

CELL BIOLOGY LAB

Pre-lab Resources

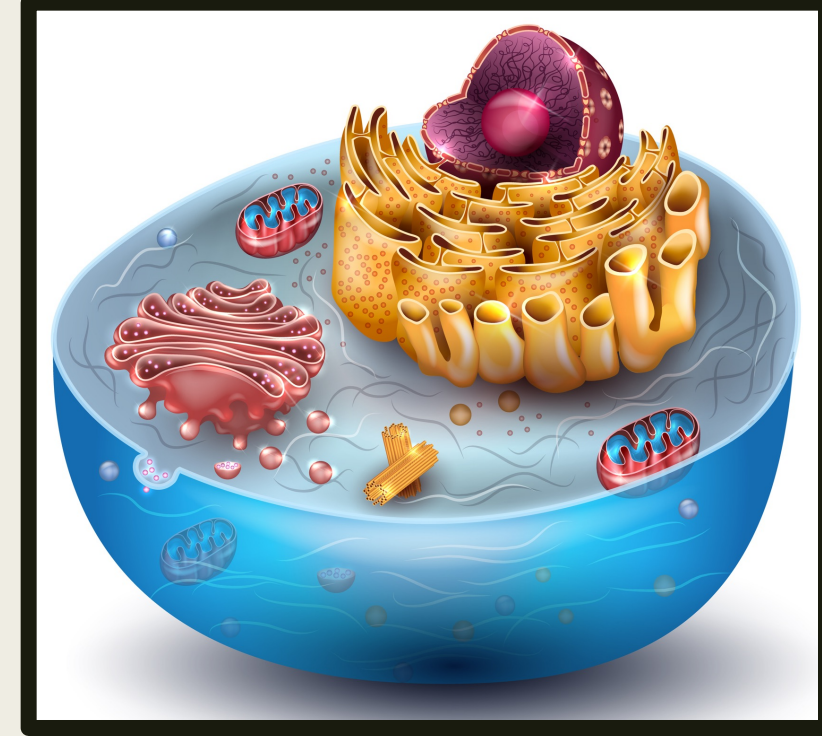
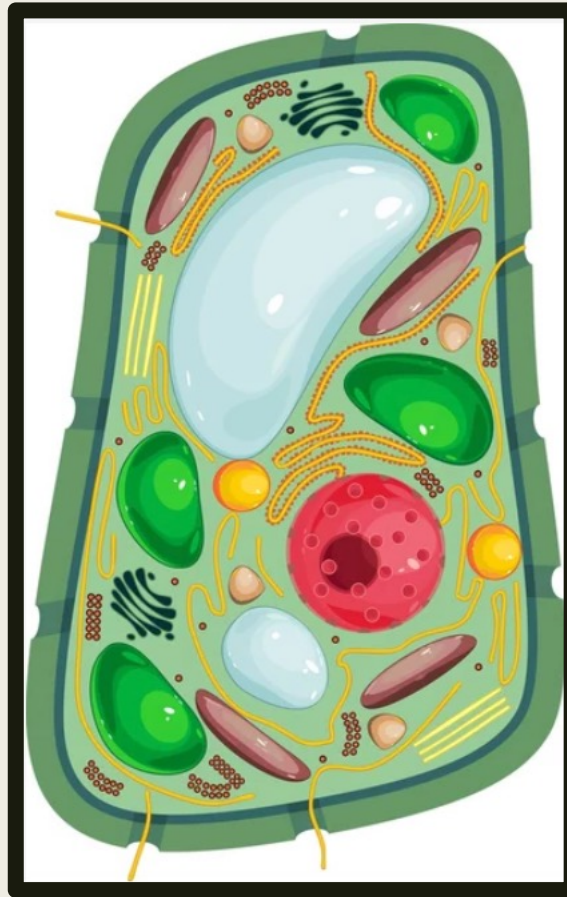
Dr. Lisa Brinn

Learning Outcomes

- Identify the structures of an animal cell.
- Outline the functions of the membranous and some non-membranous organelles.

