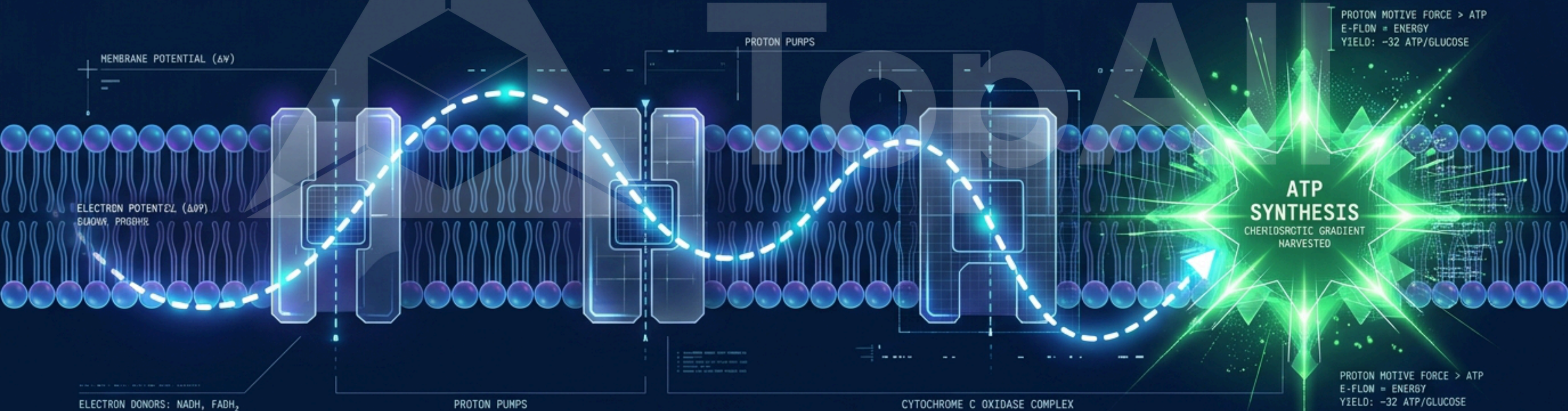


HOW ELECTRONS BUILD ATP

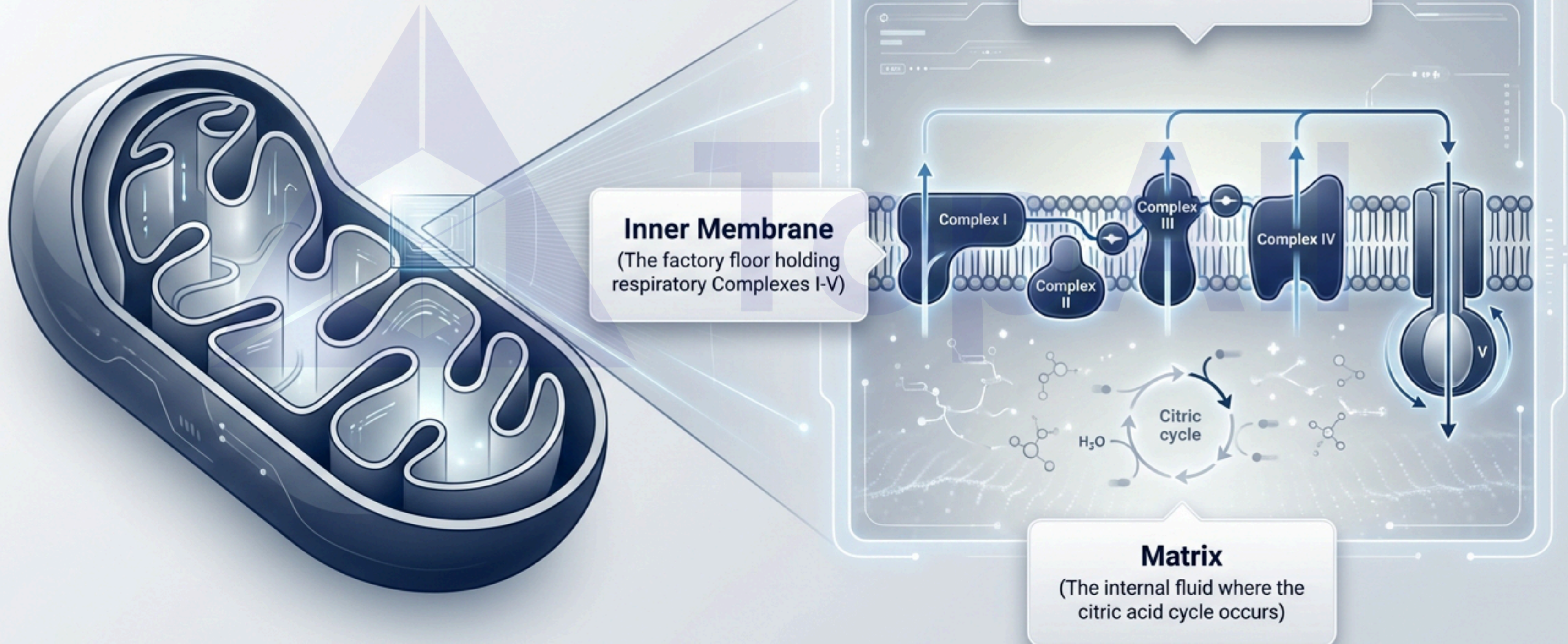


Decoding the Electron Transport System and Oxidative Phosphorylation



The Factory Floor: Inner Mitochondrial Membrane

Aerobic respiration relies on a sequence of massive protein