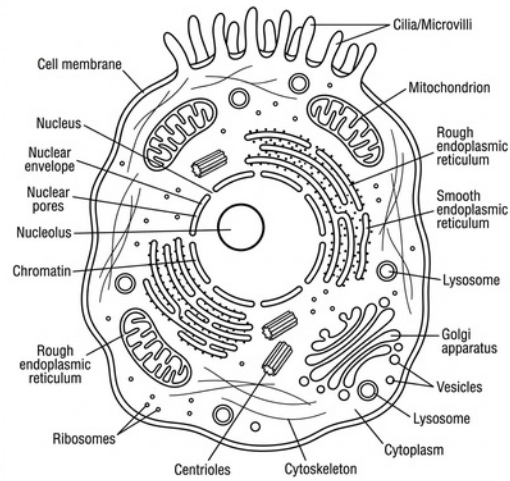


# CELL STRUCTURE & FUNCTION

## COLORING BOOK

Scientific Diagrams & 3D Illustrations

31 Cell Structures & Organelles



This coloring book features:

- 8 detailed scientific diagrams**
- 23 individual organelle outlines**
- Educational facts & color guides**
- A4 printable format**

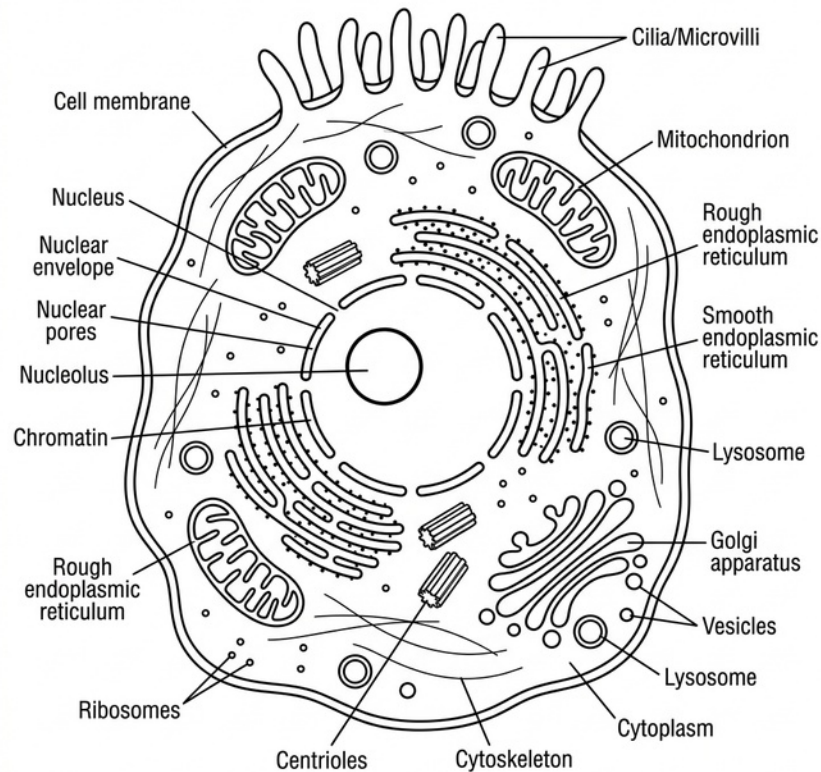
Perfect for biology students & teachers!

This book belongs to:

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# ANIMAL CELL

Cross-Section Diagram



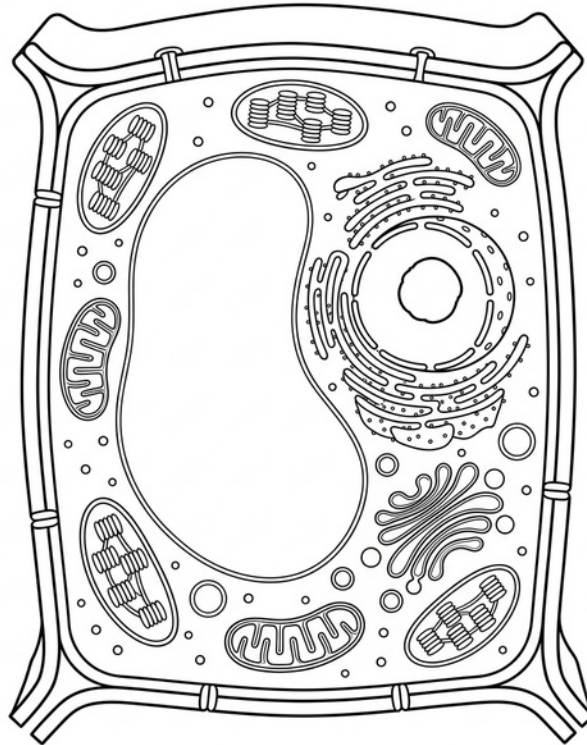
Color each organelle using the guide below. The animal cell has no cell wall and contains membrane-bound organelles.

## COLOR GUIDE:

Cell Membrane (light blue), Nucleus (purple), Nucleolus (dark purple), Mitochondria (red/orange), Rough ER (pink with blue dots), Smooth ER (lavender), Golgi Apparatus (gold), Lysosomes (orange), Ribosomes (blue dots), Centrioles (dark blue), Vesicles (light green), Cilia (cyan)

# PLANT CELL

Cross-Section Diagram



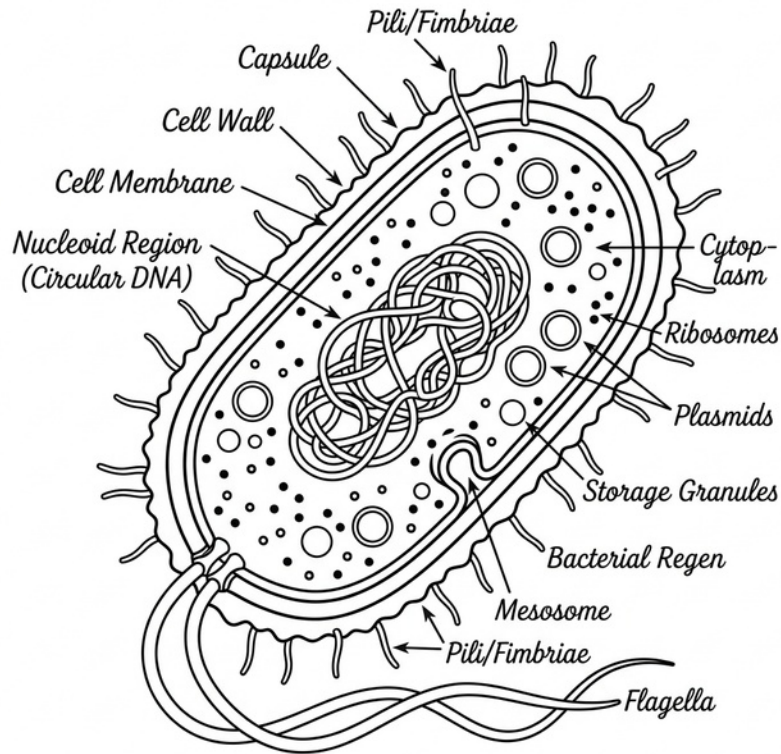
Plant cells have a rigid cell wall, large central vacuole, and chloroplasts for photosynthesis.

