

Cells (10%)

I. Organelles

a. Cell Membrane

i. Phospholipid Bilayer

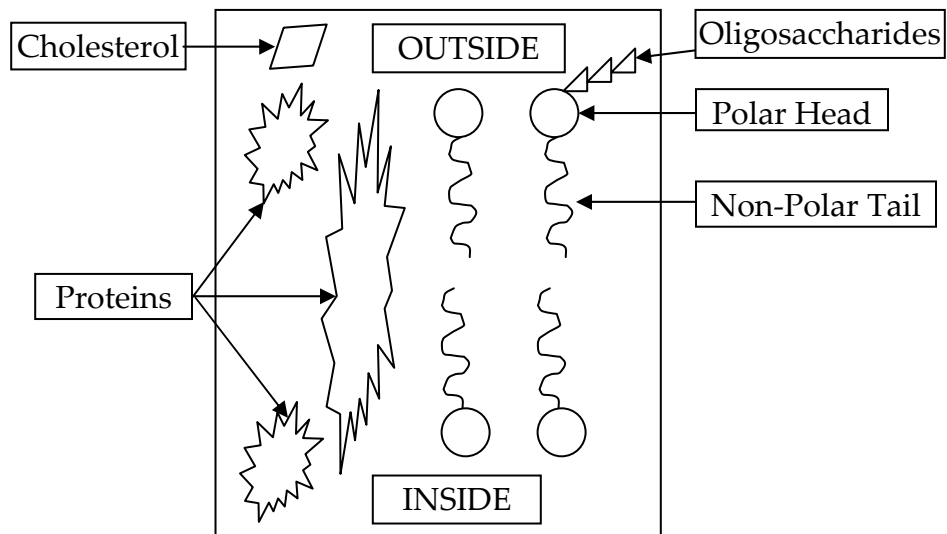
1. Polar Head
2. Two Non-polar tails
3. Oligosaccharides:
 - a. Little carbohydrates
 - b. On the surface of the membrane
 - c. Help cell-cell recognition

ii. Proteins

1. Embedded
2. Sometimes span full width of the membrane
3. Sometimes only on top
 - a. i.e. Channel Protein
 - b. i.e. Neurons: Sodium Potassium Pump

iii. Cholesterol

iv. Diagram



v. Selectively Permeable Membrane

1. Only allows certain things to go through

vi. Transport Mechanisms

1. Active
 - a. Requires energy
 - b. Low \rightarrow High energy concentration
 - c. Endocytosis
 - i. Cell ingests object and carries it into the cell

- d. Exocytosis
 - i. Vesicle fuses with membrane and spews out contents

- e. Pinocytosis
 - i. Liquid is ingested into cell membrane

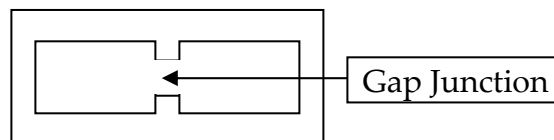
2. Passive

- a. Doesn't require energy
- b. Osmosis
 - i. Water: High \rightarrow Low Concentration
- c. Diffusion
 - i. Molecules: High \rightarrow Low Concentration
- d. Facilitated Diffusion
 - i. Assisted diffusion (carrier)

b. Inter-cell Connection

i. Animal Cells

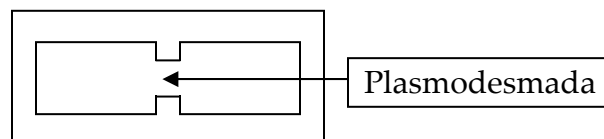
1. Gap Junction



ii. Plants Cells

1. Plasmodesmata

- a. More prevalent than in animal cells



c. Lysosome

- i. Intracellular digestion

d. Endoplasmic Reticulum

- i. Smooth
 - 1. Lipid metabolism
 - 2. Drug detoxification

ii. Rough

- 1. Contain ribosomes that synthesize proteins

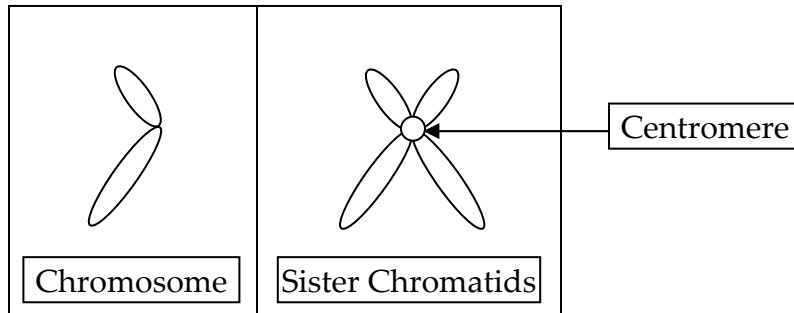
e. Amyloplasts

- i. In plants
- ii. Within storage tissue
- iii. Colorless
- iv. Form starch granules

