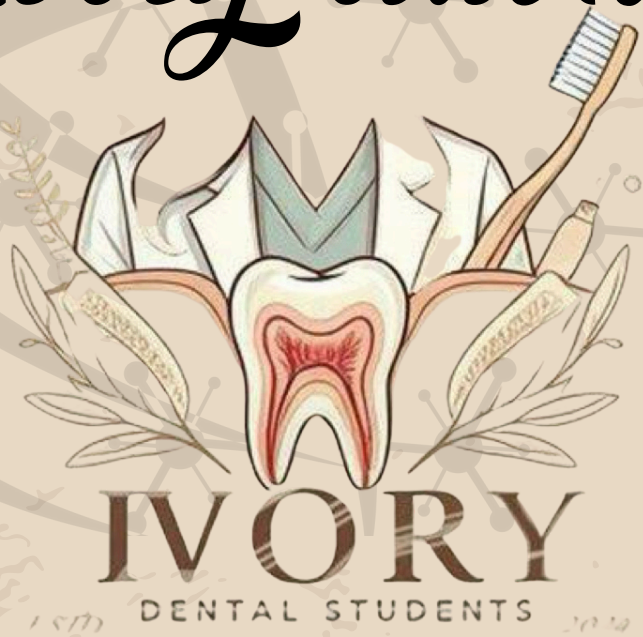
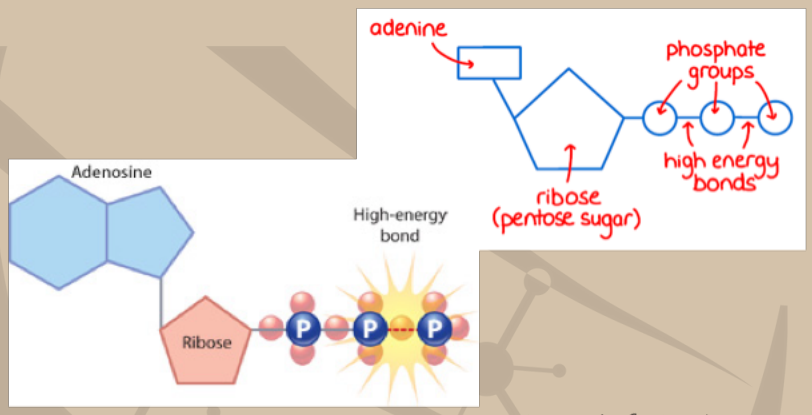
Biochemistry

SUMMARIES OF THE LECTURE 13 , ETC

Ivory batch



ATP



High-energy phosphate compound.

Formed of **adenine + ribose + 3 inorganic phosphate**s

Contain **2 high energy** phosphate **bond.**

Synthesized by Phosphorylation of ADP

ADP +P → ATP

Function of ATP

1. muscle contraction
2. Active transport
3. Anabolism
4. nerve impulses
5. phosphorylation of compound
6. creative phosphorelation system.

Metabolism

is the sum of all the reactions that take place in a living cell.

Anabolism	Catabolism
→ Synthesis of large molecules from small ones. → It is usually required energy	→ Breaking of large molecules into small ones → release energy ↳ this energy used again in anabolism – Catabolism pass into stages: 1. Stage I → Hydrolysis of complex molecules to their component building blocks. 2. Stage II → Conversion of building blocks to acetyl CoA (or other simple intermediates) 3. stage III : Oxidation of acetyl CoA : oxidative phosphorylation.

two steps

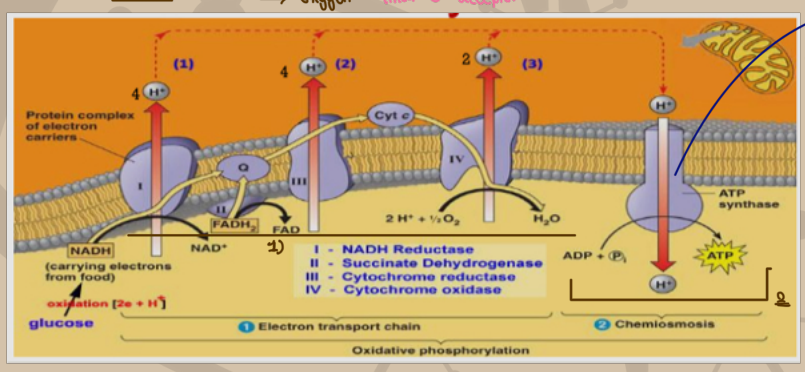
1) ETC

→ serious of carriers, with Catalyze a stepwise transfer of electrons and hydrogen from reduced Coenzyme (NADH & $FADH_2$) to oxygen to form H_2O and Energy.

→ energy that loss when e- pass used in → synthesis of ATP / released Heat

📍 Inner mitochondria membrane

component → reduced coenzymes, ETC complex, mobile carrier, oxygen (final e⁻ acceptor)



