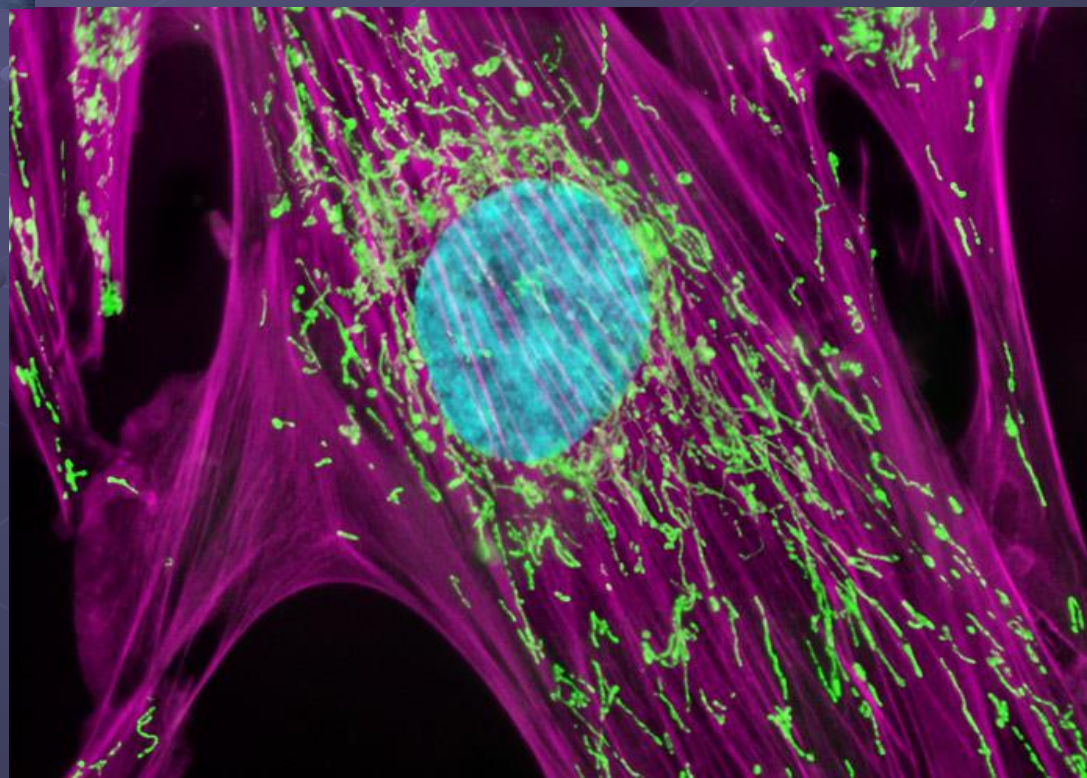
Cell Organelles

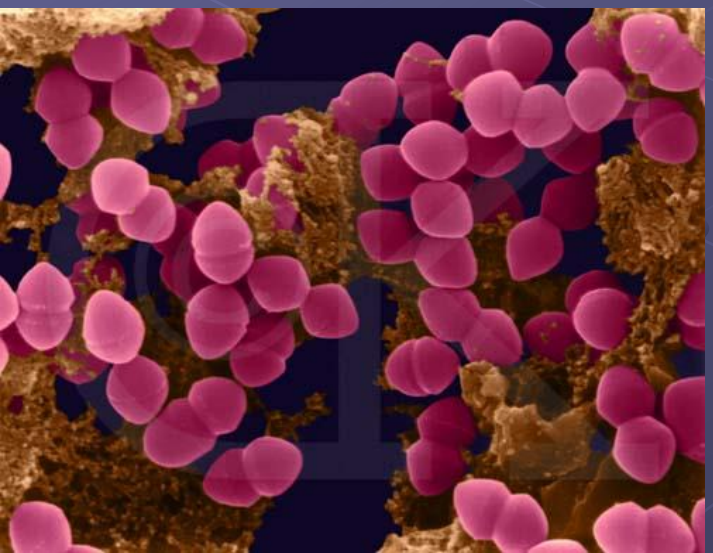
Unit 2: Cells

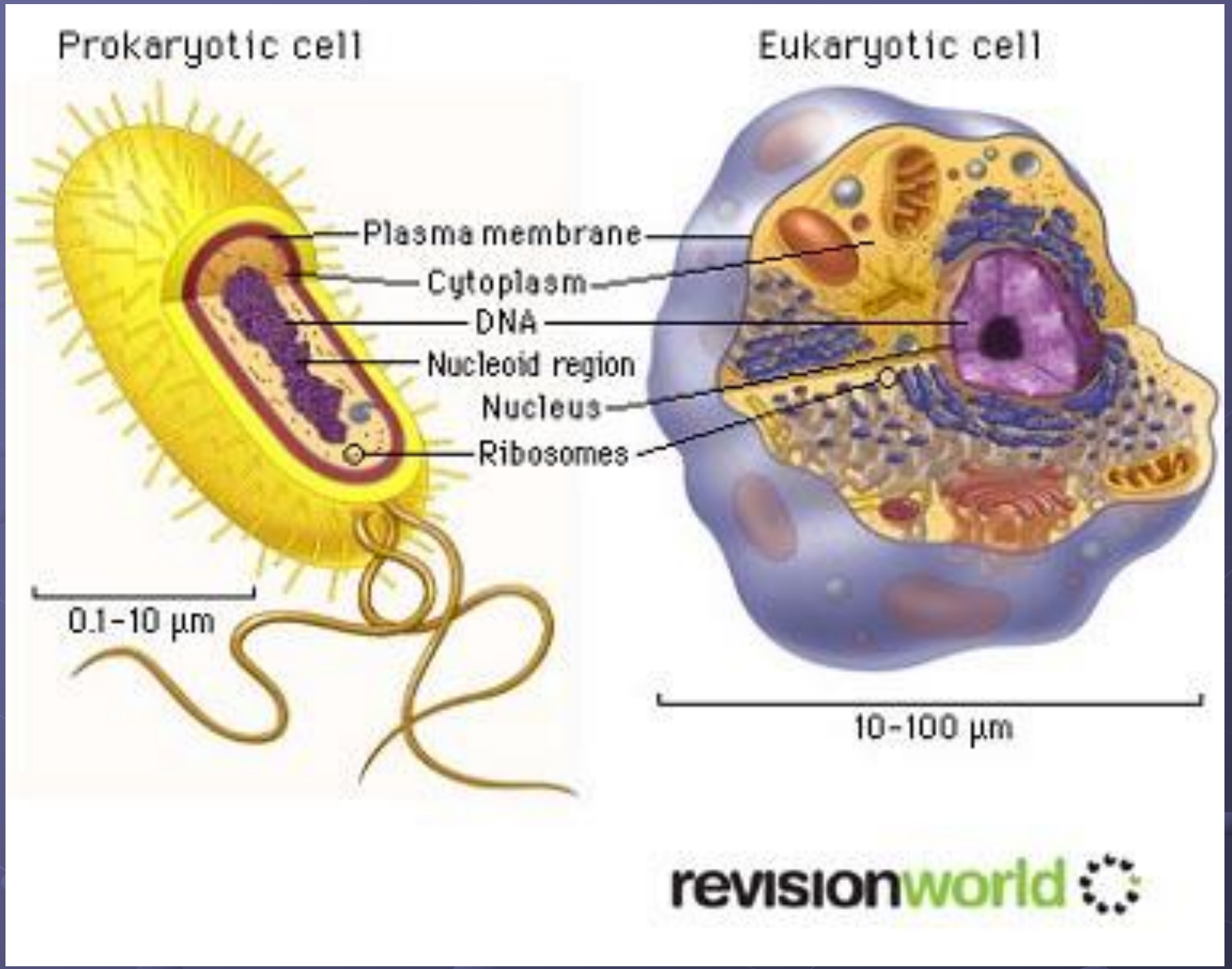
Ch. 7-2



Let's Review!

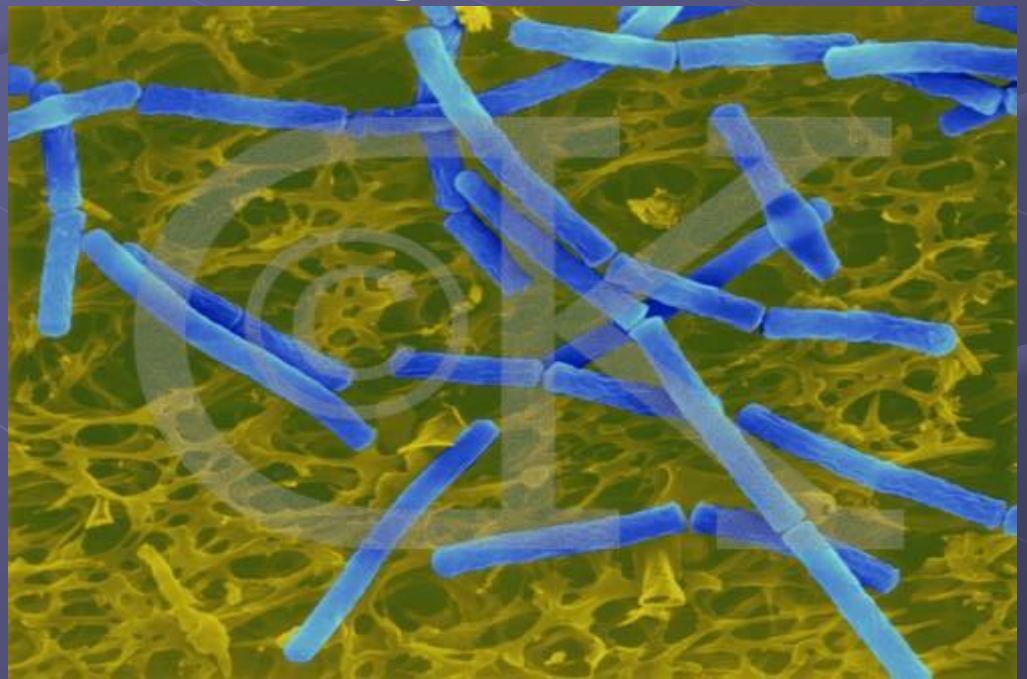
- **Two cell types**
  - Prokaryotes (Prokaryotic Cells)
  - Eukaryotes (Eukaryotic Cells)

