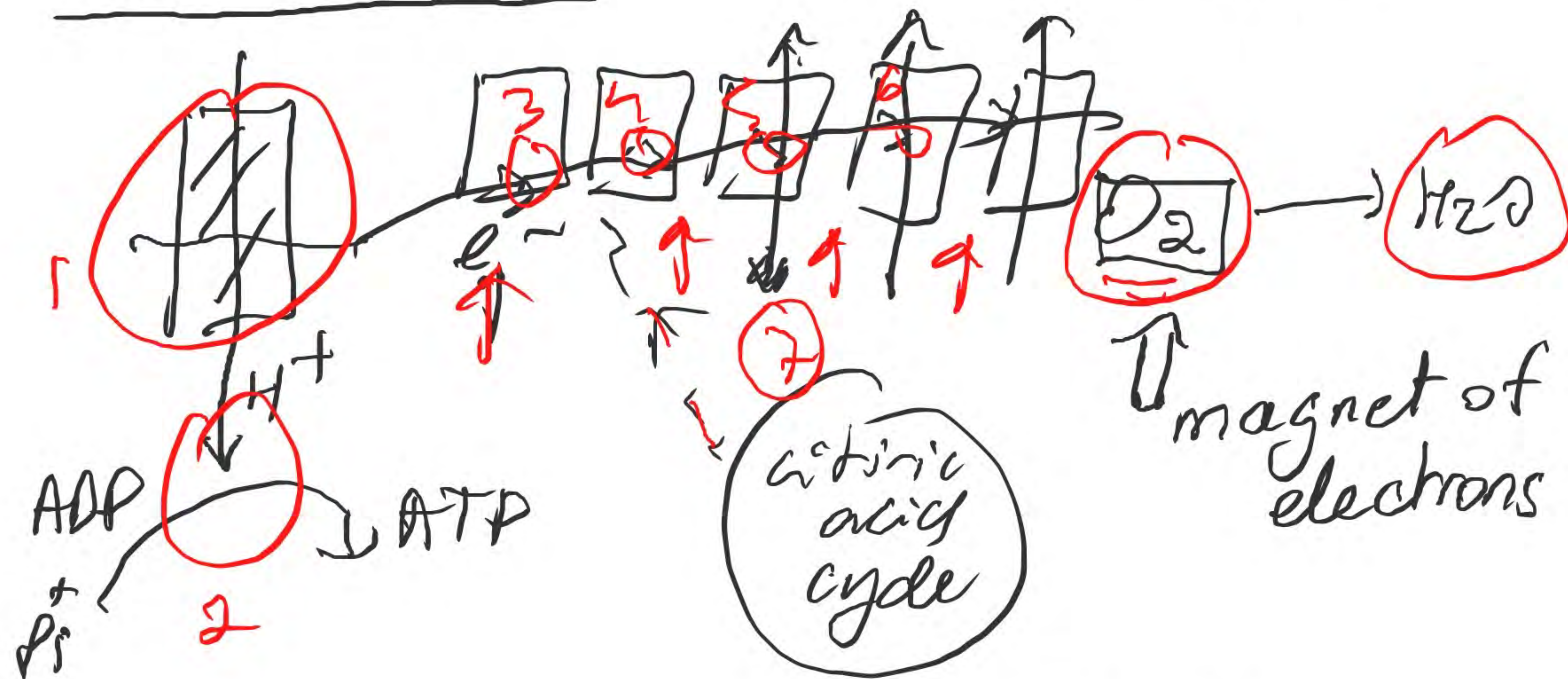


Mitochondria: look note #6:



