ORGANELLE RECOVERY MISSION

Animal Cell

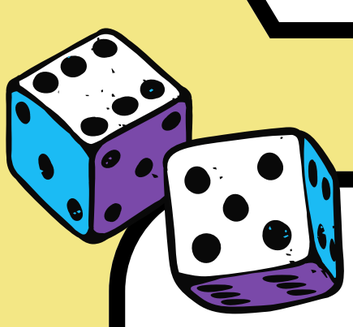
Plant Cell

Organelle Recovery Mission

Game Theme
Cell
Organelles

Grade Level
VII-VIII

Game Type
Card Game



Game Overview

- Organelle Recovery Mission is a card game where students help Ms. Cellulina reorganise the jumbled parts of a cell after a fictional meteor strike. The game serves as a conceptual reinforcement tool for students learning cell structure and function, encouraging visual recognition, deductive reasoning, and collaborative discovery.
- As players follow a storyline set inside a giant model of a cell, they must identify organelles based on clues about shape, location, and function. Each correct identification unlocks a visual or model of the organelle, helping students reconstruct a complete and organised cell.
- By the end of the gameplay, players will be able to identify the organelle names, shapes, locations, and functions.
- A complete game set, for one group, includes the following materials:
    - Instruction document
    - Organelle Checklist (8 Total)
        - Cell Membrane
        - Cytoplasm
        - Nucleus
        - Ribosome
        - Vacuole
        - Golgi Apparatus
        - Mitochondrion
        - Endoplasmic Reticulum (Rough & Smooth)
    - A deck of 32 cards (each organelle picture divided into 4 cutouts)
    - A deck of 32 cards (each organelle has information cards covering name, shape, location, and function).
    - 8 pictures of organelles

Gameplay Instructions

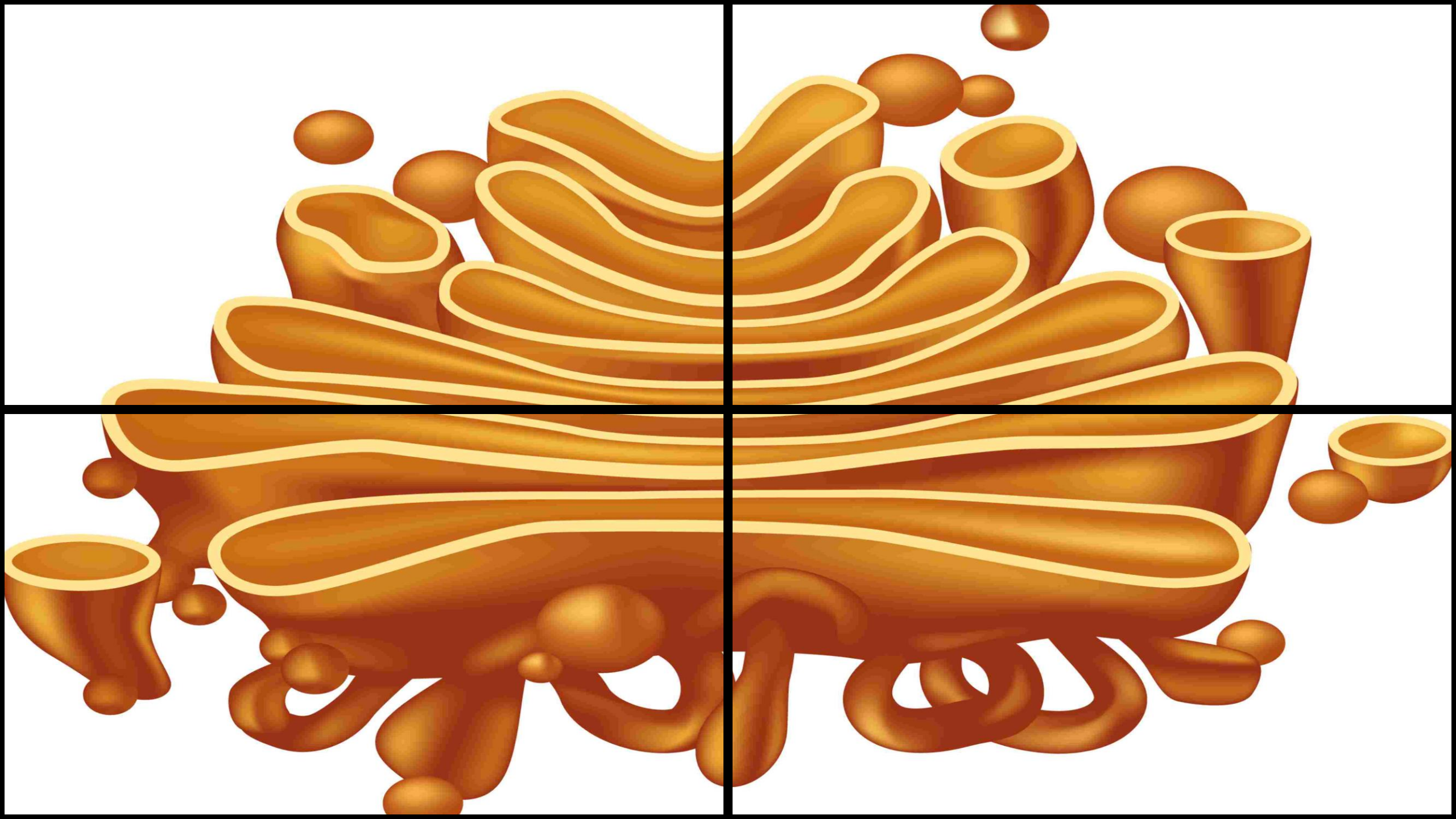
- Divide students into small groups of 4-5 players depending on the class size.
- Each group begins by sorting the jumbled deck of cards. Students must match and create complete sets for each organelle by grouping the name, shape, location, and function cards together.
- Students must also match the shape of the organelles
- Once a group correctly completes a set for an organelle (both information and picture), they earn a large picture of the organelle as a reward. The process repeats until all organelles are assembled.
- Once all organelle pictures are collected, provide each group with a symbolic animal cell board.
- The students then place the organelle pictures in their correct locations on the cell board, ensuring they understand the spatial arrangement of organelles within the cell.
- The first group to correctly place all organelles on the cell board shouts "CELL" and is declared the winner.

Debriefing and Reflection

- Ask students to share what they learned about each organelle's name, function, location, and shape. Highlight the importance of understanding how organelles work together to support the cell's functions.
- Go over any incorrect matches or misplaced organelles on the cell board. Provide additional clarification for any concepts that were challenging.
- Discuss how understanding cell organelles is important in fields like medicine, biotechnology, and environmental science. Ask: Can you think of how organelles like mitochondria or ribosomes are important in real life?

Adaptations for Gamplay

- **For Lower Grades:** Simplify the game by using fewer organelles (e.g., 4 instead of 8). You can also focus only on names and basic functions of organelles.
- **For Higher Grades:** Increase the challenge by including more organelles for comparison. You can also focus on detailed functions (e.g., 'how mitochondria produce energy') and interactions between organelles.