complexes embedded specifically within the highly folded inner membrane (cristae) of the mitochondria.

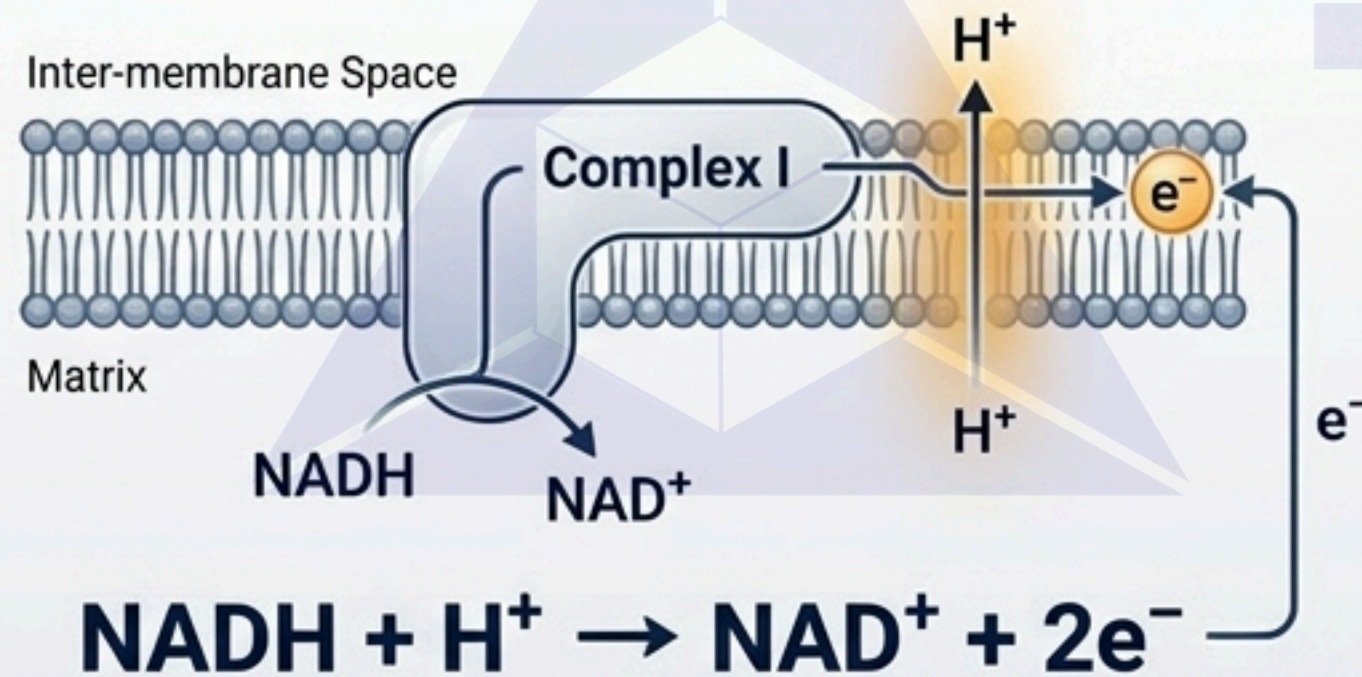


Dropping Off the Payload

Both complexes feed electrons into the transport system, but only Complex I directly contributes to the proton gradient.