= Complex steps

↓
synthesis of
ATP

= Lack of ATP → fatal consequences

→ BACK UP strategy ⇒ from cells

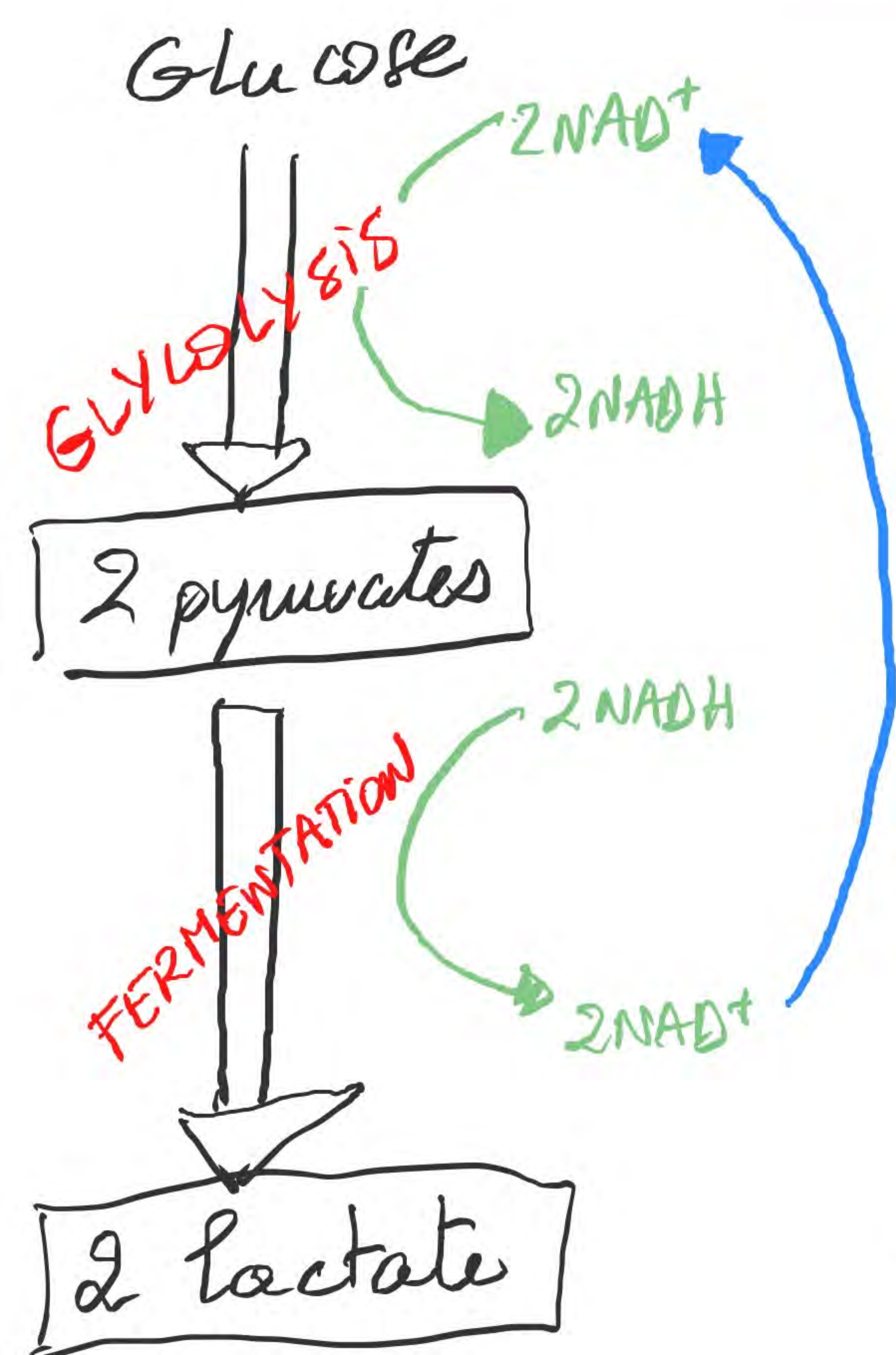
BACK UP PLAN: ANAEROBIC RESPIRATION.

ANAEROBIC RESPIRATION (OR FERMENTATION):

- In absence of oxygen, **PYRUVATE** has a different fate.
- Lack of oxygen in muscles \rightarrow pain \rightarrow lactic acid buildup (or accumulation).
- "Burn" feeling when overexercise \rightarrow SIGNAL \rightarrow **STOP, REST, ALLOW MUSCLES TO GET BACK OXYGEN.**
- Some organisms (unlike us) like yeast can survive using anaerobic respiration.
(Ex: yeast used for beer or wine-making)

Lactic acid fermentation is common in muscles that have been used exhaustively. (use too much!)

LACTIC ACID FERMENTATION



common with anaerobic respiration
(GLYCOLYSIS)
(we know from Note #6)

what happens here?

→ next page...

pyruvic acid

CO_2 + Acetaldehyde

Acetaldehyde

Ethanol

NADH

NAD⁺

FERMENTATION:

GRAPE FRUIT

WINE + CO_2 (dissolved in wine)
(= byproduct)




wood tanks of wines

cap

opening this cap time by time (using a valve)

("prevent explosion")

Glycogen (polymer of carbohydrates or sugars)

 = Reserve of sugar.