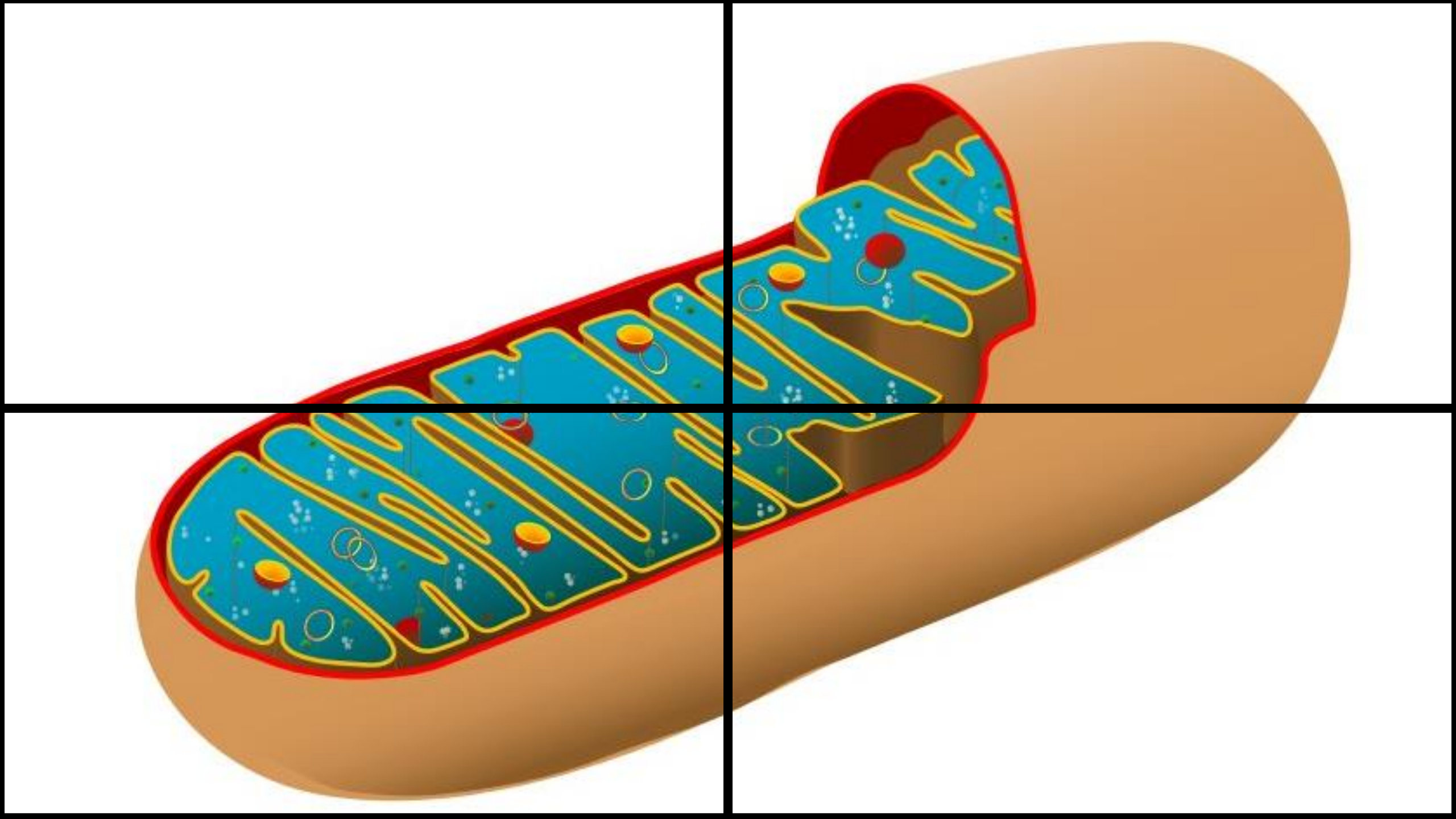


Golgi Apparatus

Near the Nucleus and next to the Rough Endoplasmic Reticulum

Protein synthesized by endoplasmic reticulum is packaged here and transported outside the cell or to other cell organelles

Tubules, small nodules, cavities or long cisterns or lamellae

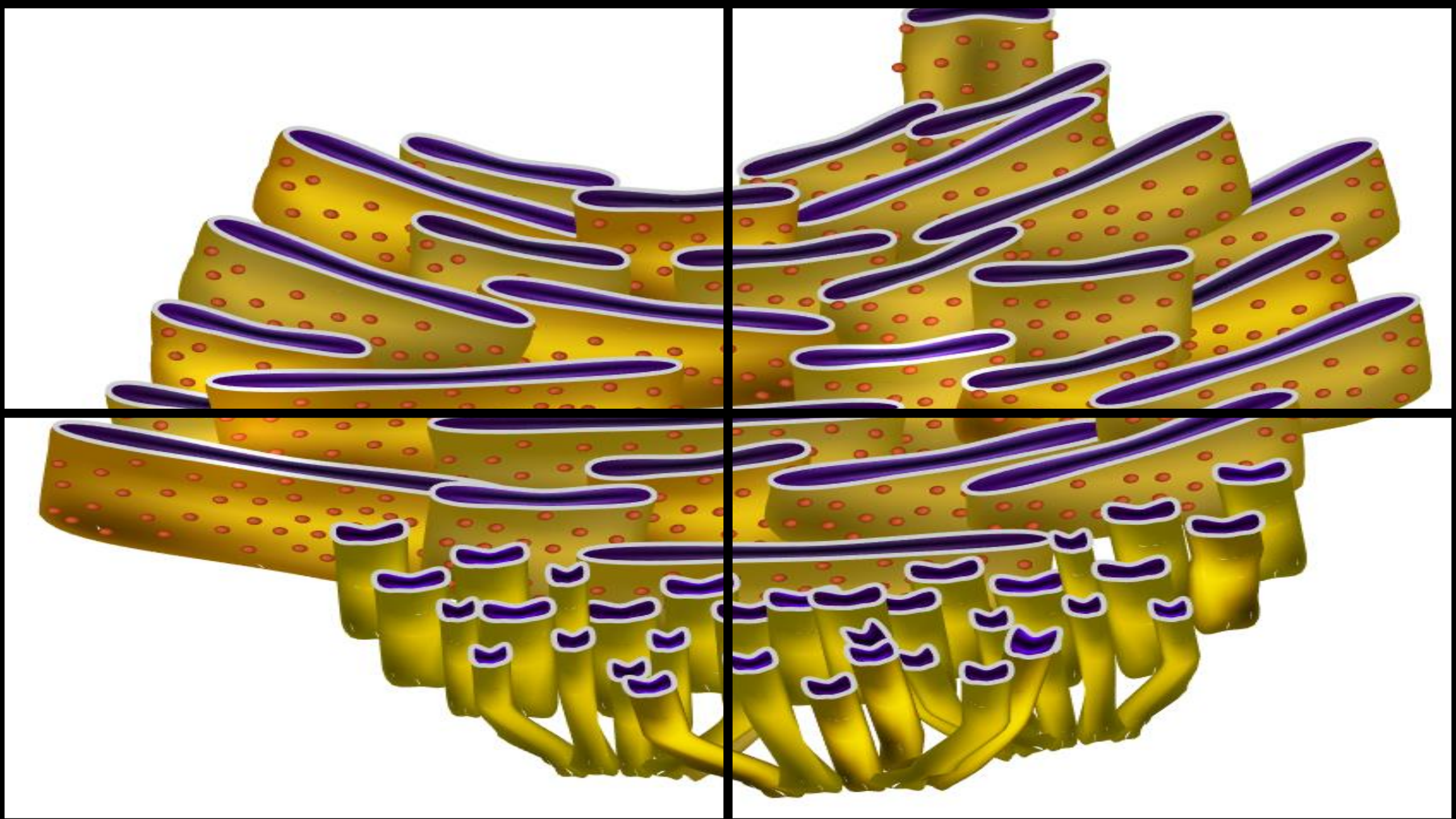


Mitochondrion

Found in the cytoplasm of the cell

Known as the ‘powerhouse’ of the cell, as it releases energy by breaking complex molecules using the process of ‘cellular respiration’.

Can be circular, rod shaped, filamentous, star shaped and twisted.

