

# Organization of the Plant Body

- Overview of Plants
- Organs
- Tissues
- Plant Cell

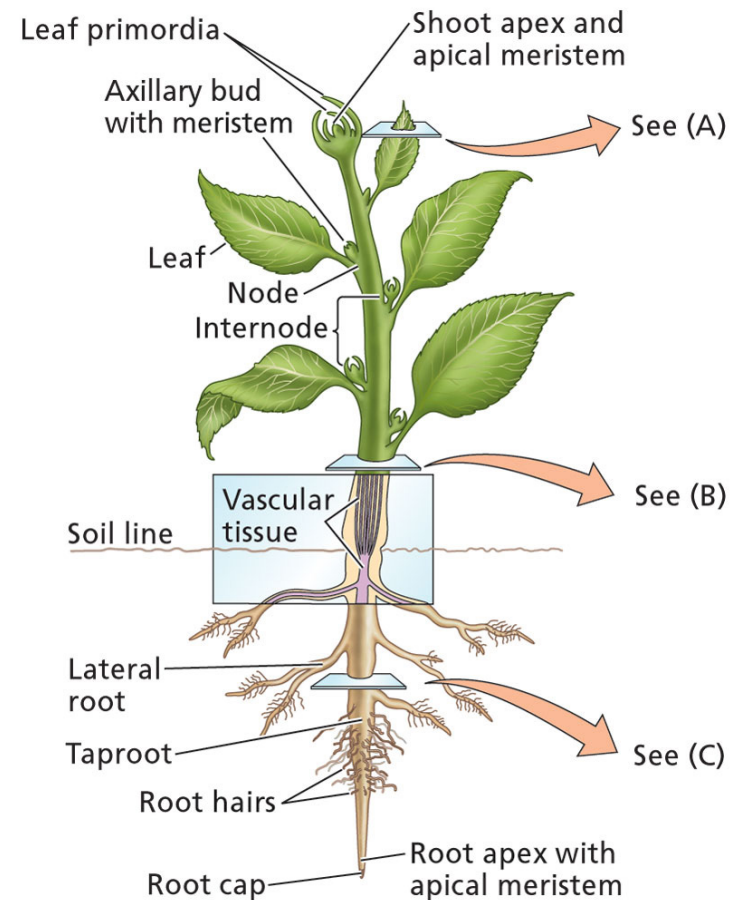


# Overview of Plants

- Primary producers
- Non-motile with exceptions for some sex cells
- Terrestrial plants have evolved structural supports, such as lignin and transport structures
- Lose water by evaporation: cuticle
- Indeterminate growth