Complex I

NADH Dehydrogenase

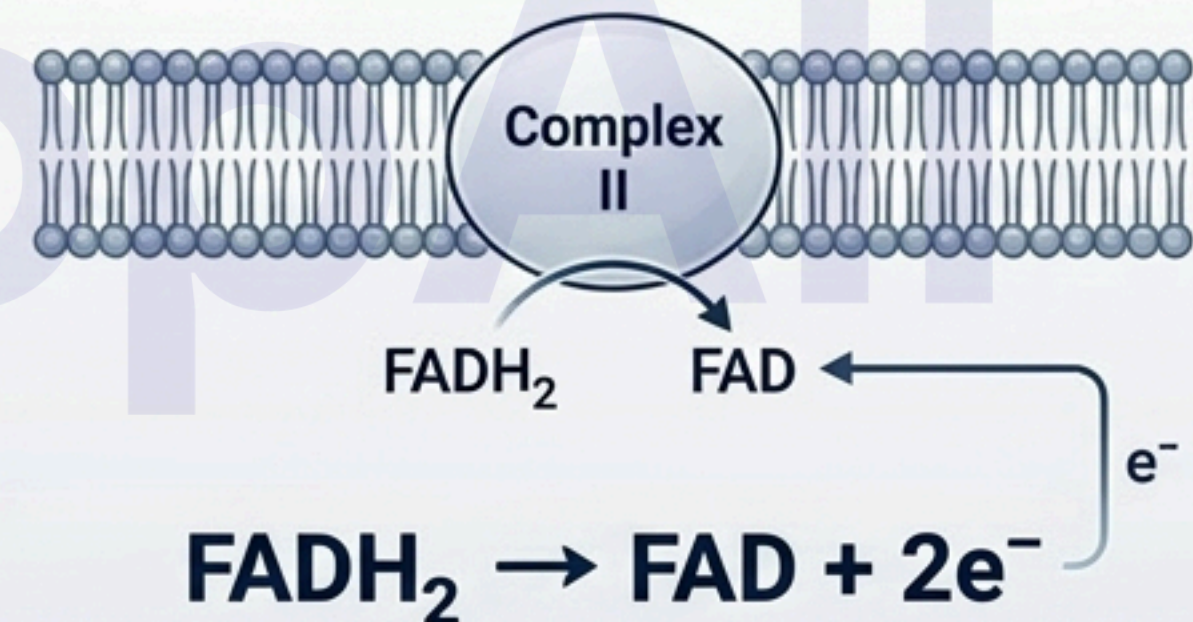


Amber Note Panel

Actively pumps protons (H⁺) across the membrane into the inter-membrane space.

Complex II

Succinate Dehydrogenase



Amber Note Panel

Transfers electrons directly from the citric acid cycle without pumping protons.