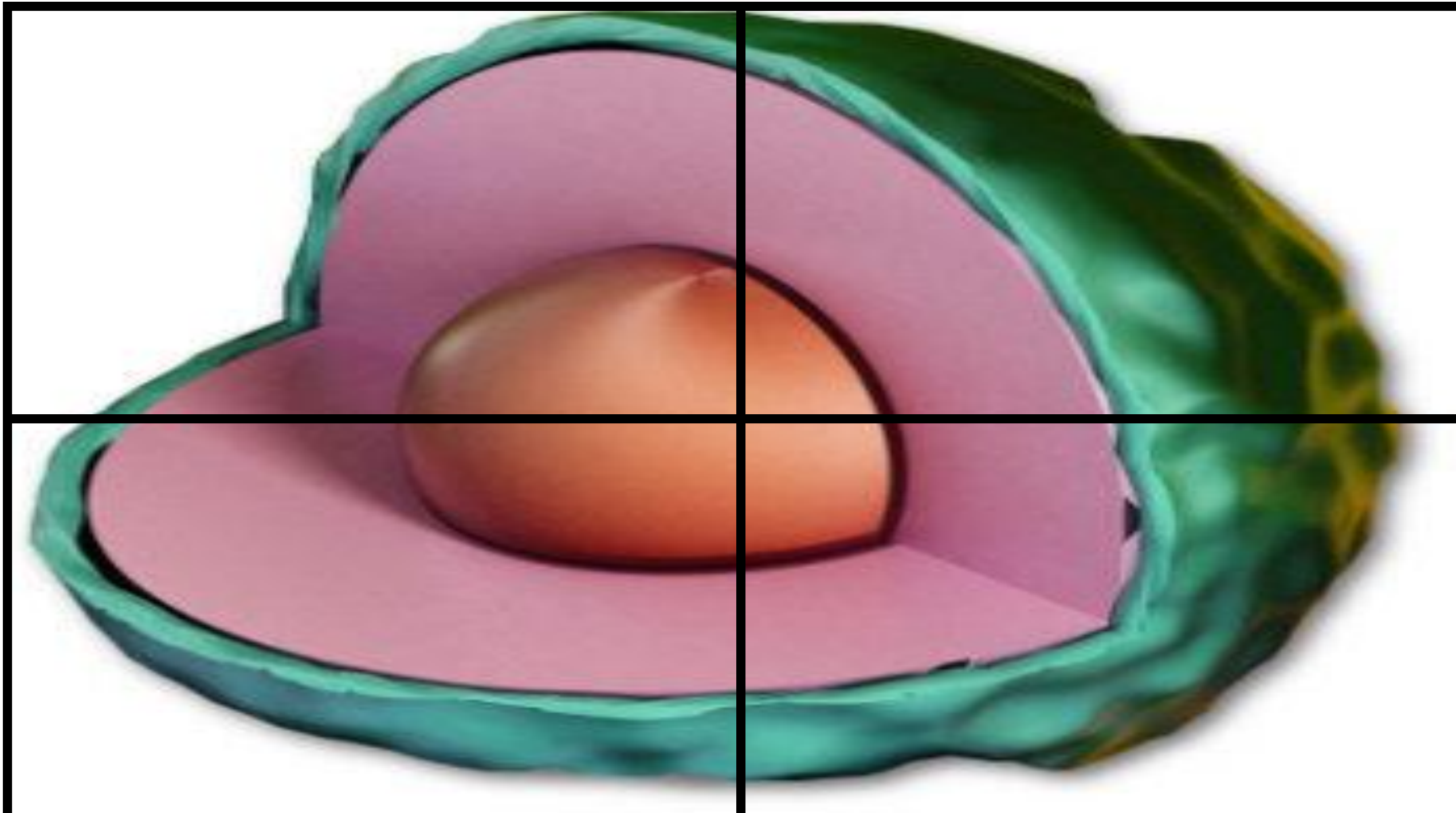


Rough and Smooth Endoplasmic Reticulum (ER)

Rough ER is adjacent to the nucleus, whereas Smooth ER is attached to Rough ER

Rough ER synthesizes protein, whereas Smooth ER synthesizes steroids and stores carbohydrates. Both provide internal framework, and transport materials to other organelles.

Both are tubular, but Rough ER is covered in ribosomes unlike Smooth ER

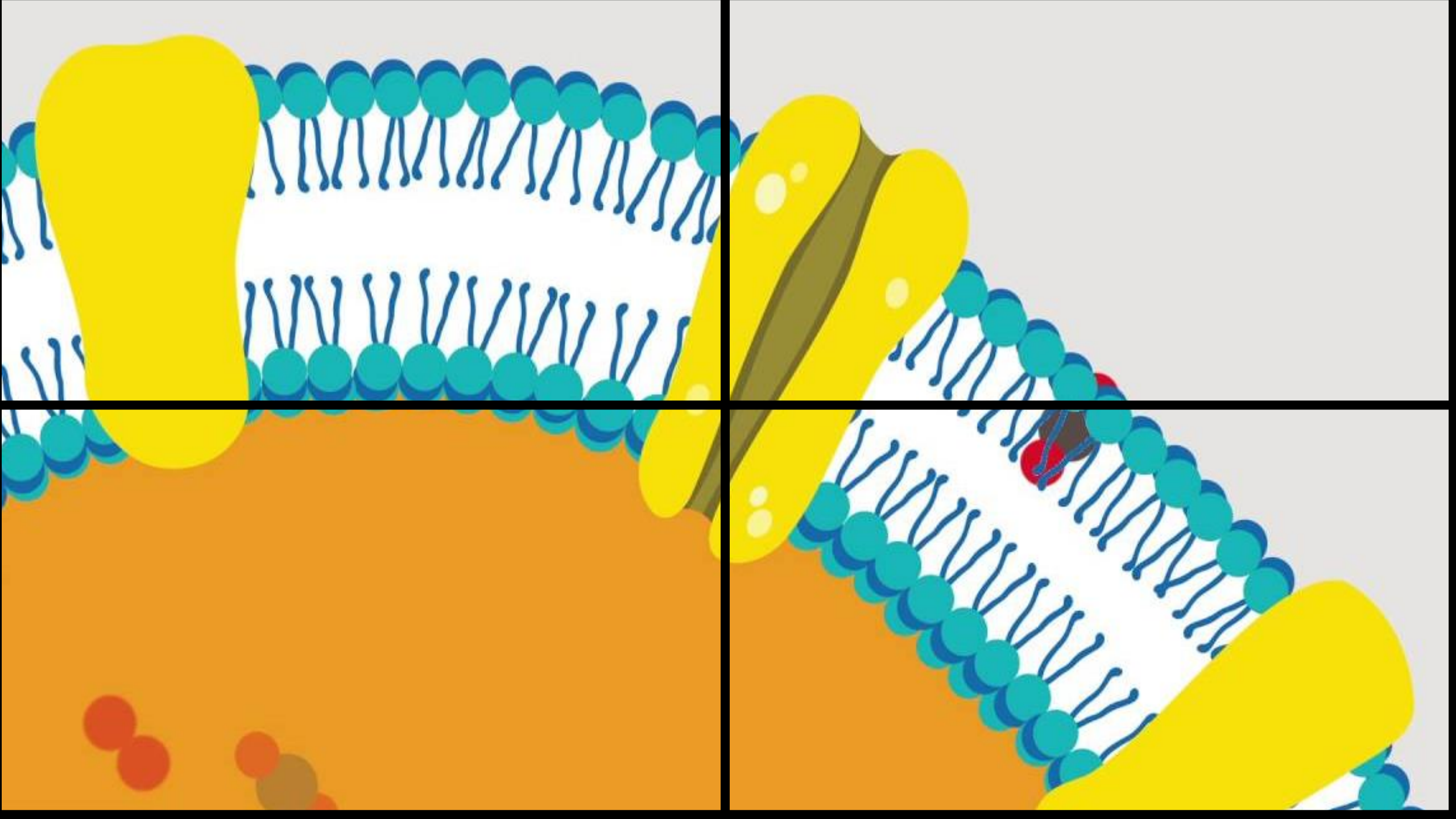


Nucleus

In the middle of the cell, separated from the cytoplasm by the nuclear membrane.

Acts as control centre of the activities of the cell and it is essential for the functioning of the cell.