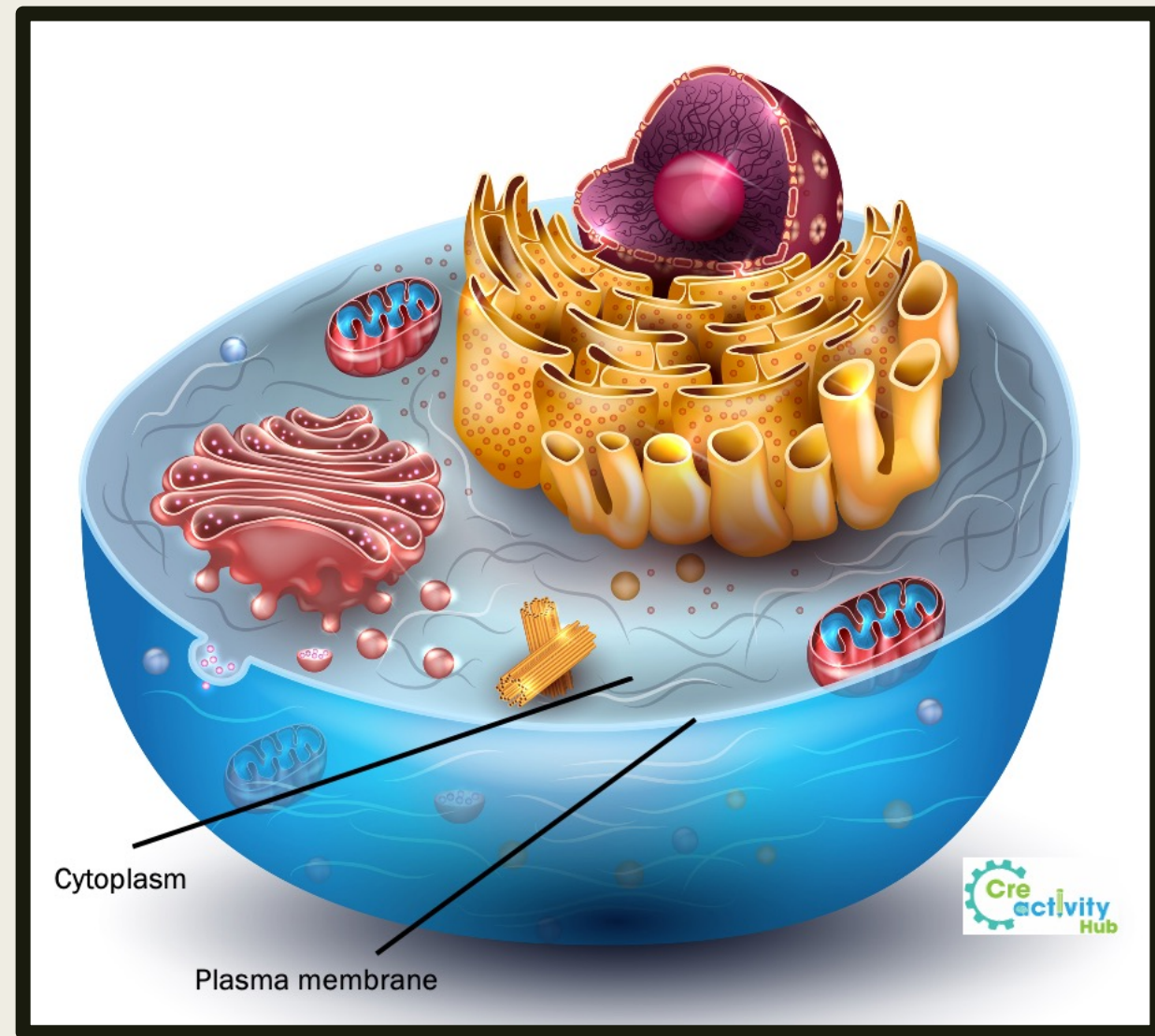
Cells

- Smallest living units
- Common structures
 - *Cell membrane*
 - *Cytoplasm*
 - *DNA*
- Categories
 - *Eukaryotic*
 - Have organelles
 - *Prokaryotic*
 - Don't have organelles