## COLOR GUIDE:

Cell Wall (brown), Cell Membrane (light blue), Central Vacuole (light blue/white), Nucleus (purple), Chloroplasts (green), Mitochondria (red), Rough ER (pink), Golgi (gold), Plasmodesmata (green channels)

# BACTERIAL CELL

Prokaryotic Cell Diagram



Bacteria lack a membrane-bound nucleus. Their DNA floats freely in the nucleoid region.

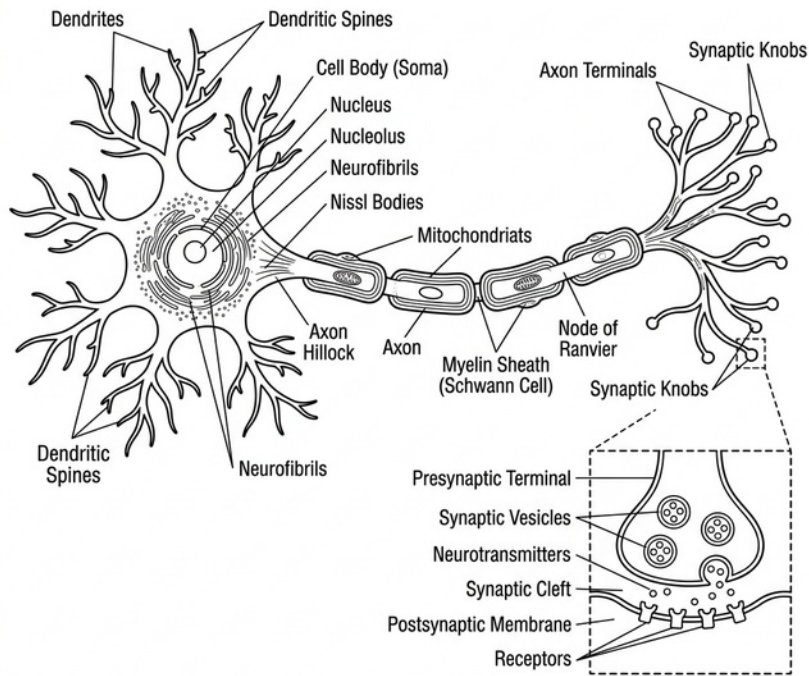
**COLOR GUIDE:**

Capsule (light yellow), Cell Wall (tan/brown), Cell Membrane (light blue), Nucleoid DNA (red loops), Plasmids (orange rings), Ribosomes (blue dots), Flagella (green), Pili (pink)

# NEURON

Nerve Cell Structure

## THE STRUCTURE OF A NEURON



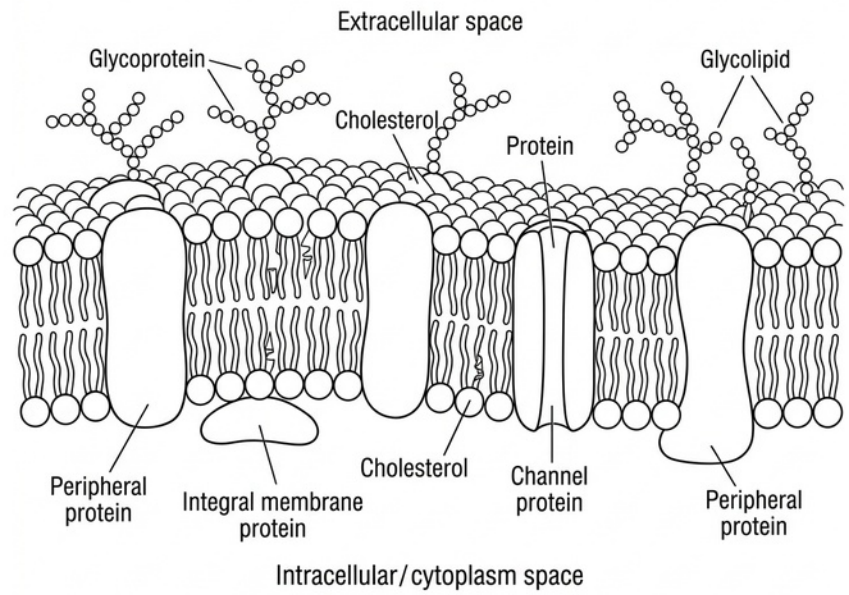
Neurons transmit electrical signals. Color the different parts to learn the signal pathway.

### COLOR GUIDE:

Cell Body/Soma (yellow), Dendrites (pink), Axon (light blue), Myelin Sheath (gold/orange segments), Nodes of Ranvier (white gaps), Axon Terminals (green), Nucleus (purple)

# CELL MEMBRANE

Fluid Mosaic Model



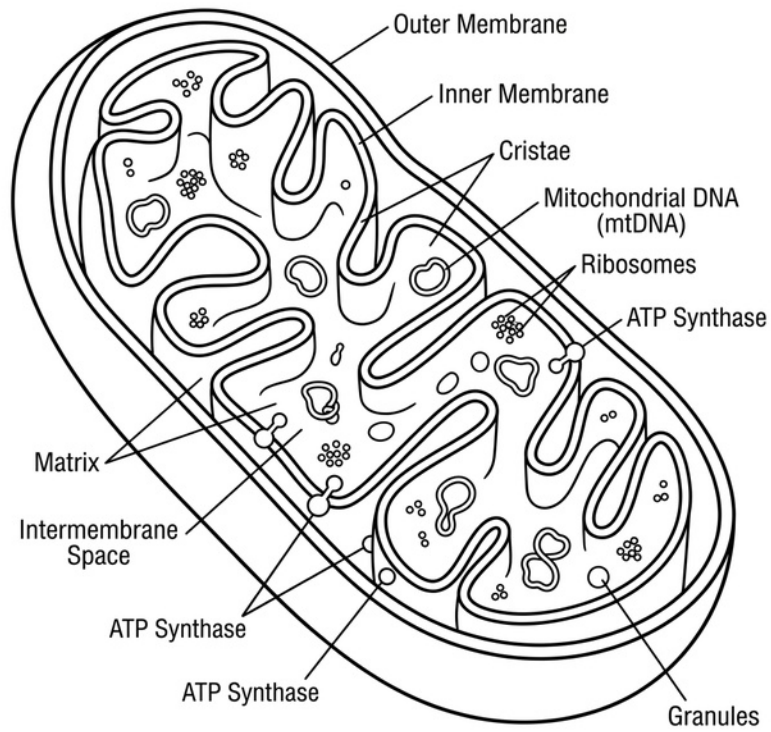
The cell membrane controls what enters and exits cells. It is made of a phospholipid bilayer with embedded proteins.

