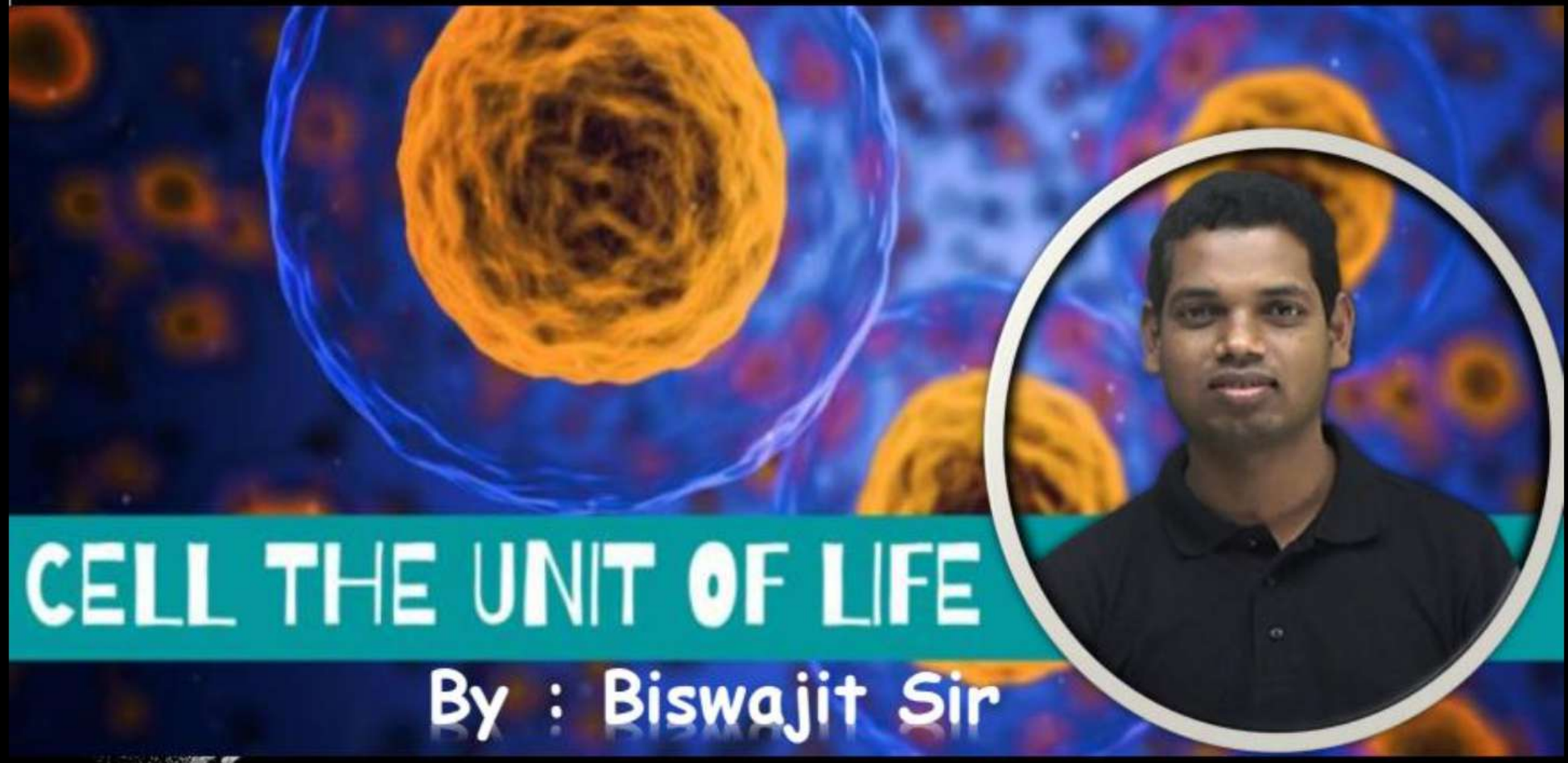
ARJUNA NEET BATCH



Download The Lecture Notes From PW App

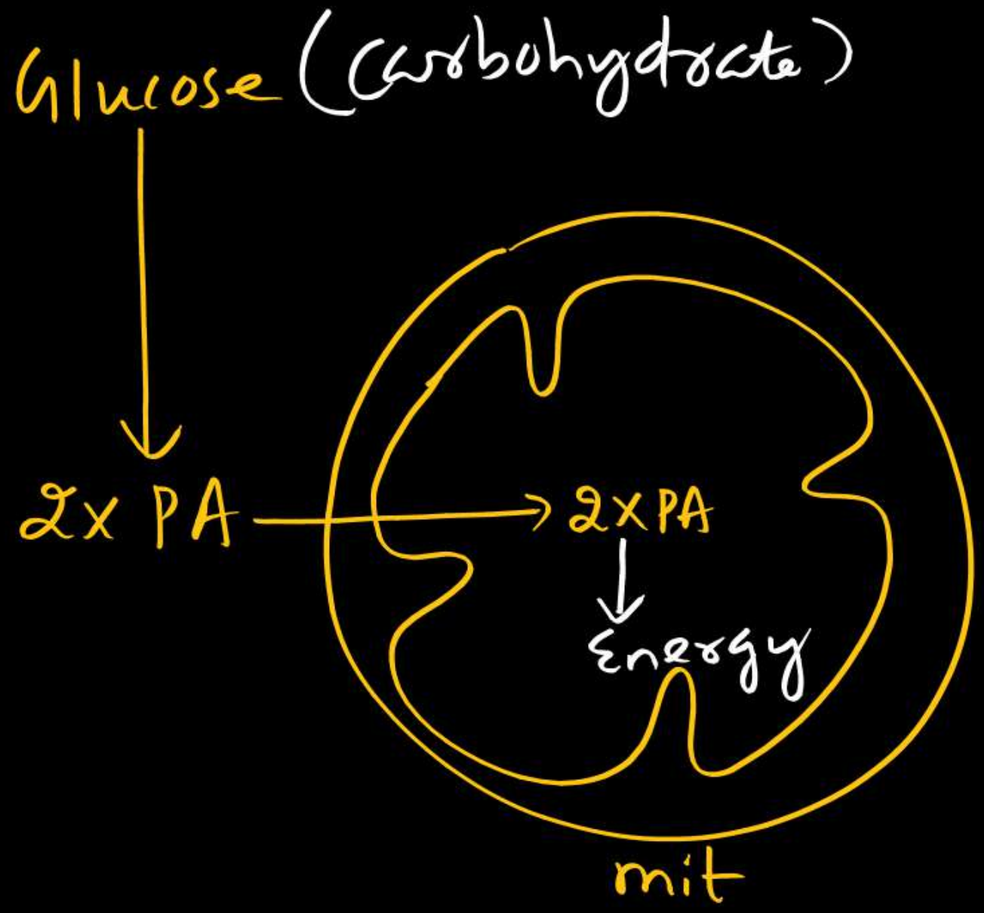
Functions of Mitochondria

- Site of aerobic respiration

(mitochondria ⟶ aerobic organelle)

- ATP synthesis (Adenosine triphosphate)
  ↳ energy currency of cell.
- Vitellogenesis → yolk formation
- β Oxidation of fatty acids
  - animals → peroxisome, mitochondria
  - plants → peroxisome
- Photorespiration in C_3 plants along with chloroplast, peroxisome