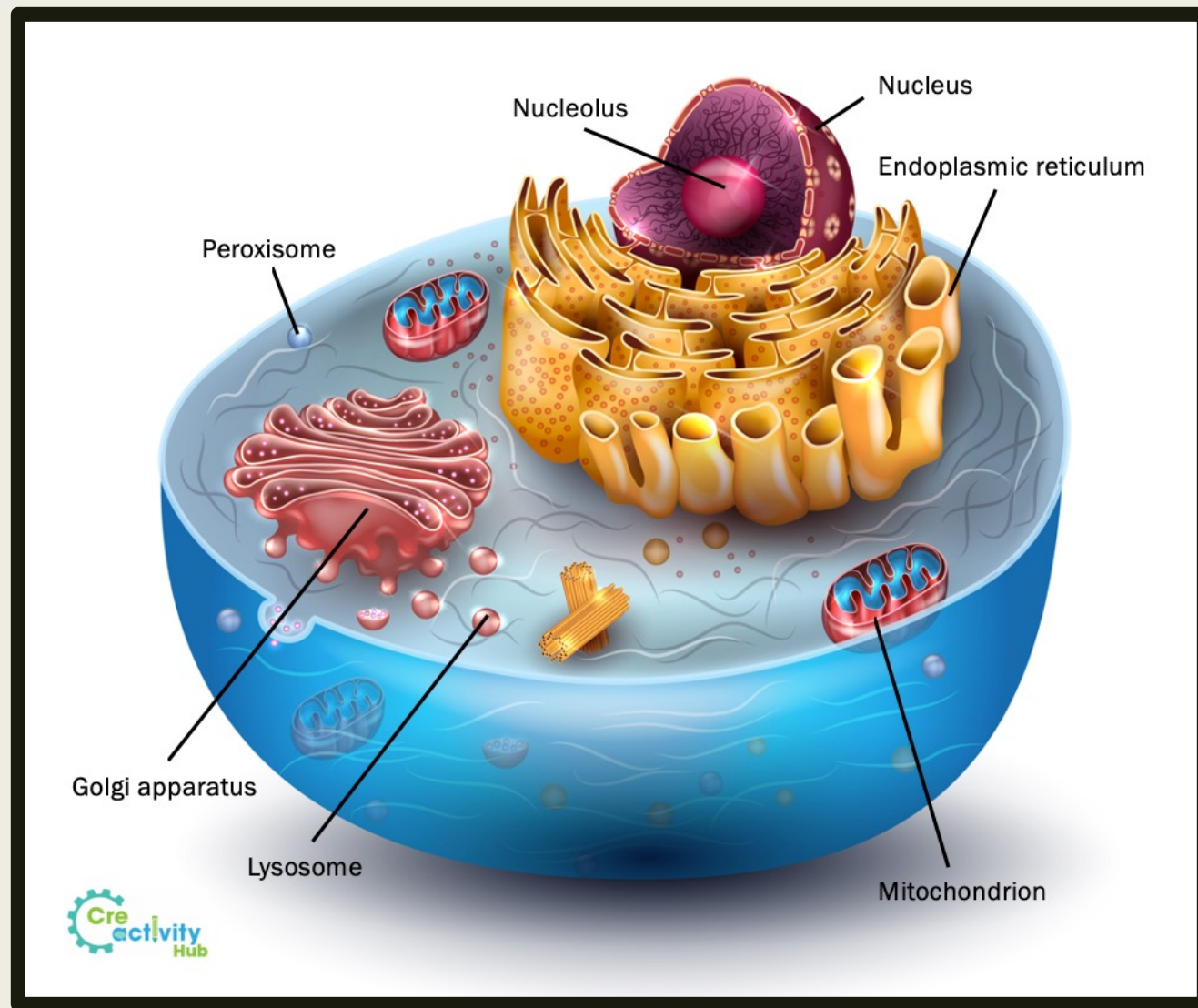
Cell Composition

- Cell membrane
 - *Function:*
 - Isolate
 - Protect
 - Support
 - Control entrance and exit
- Cytoplasm → cytosol + organelles
 - *Organelles*
 - Diverse with specific functions
 - *Cytosol*
 - Contains:
 - *Nutrients*
 - *Proteins*
 - *Wastes*
 - *Ions* - ↑ concentration of K^+
 - Allows for diffusion