Dense and spherical

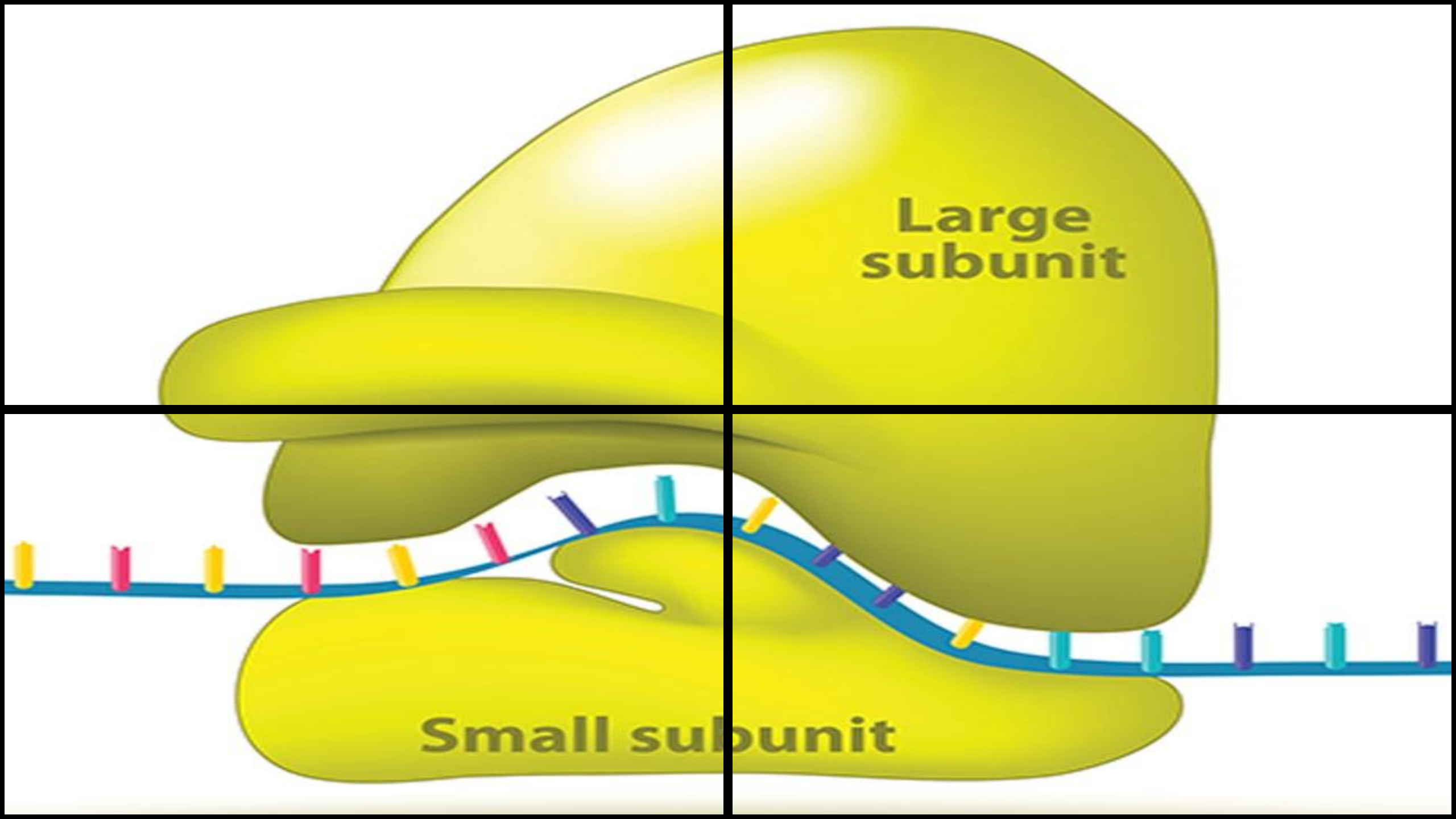


Cell Membrane

Encloses the cell and its organelles.

Also allows water, nutrients, etc. to enter the cell and waste material to leave.

The layer which gives shape to the cell.