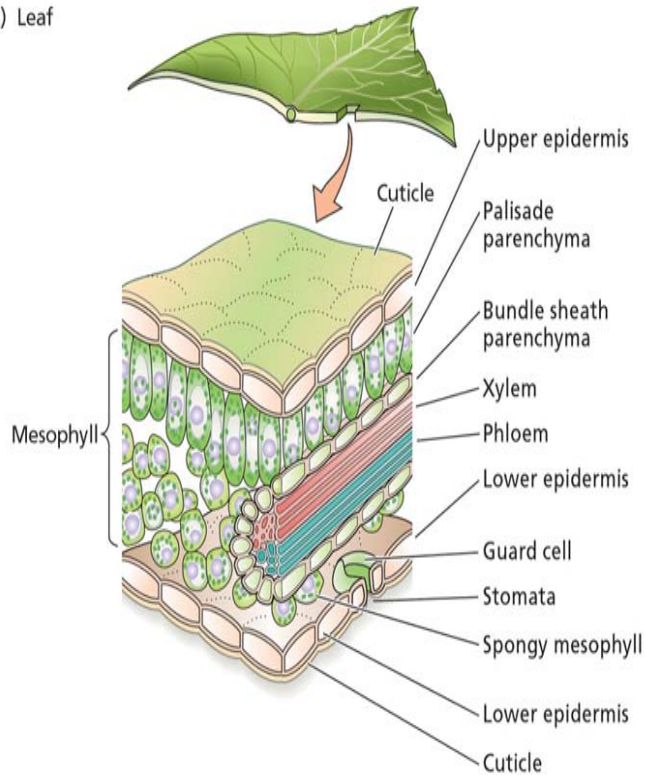
# Organs

- Shoot: stem and leaf
- Node/internode
- Root
- Meristems: Apical & lateral



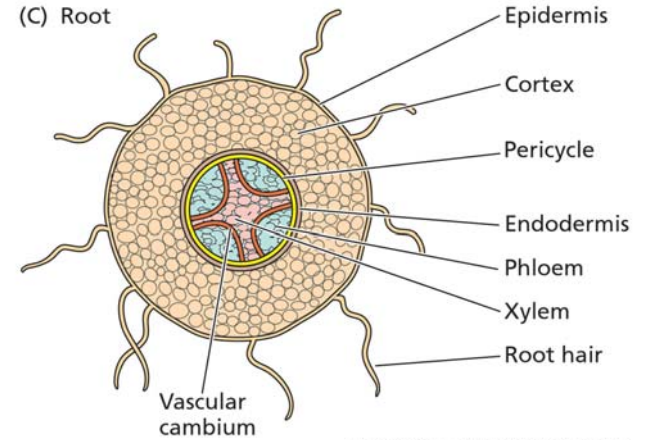
# Organs

(A) Leaf



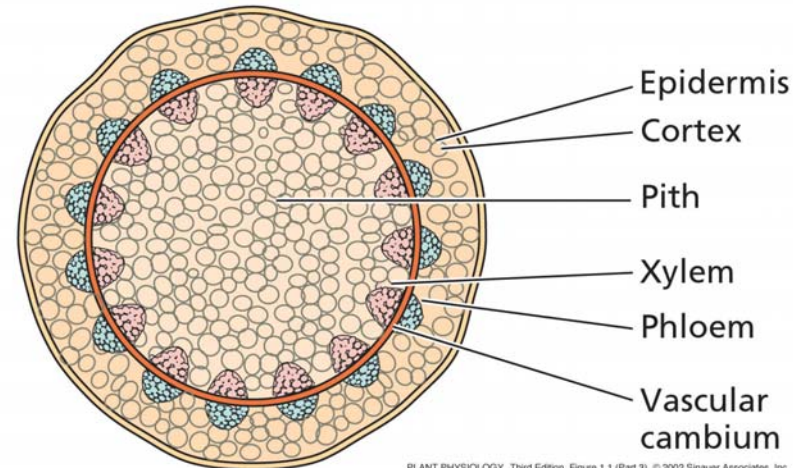
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(C) Root



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(B) Stem

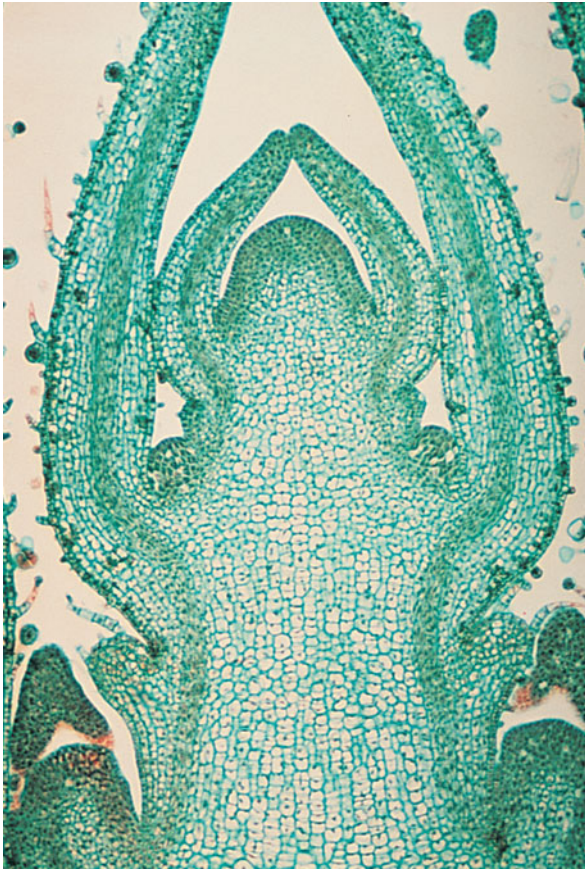


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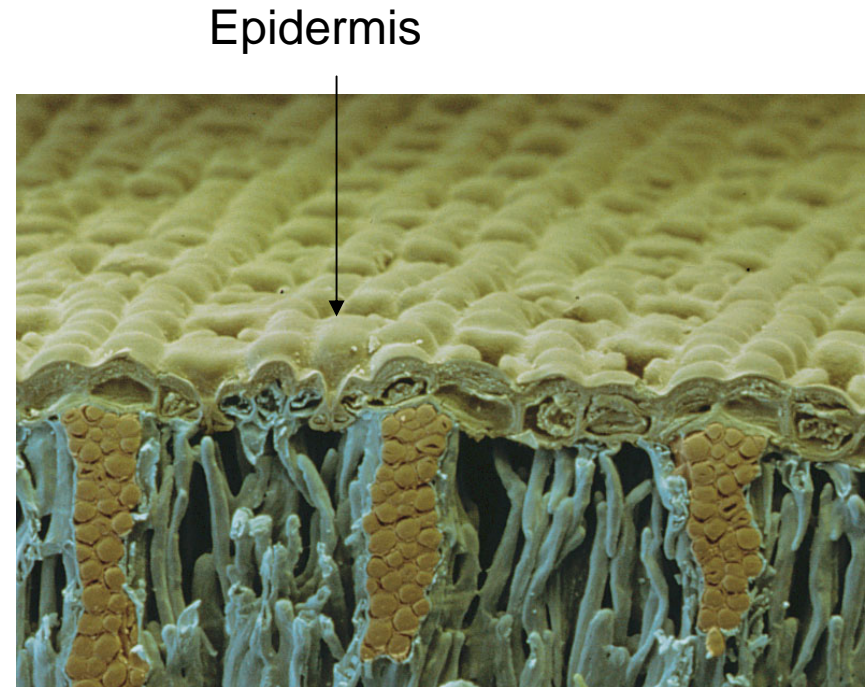
# Meristems