1 Glycogen (reserve of Glc) $\xrightleftharpoons[\text{"building"}]{\text{"breaking"}} n \text{ Glucose (Glc)} \rightarrow \text{Energy}$

* Carbohydrates
* Some amino acid
* Glycerol

GLYCOLYSIS

pyruvate
oxidation

citric acid
cycle

oxidative
phosphorylation

* Fatty acids
* Some amino acid

Conclusion: Glycogen (liver/muscle), with fats can also feed into the catabolic pathways for carbohydrates.

Some facts...

⊕ Cellular respiration also use energy from proteins and fats.

⊕ FATS >>> Carbohydrates or proteins
more calories

↳ more high energy chemical bonds

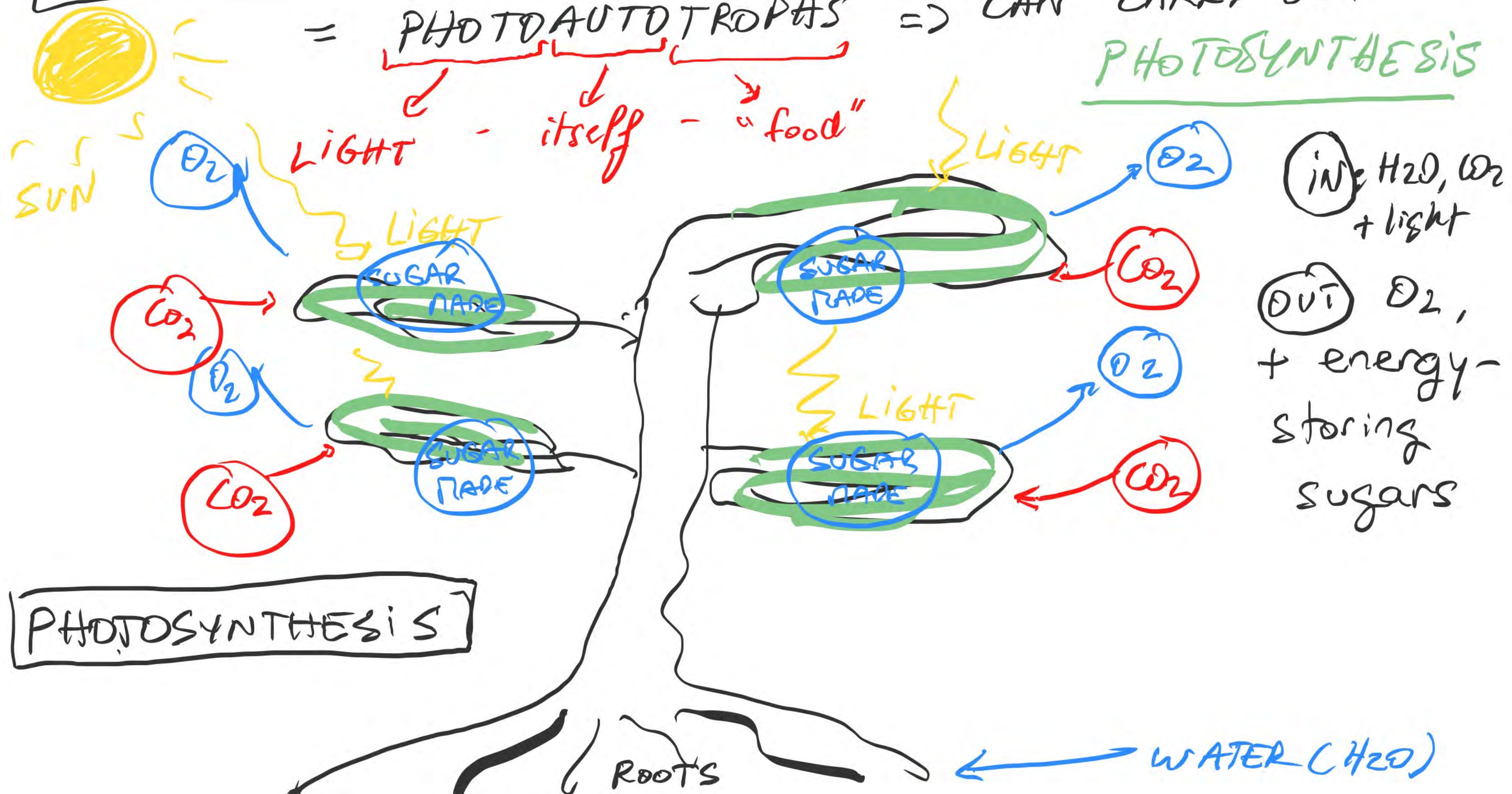
↳ more electrons to feed the transport chains.