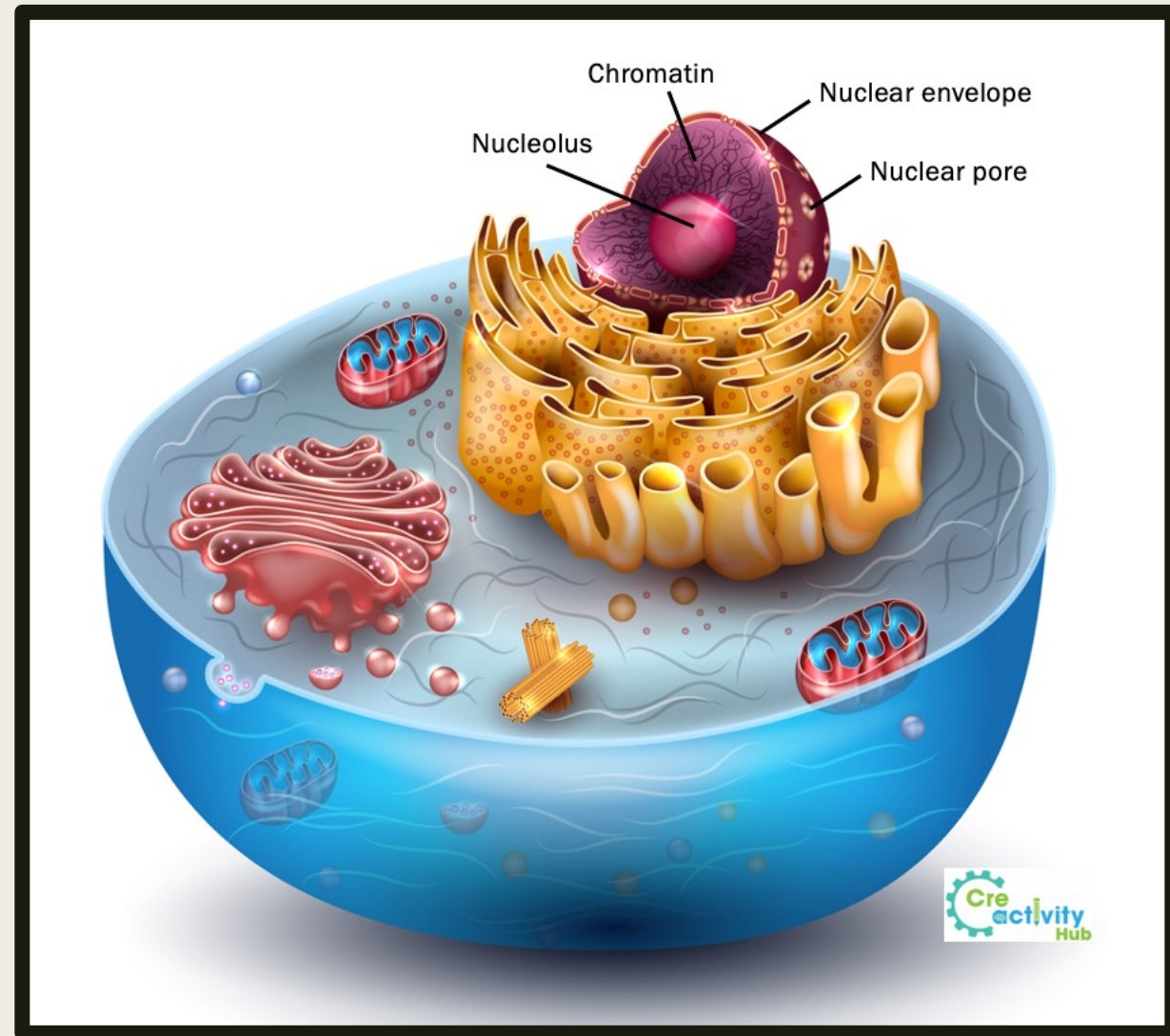
Organelles

- Definition – little organs
- Examples of organelles
 - *Nucleus*
 - *Nucleolus*
 - *Endoplasmic reticulum*
 - *Mitochondria*
 - *Golgi apparatus*
 - *Vesicles*
 - Lysosomes
 - *Peroxisome*