Apical



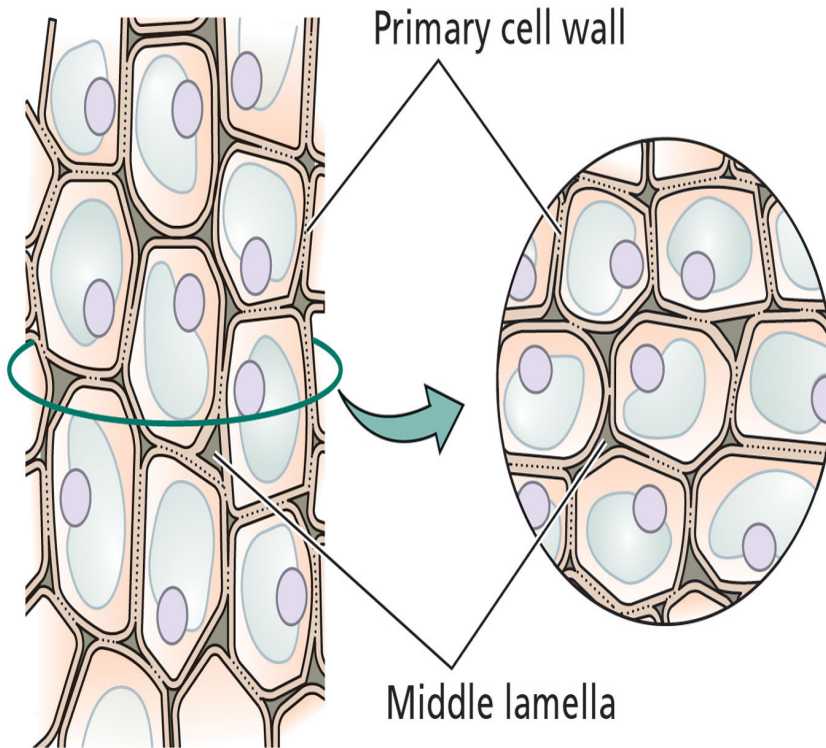
# Tissues

- **Dermal: epidermis & guard cells**
- **Dermal: Cork**
- **Ground: Parenchyma,**
- **Collenchyma & Sclerenchyma**
- **Sclerids & fibers**
- **Vascular:**
- **Xylem: vessels, tracheids**
- **Phloem: sieve tube members, companion cells**