NEW CHAPTER

PHOTOSYNTHESIS

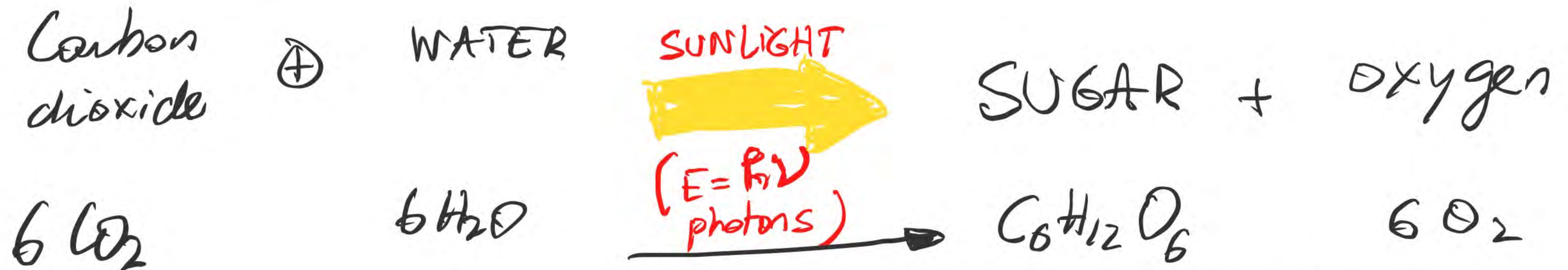
Plants, algae, certain bacteria (CYANOBACTERIA)