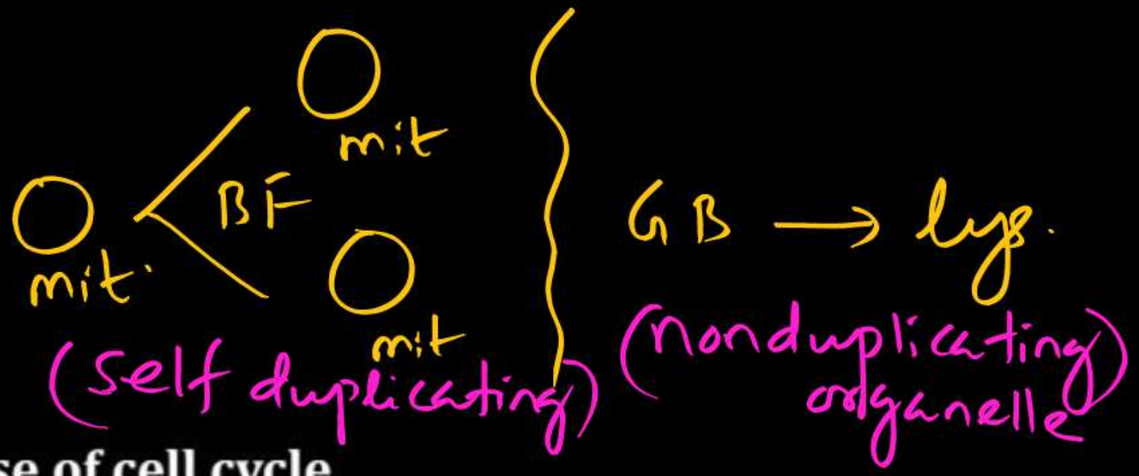
Resp?
- Anaerobic → Glycolysis → Cytosol.
- Aerobic → Glycolysis → mit
  - LR ✓
  - KC ✓
  - ETS ✓


Glucose (carbohydrate)
2x PA
2x PA
Energy
mit

Functions of Mitochondria

continued .....

- Male sterility in maize
  - ↳ cytoplasmic inheritance



Note:
Mitochondria are self duplicating
↳ in G_2 phase of cell cycle

• Divide by fission

• Mitochondria is associated with production of energy from carbohydrate's derivative. / carbohydrate

PLASTIDS

- **Occurrence:**

  all plants and euglenoids

- **Size:**
  - **large** → **can be easily observed under microscope**
  - **larger than mitochondria**

- **Classification : (basis – pigmentation)** #

Plastids	color	pigments
Leucoplast	Colorless	–ve
Chloroplast	green	Chla, Chlb, Carotenoid
Chromoplast	Colored other than green	Carotenoid

- Presence of some specific pigments impart color to various plastids

Leucoplast + chloroplast + chromoplast

- Double membrane bound
- Have common precursor called proplastid

proplastid ⇄ leucoplast, chloroplast, chromoplast

- Interchangeable

leucoplast ⟶ chloroplast ⟶ chromoplast

leucoplast ⟶ chromoplast

- Self duplicating in G_2 phase of cell cycle
- Have ⟶ 70S ribosome, DNA, RNA
- Semiautonomous

Chromoplast se kuch v leucoplast ya chloroplast nahi bante

Leucoplast

- Colorless ⟶ due to absence of pigments
- Size , shape ⟶ greatly vary
- # Largest plastid
- Function: food storage
- classified on the basis of nature of food stored #

| leucoplast | food stored | examples |
|---|---|---|
| Amyloplast | Carbohydrate (Starch) | potato, rice |
| Elaioplast (Oleoplast) | lipid (fat, oil) | Castor |
| Aleuroplast (Proteinoplast) | Protein | Aleurone in maize |

Chromoplast

- Colored other than green
  due to → carotenoids
  - Bound to thylakoid membrane
  - Fat soluble / lipid soluble
  - Gives red, orange, yellow color
  - (Mainly) two types:
    - xanthophyll
    - Carotene
      example → lycopene → red color of tomato is due to lycopene.
- Function: imparts color to various plant parts

Chloroplast

- Green plastids (due to abundance of chlorophyll)
- Kitchen house of cell → because food is prepared in it.
- Size, shape and number: variable

Size

- Large, width- 2 to 4 µm , length- 5 to 10 µm
- Can be easily observed under microscope

Shape (LORDS)

- Lens, Oval, ribbon like, Discoid, Spherical shape

Number (of chloroplast per cell)

• *Chlamydomonas* → 1

(Green algae)