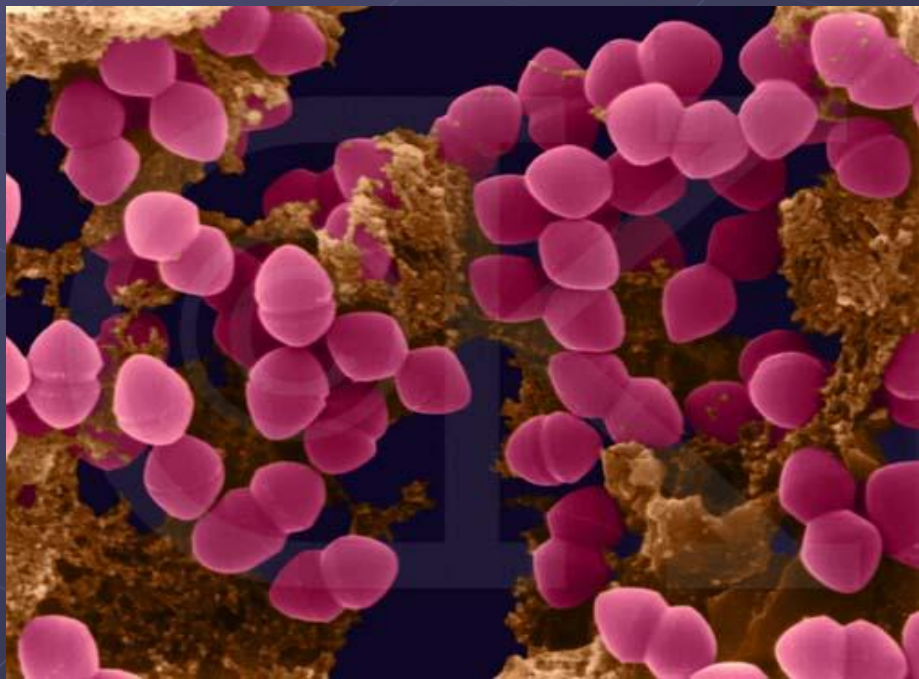



Prokaryotic cell
Eukaryotic cell
Plasma membrane
Cytoplasm
DNA
Nucleoid region
Nucleus
Ribosomes
0.1-10 µm
10-100 µm
revisionworld

Prokaryotes - Bacteria

- No Nucleus
- No Membrane bound organelles.

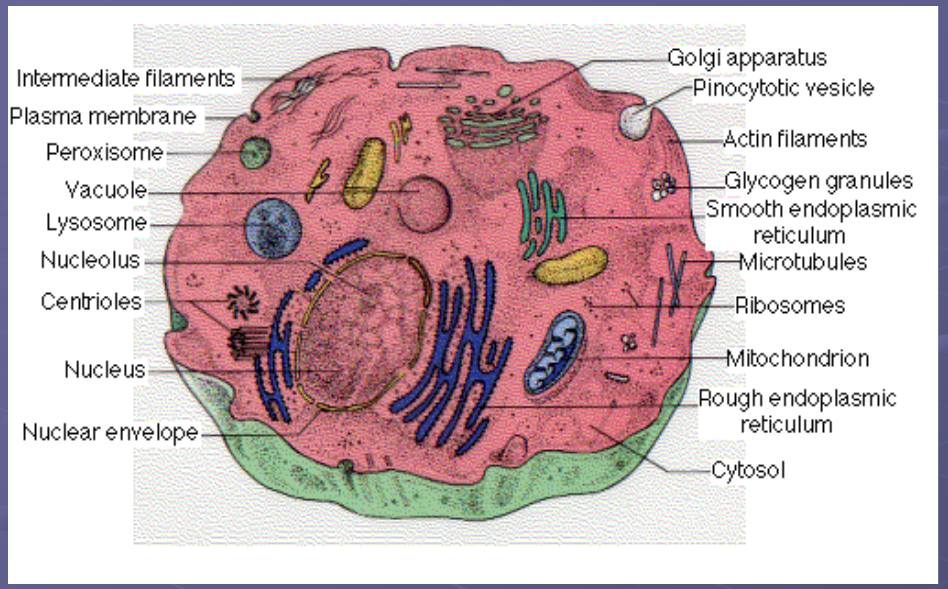


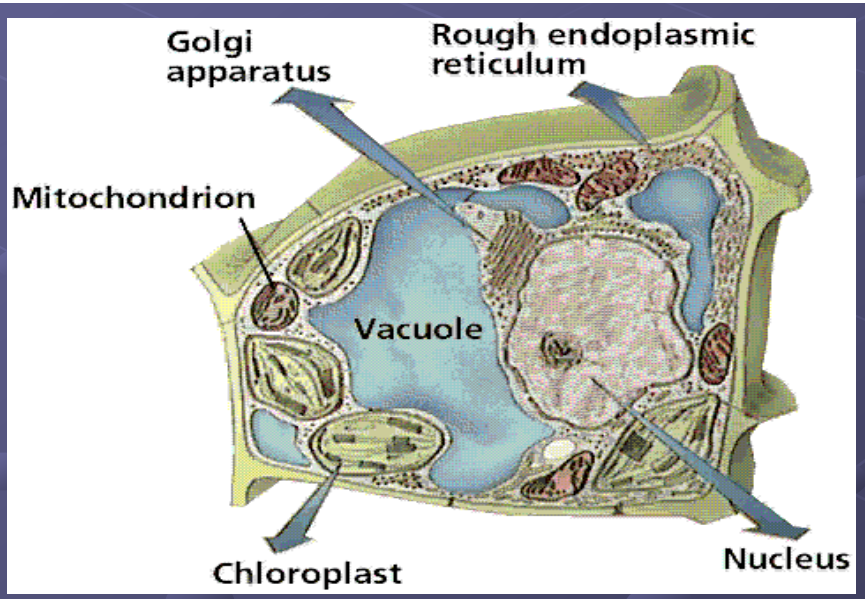


Eukaryotes

- Have a nucleus
- Have membrane bound organelles

Two Types of Eukaryotic Cells



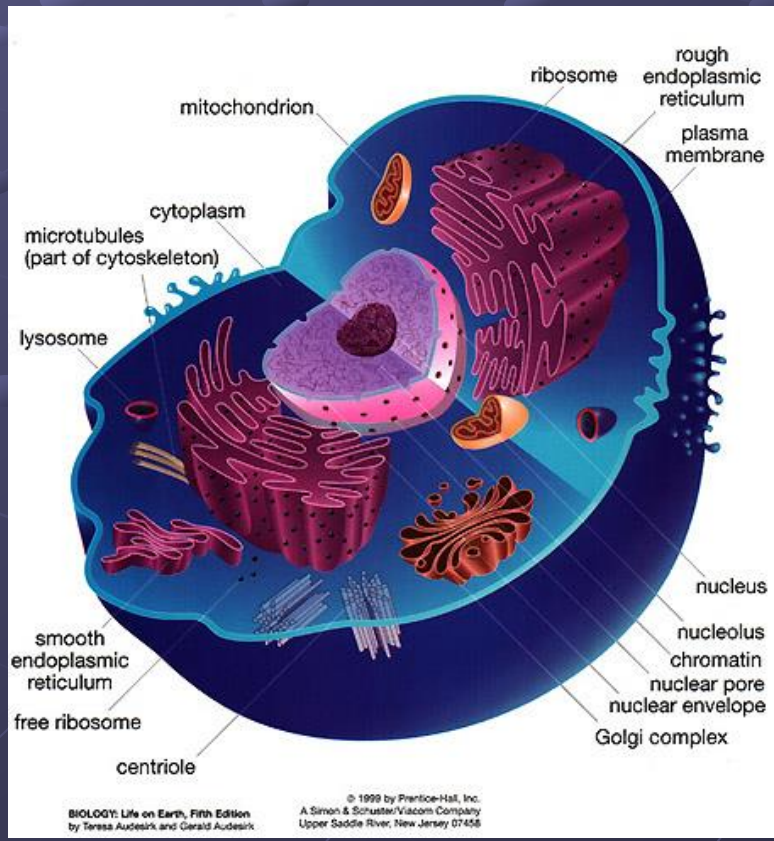


1. Animal Cell
2. Plant Cell

- Both cells function similarly

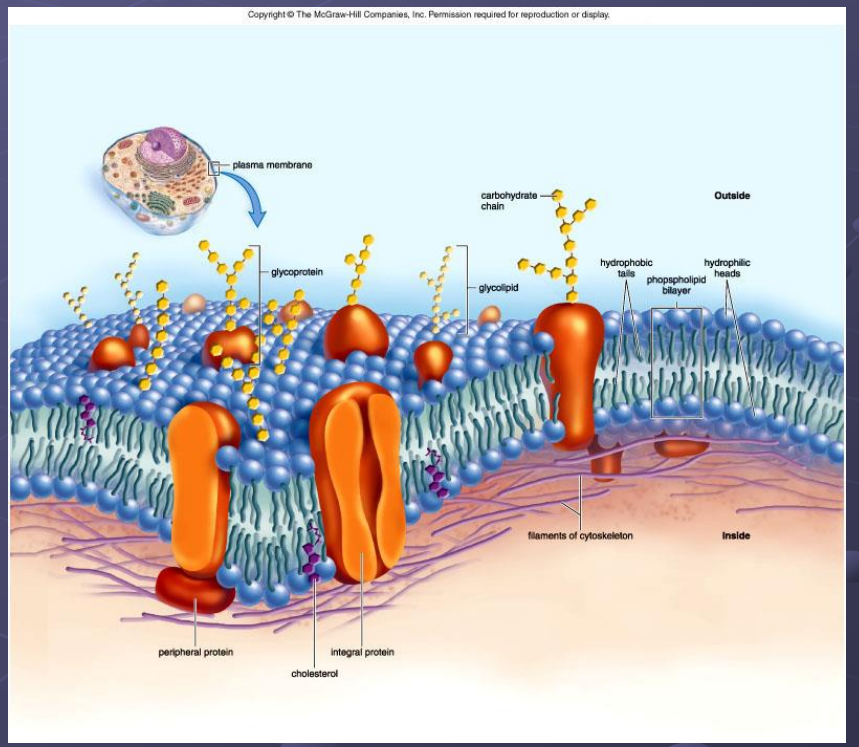
Cell Organelles

- **Organelle = "little organs"**
  - Specialized structures that **perform specific jobs** in the cell
- Found only in **eukaryotic cells**
- Many are **"membrane-bound"** (a membrane surrounds the organelle)
- **Cytosol:** watery matrix that organelles float in
- **Cytoplasm:** Everything in a cell except the nucleus