You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



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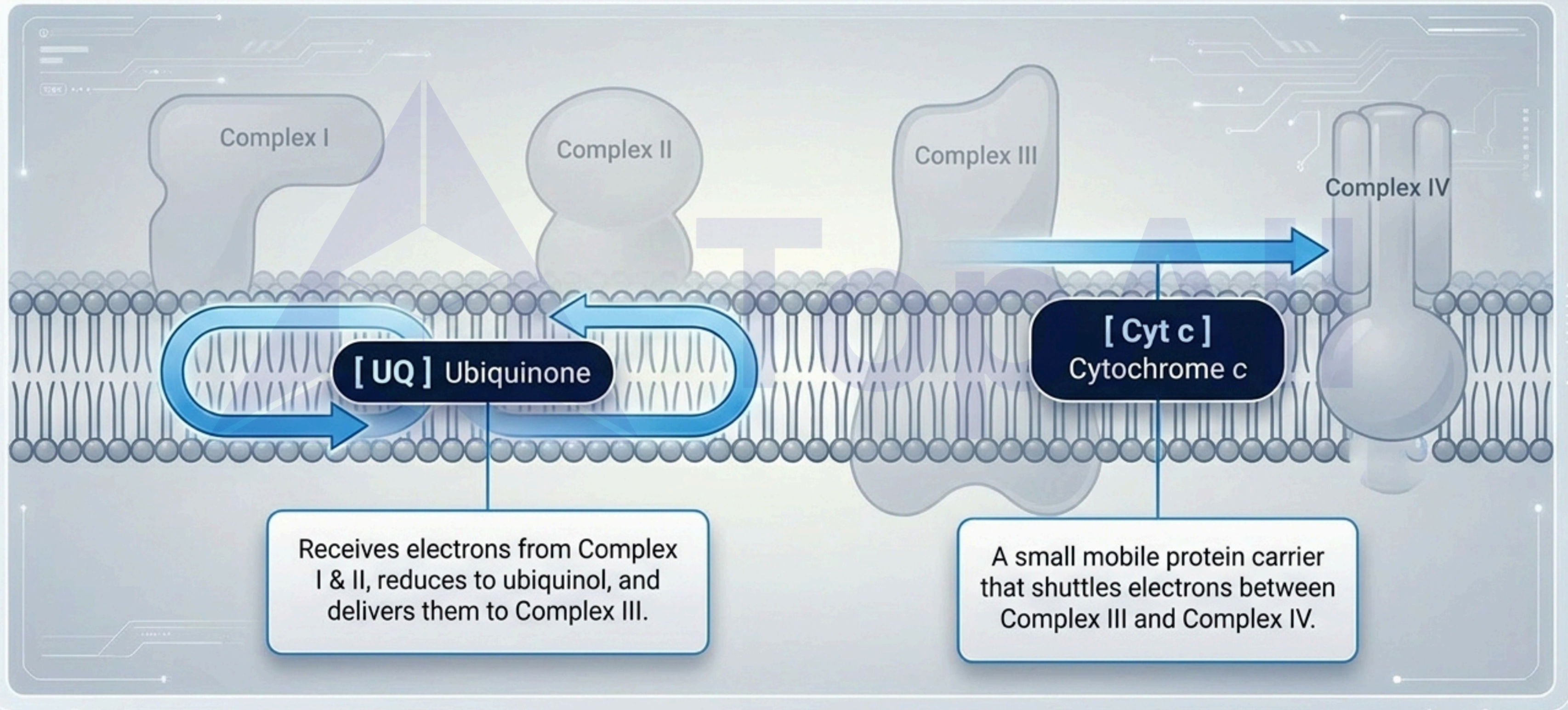
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- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter



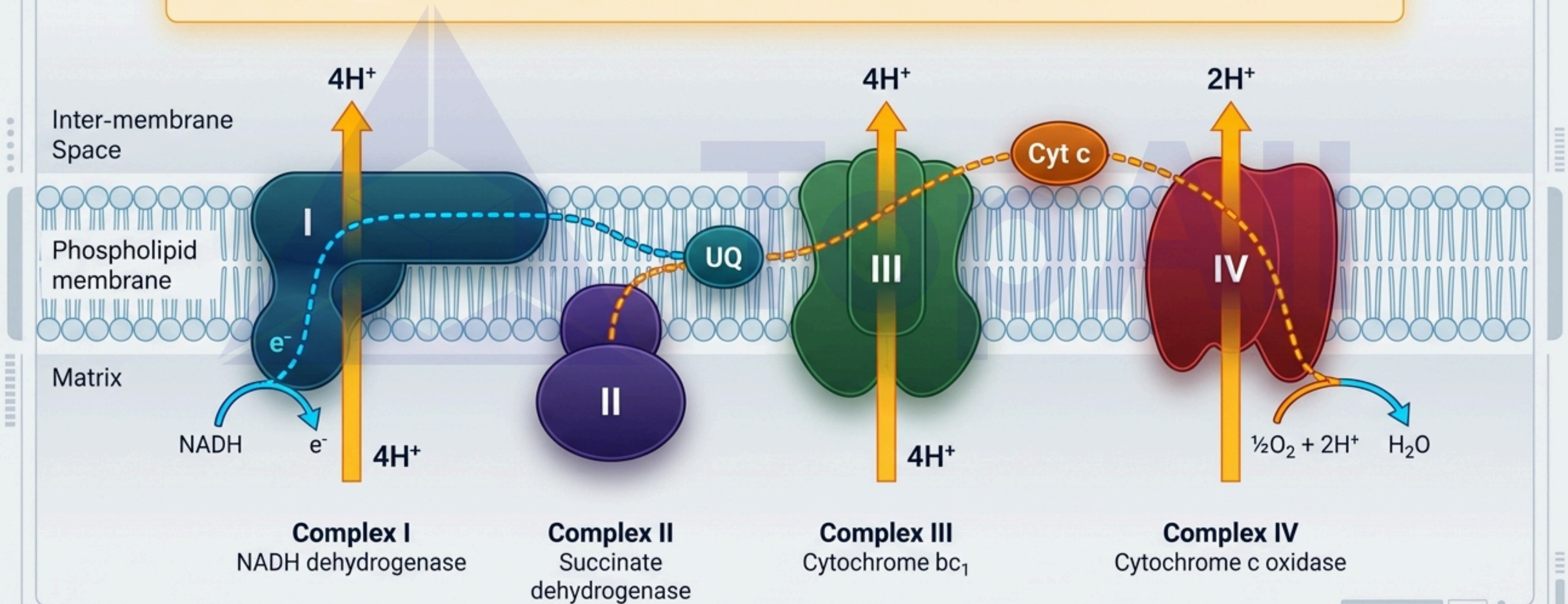
The Biochemical Shuttle Service



The Electron Transport System (ETS)

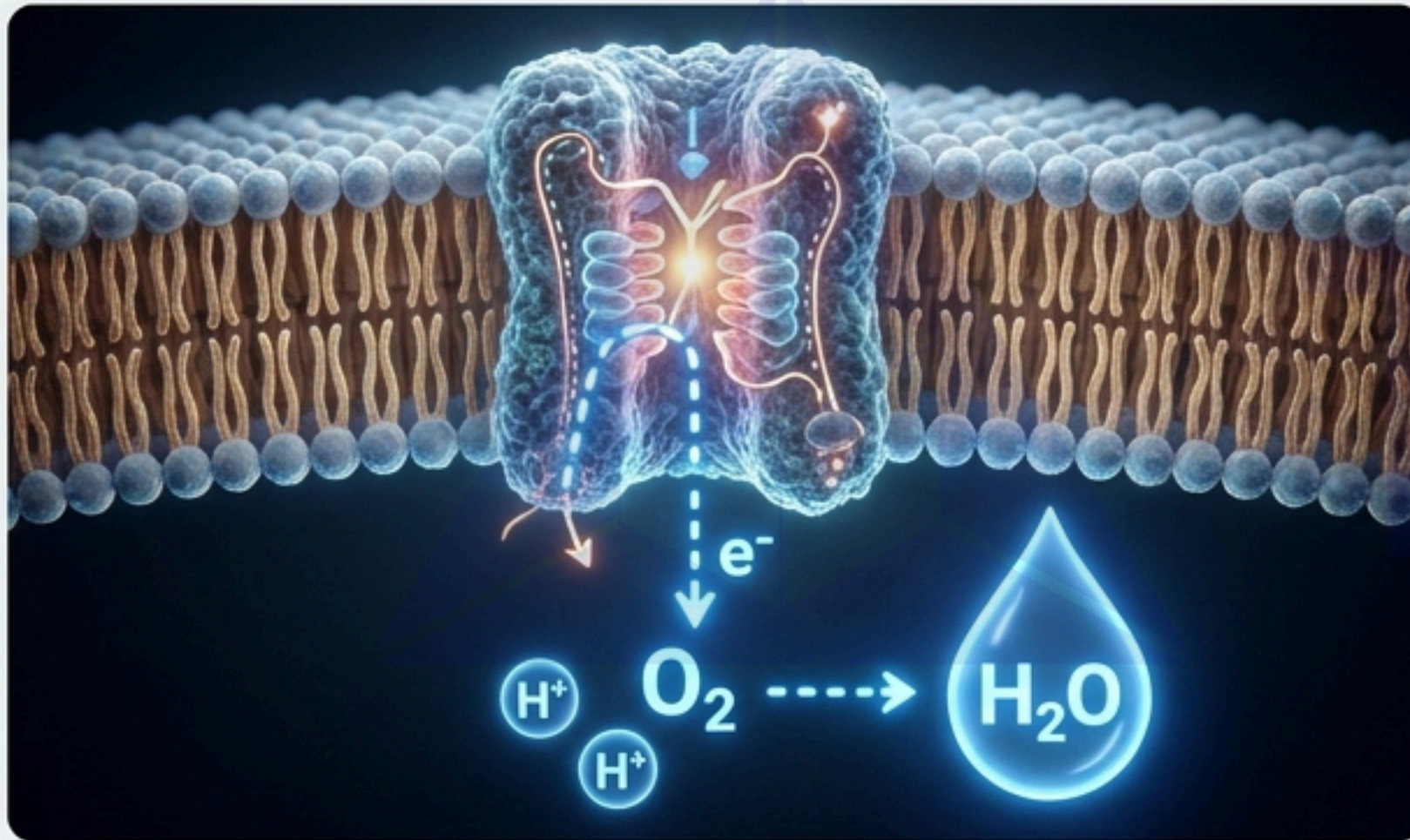
Amber Note

Stored Energy: Outward pumping creates a High H^+ Electrochemical Gradient in the inter-membrane space.