= PHOTOAUTOTROPHS => CAN CARRY OUT PHOTOSYNTHESIS



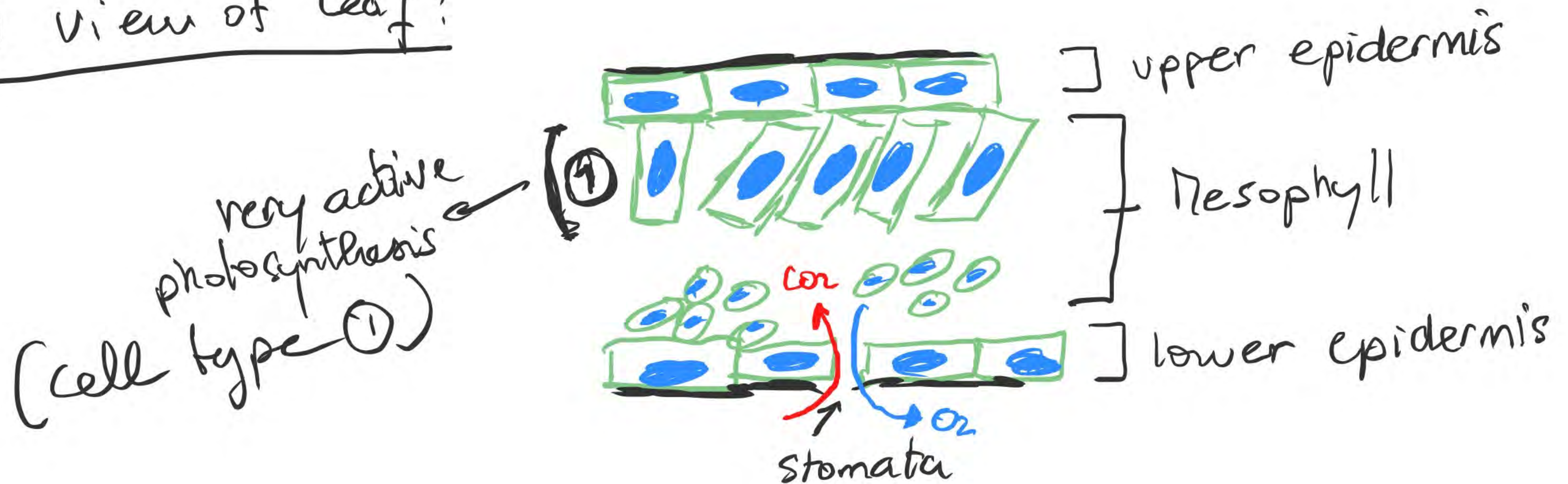
PHOTOSYNTHESIS

