrane plays a vital role in maintaining homeostasis in both plant and animal cells, and the 3-ribosomes are the site of protein synthesis for both types of cells.
- See Table 1 page 68 in textbook

Organelles at Work

- Knowledge of organelles allows for an increased understanding of cellular processes.
- Protein synthesis begins in the nucleus with DNA.
- RNA and ribosomes leave the nucleus and produce a protein on the endoplasmic reticulum.
- Proteins produced in the ER are sent to Golgi apparatus for packaging.
- Packaged proteins are delivered to other organelles, where they serve a variety of functions.

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