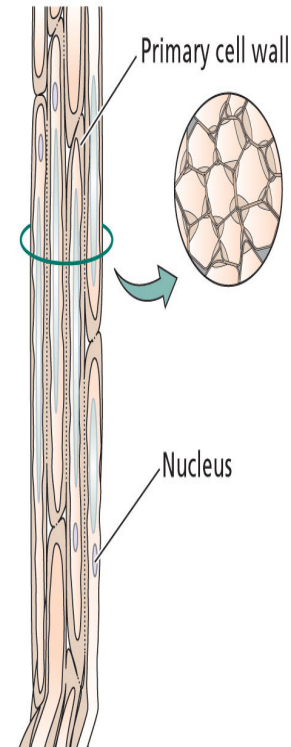


# Ground tissue

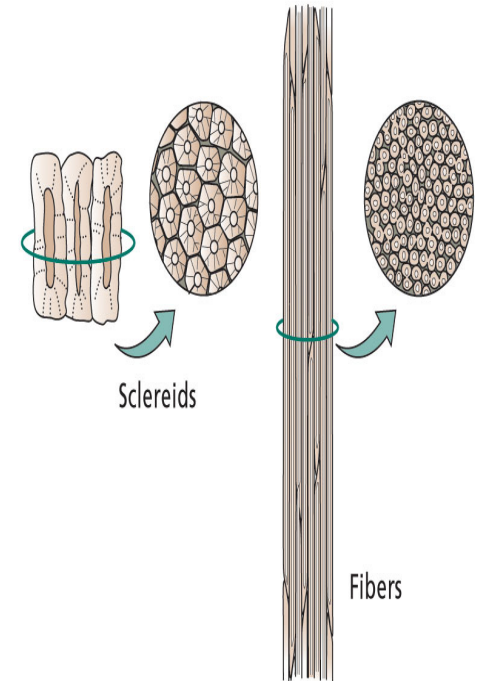
(B) Ground tissue: parenchyma cells



(C) Ground tissue: collenchyma cells



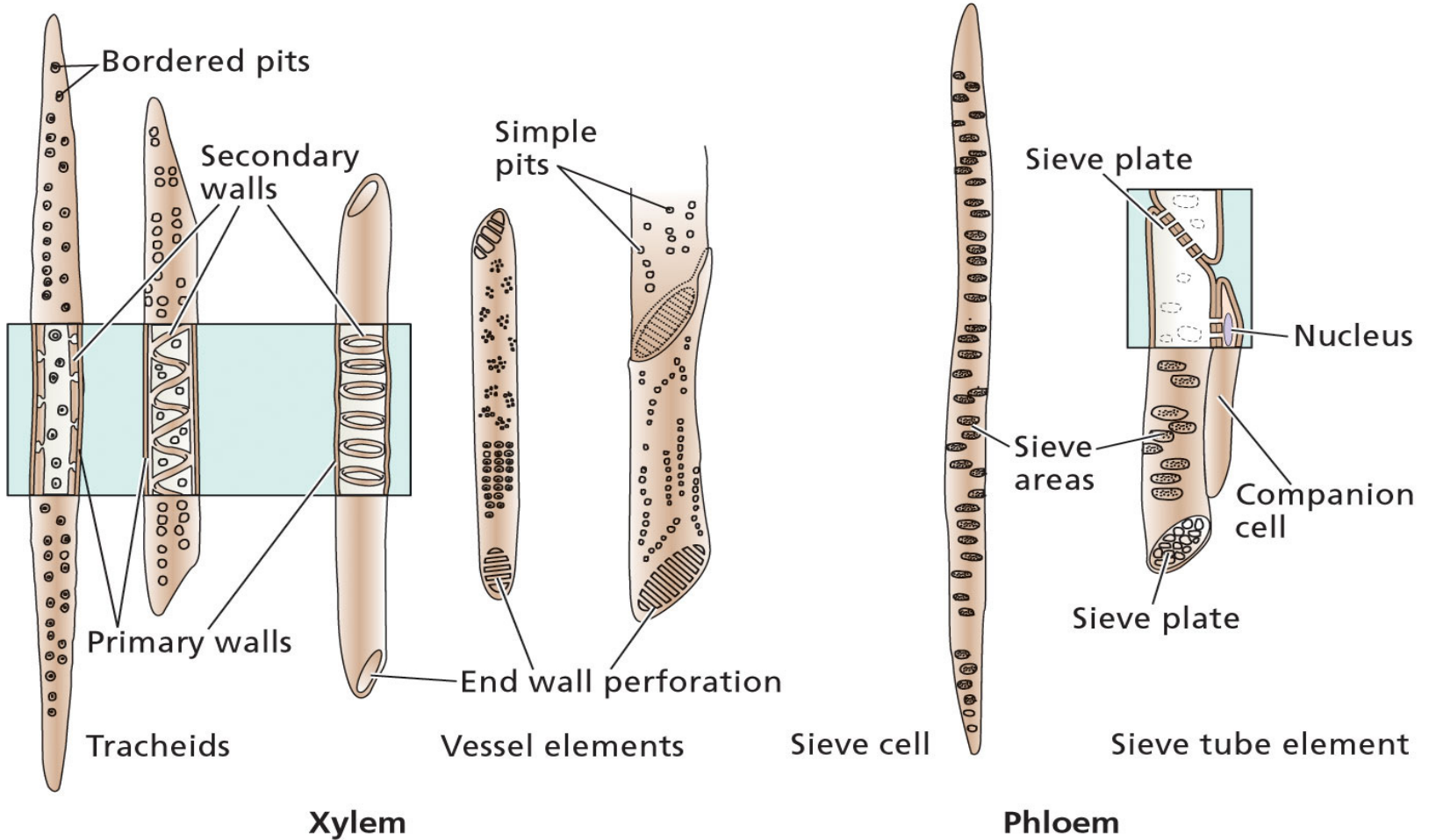
(D) Ground tissue: sclerenchyma cells





# Vascular Tissue

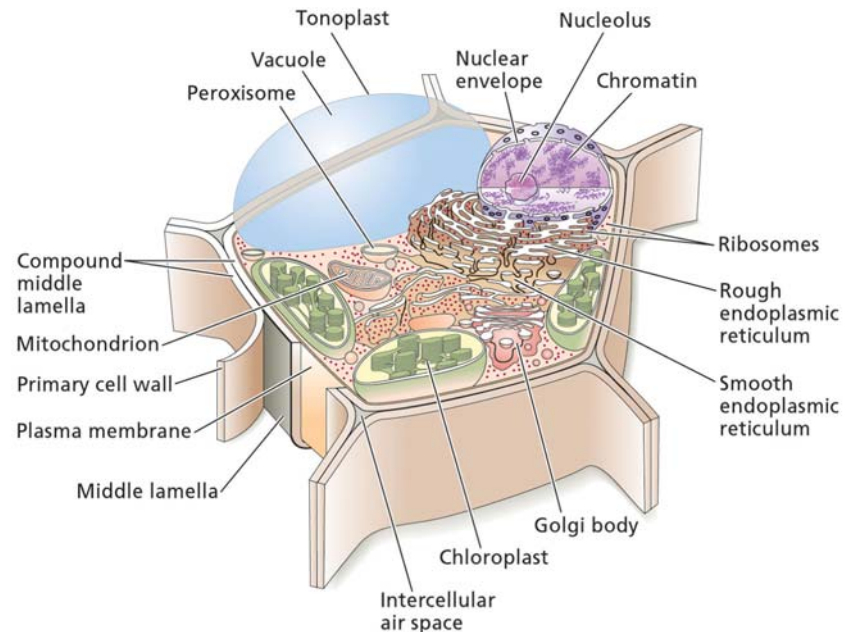
(E) Vascular tissue: xylem and phloem





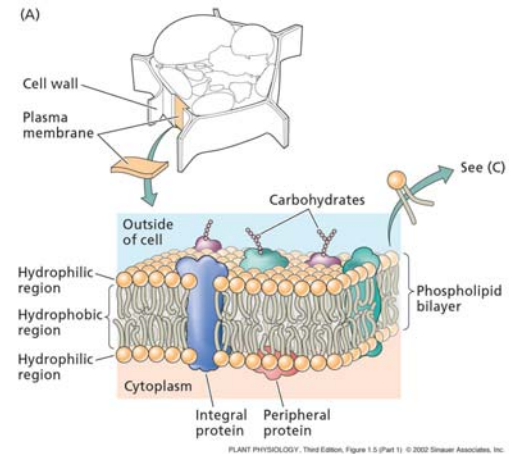
# Plant Cell

- Symplast vs apoplast