**COLOR GUIDE:**

Phospholipid Heads (blue circles), Phospholipid Tails (yellow), Integral Proteins (red/orange), Channel Proteins (green), Cholesterol (light purple), Glycoproteins (purple with pink chains)

# MITOCHONDRION

The Powerhouse of the Cell



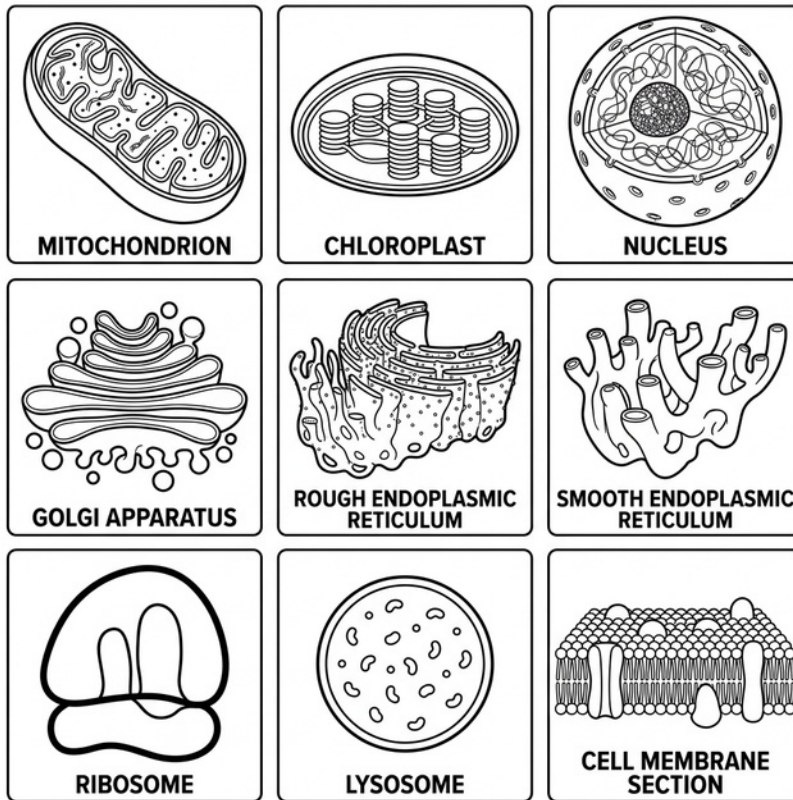
Mitochondria generate ATP (energy) through cellular respiration. Note the folded inner membrane.

**COLOR GUIDE:**

Outer Membrane (dark red), Inner Membrane (orange), Cristae Folds (orange/yellow), Matrix (light yellow), DNA (small blue loops), Ribosomes (blue dots), ATP Synthase (green)

# CELL ORGANELLES

Detailed Structure Comparison



Compare the internal structures of different organelles. Each has a unique shape related to its function.

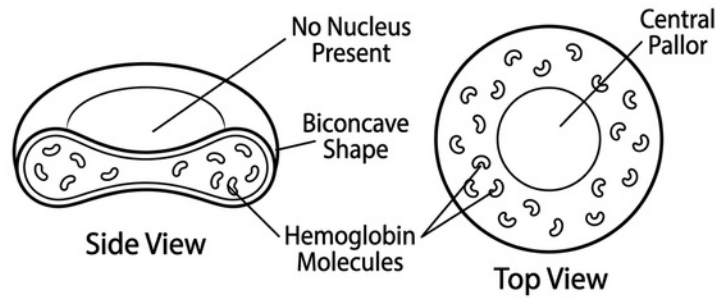
## COLOR GUIDE:

Mitochondrion (red/orange), Chloroplast (green), Nucleus (purple), Golgi (gold),  
 Rough ER (pink), Smooth ER (lavender), Ribosome (blue), Lysosome (orange), Membrane  
 (blue/yellow)

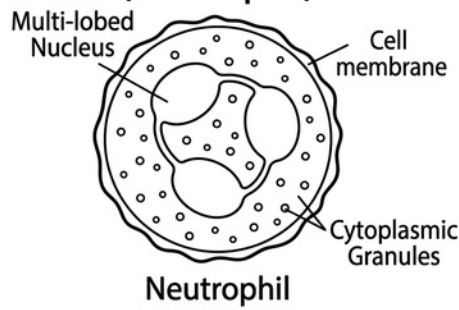
# BLOOD CELLS

Types of Blood Cells

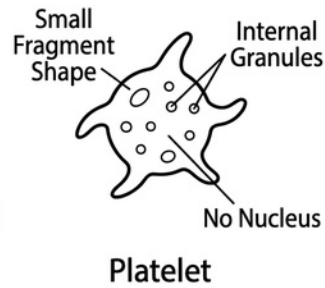
## Red Blood Cell (Erythrocyte)



## White Blood Cell (Neutrophil)



## Platelet (Thrombocyte)



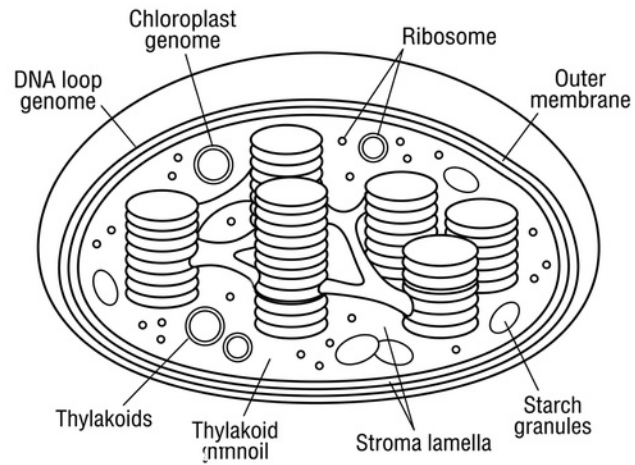
Blood contains red cells (carry oxygen), white cells (fight infection), and platelets (clotting).

### COLOR GUIDE:

Red Blood Cells (red/dark red), White Blood Cell nucleus (purple lobes), WBC cytoplasm (light lavender), Platelets (light purple)

# CHLOROPLAST

The green organelle that captures light energy for photosynthesis.



Color the structure above using the guide below

## DID YOU KNOW?

Chloroplasts contain stacks of thylakoids called grana!

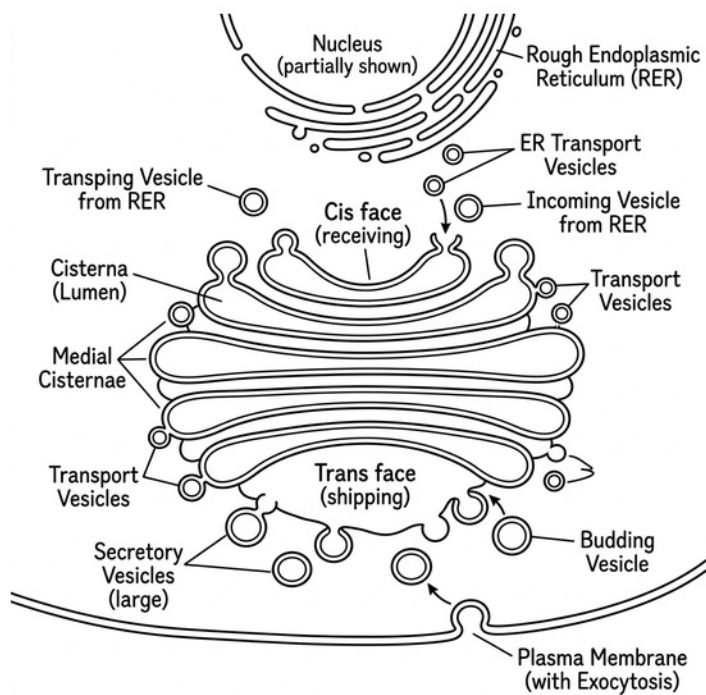
## COLOR GUIDE:

Outer membrane (dark green),  
Thylakoids/Grana (bright green stacks),  
Stroma (light green), DNA (blue)

My Notes:

## GOLGI APPARATUS

A stack of flattened membrane sacs that modify and package proteins.



Color the structure above using the guide below

### DID YOU KNOW?

Named after Camillo Golgi who discovered it in 1898!