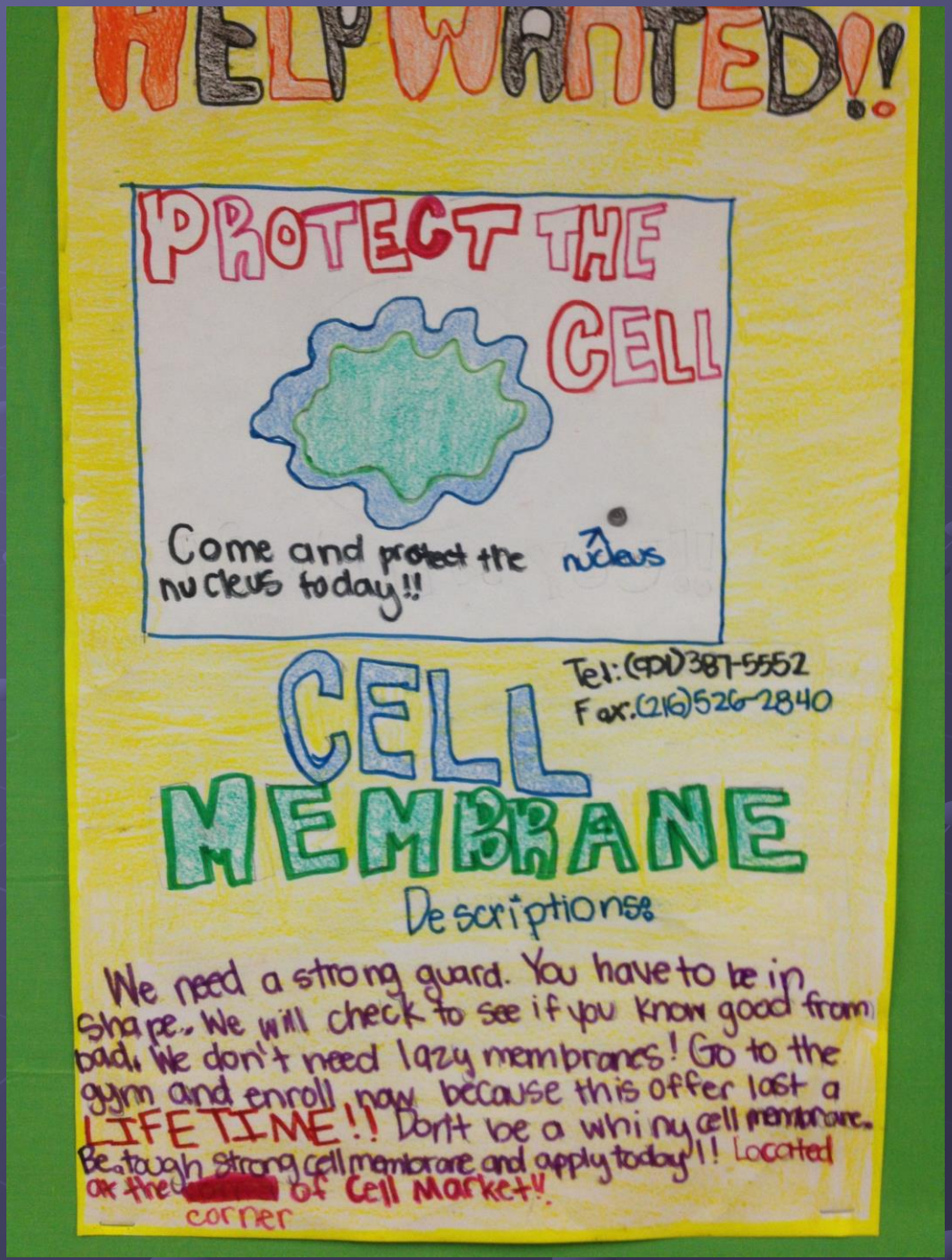


Cell Membrane

- Surrounds the cell and decides what comes in and out
- Semi-permeable: allows nutrients in and waste products out
- Made of a phospholipid bilayer
- Also called Plasma Membrane

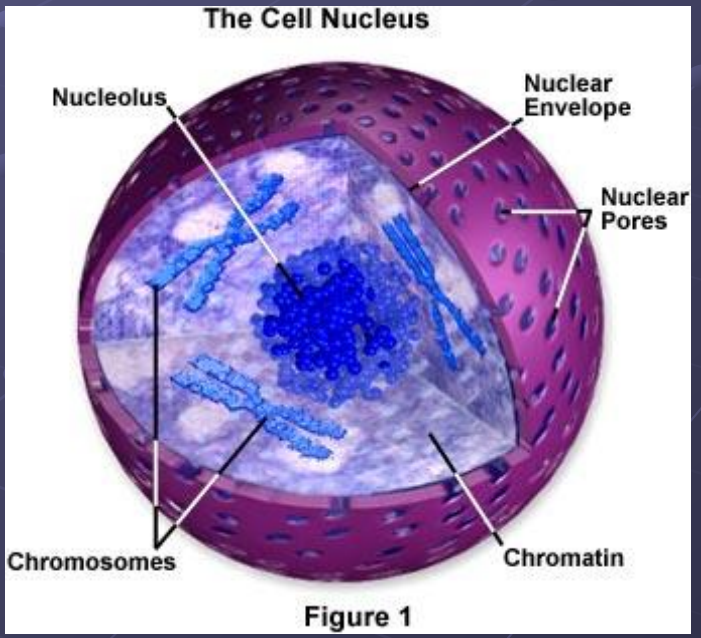


- **Factory Part:**
  - **Gates or Doors**
- **Found in:**
  - **Plant cells**
  - **Animal cells**
  - **Prokaryotic cells**

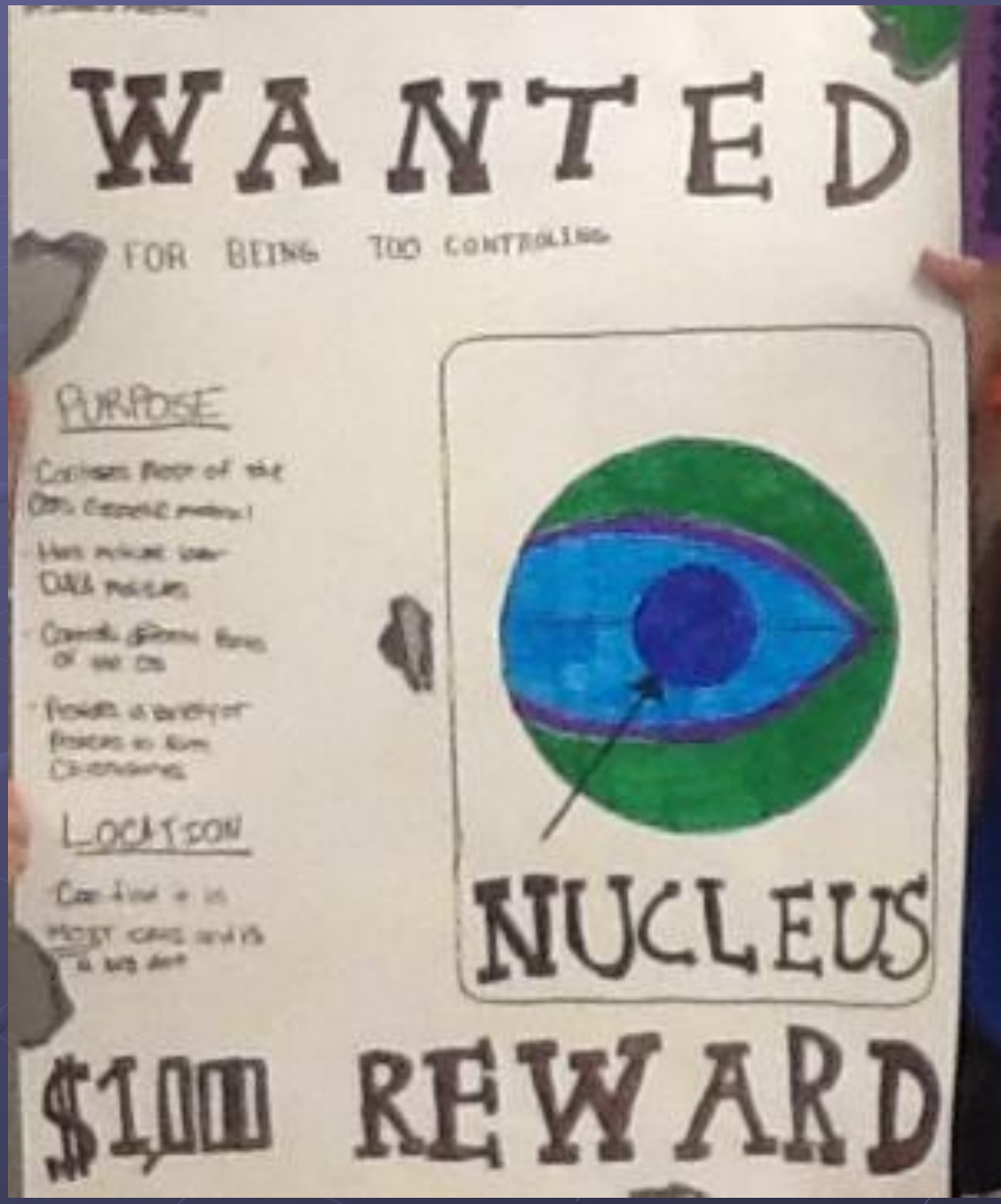


Nucleus

- Control center of the cell
- Stores DNA (chromosomes)
- Surrounded by the nuclear membrane
  - Pores let material in and out
- Also contains the Nucleolus, which makes ribosomes