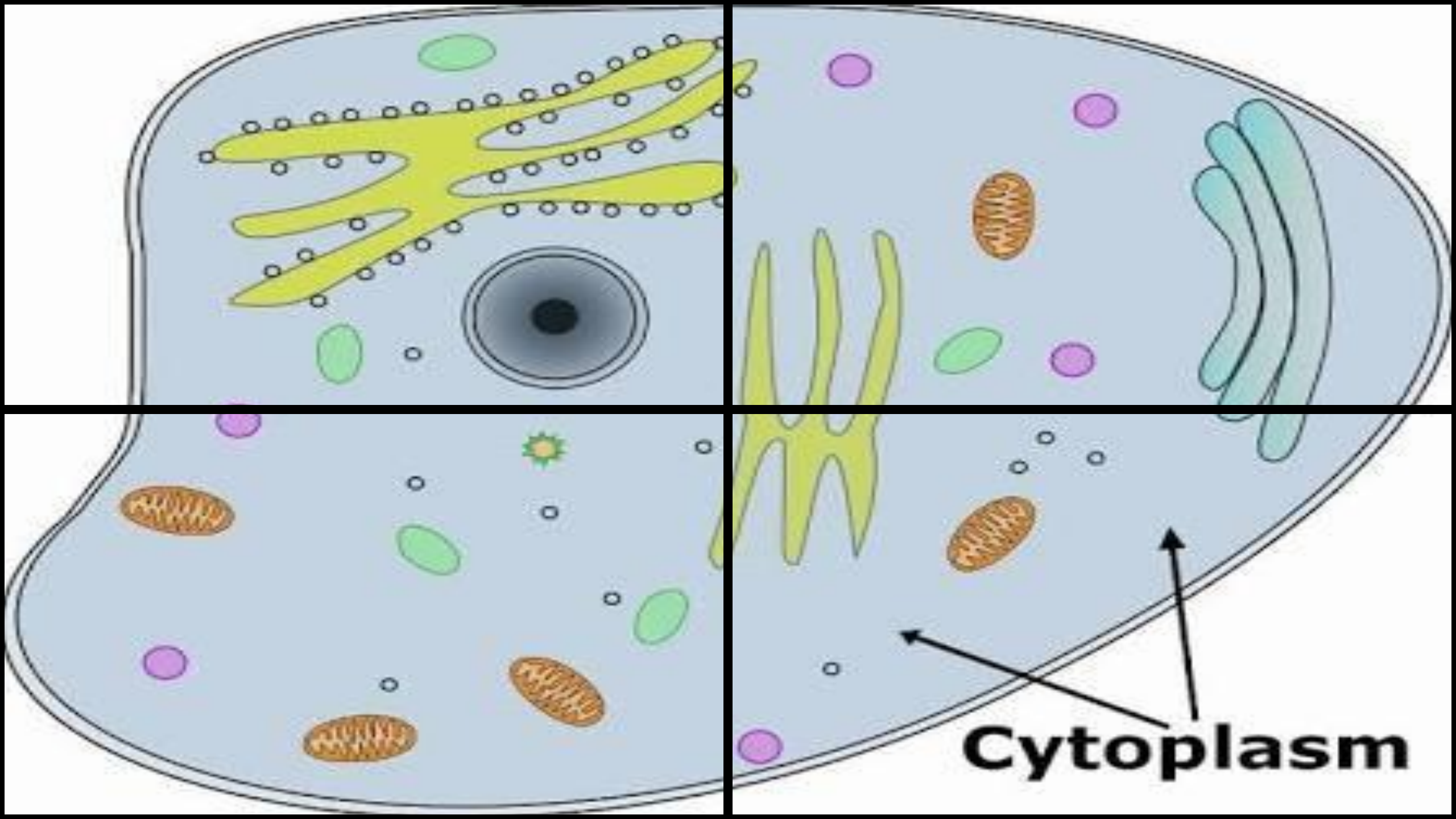

Large subunit
Small subunit

Ribosome

Found in cytoplasm, mitochondria, and they make endoplasmic reticulum rough

The molecules combine together to synthesize protein

Spherical, made up of large molecules of RNA and protein

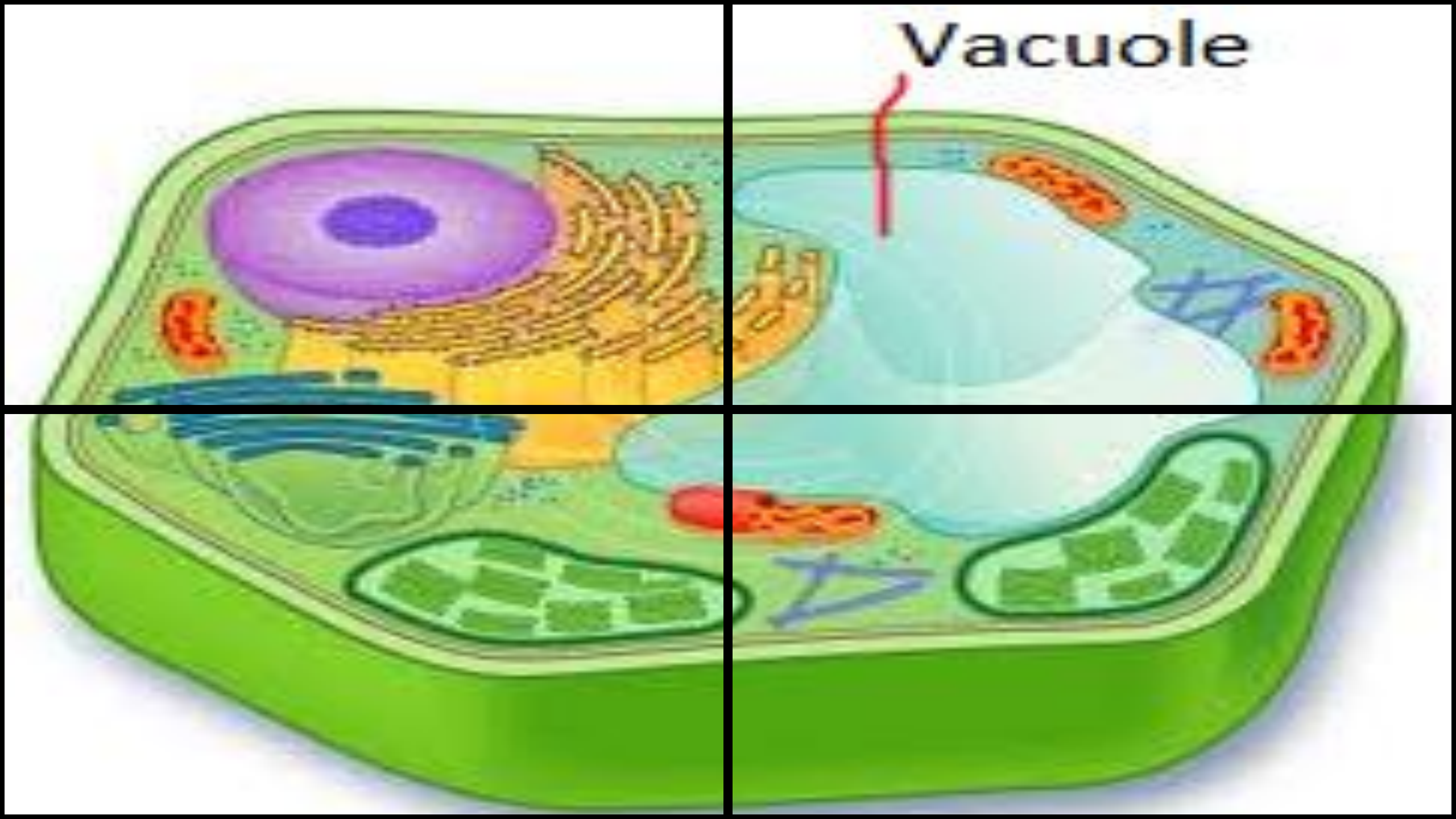

Cytoplasm

Cytoplasm

Outside the nucleus and surrounded by the cell membrane

Various other components are present in the cytoplasm, such as mitochondria, golgi bodies, ribosomes, etc.

Jelly-like substance, present between the cell membrane and the nucleus.


Vacuole

Vacuole

Surrounded by membranes

Storage areas filled with liquids and solid material.

No specific shape, as it depends on the requirement of the cell.

Inside the Cell

An Organelle Recovery Mission

Ms. Cellulina, a curious Grade 8 student, has embarked on a thrilling journey through a giant model of a cell to learn about its structure and functions. As she travels through the cell, observing each part closely, a sudden meteor strike jumbles all the organelles! Now, they're all mixed up, and Ms. Cellulina needs your help to reorganise them.

