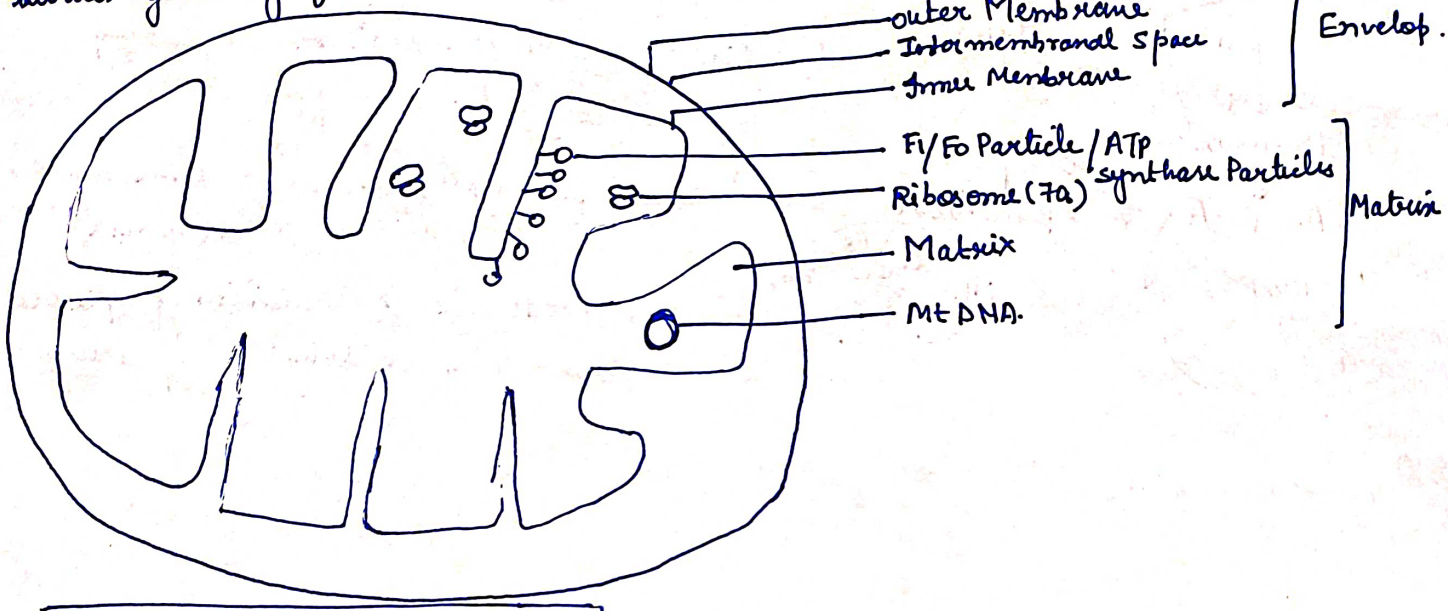
Mitochondria ⇒ 'Powerhouse of the cell'

→ It is a double membrane bound organelle.
→ It is semi-autonomous as it has DNA of its own
→ It divides by binary fission



Ultrastructure of Mitochondria

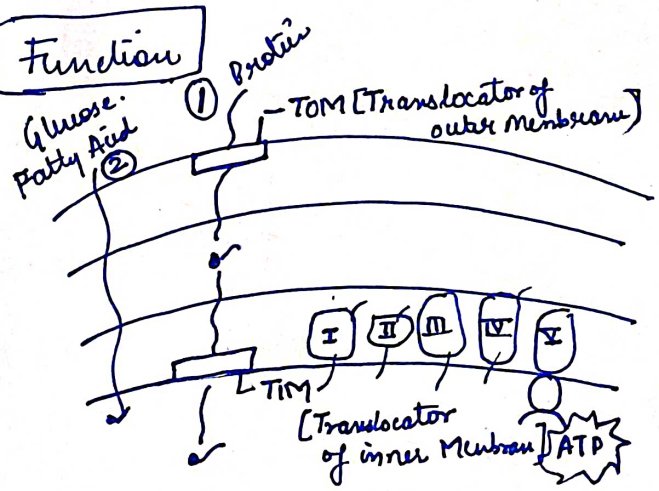
(I) Envelop :→ 1) outermost : OUTER MEMBRANE : have Porins, which makes it permeable.

→ 2) INTERMEMBRANAL SPACE :- contains enzyme complex for ETC (oxidative phosphorylation)

→ 3) INNER MEMBRANE :- Folded inwards into cristae
→ contains cardiolipin making it less permeable.

(II) Matrix :→ Space inside inner Membrane.
It contains :- i) Mitochondrial DNA (Mt-DNA)
→ Maternal DNA, codes for Mt protein.
ii) Ribosomes :- 70s subunit present.

Function

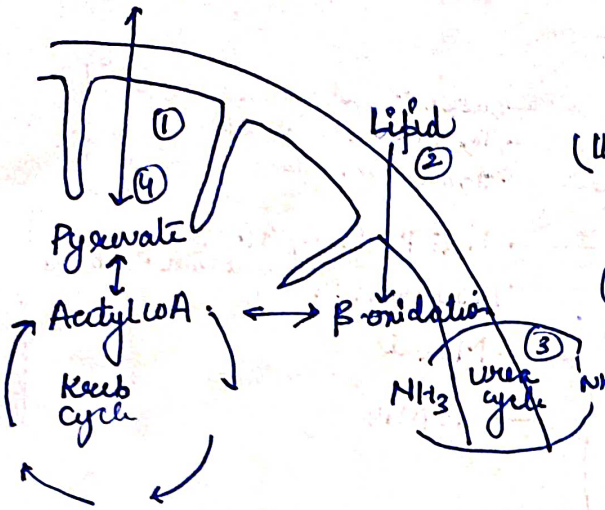


① Protein Transport from outside to inner side into matrix via surface Translocators

② Miscellaneous Transport → Substances like Glucose, fatty acid are transported into the matrix.

③ Electron Transport chain Complex
→ Generation of (ATP) through complexes of ETC due to the proton gradient across membrane. As the ATP generates by reduction of O_2 i.e K/a. Oxidative phosphorylation

(II) Matrix Function



(I) Conversion of Pyruvate to Acetyl CoA. which runs the Krebs cycle involved in aerobic respiration.
i.e why K/a site for cellular Respiration.

(II) Lipid enters the matrix & undergo β-oxidation for energy.

(III) Urea cycle {NH_3 exchange from matrix to out & vice versa}

(IV) Gluconeogenesis → Conversion of Glucose from non-carbohydrate precursors.