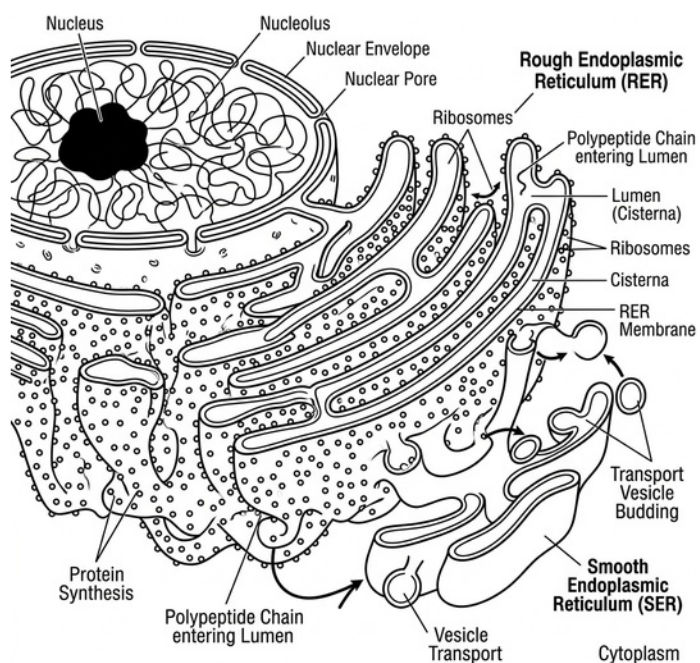
### COLOR GUIDE:

Cisternae (golden yellow), Vesicles (orange), Transport vesicles (light green)

My Notes:

## ROUGH ENDOPLASMIC RETICULUM

ER studded with ribosomes for protein processing.



Color the structure above using the guide below

### DID YOU KNOW?

The rough ER surface area can be 30x larger than the cell membrane!

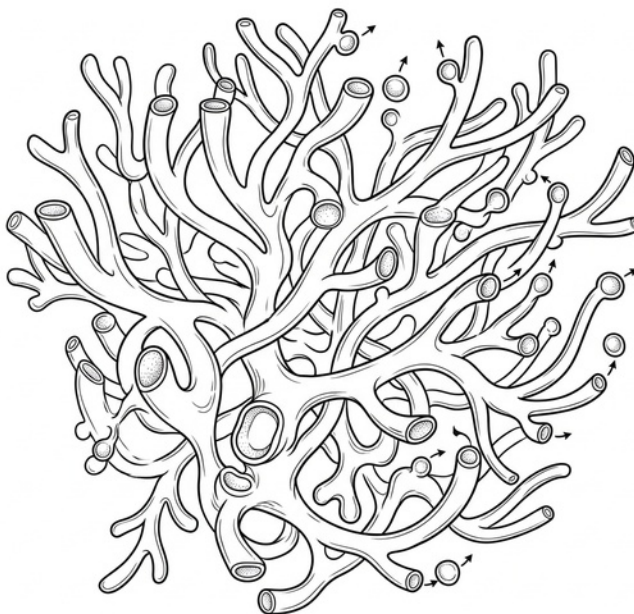
### COLOR GUIDE:

Membrane folds (pink/magenta),  
Ribosomes (blue dots), Lumen (light pink)

My Notes:

# SMOOTH ENDOPLASMIC RETICULUM

ER without ribosomes, involved in lipid synthesis.



Color the structure above using the guide below

**DID YOU KNOW?**

Liver cells have extensive smooth ER for detoxification!

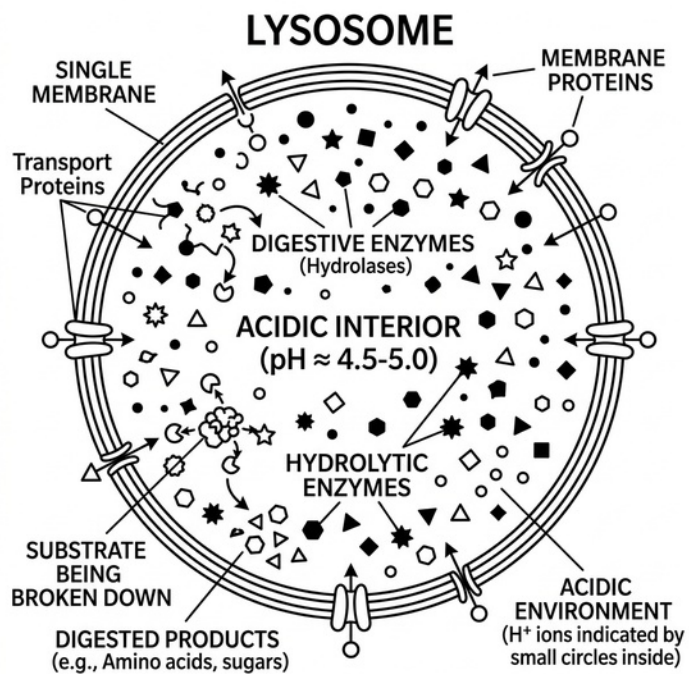
**COLOR GUIDE:**

Tubular membrane network (lavender/light purple)

My Notes:

## LYSOSOME

A membrane-bound sac filled with digestive enzymes.



Color the structure above using the guide below

### DID YOU KNOW?

Lysosomes maintain a pH of about 5, much more acidic than cytoplasm!

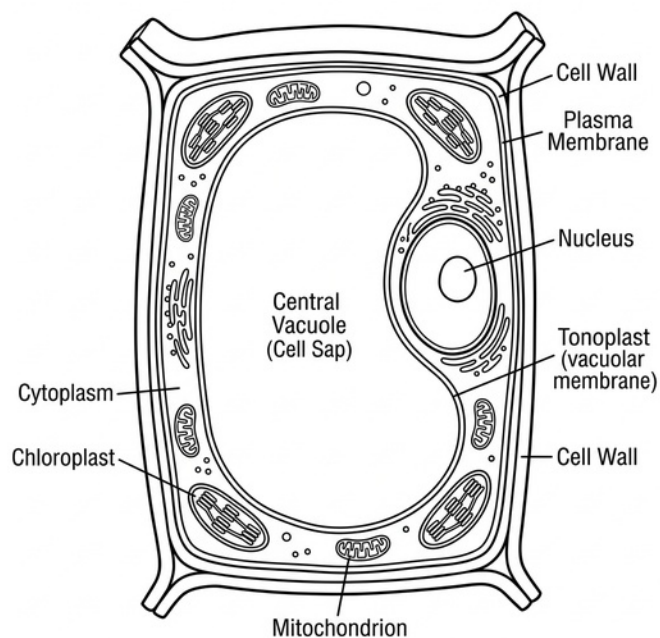
### COLOR GUIDE:

Outer membrane (orange), Digestive enzymes (yellow shapes inside)

My Notes:

## VACUOLE

A large fluid-filled sac used for storage and maintaining turgor pressure.



Color the structure above using the guide below

### DID YOU KNOW?

Plant vacuoles help flowers display their colors!