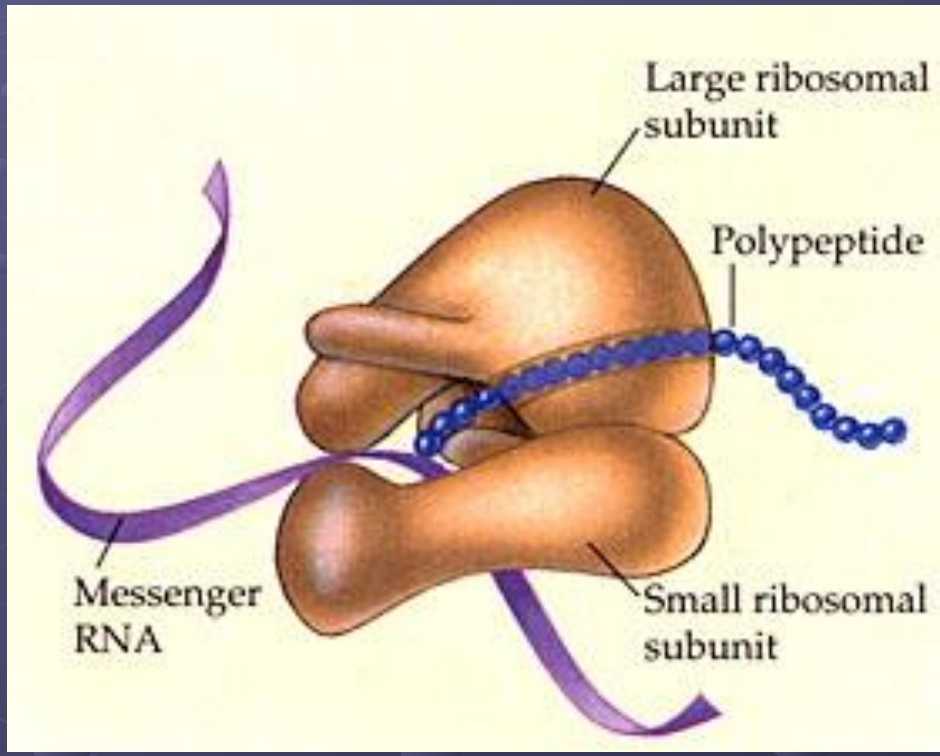


- **Factory Part:**
  - **Manager's Office**
- **Found in:**
  - **Plant cells**
  - **Animal cells**



Ribosome

- Smallest organelle
- NOT surrounded by a membrane
- Makes proteins according to DNA instructions.
- Two Types:
  - Free ribosomes: float free in cytosol
  - Bound ribosomes: attached to rough ER

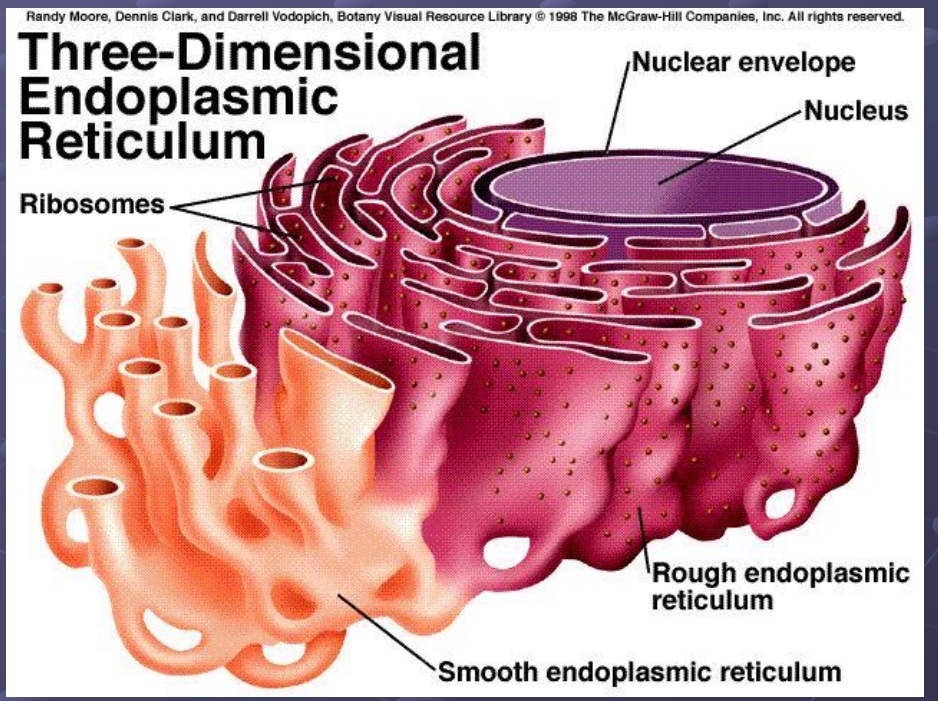


That looks familiar…what is a **polypeptide**?

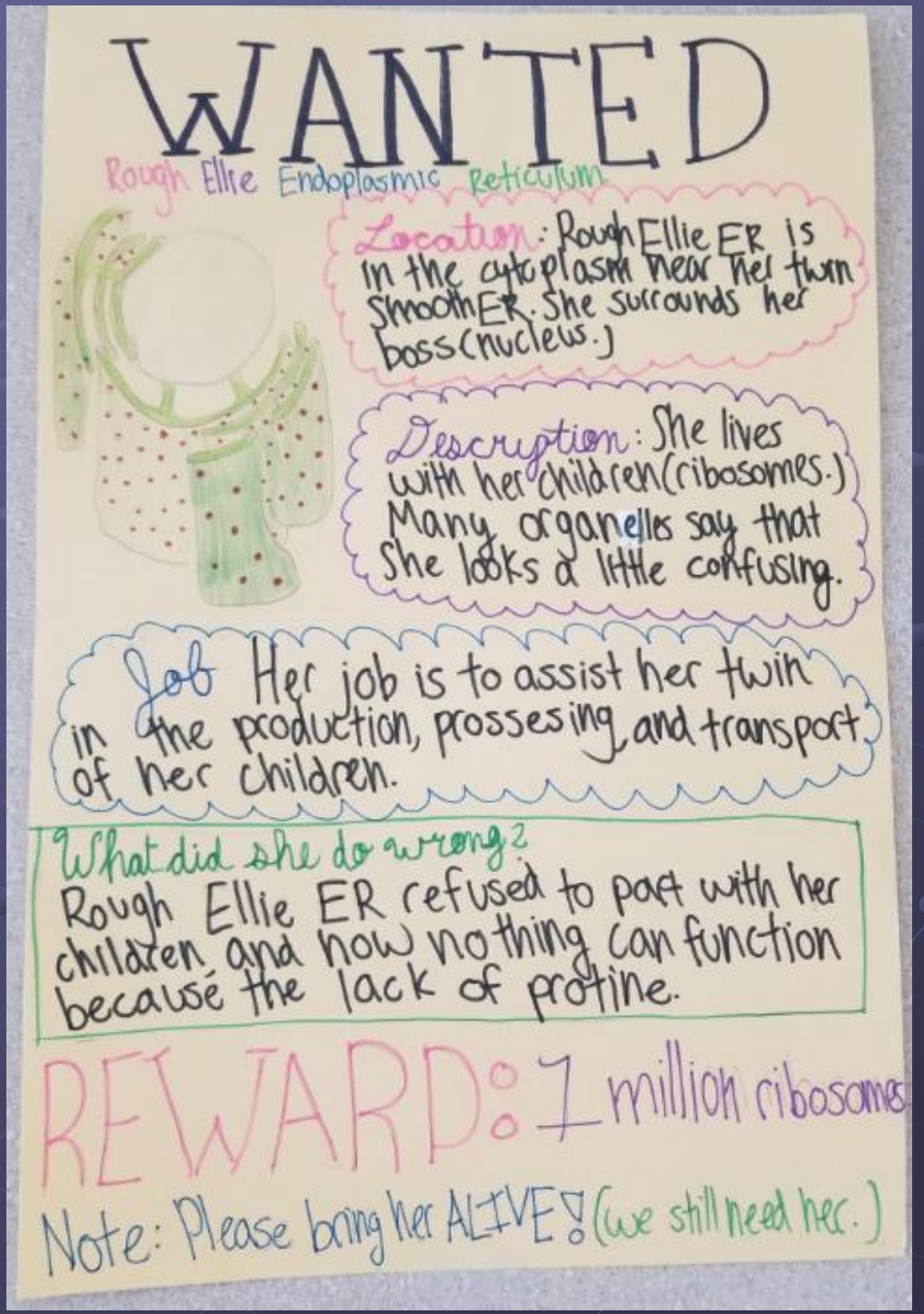
- **Factory Part:**
  - **Machines**
- **Found in:**
  - **Plant cells**
  - **Animal cells**
  - **Prokaryotic cells**

Rough Endoplasmic Reticulum

- **Transport system for materials in cell**
- **<u>Rough ER</u>: covered with ribosomes; site of protein synthesis**

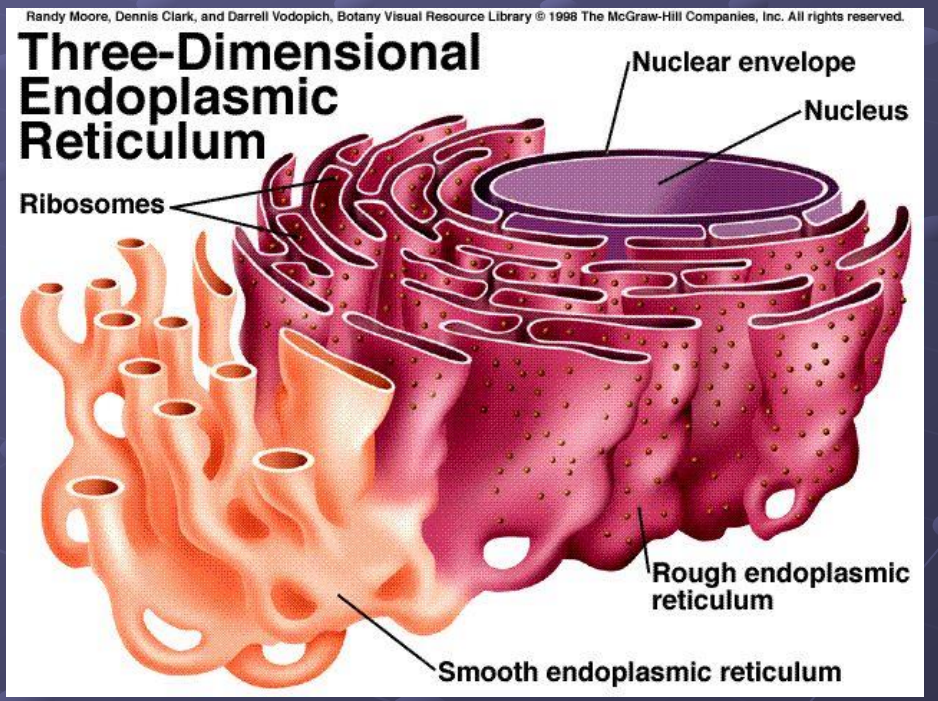


- **Factory Part:**
  - **Conveyor Belts**
- **Found in:**
  - **Plant cells**
  - **Animal cells**