- Membranes
- Central vacuole
- Chloroplast/plastids
- Microbodies
- Cytoskeleton
- Plasmodesmata
- Cell wall

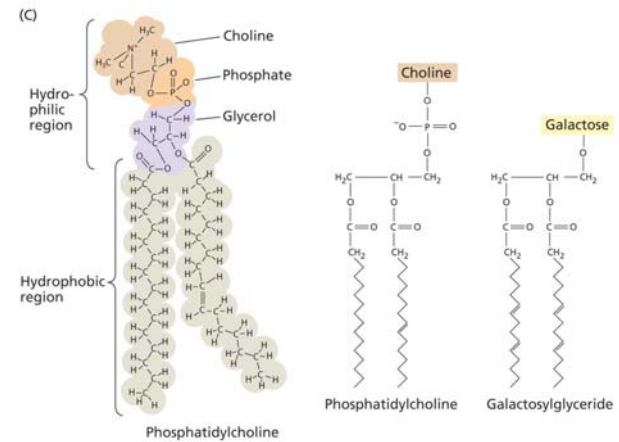


# Biological membranes

- **Phospholipids**
- **Plastids:**  
glycosylglycerides with galactose head groups
- **Unsaturated fatty acids, such as linoleic acid (2), linolenic acid (3)**
- **Sterols: sitosterol, stigmasterol, and 24-methylcholesterol**
- **Fluidity of membrane**