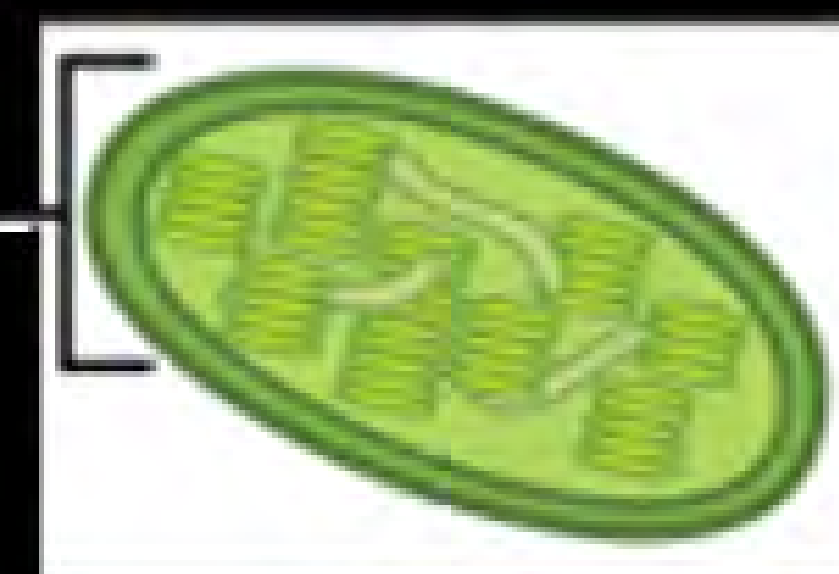
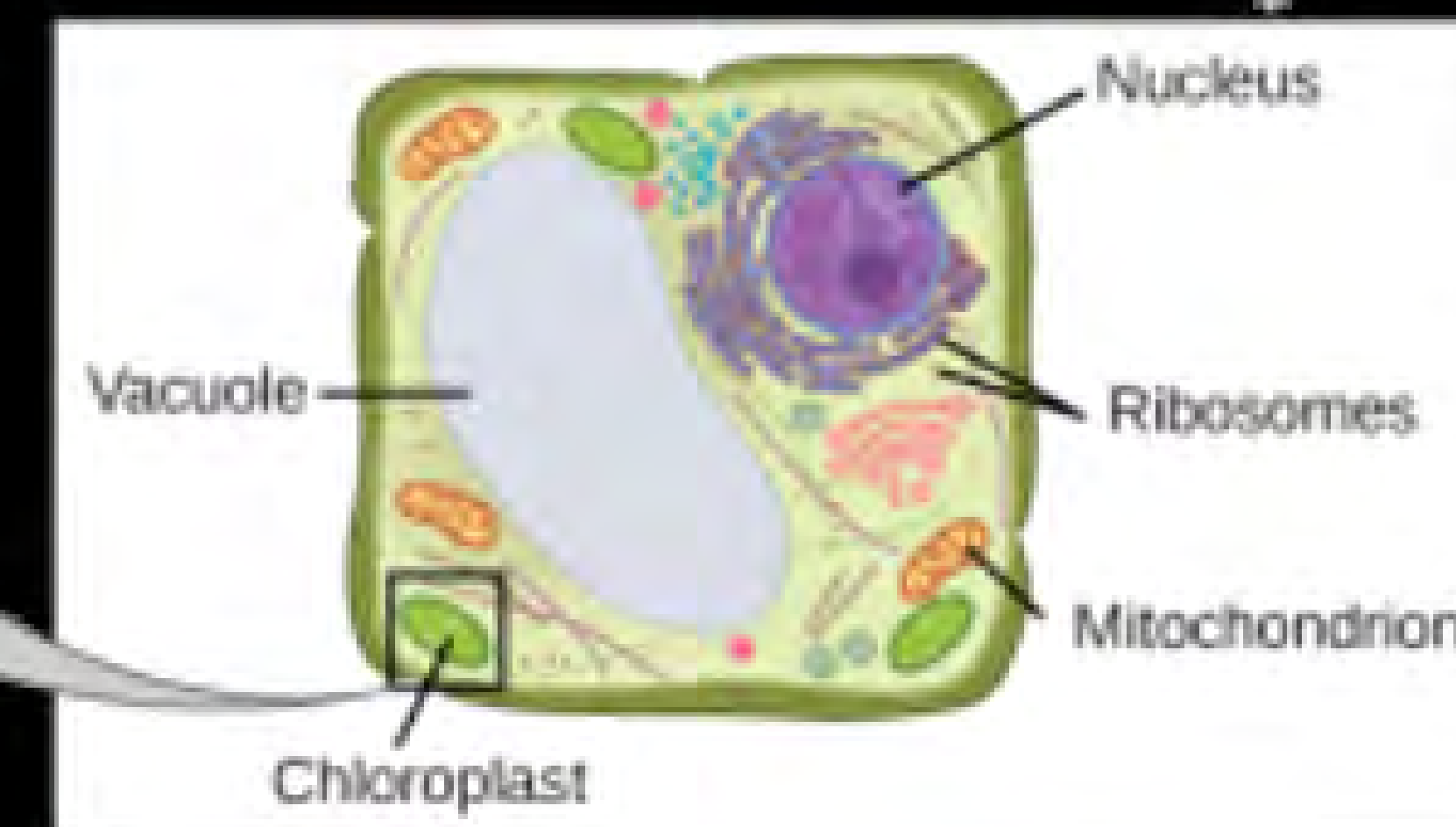
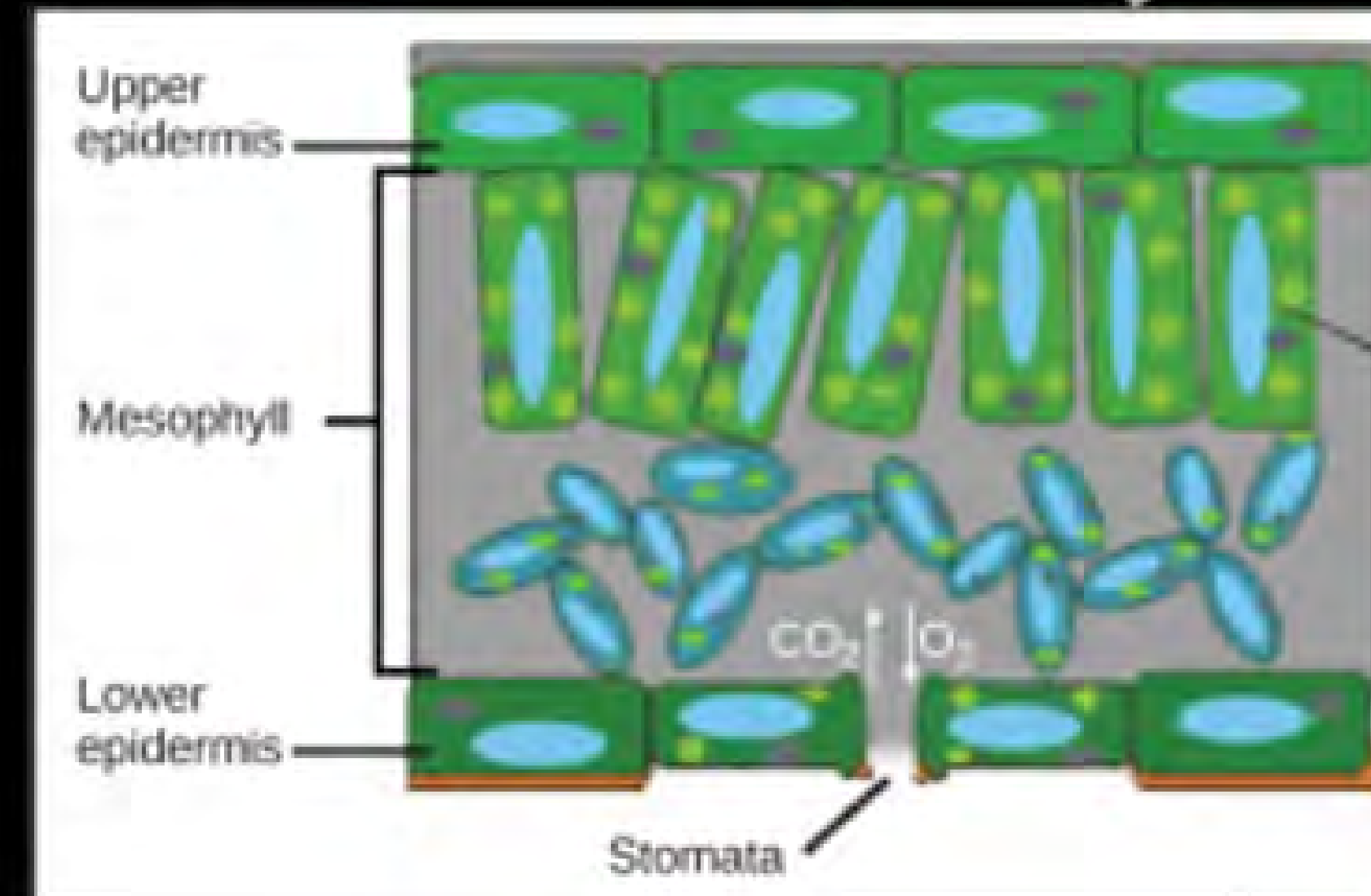
Photosynthesis Equation:



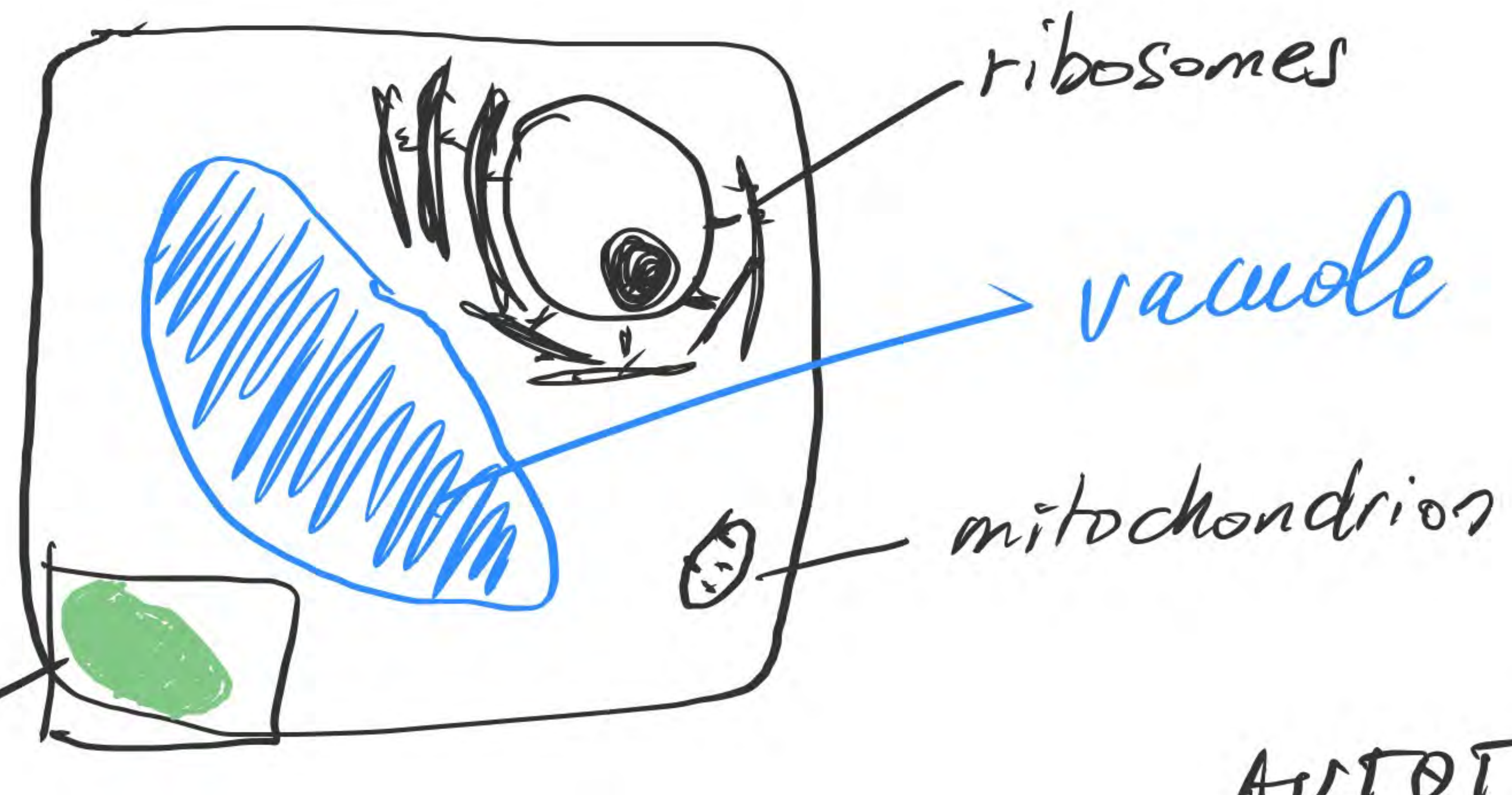
On a leaf, not all cells are doing photosynthesis.
(middle layer of a leaf have chloroplasts)