Nucleus

- Cell control center
- Contains:
 - *DNA*
 - Chromatin
 - Chromosomes
 - *Nucleolus*
 - Makes ribosomes

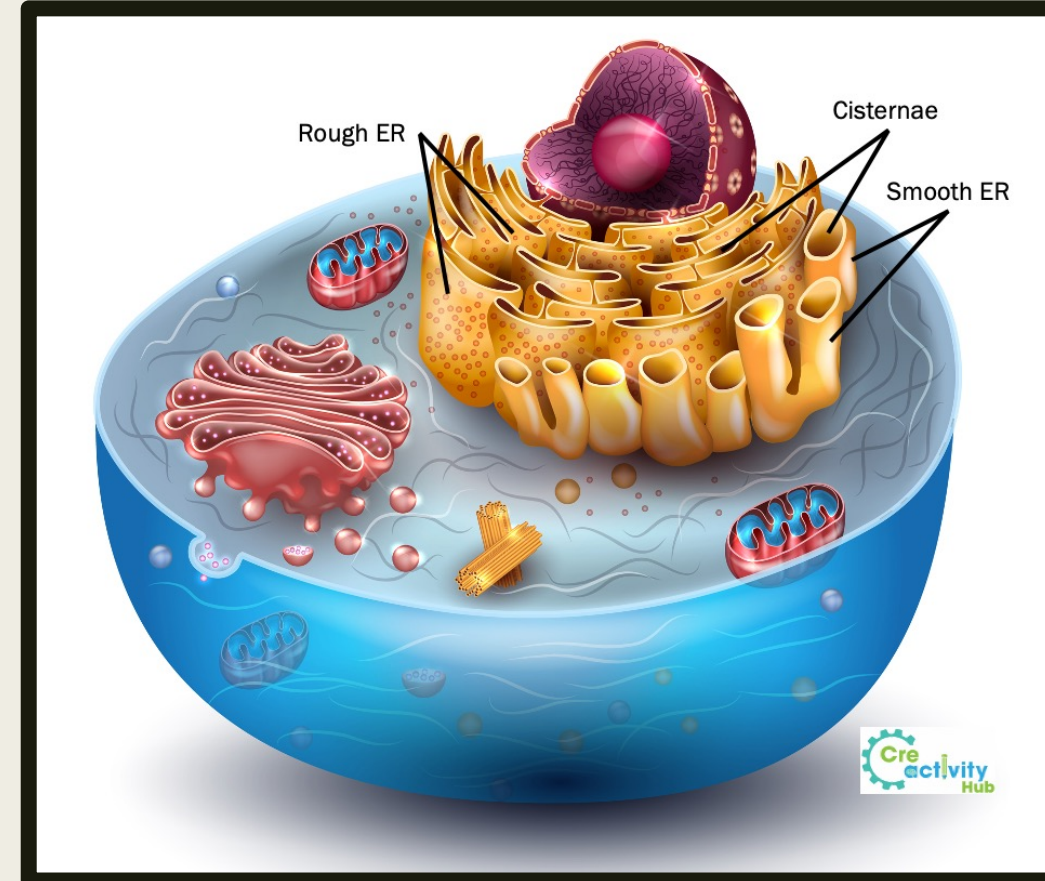


Endoplasmic Reticulum (ER)