• **Oxidative phosphorylation :**

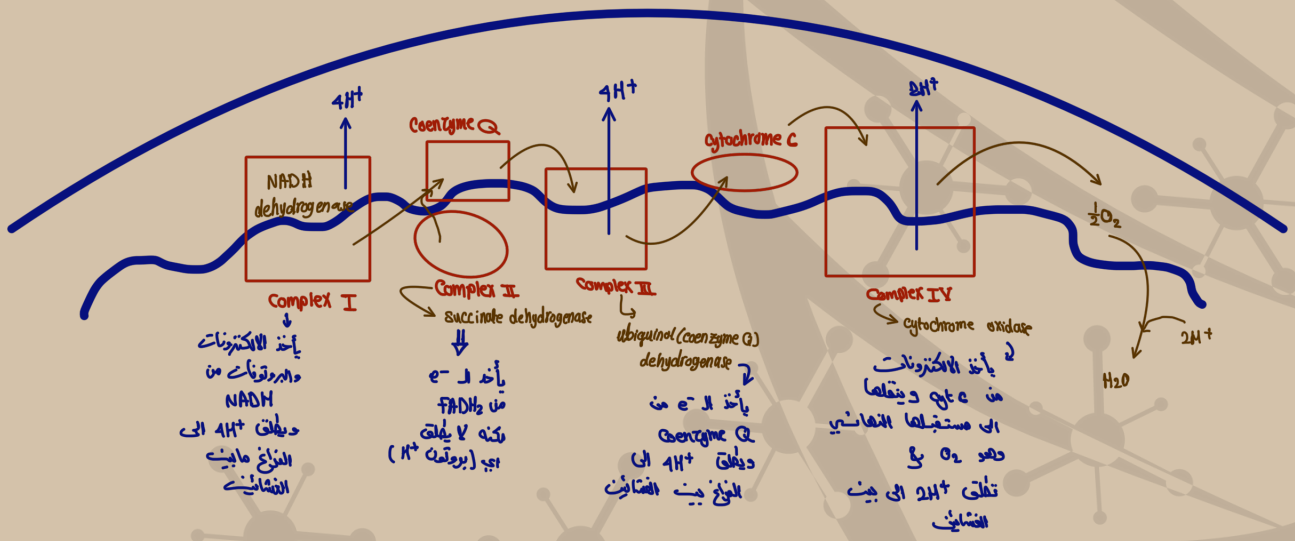
Synthesis of ATP by phosphorylation of ADP for which energy is obtained by electron transport that takes place in the mitochondria during aerobic respiration.

2. phosphorylation

→ main goal : ATP synthesis

📍 Inner mitochondria membrane

Electron transport chain



يأخذ الالكترونات والبروتونات من NADH ويطلق 4H+ الى الفراغ مابين الغشائين

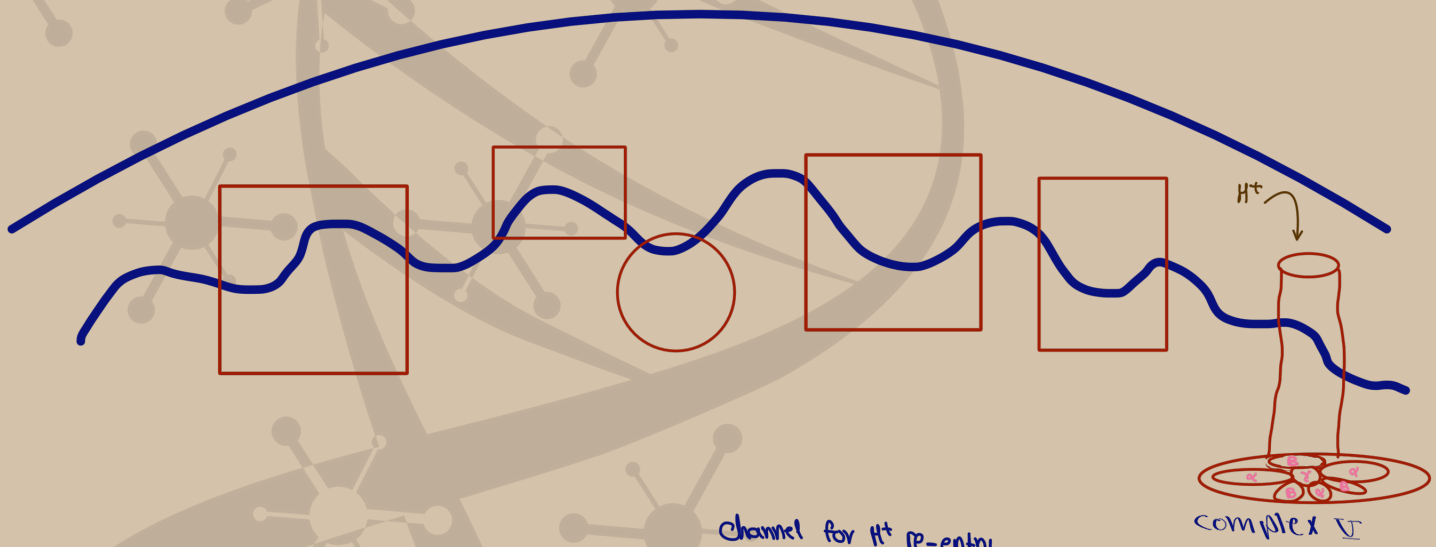
يأخذ الـ e- من FADH2 ثم يطلق (بروتين) H+

يأخذ الـ e- من Coenzyme Q ويطلق 4H+ الى الفراغ بين الغشائين

يأخذ الالكترونات من c ويوقلها الى مستقبلها النهائي وهو O2 ثم يطلق 2H+ الى بين الغشائين

* لهذه الخطوة لم يتم انتاج ATP

* يسبب نقل الالكترونات عبر "ETC" دفع H+ الى الفراغ بين الغشائين مما يولد تركيز عالي



Channel for H+ re-entry to the matrix ← F_0

Synthesis of ATP from ADP & P_i ← F_1

formed of

β subunit it catalytic site at which ATP is synthesized ← formed of 3α, 3β 1γ subunits

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P:O ratio

tip

- → 3:1 if e^- enter through NADH +H
- → 2:1 if e^- enter through $FADH_2$