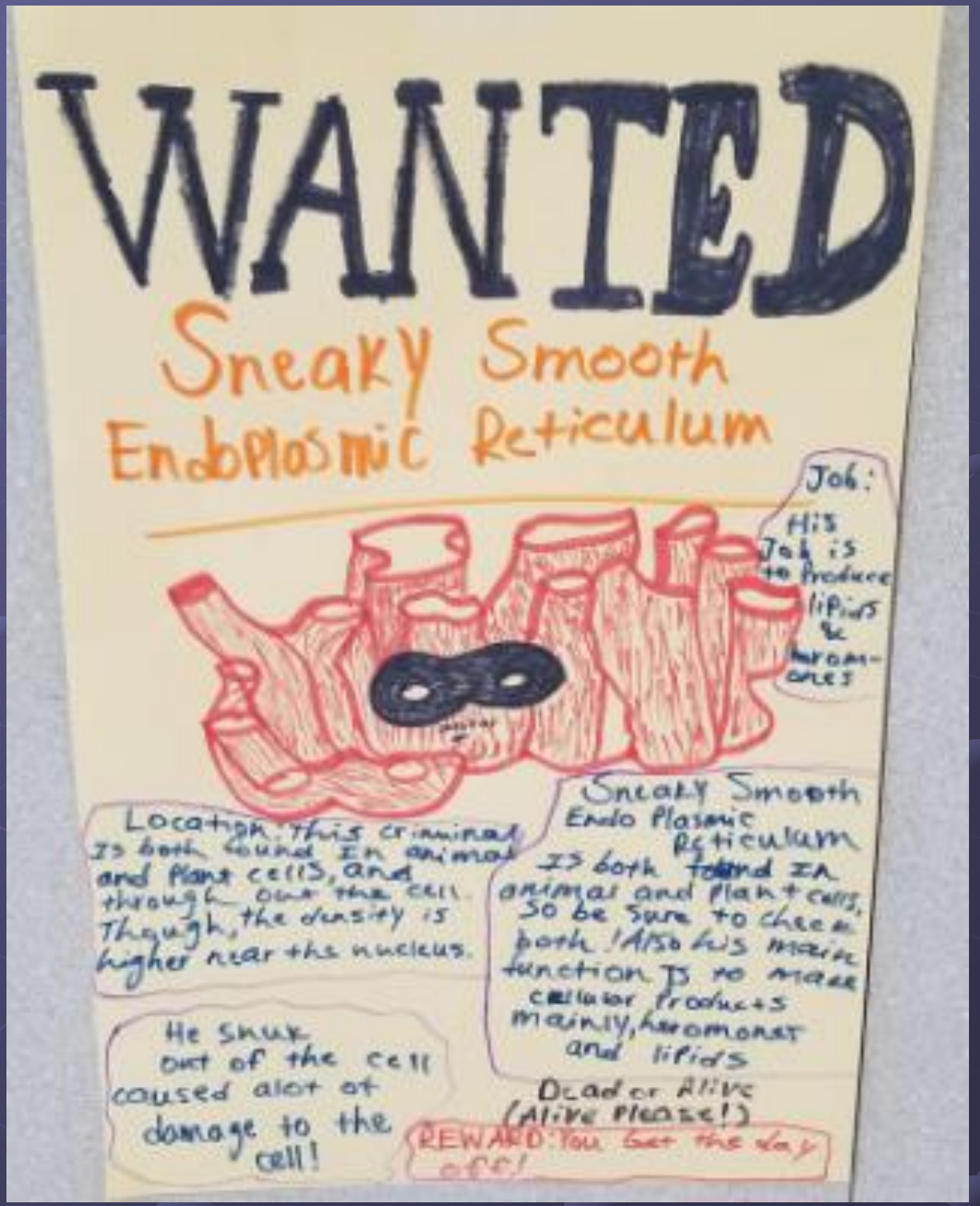


Smooth Endoplasmic Reticulum

- **Transport system for materials in cell**
- **<u>Smooth ER</u>: NO ribosomes; it makes hormones & lipids**

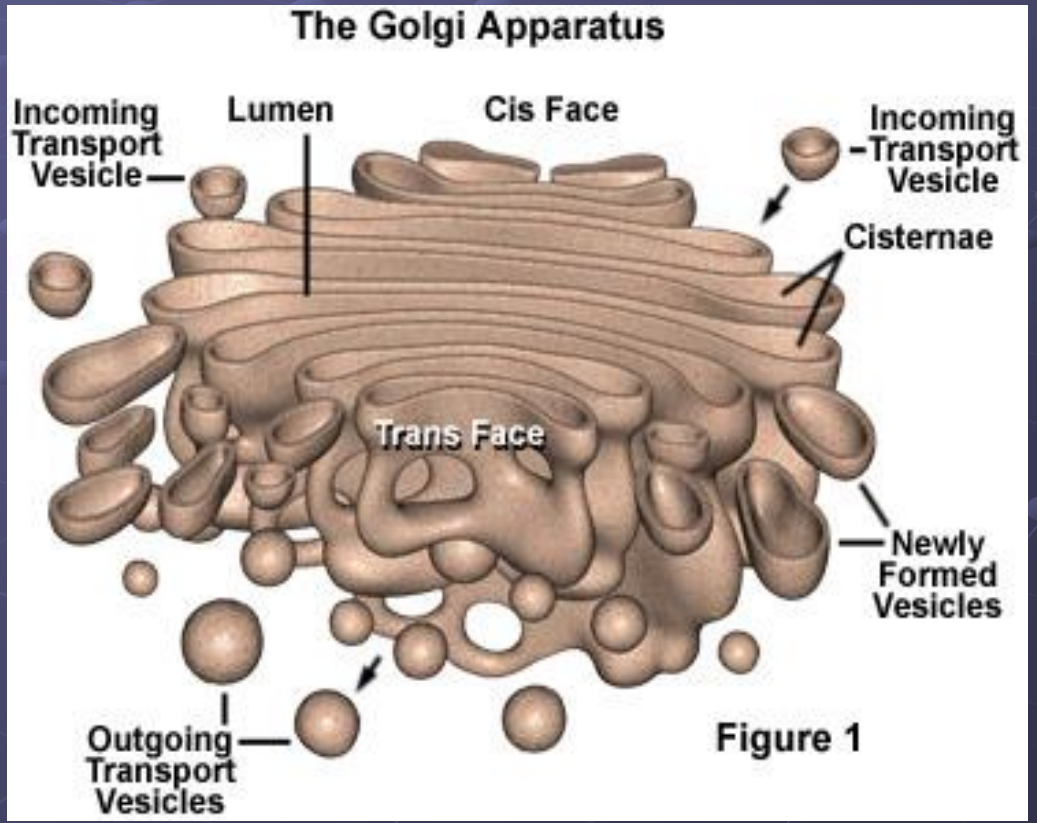


- **Factory Part:**
  - **Conveyor Belts**
- **Found in:**
  - **Plant cells**
  - **Animal cells**

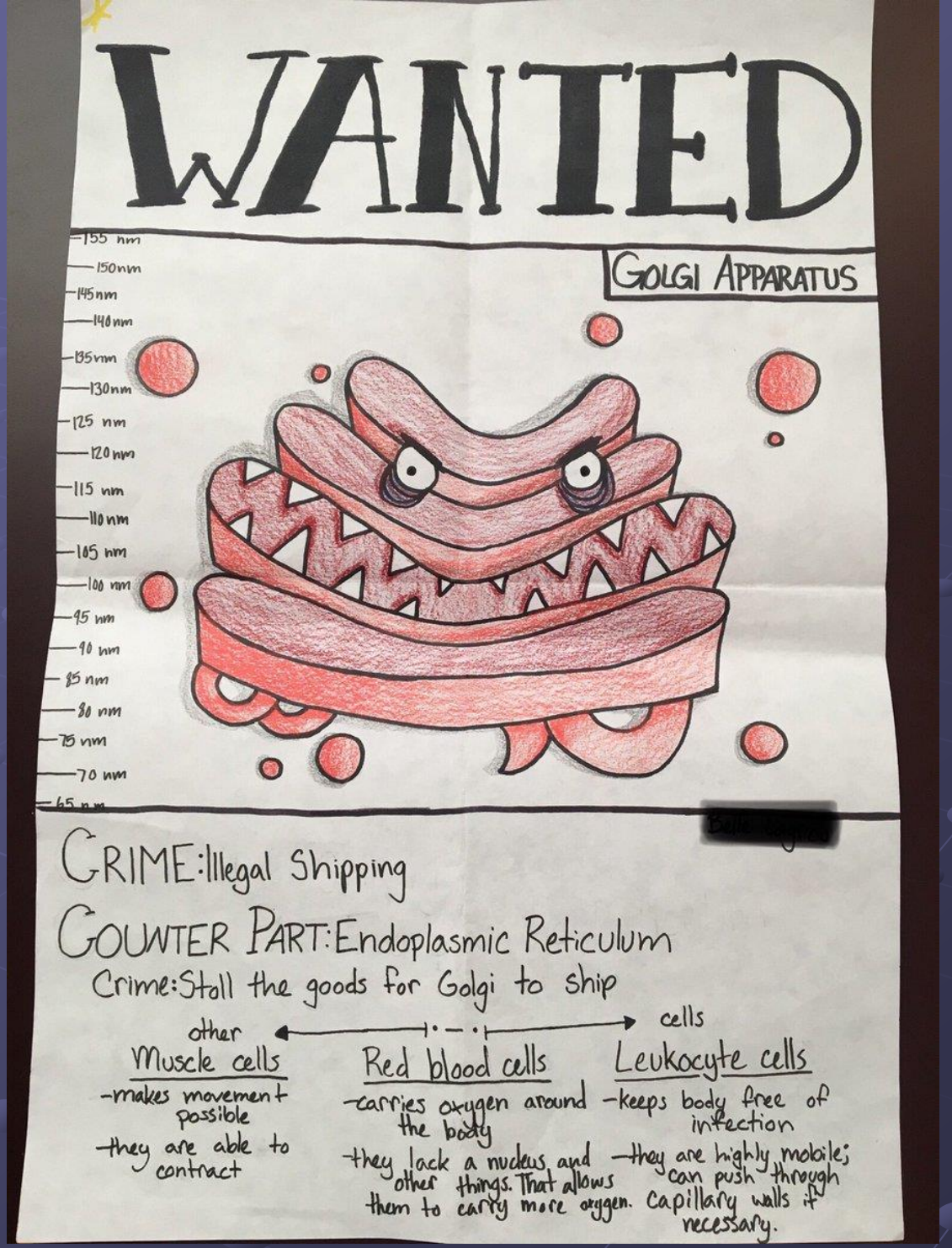


Golgi Apparatus

- Delivery system of the cell
- Collects, modifies, and packages molecules in the cell
- Distributes and transports molecules in vesicles