### COLOR GUIDE:

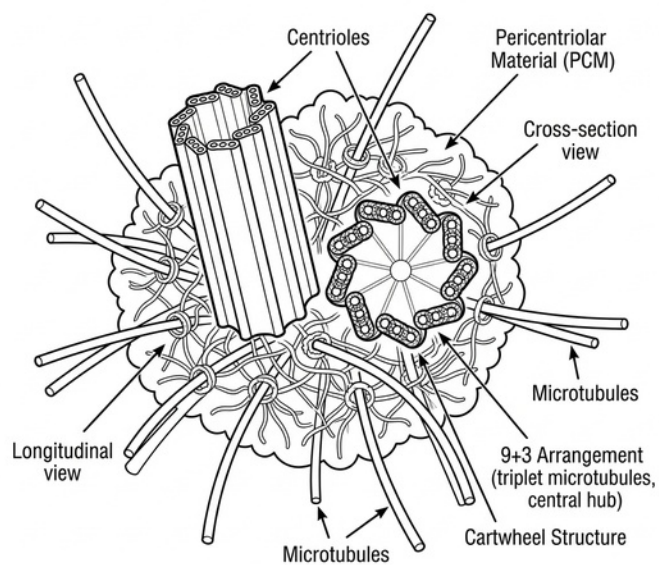
Tonoplast membrane (dark blue outline), Cell sap (light blue/cyan)

My Notes:

## CENTROSOME

An organelle that organizes microtubules during cell division.

### SCIENTIFIC DIAGRAM OF A CENTROSOME



Color the structure above using the guide below

#### DID YOU KNOW?

Each centrosome contains a pair of centrioles at right angles!

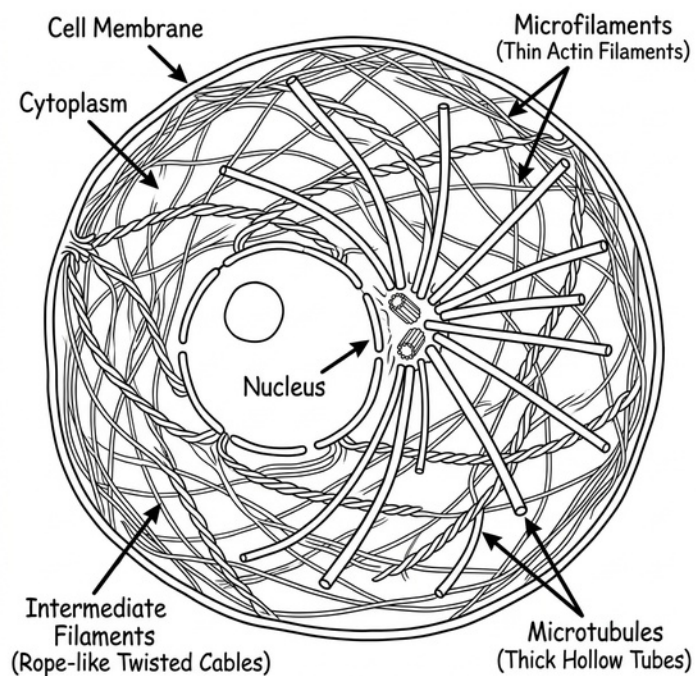
#### COLOR GUIDE:

Centrioles (dark blue cylinders),  
PCM material (light purple halo)

My Notes:

## CYTOSKELETON

A network of protein filaments giving cells shape and structure.



Color the structure above using the guide below

### DID YOU KNOW?

The cytoskeleton is constantly being assembled and disassembled!

### COLOR GUIDE:

Microfilaments (red), Microtubules (green), Intermediate filaments (blue)

My Notes:

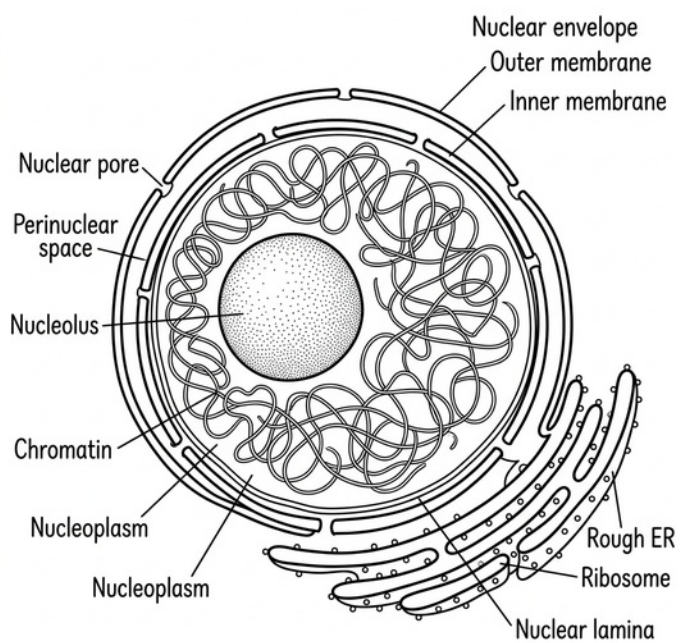
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## NUCLEUS

The 'control center' housing DNA in a double membrane envelope.



Color the structure above using the guide below

### DID YOU KNOW?

Contains about 6 feet of DNA packed into a tiny space!

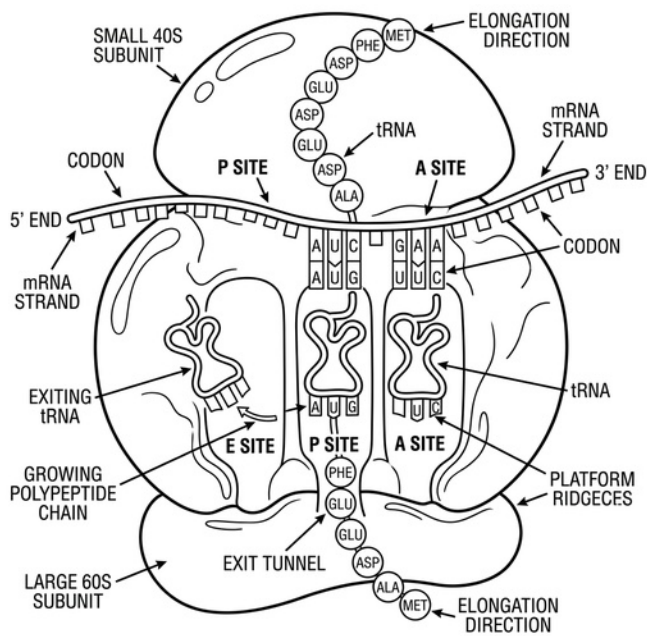
### COLOR GUIDE:

Nuclear envelope (purple),  
Nucleolus (dark purple), Chromatin  
(pink/red strands)

My Notes:

# RIBOSOME

Tiny molecular machines that read mRNA to build proteins.



Color the structure above using the guide below

**DID YOU KNOW?**

A single cell can contain millions of ribosomes!

**COLOR GUIDE:**

Large subunit (dark blue), Small subunit (light blue)

My Notes:

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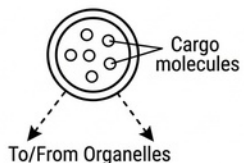


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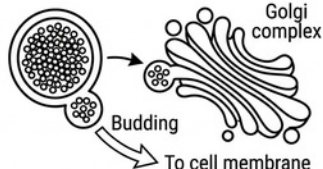
# VESICLE

Small membrane-bound bubbles transporting materials within cells.