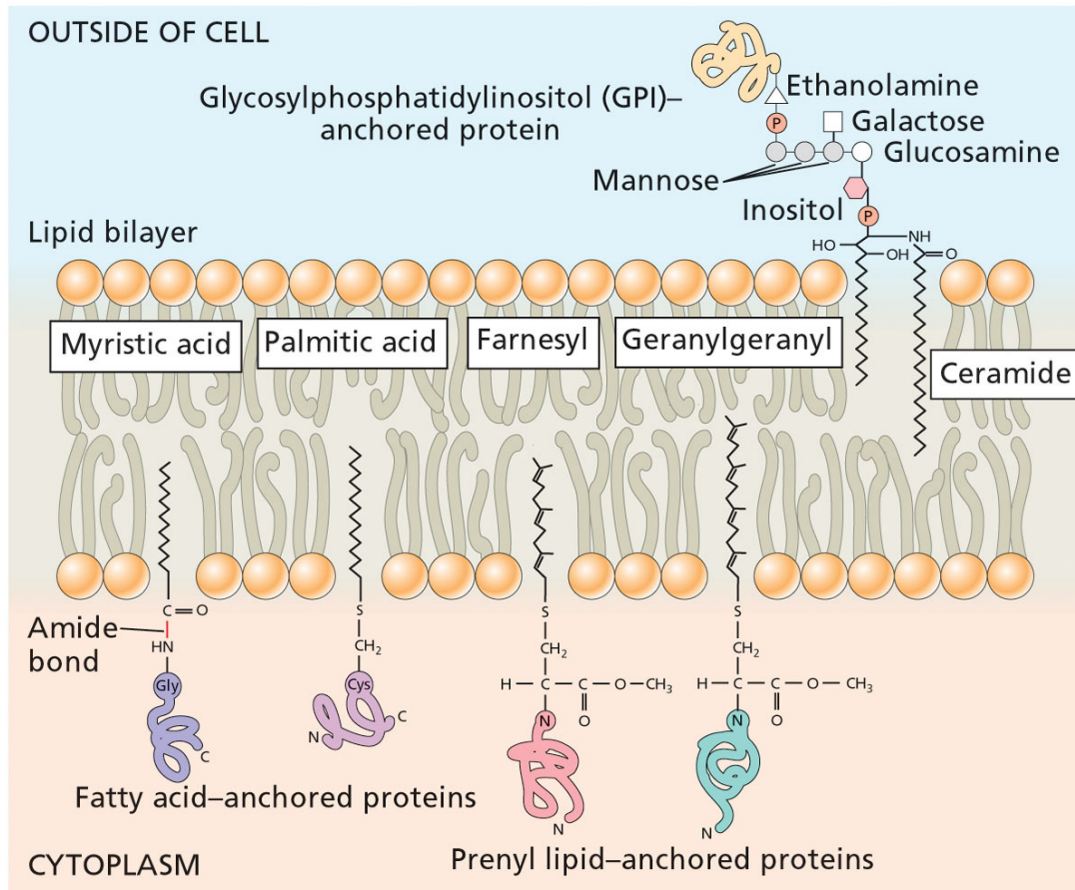


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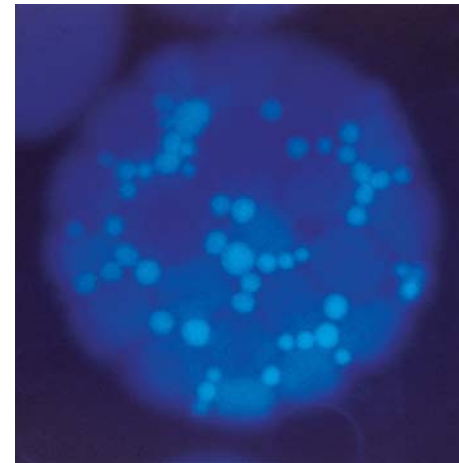
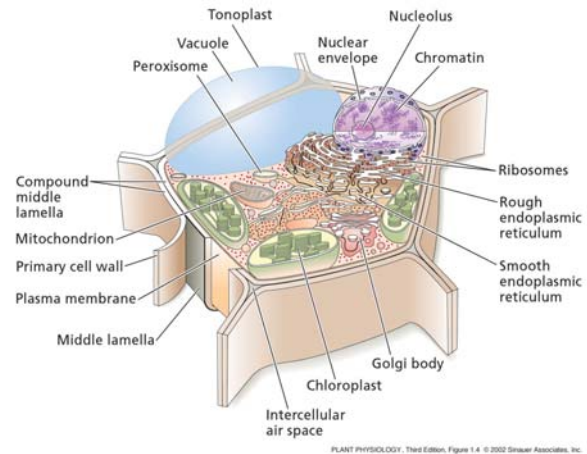
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# Membranes