• *Zygnema* → 2

• **Mesophyll cell** → 20 – 40

• **Internodal cells of *Chara*** → Several

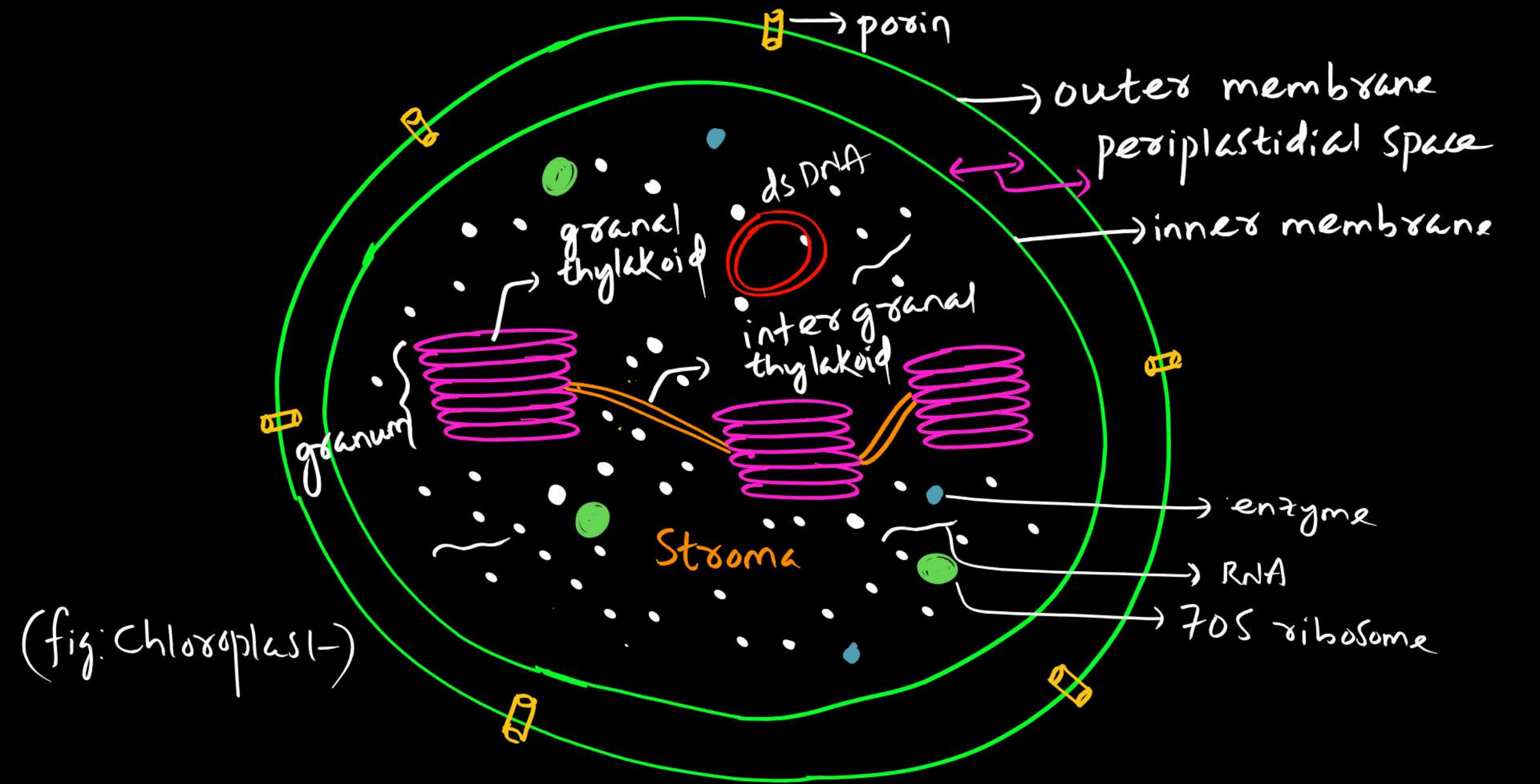
• **Note:**

Majority of chloroplasts in green plants are found in mesophyll cells

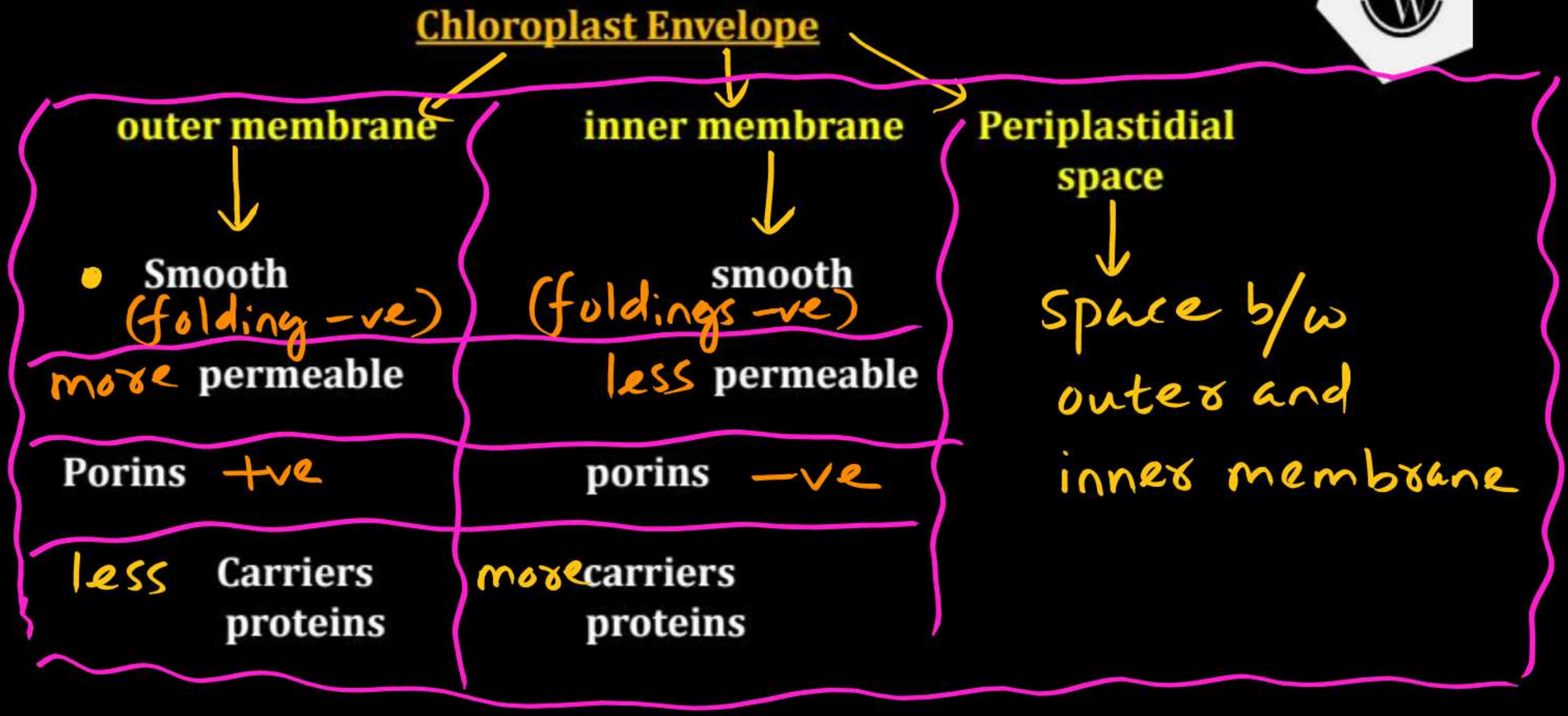
Ultrastructure of chloroplast

chloroplast

- **Envelope** ← made of → **grana** — **stroma** contains
  - Outer membrane
  - Inner membrane
  - Periplastidial space
- **grana**
  - thylakoids
- **stroma** contains
  - DNA, RNA,
  - ribosome,
  - enzymes