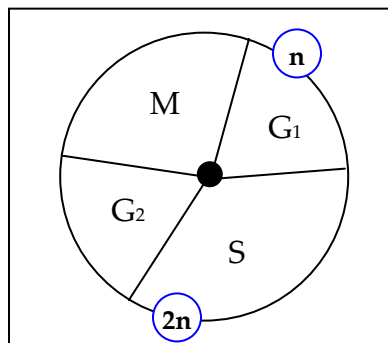
v. Help gravitropism

II. Cell Life Cycle

a. Chromosomes



b. Diagram



i. G₁

1. Cell growth during lifespan
2. Synthesization of new organelles
3. Great amount of protein synthesis
4. High metabolic rate

ii. S

1. DNA Replication

iii. G₂

1. DNA Check
2. Cell growth (for division)

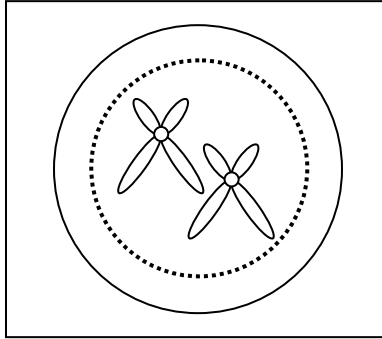
iv. M

1. Mitosis
2. Meiosis

1. Mitosis

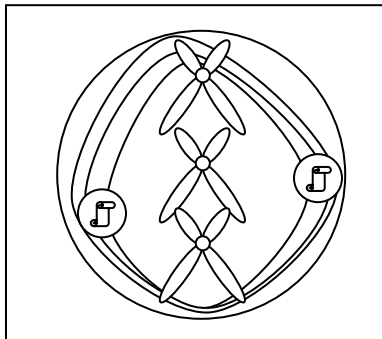
a. Prophase

- i. Sister Chromatids condense and become visible
- ii. Nuclear envelope breaks down



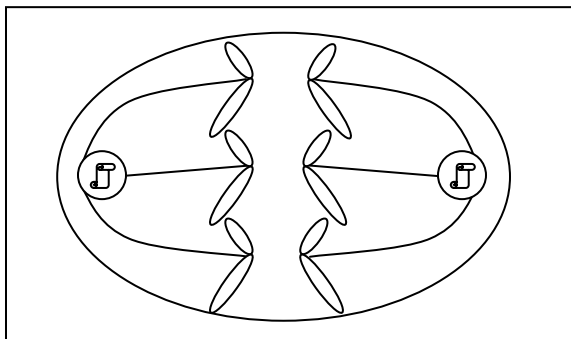
b. Metaphase

- i. Centrioles pull spindle fibers to line sister chromatids down the middle
 - 1. "Head over heels"
 - 2. NOT "side by side"

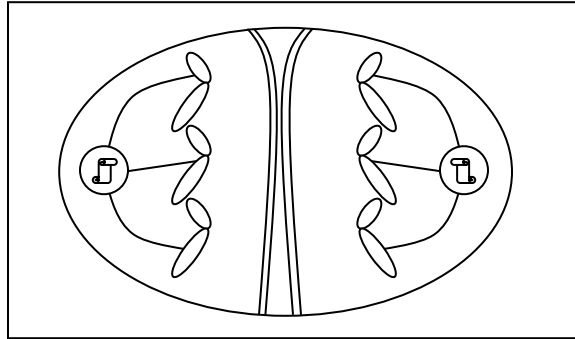


c. Anaphase

- i. Centrioles pull apart sister chromatids



- d. Telophase
 - i. Cell begins pinching at the center to form two new cells
- e. Cytokineses
 - i. Animal Cells
 - 1. Cleavage Furrow
 - ii. Plant Cells
 - 1. Cell Plate



III. Plant Cells Vs. Animal Cells

Plant Cells	Animal Cells
<ul style="list-style-type: none"> • Chloroplasts • Cell wall • No centrioles • Cell plate • Amyloplasts • Large vacuole 	<ul style="list-style-type: none"> • no chloroplasts • no cell wall • centrioles • cleavage furrow • no amyloplasts • moderately sized vacuoles