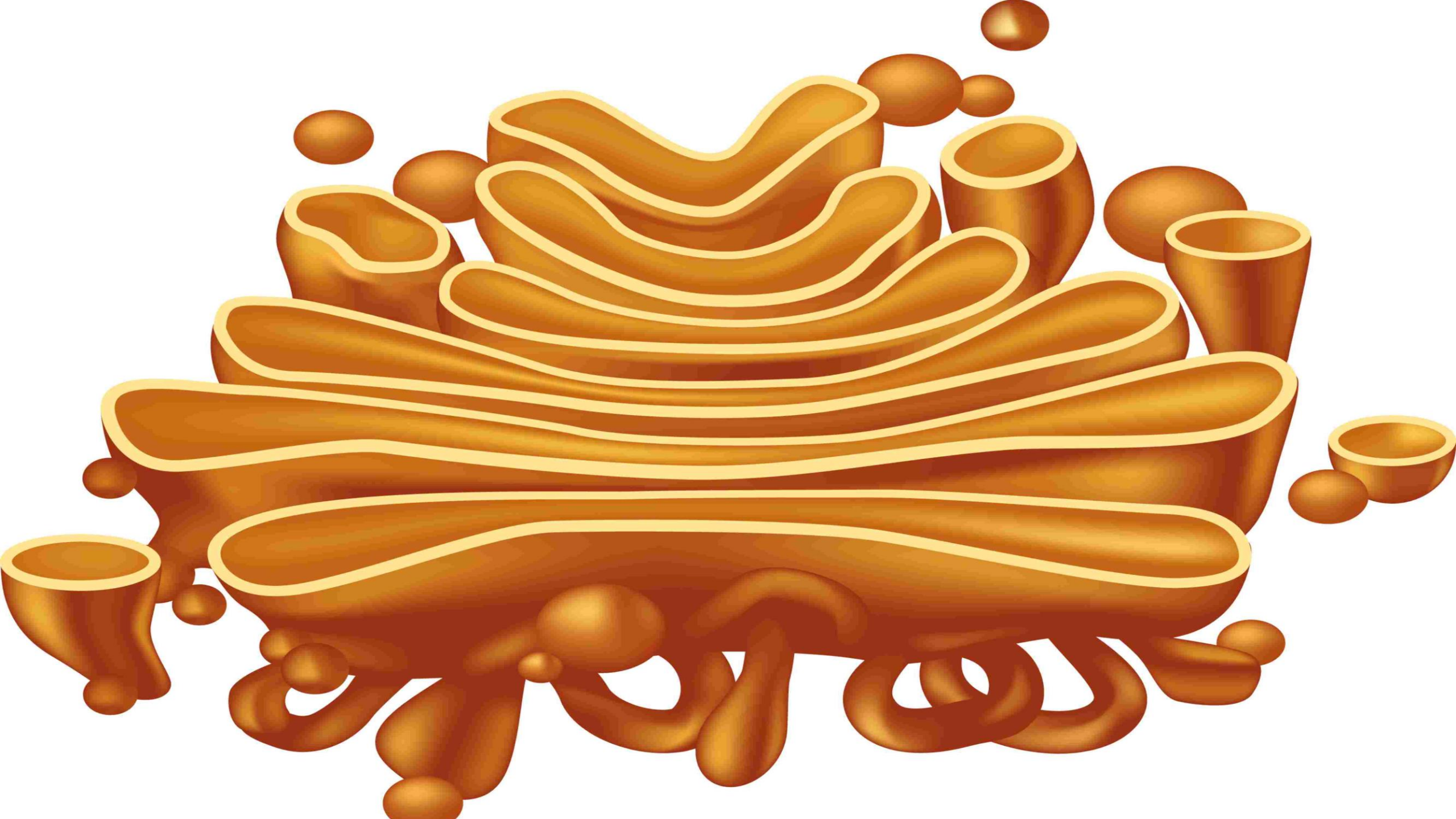
Your Mission

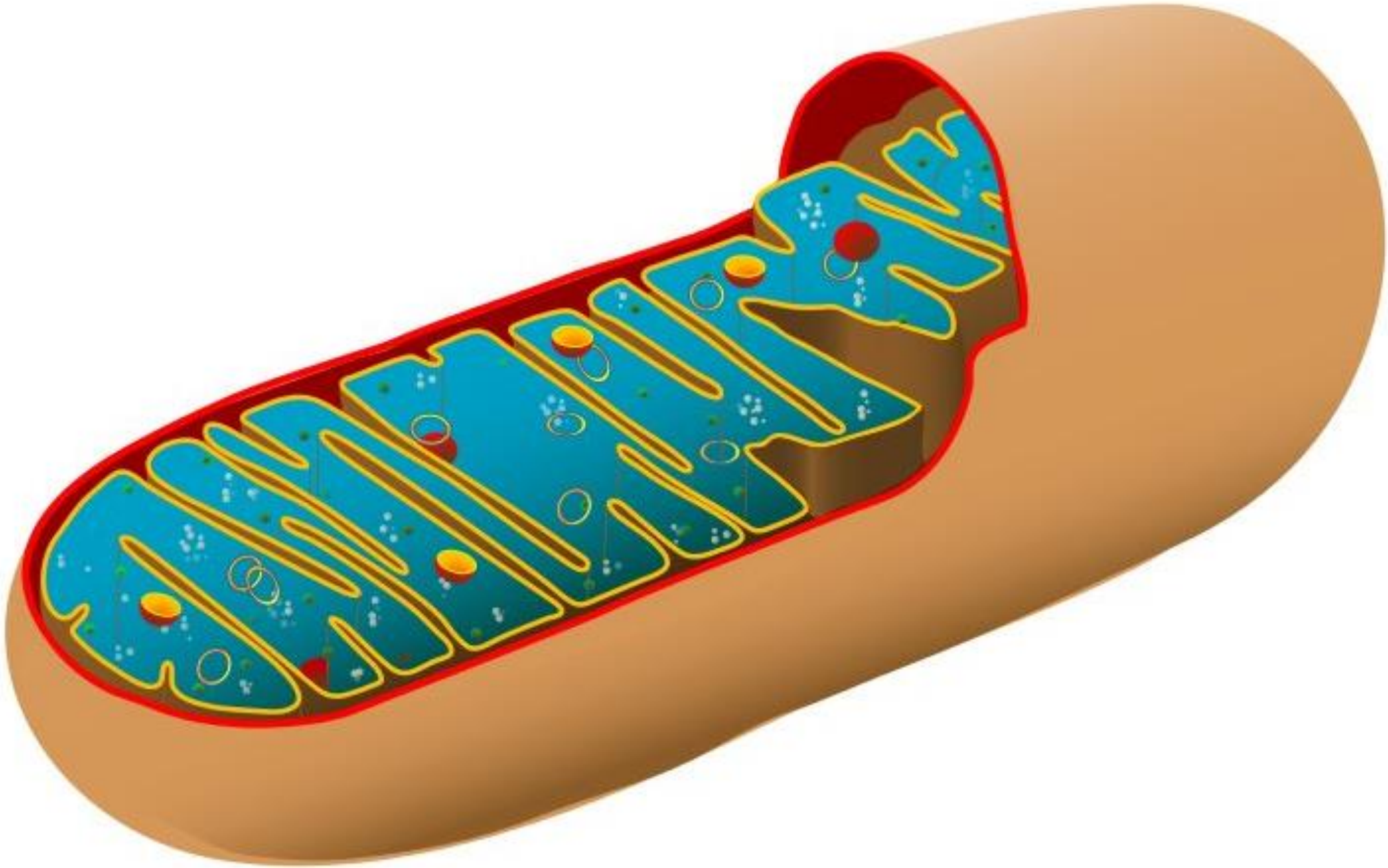
In this game, you will discover clues about each organelle's name, location within the cell, its key function, and shape. Assist Ms. Cellulina in identifying all the organelles using these hints. With each organelle you successfully identify, you will unlock a visual image of it. Gather all the images to piece together and reconstruct the cell. Help Ms. Cellulina organise the cell back to its original state and continue her microscopic adventure!