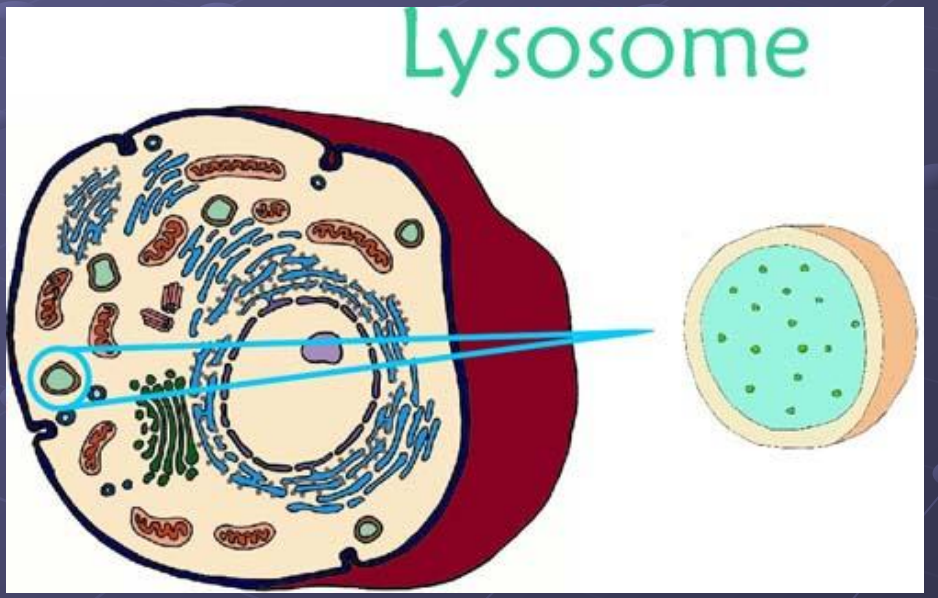


- **Factory Part:**
  - **Post office or Mail Room**
- **Found in:**
  - **Plant cells**
  - **Animal cells**

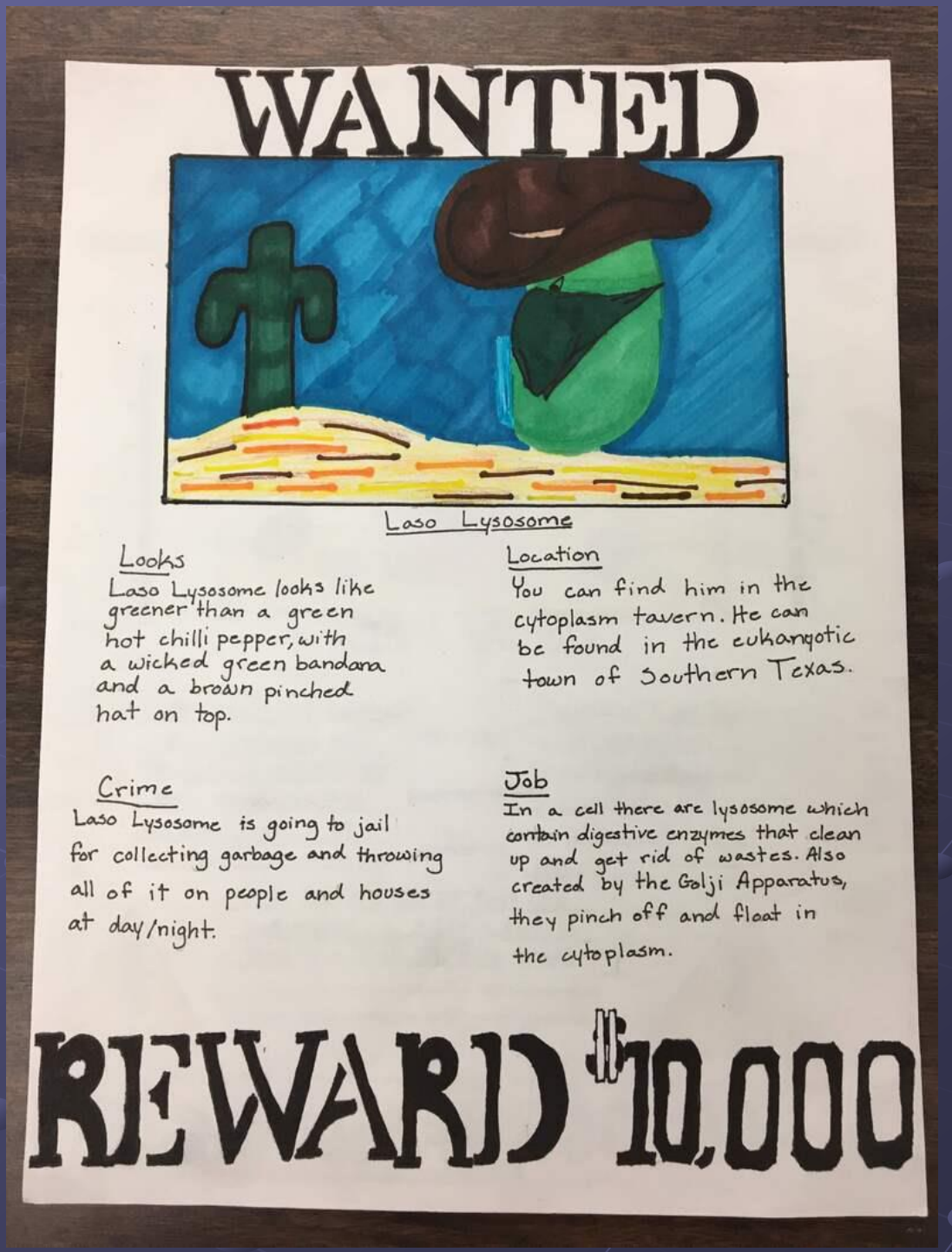


Lysosomes

- Trash Disposal of the cell
- Contain digestive enzymes that break down waste

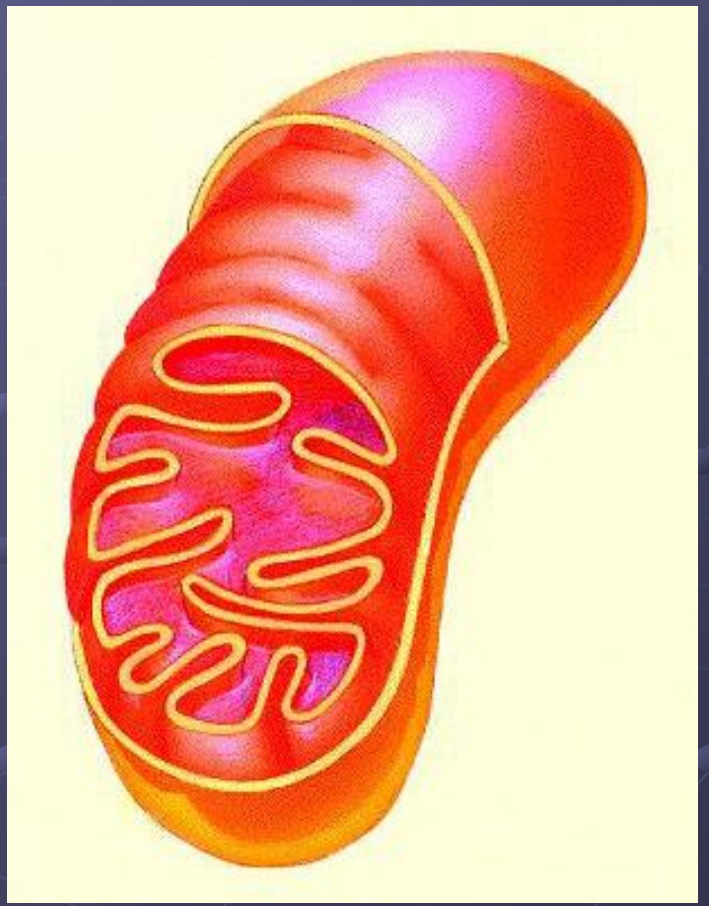


- **Factory Part:**
  - **Janitors**
- **Found in:**
  - **Plant cells**
  - **Animal cells**



Mitochondria

- "Powerhouse" of the cell
- Site of cellular respiration
- Converts energy stored in food into energy the cell needs – ATP



- **Sugar + Oxygen → Carbon dioxide + Water + ATP**

ATP = Adenosine triphosphate

- **Factory Part:**
  - Power Plant / Electrical Room
- **Found in:**
  - Plant cells
  - Animal cells

WANTED!