1. Rough endoplasmic reticulum
2. Smooth endoplasmic reticulum

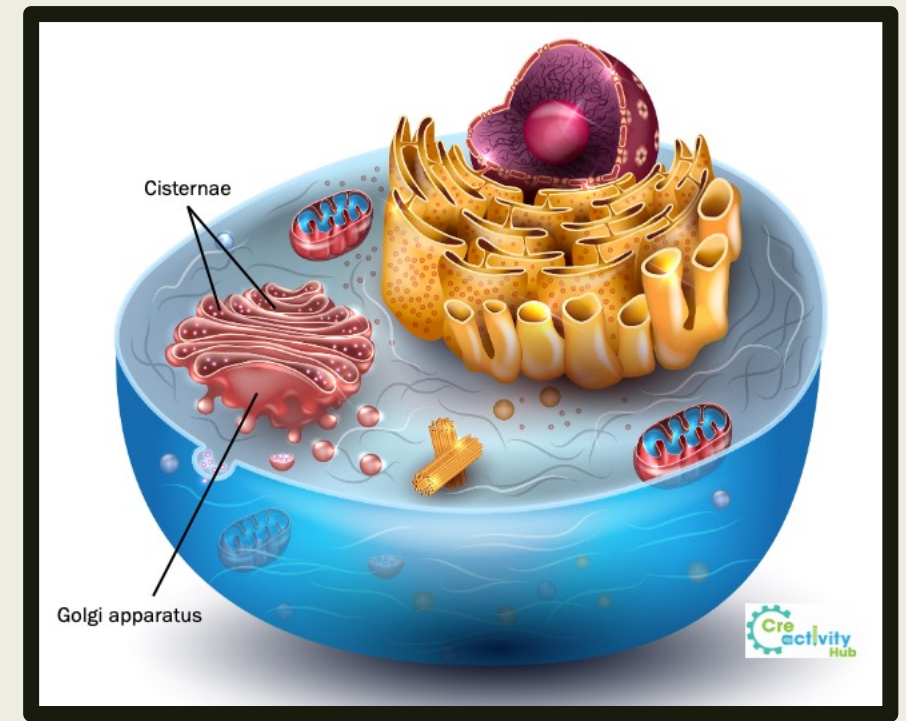
■ Functions:

- *Synthesis*
- *Storage*
- *Transport*
- *Detoxification*



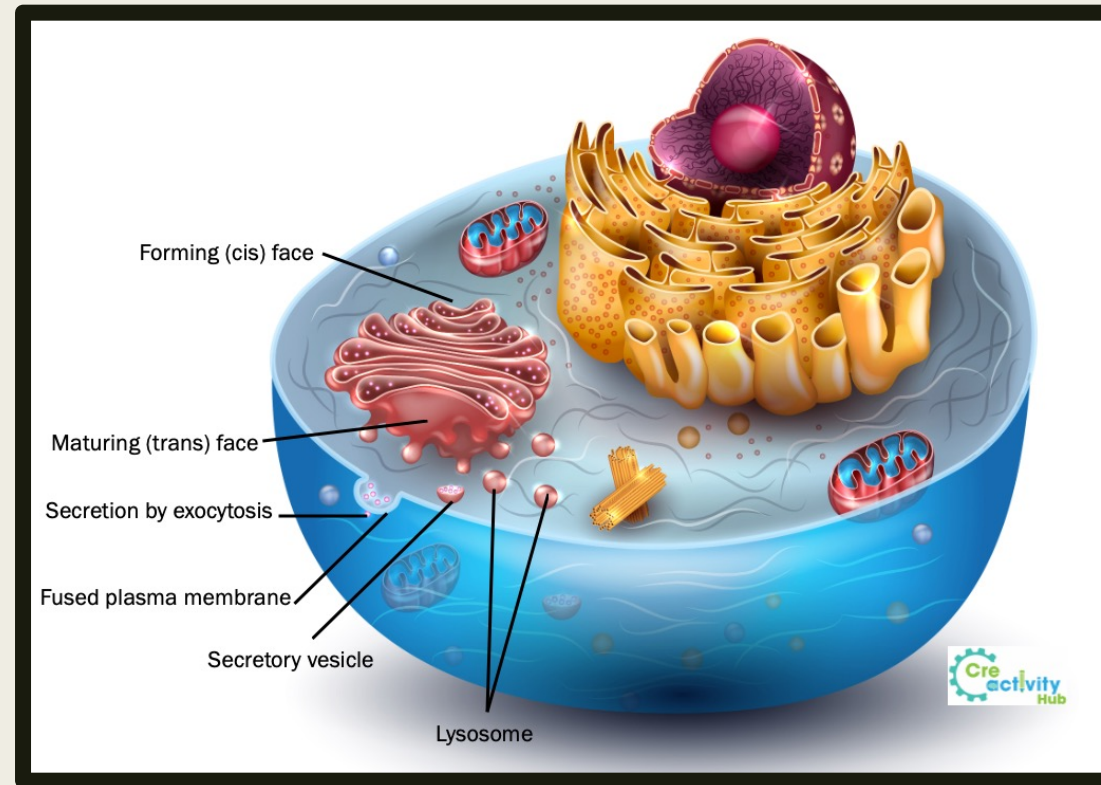
Golgi Apparatus

- Also known as:
 - *Golgi body*
 - *Golgi complex*
- Functions:
 - Package enzymes for use in the cytosol
 - Renew or modify the plasma membrane
 - Synthesize and package secretions



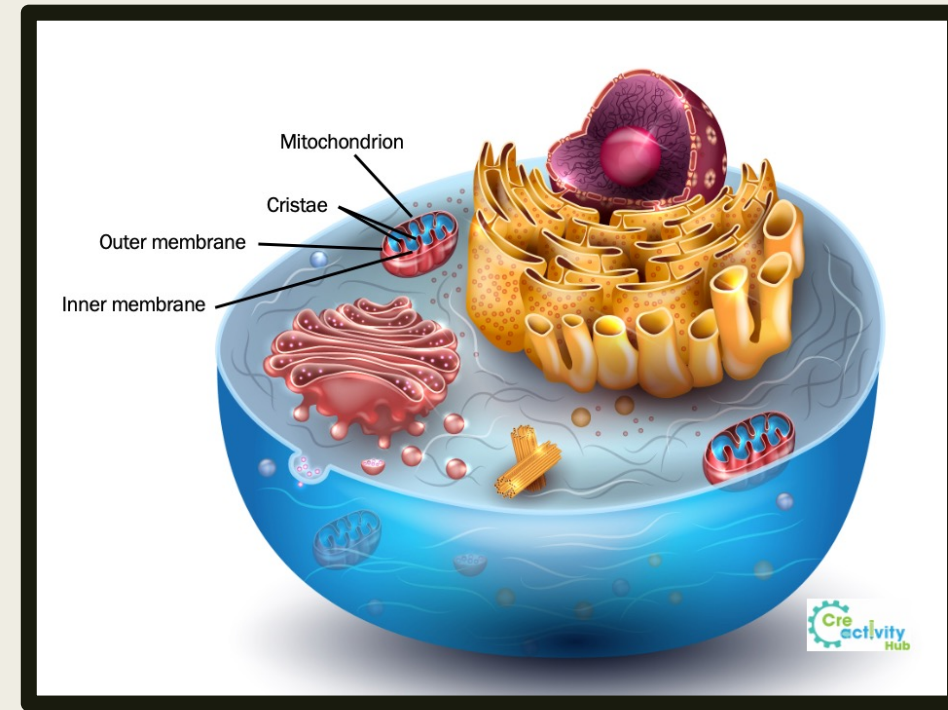
Secretory Vesicles

1. Package enzymes for use in the cytosol
 - Formation of lysosomes
2. Renew or modify the plasma membrane
 - Golgi apparatus
 - Loses membrane by forming vesicles
 - Gains membrane by fusion of transport vesicles
 - Golgi-generated vesicles → fuse with plasma membrane
 - Adds to cell surface area
3. Synthesize and package secretions
 - Formation of secretory vesicles → fuse with plasma membrane
 - Exocytosis – contents are released into extracellular fluid



Mitochondria

- Mitochondrion (singular)
- Double-layered membrane
 - *Outer membrane*
 - *Inner membrane*
 - Cristae (enzymes)
- Generates chemical energy
 - *Produces ATP*
 - Breaking down organic molecules that consume O_2 and generate CO_2



Peroxisomes

- Similar to lysosomes
 - Carry enzymes
 - But smaller
 - Carry different enzymes
- Formed by free ribosomes inserted into pre-existing peroxisomes
- Enzymes
 - Organic compounds $\xrightarrow{\text{oxidases}}$ H_2O_2