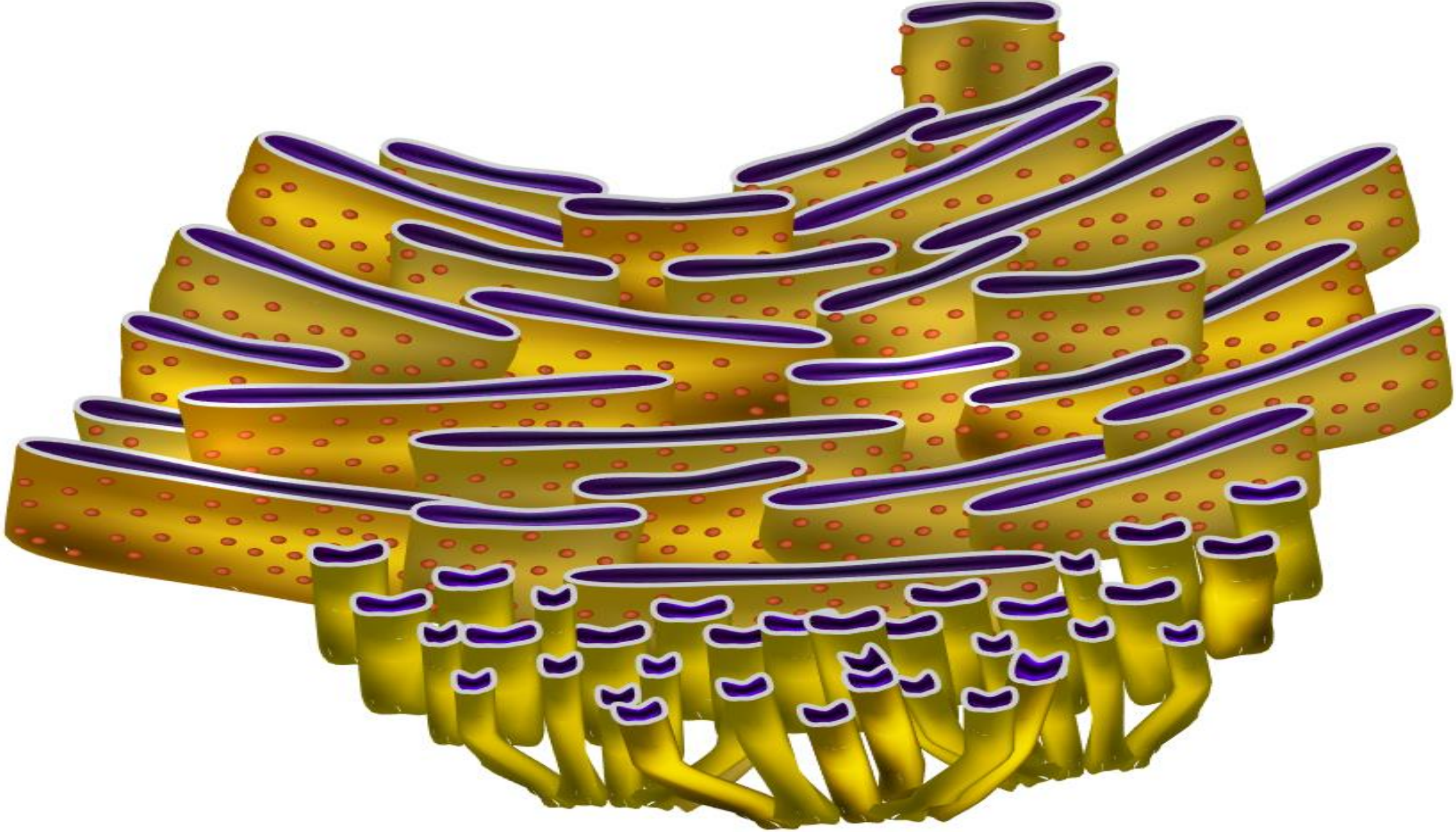
Check Off Corner

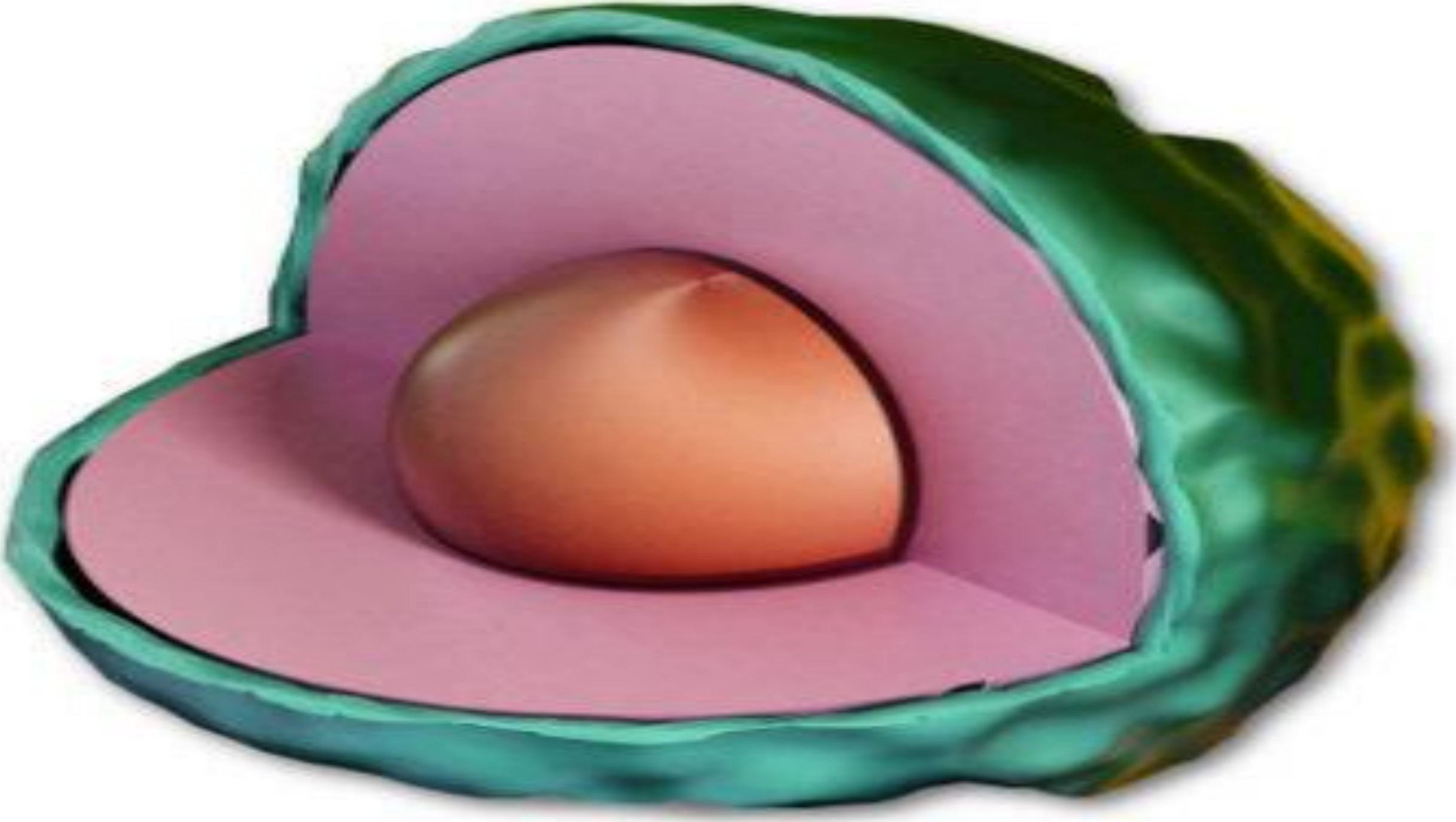
Once you have successfully identified an organelle, check off the box next to it, and then collect the corresponding image or model from your teacher.

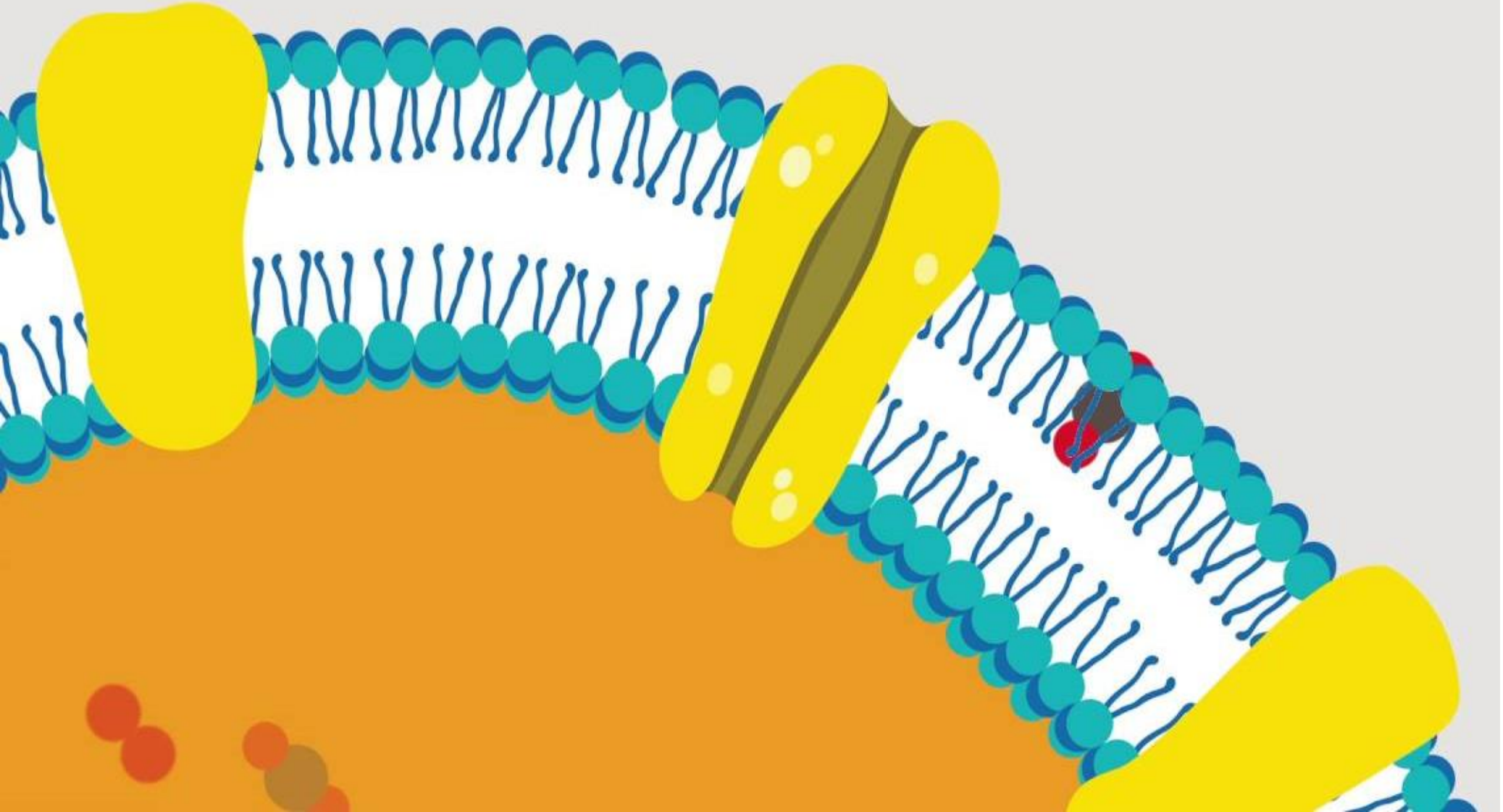
- Cell Membrane ☐
- Cytoplasm ☐
- Nucleus ☐
- Ribosomes ☐
- Vacuole ☐
- Golgi Apparatus ☐
- Mitochondrion ☐
- Endoplasmic Reticulum ☐