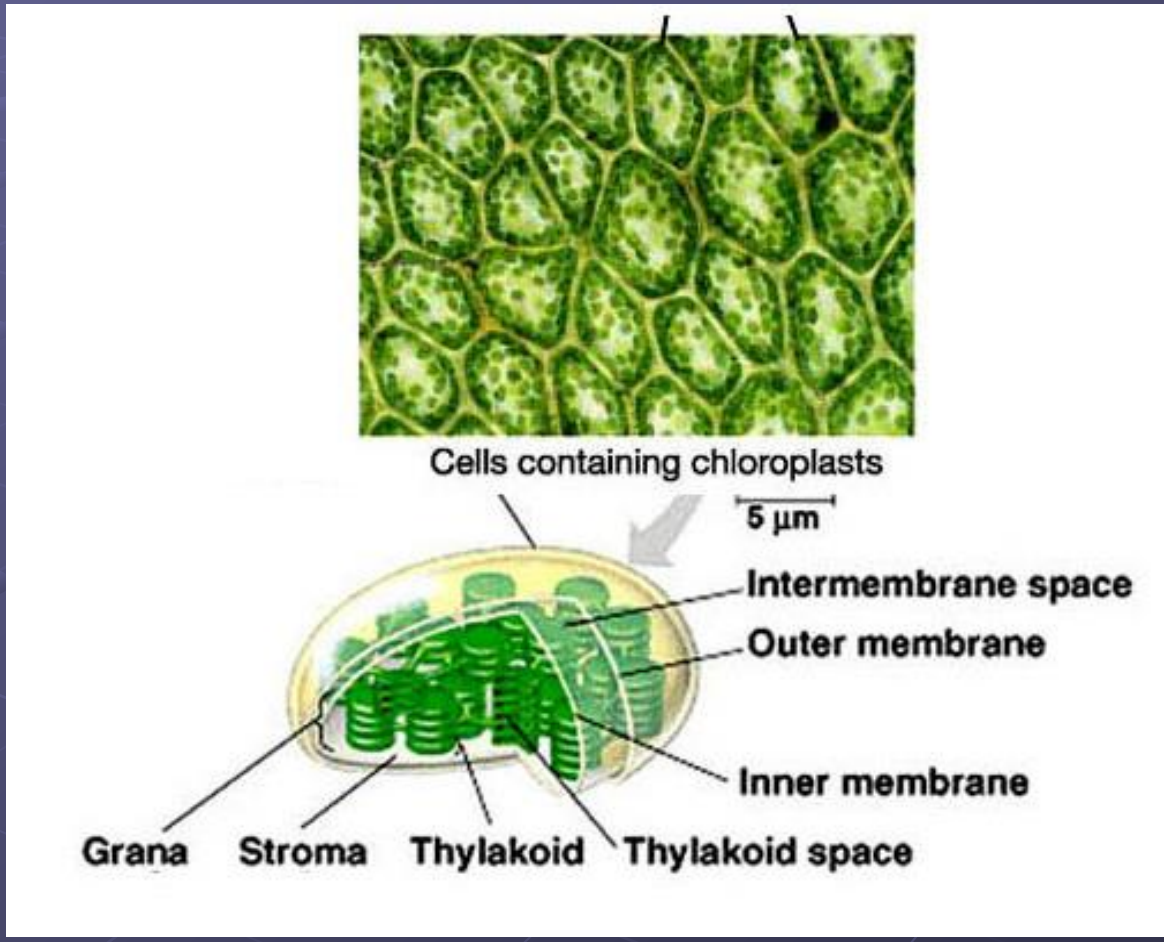
"The Malicious Mitochondria"

Other alias: "The Powerhouse of the Cell"
Height: 46 µm tall
Shape: Oblong
Last seen: In the cytoplasm outside the nucleus of the cell.
Wanted For: Escaping fromit's cell duties. May be illegally producing ATP for other cells.

Other information: The Malicious Mitochondria is a membrane-bound organelle, and like the nucleus has a double membrane. The outer membrane is fairly smooth, but the inner membrane is highly intricate, and forms folds called cristae. It is on these cristae that food (sugar) is combined with oxygen to produce the ATP - the primary energy source for the cell. He is carrying deoxyribonucleic acid and ribosomes, both of which aid in ATP production.

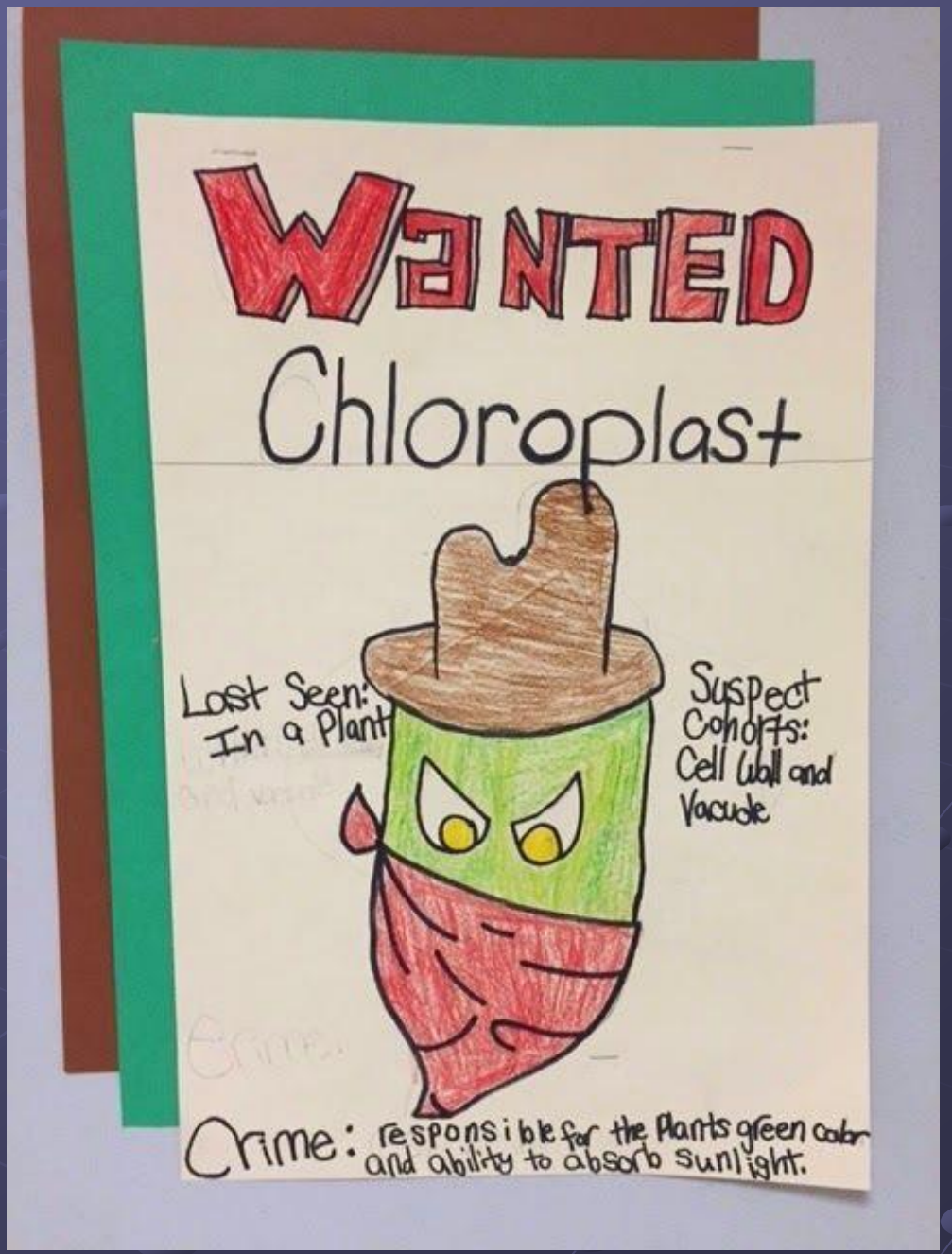
Chloroplast

- Found only in plant cells and algae
- Contains green pigment, chlorophyll
- Changes sunlight (solar energy) into food like glucose (chemical energy)



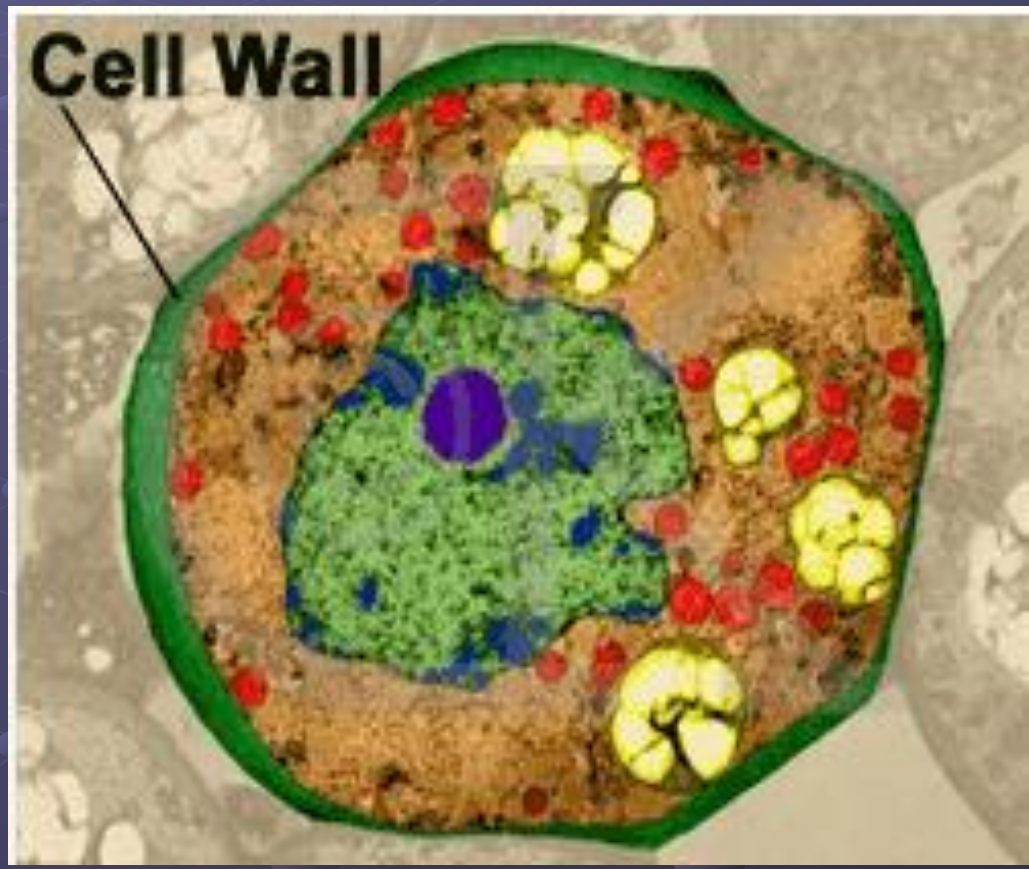
Sunlight + Carbon Dioxide + Water → Sugar + Oxygen