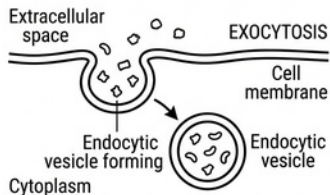
## TRANSPORT VESICLE



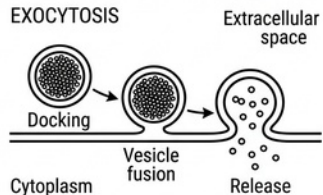
## SECRETORY VESICLE



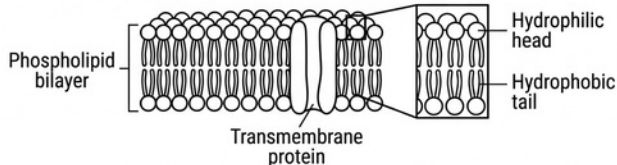
## ENDOCYTIC VESICLE



## EXOCYTOSIS PROCESS



## CROSS-SECTION OF VESICLE MEMBRANE



Color the structure above using the guide below

### DID YOU KNOW?

Neurons use vesicles to release neurotransmitters at synapses!

### COLOR GUIDE:

Membrane (light blue), Contents (varies by cargo type)

My Notes:

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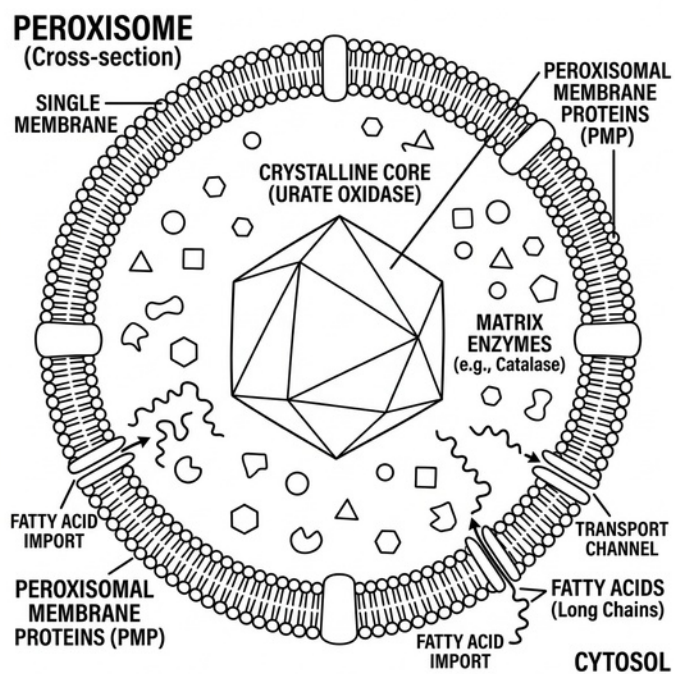
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## PEROXISOME

A small organelle using oxygen to break down fatty acids and toxins.



Color the structure above using the guide below

### DID YOU KNOW?

Peroxisomes produce and break down hydrogen peroxide!

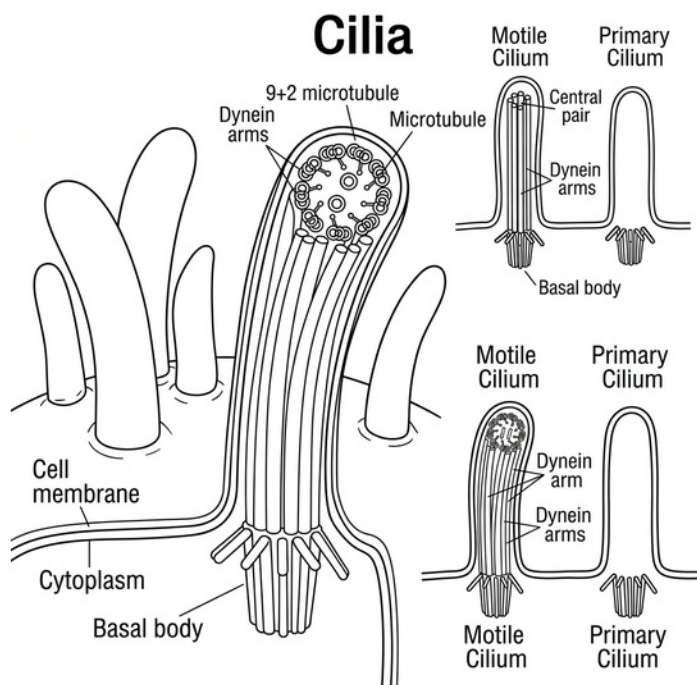
### COLOR GUIDE:

Membrane (green), Crystalline core (light yellow), Enzymes (small shapes)

My Notes:

# CILIA

Short hair-like projections that beat in coordinated waves.



Color the structure above using the guide below

**DID YOU KNOW?**

Your windpipe has millions of cilia sweeping mucus upward!

**COLOR GUIDE:**

Cilia shafts (light blue/cyan),  
Basal body (dark blue), 9+2  
microtubule arrangement

My Notes:

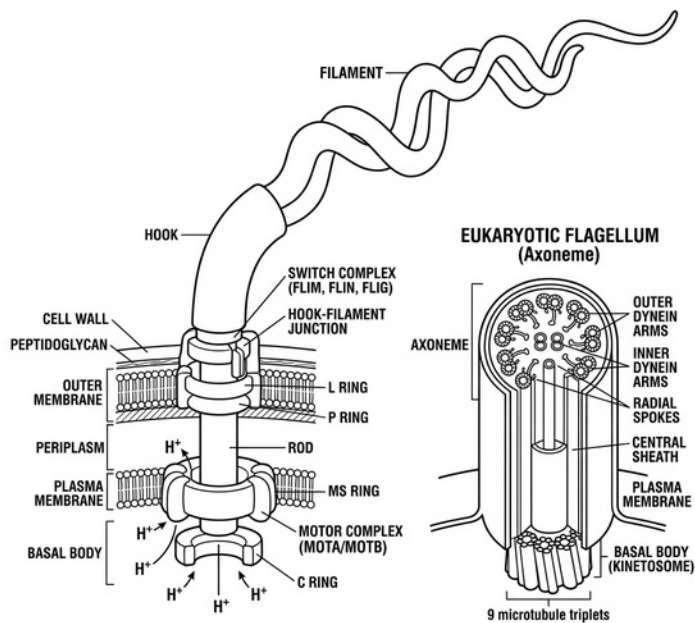
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# FLAGELLUM

A long whip-like tail used for cell locomotion.



Color the structure above using the guide below

**DID YOU KNOW?**

A sperm cell's flagellum can beat up to 1,100 times per second!

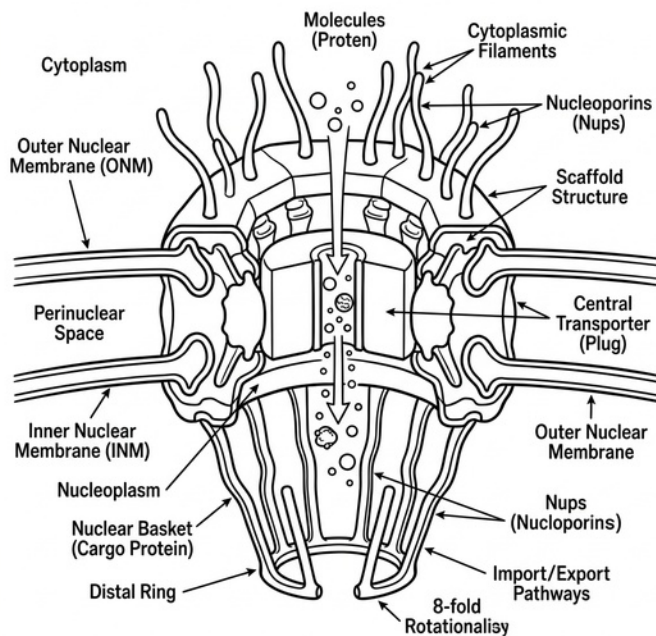
**COLOR GUIDE:**

Flagellum tail (blue), Hook (green), Basal body (purple)

My Notes:

## NUCLEAR PORE

Channels through the nuclear envelope controlling molecular traffic.