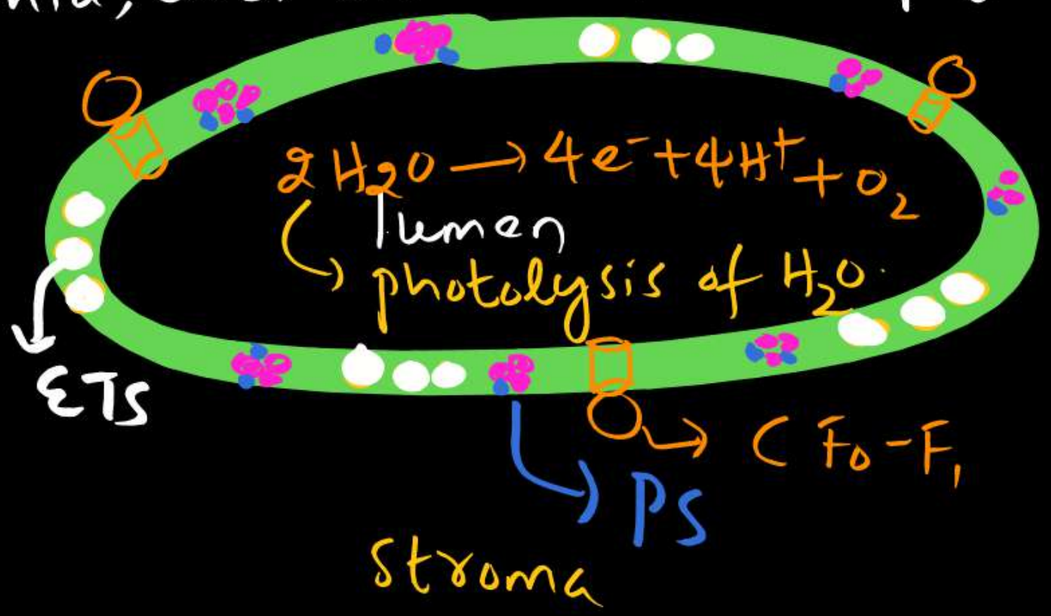
(fig: Chloroplast)



Grana (sing: granum)

made of stack of thylakoids (like piles of coins)

- Organised, membrane bound flattened sacs
- Membrane contains
  - * Pigments → chla, chlb, carotene, xanthophyll → fat soluble
  - * ETS
  - * CF_0- F_1



thylakoids

granal thylakoid

flattened sac

stromal thylakoid

- interconnects thylakoids two different grana
- known as stroma lamella, fret lamella, intergranal thylakoid
- flat membranous tubules