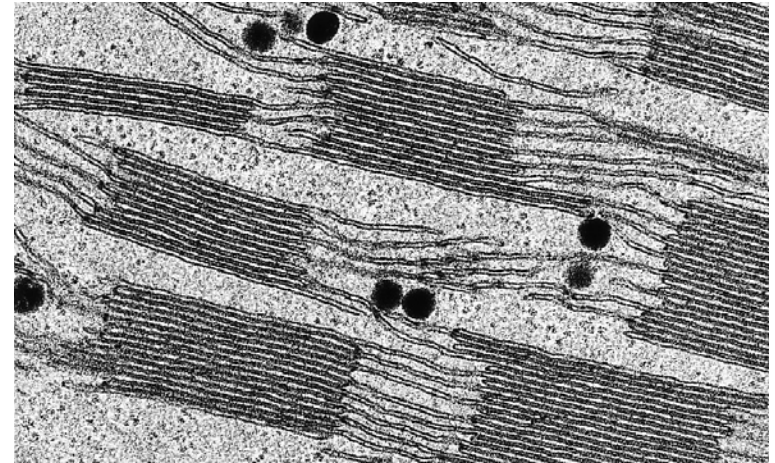
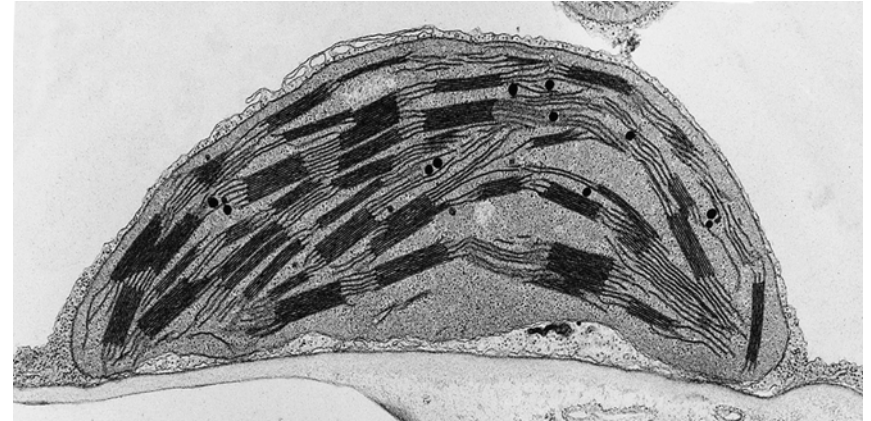
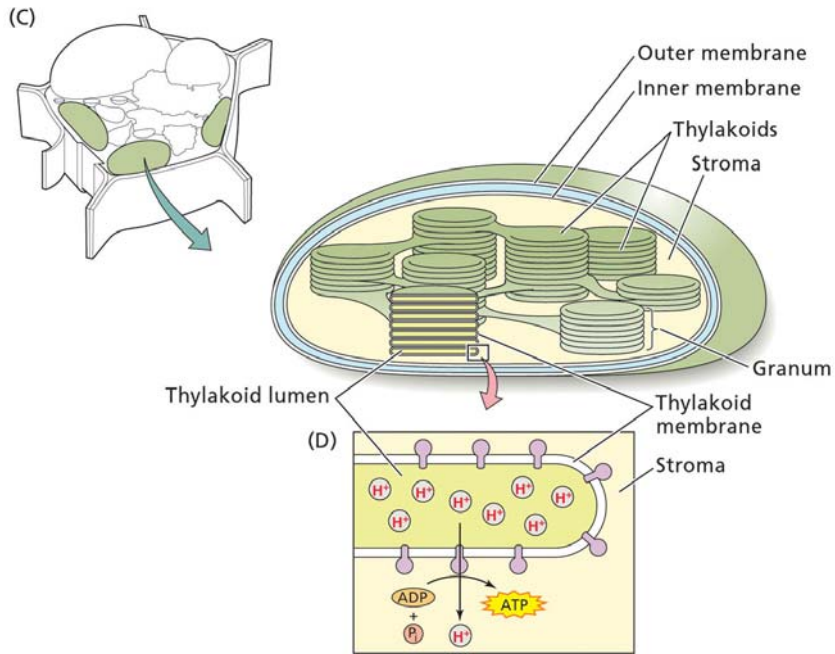
# central vacuole

- 80-90% of cell volume
- Surrounded by membrane (tonoplast)
- Meristems have provacuoles
- Contains water, inorganic ions, organic acids, sugars, enzymes (hydrolytic), secondary metabolites
- Protein-storing vacuoles (protein bodies) in seeds



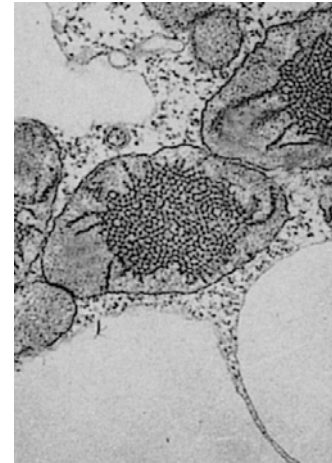
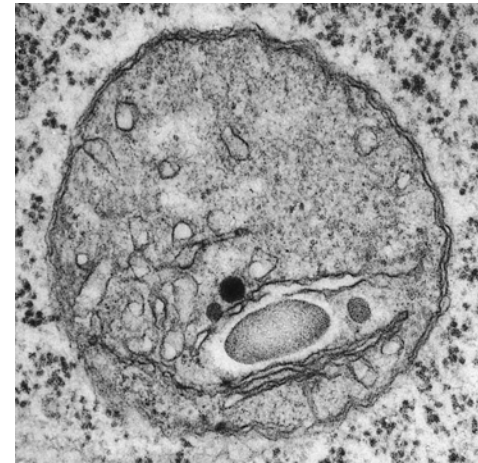


# Chloroplast/plastids



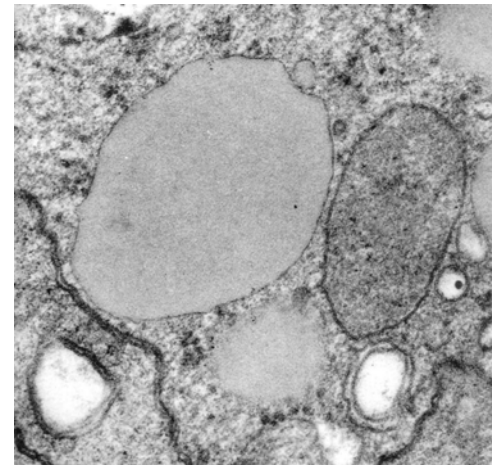
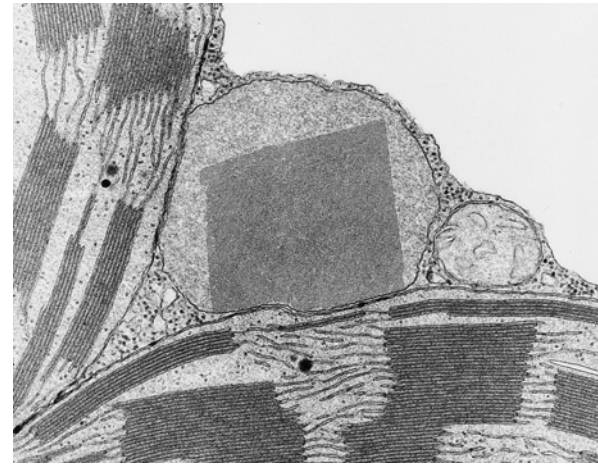
# Plastids