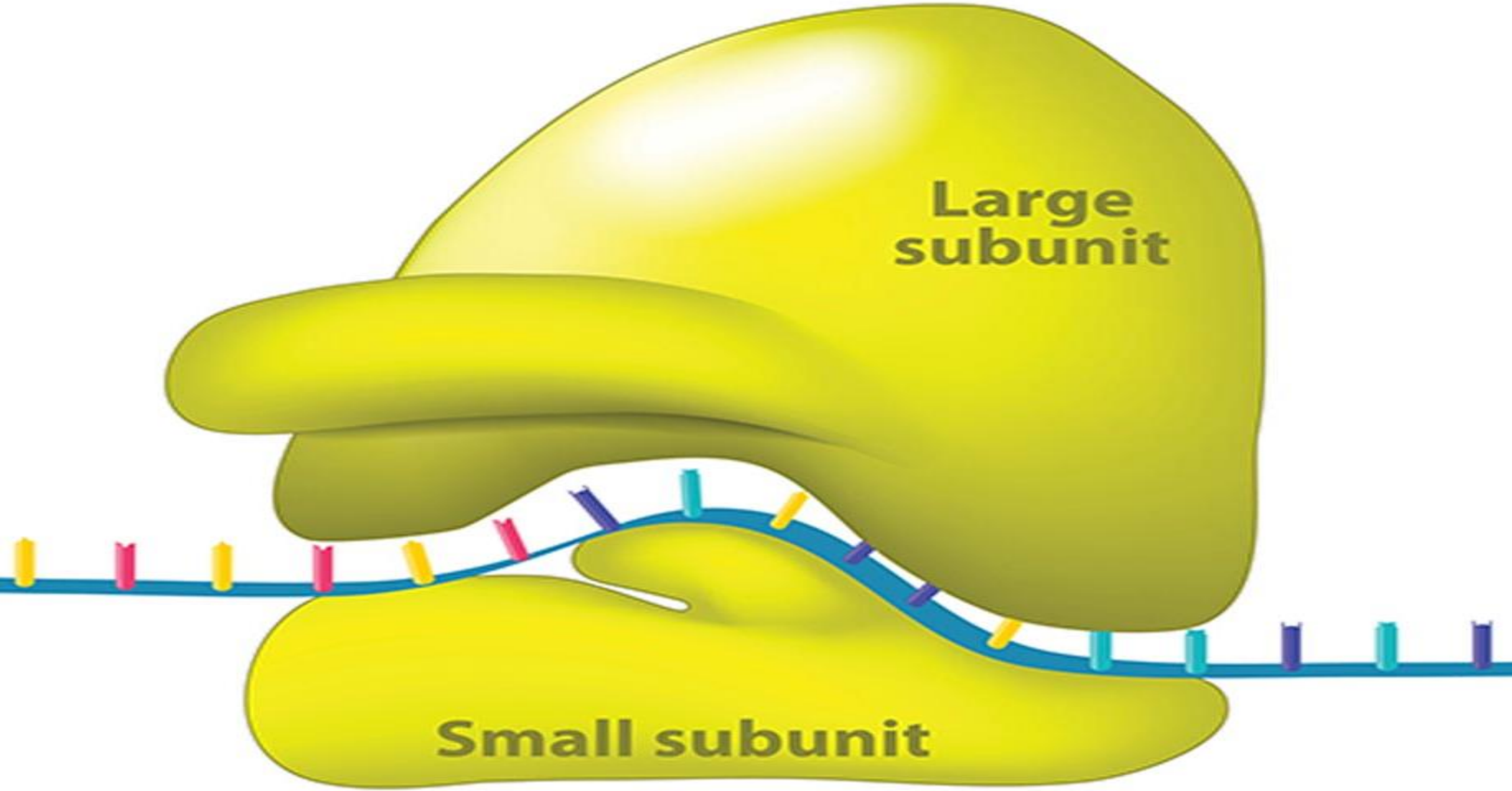


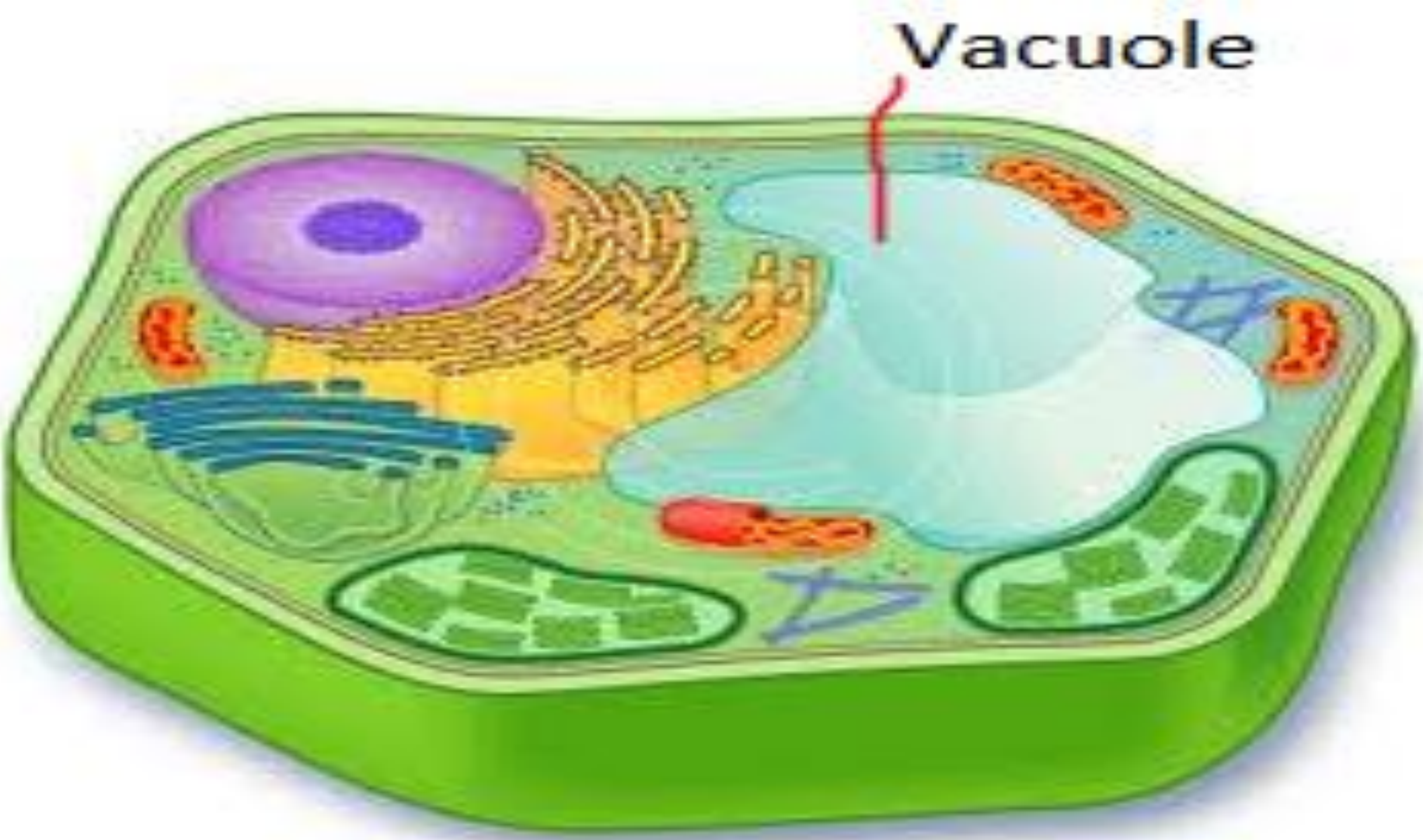









Large subunit
Small subunit


Vacuole