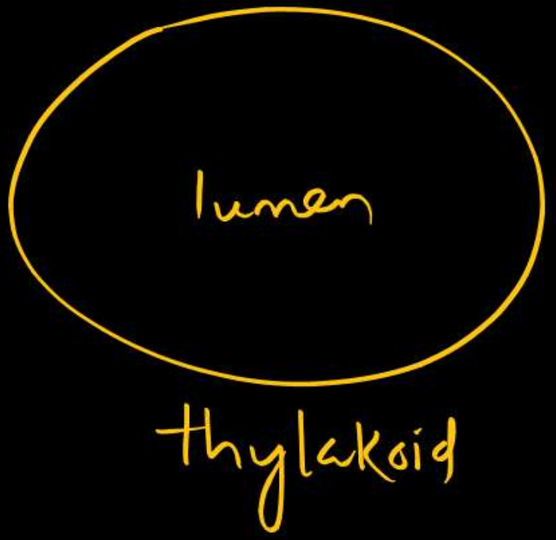
lumen in thylakoids

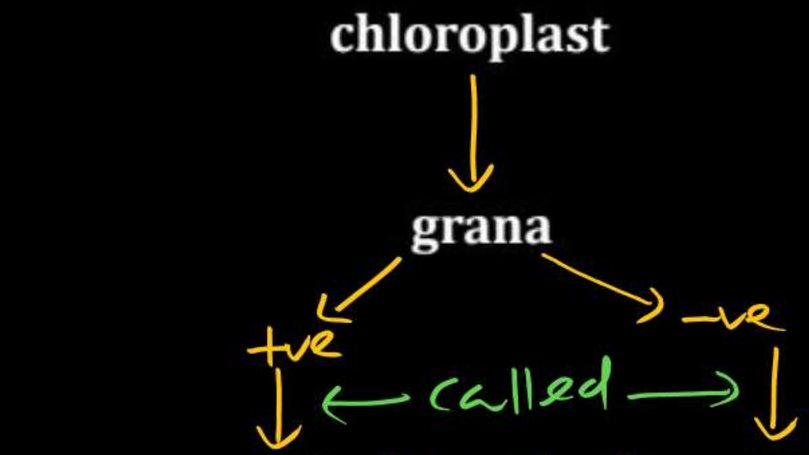
called

loculus — fret channel

of

granal thylakoid — stromal thylakoid





mesophyll cells of C_3 plants, C_4 plants, CAM plants

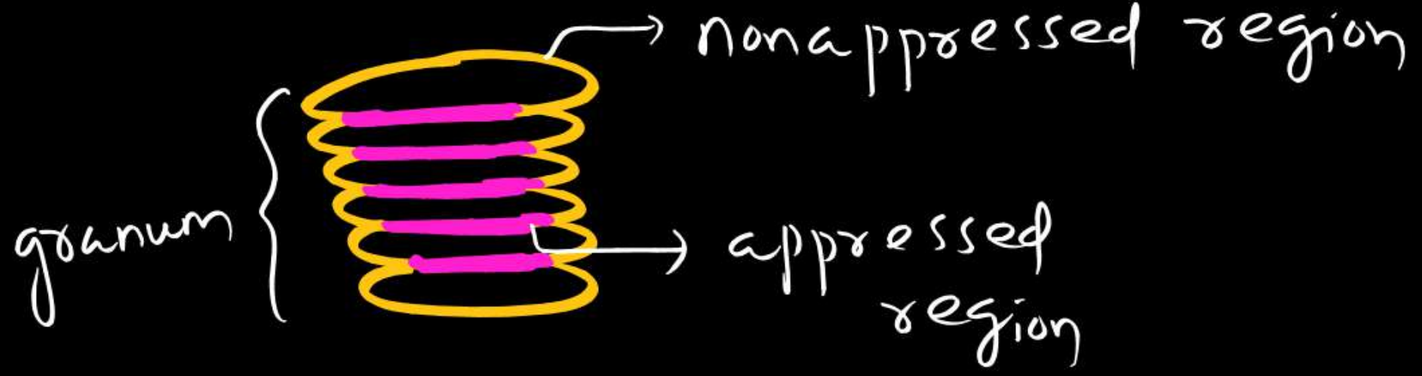
\# Bundle sheath cells of C_4 plants

Note:

One cholorplast → 40 – 60 **grana**

One granum → 20 – 100 **thylakoids**

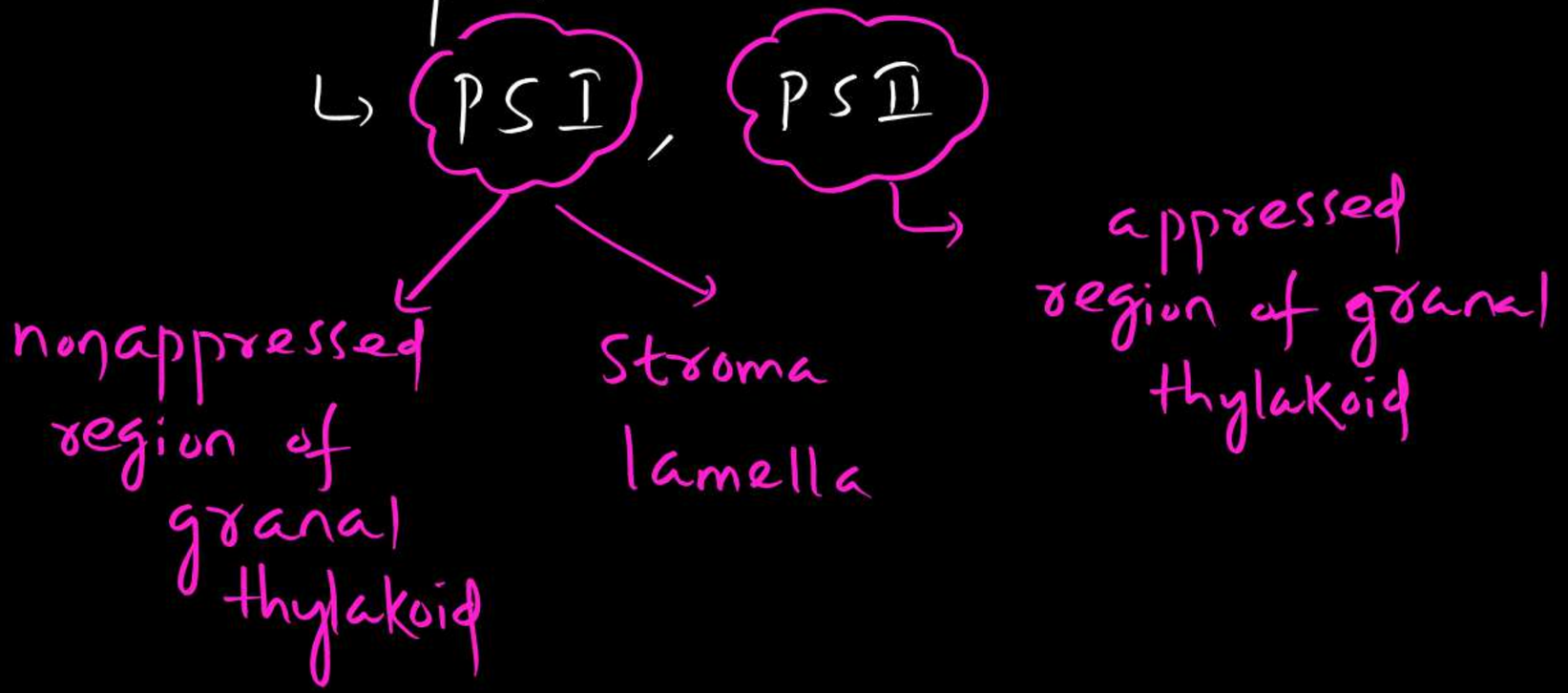
Regions of granal thylakoid



Phtosystems (PS)

↳ organised PS pigments along with proteins which act as a unit.

↳ PS I, PS II



Stroma

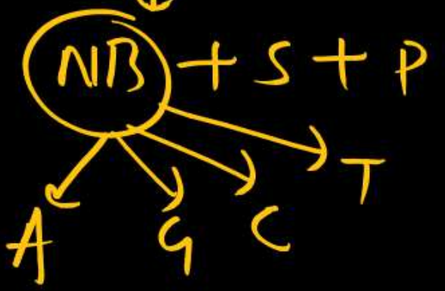
DNA
- → Small
- → Circular
- → ds (double stranded)
- → GC rich
- → histone -ve (naked DNA)
- → Copy no. → >1

RNA
- → few
- → mRNA, tRNA, rRNA

Ribosome
- ↓
- 70S
- ↓
- Smaller than EK (80S) ribosome

enzymes
- ⇓
- to synthesise protein and carbohydrate
  - ↳ RUBISCO

DNA
- ↓



RUBISCO

Present in stroma
most abundant protein on earth

As you may recall, a non-living rigid structure called the cell wall forms an outer covering for the plasma membrane of fungi and plants. Cell wall not only gives shape to the cell and protects the cell from mechanical damage and infection it also helps in cell-to-cell interaction and provides barrier to undesirable macromolecules. Algae have cell wall, made of cellulose, galactans, mannans and minerals like calcium carbonate, while in other plants it consists of cellulose, hemicellulose, pectins and proteins. The cell wall of a young plant cell, the primary wall is capable of growth, which gradually diminishes as the cell matures and the secondary wall is formed on the inner (towards membrane) side of the cell. The middle lamella is a layer mainly of calcium pectate which holds or glues the different neighbouring cells together. The cell wall and middle lamellae may be traversed by plasmodesmata which connect the cytoplasm of neighbouring cells.

→ Note making ✓

→ Revision ✓

→ NCERT reading ✓

→ How to memorize ✓