- **Factory Part:**
  - **Solar Powered Energy Panels**
- **Found in:**
  - **Plant cells**



Cell Wall

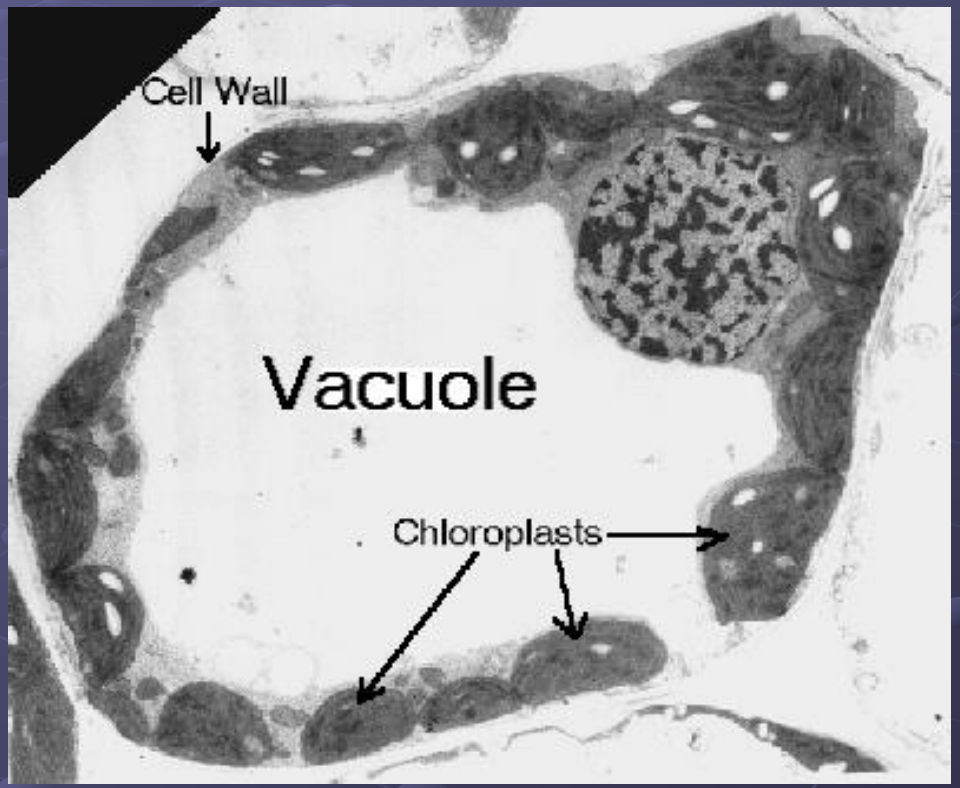
- Rigid, protective barrier (maintains cell shape)
- Found in plant and bacterial cells
- Located outside of the cell membrane
- Made of cellulose (Carbohydrate fiber)



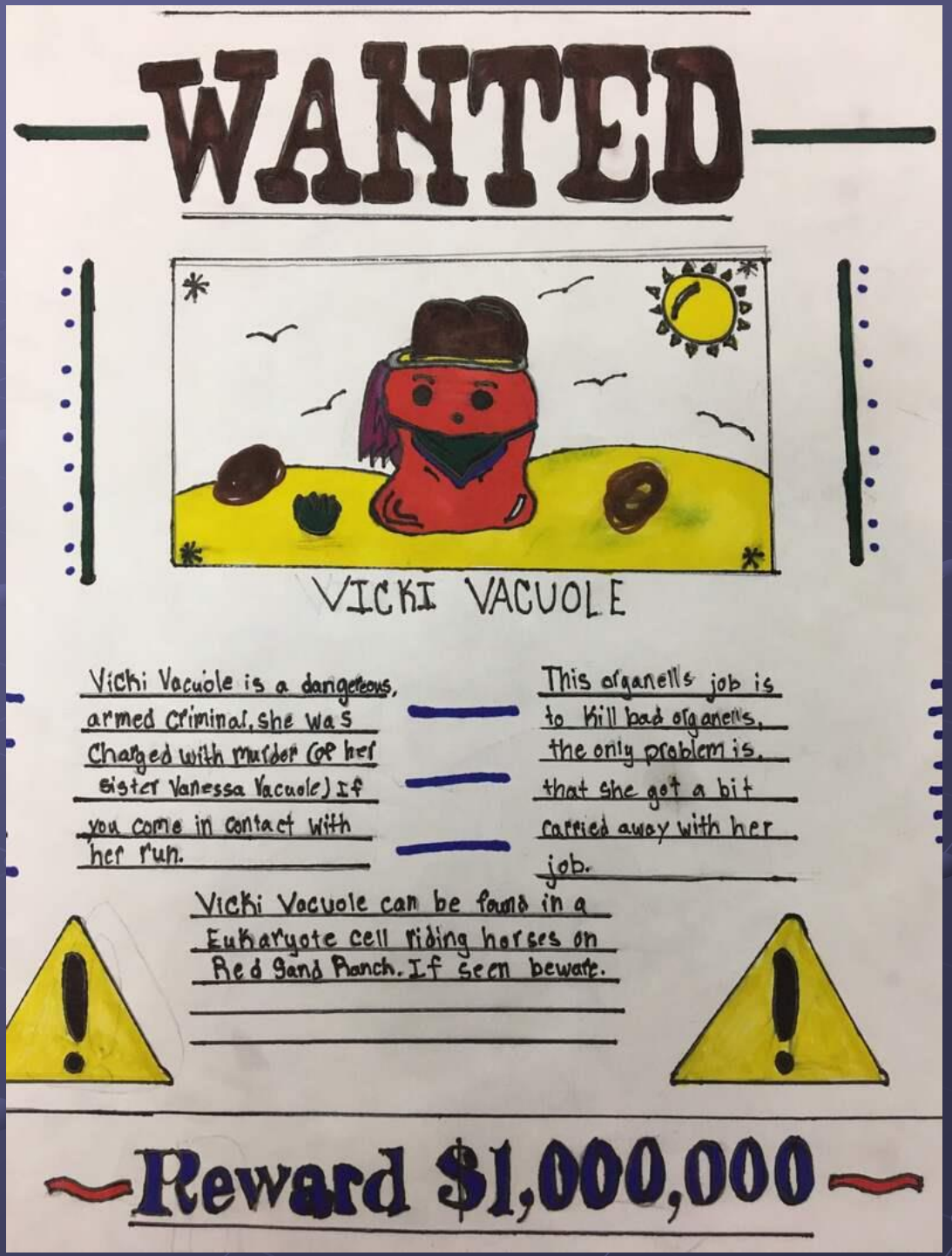
- **Factory Part:**
  - Factory Gates
- **Found in:**
  - Plant cells
  - Some Prokaryote cells

Vacuoles

- Large central vacuole usually in plant cells
- Many smaller vacuoles in animal cells
- Storage container for water, food, enzymes, wastes, etc
- Supports cell shape in plants

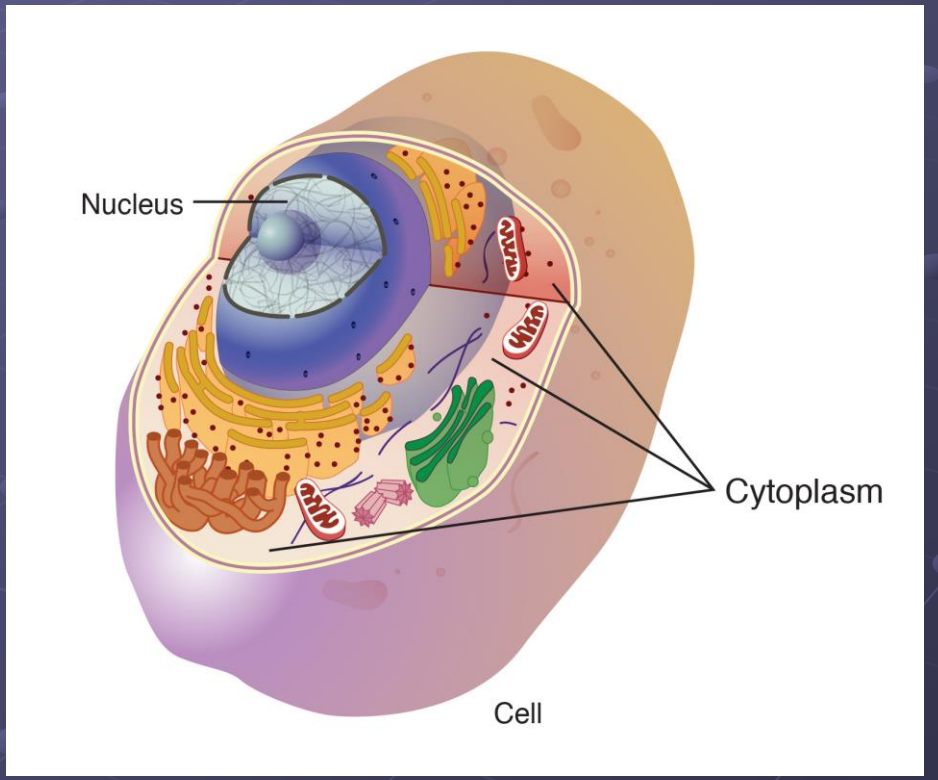


- **Factory Part:**
  - Storage room
- **Found in:**
  - Plant cells
  - Animal cells (smaller)



Cytoplasm

- Gelatinous liquid that fills the inside of a cell
- It is the medium for chemical reaction.
- It provides a platform upon which other organelles can operate within the cell



- **Factory Part:**
  - Space/Ground
- **Found in:**
  - Plant cells
  - Animal cells