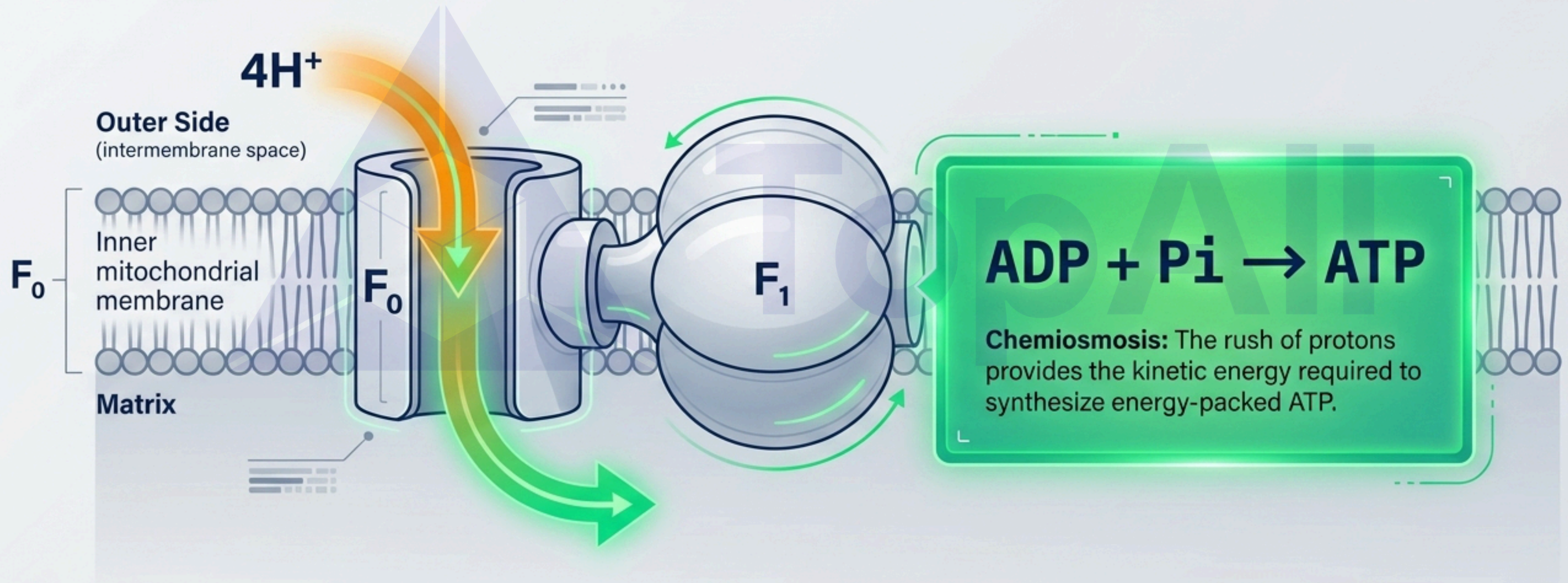
Oxygen: The Final Hydrogen Acceptor

Oxygen's role is limited to the terminal stage, but it drives the entire process by constantly clearing out hydrogen and electrons.



WARNING: Without O₂, the final electron transfer cannot occur. Electrons back up, the entire transport chain stops, and ATP production halts instantly.

ATP Synthase: The Molecular Turbine



The Final Balance Sheet

Oxidative Phosphorylation

Unlike photosynthesis (which uses light), respiration uses the energy of oxidation-reduction to produce the proton gradient required for phosphorylation.

[1 NADH] → Generates 3 ATP

[1 FADH₂] → Generates 2 ATP

The entire factory runs on a continuous flow of electrons, driven by the presence of Oxygen clearing the end of the line.



You've Learned the Theory.

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