Color the structure above using the guide below

### DID YOU KNOW?

Each nucleus has thousands of nuclear pores!

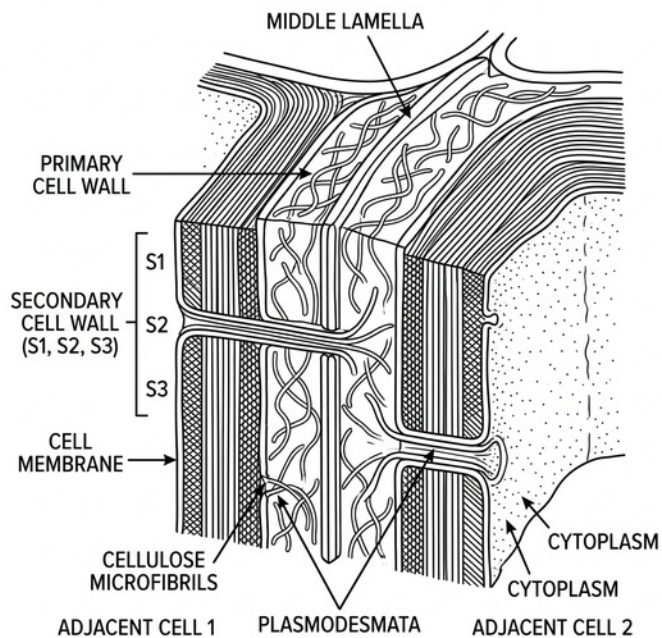
### COLOR GUIDE:

Nuclear envelope (purple), Pore complex proteins (blue/cyan)

My Notes:

## CELL WALL

A rigid outer layer of cellulose in plant cells.



Color the structure above using the guide below

### DID YOU KNOW?

Cell walls can be several micrometers thick!

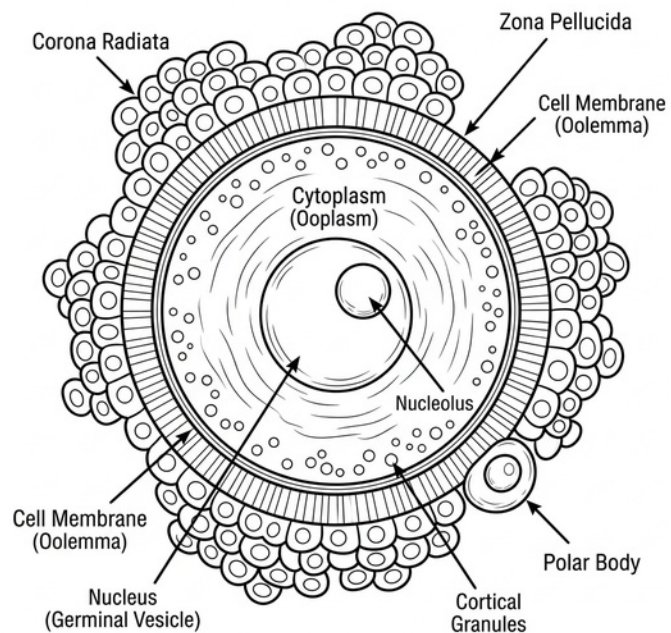
### COLOR GUIDE:

Cellulose fibers (brown/tan),  
Middle lamella (light green)

My Notes:

## EGG CELL (OVUM)

The largest human cell, containing genetic material for new life.



Color the structure above using the guide below

### DID YOU KNOW?

The human egg is about 0.1mm visible to the naked eye!

### COLOR GUIDE:

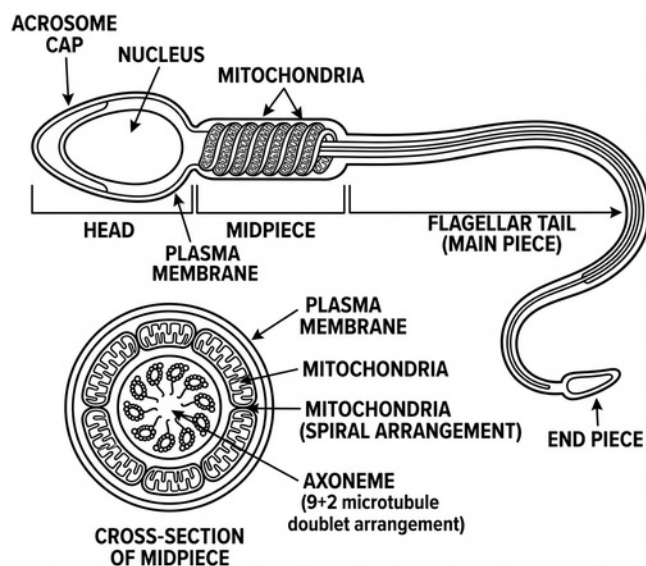
Cytoplasm (light yellow), Zona pellucida (orange), Nucleus (purple)

My Notes:

## SPERM CELL

A streamlined cell with head, midpiece, and flagellar tail.

### HUMAN SPERM CELL ANATOMY



Color the structure above using the guide below

#### DID YOU KNOW?

Sperm are among the smallest cells in the human body!

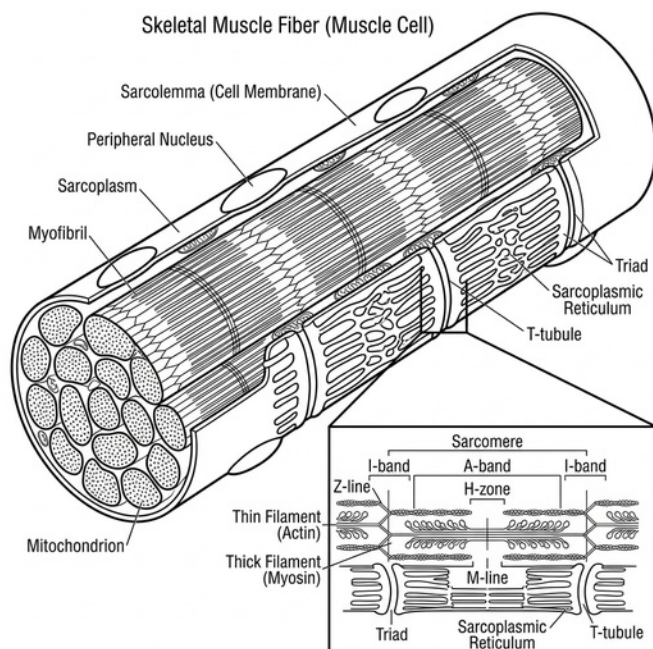
#### COLOR GUIDE:

Head/Acrosome (dark blue), Midpiece (green), Tail (cyan)

My Notes:

# MUSCLE CELL

An elongated cell containing contractile protein filaments.



Color the structure above using the guide below

**DID YOU KNOW?**

Muscle cells can contain hundreds of nuclei!