- Proplastids
- Etioplasts
- Amyloplasts
- Chromoplasts



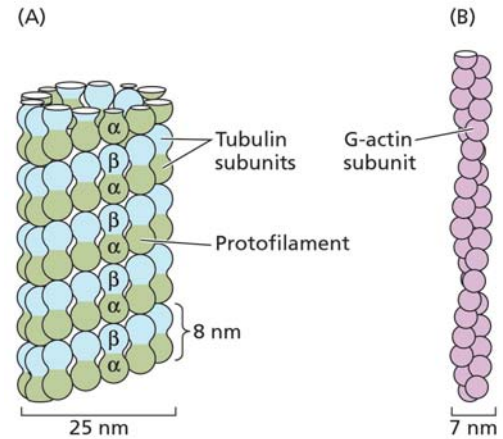
# Microbodies

- Peroxisomes
- Glyoxysomes
- Oleosomes

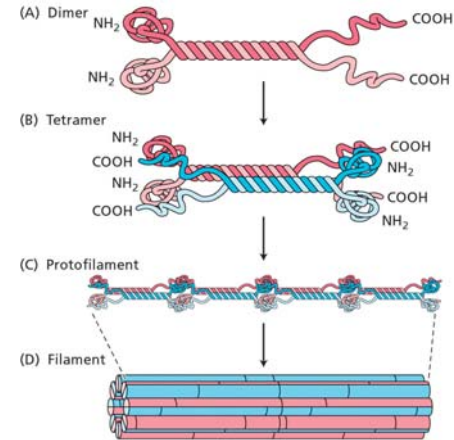


# Cytoskeleton

- Microtubules
- Microfilaments
- Intermediate filaments



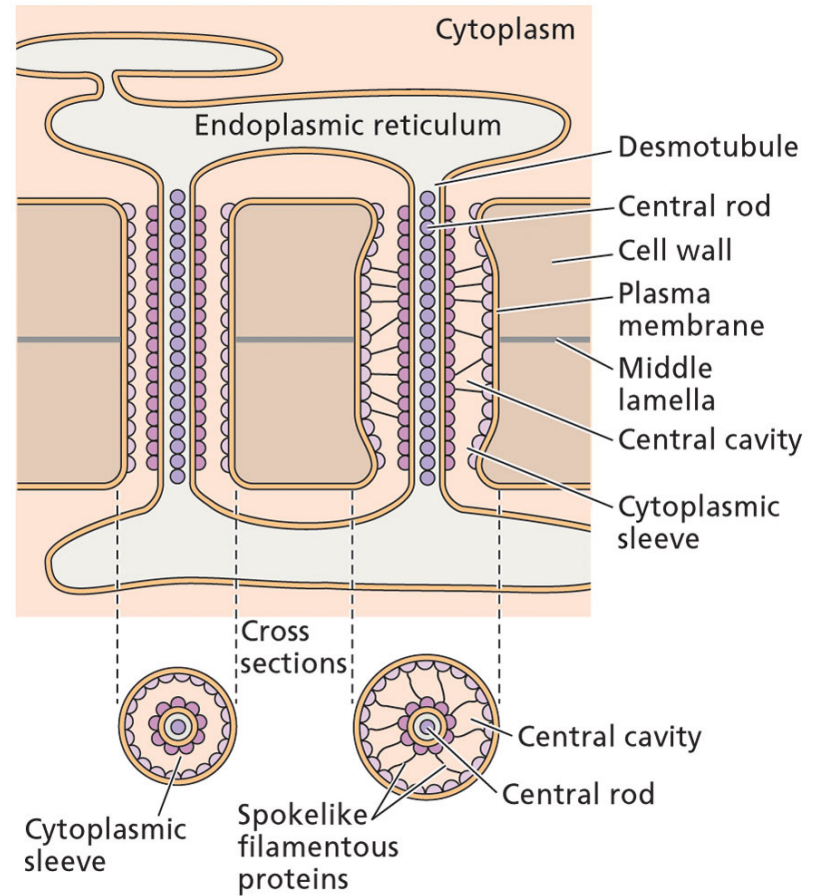
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# Plasmodesmata



# Cell Wall

- Primary
- Secondary
- Middle Lamella