Section view of leaf:





section ① cell :



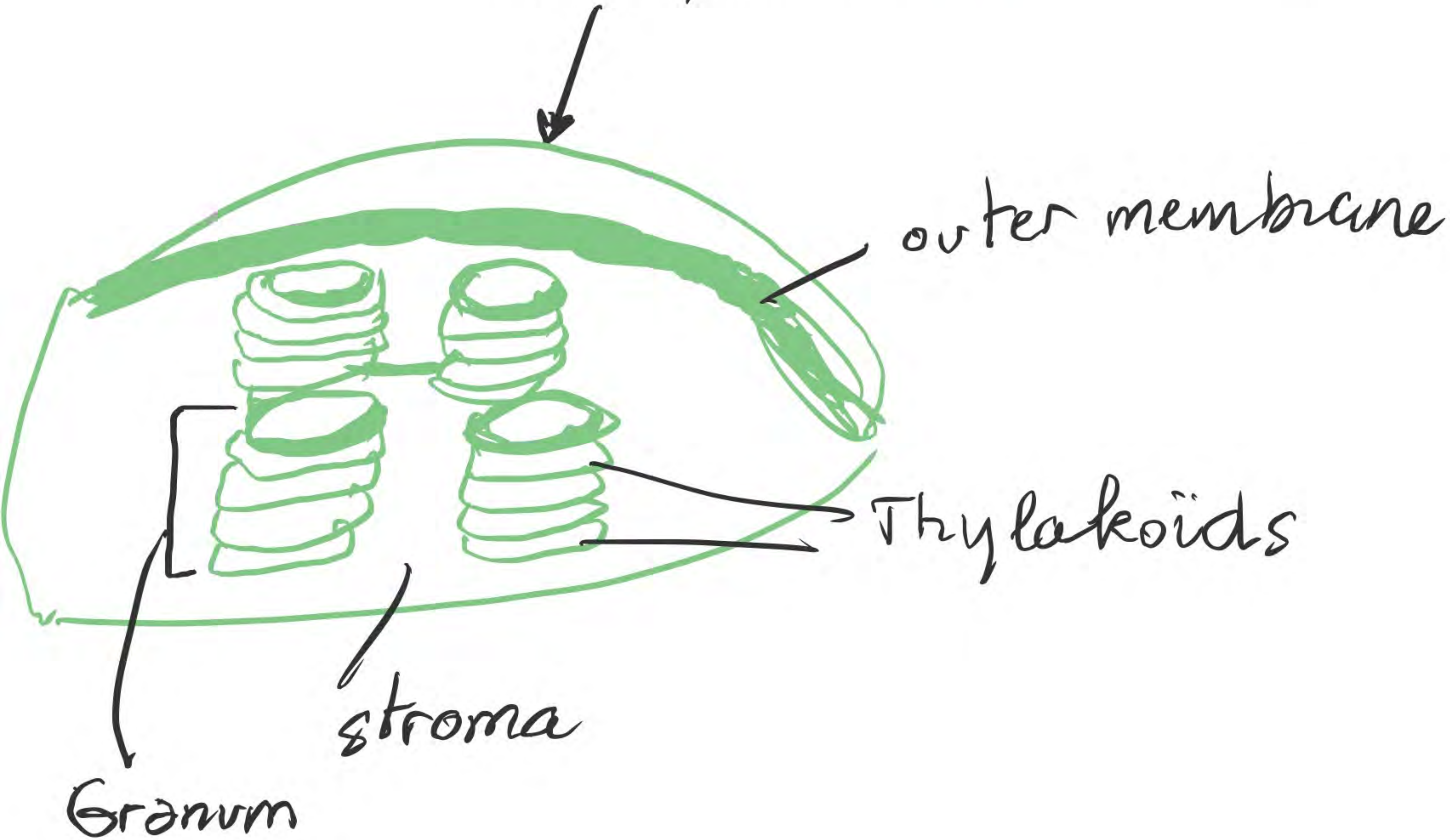
chloroplast

mitochondrion

AUTOTROPHS

CAPTURE LIGHT ENERGY

CONVERT INTO CHEMICAL ENERGY



outer membrane

Thylakoids

stroma

Granum