**COLOR GUIDE:**

Myofibrils (red/pink), Sarcomere striations (alternating bands), Nuclei (purple)

My Notes:

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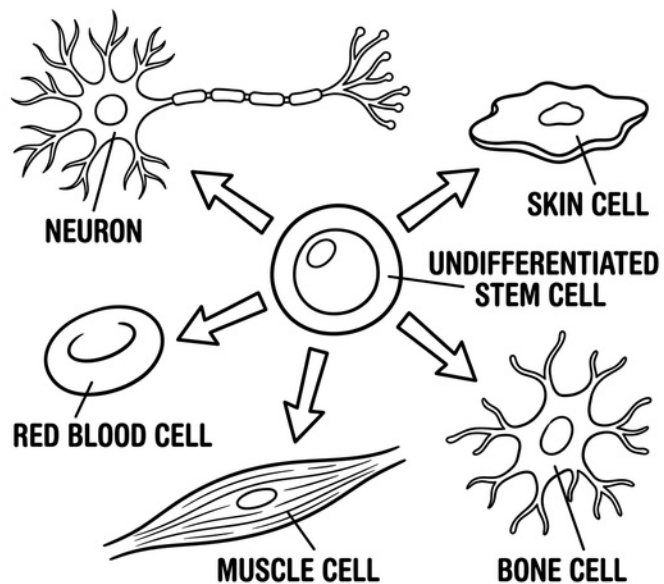


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## STEM CELL

An undifferentiated cell with potential to become specialized.

### STEM CELL DIFFERENTIATION



Color the structure above using the guide below

#### DID YOU KNOW?

Embryonic stem cells can become any of 200+ cell types!

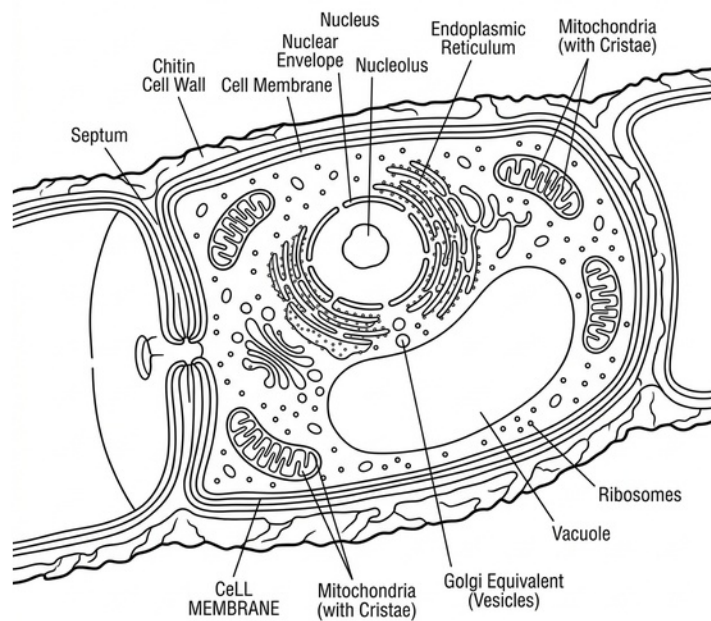
#### COLOR GUIDE:

Cytoplasm (light blue/cyan),  
Nucleus (purple), Potential  
lineages (varied)

My Notes:

## FUNGAL CELL

A eukaryotic cell with a chitin cell wall.



Color the structure above using the guide below

### DID YOU KNOW?

Chitin is the same material as insect exoskeletons!

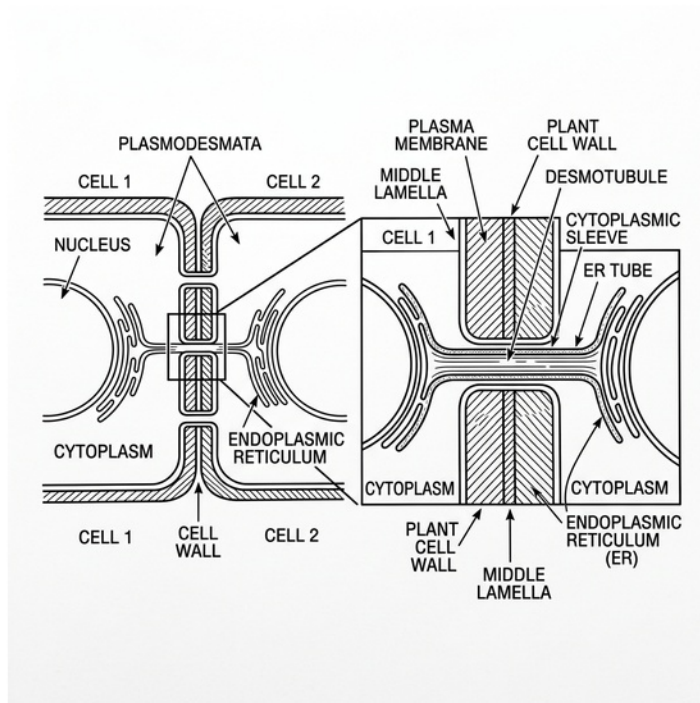
### COLOR GUIDE:

Chitin wall (brown), Cytoplasm (light blue), Nucleus (purple)

My Notes:

## PLASMODESMATA

Tiny channels connecting neighboring plant cells.



Color the structure above using the guide below

### DID YOU KNOW?

They create a continuous cytoplasm network called the symplast!

### COLOR GUIDE:

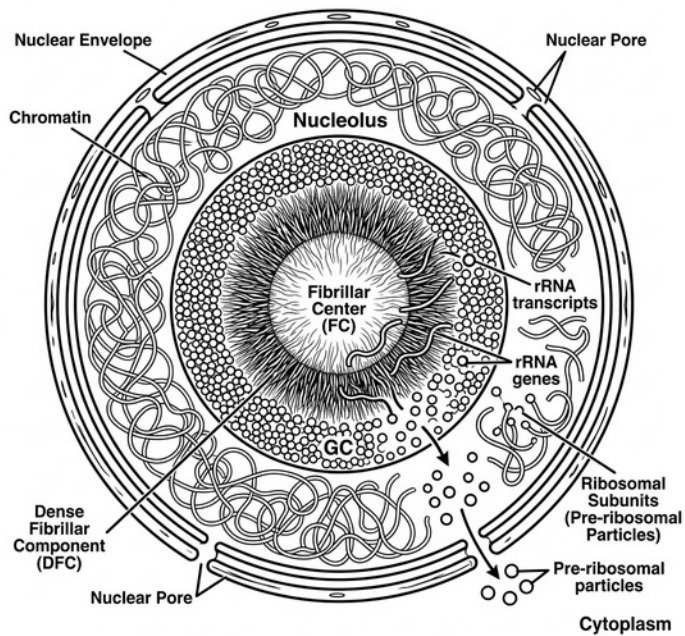
Cell walls (green), Channels (blue), Desmotubule (purple)

My Notes:

# NUCLEOLUS

Dense region inside the nucleus making ribosomal RNA.

## THE NUCLEOLUS AND RIBOSOME BIOGENESIS



Color the structure above using the guide below

### DID YOU KNOW?

Disappears during cell division and reforms afterward!

### COLOR GUIDE:

Dense granular component (dark purple/magenta), Fibrillar center (pink)

My Notes:

## **Great Job, Scientist!**

You've explored 31 amazing cell structures!

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interactive biology games and activities!

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