

Cellular Respiration & Fermentation

7.1

Catabolic Pathways - breaking down molecules
- release energy

Anabolic Pathways - build molecules
- store energy.

Complex organic molecules
w/ LOTS of Potential Energy

degraded into

Waste products with
less potential energy

+

Energy available
to do work

and

HEAT

Glucose - breakdown is exergonic

$$\Delta G = -686 \text{ kcal/mol}$$

Redox Reactions

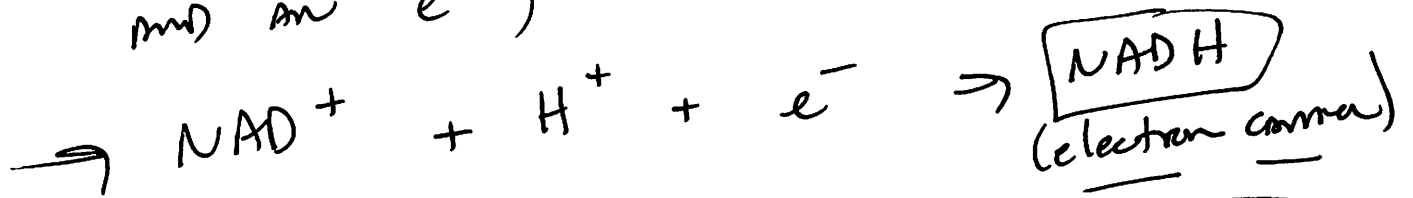
LEO (the lion) says GER

Loss of Electrons
is Oxidation

Gain of Electrons
is Reduction

NAD⁺ (nicotinamide adenine dinucleotide)

- becomes reduced (gains electron) by accepting a hydrogen atom (an H⁺ and an e⁻) from Glucose (C₆H₁₂O₆)



★ the e⁻ will ultimately move through the ETC and end up being donated to Oxygen to form water

and
the H⁺ will be pumped out of the matrix into the Inter Membrane Space to create the Proton-motive Force to generate ATP at ATP Synthase 😊

★ Dehydrogenases (enzymes) strip 2 hydrogens from Glucose

[2 e⁻ and one H⁺ go to NAD⁺]
the other H⁺ goes into solution

Electrons !!

glucose $\rightarrow$ NADH $\rightarrow$ ETC $\rightarrow$ OXYGEN

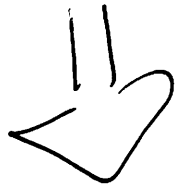
substrate level
phosphorylation

Glycolysis



Pyruvic Acid
Oxidation
(Acetyl CoA)

(link reaction)



CITRIC ACID
CYCLE
(KREBS cycle)
(TCA cycle)



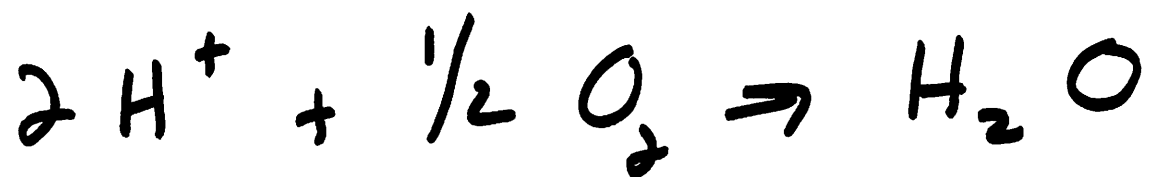
OXIDATIVE Phosphorylation:

ETC

and

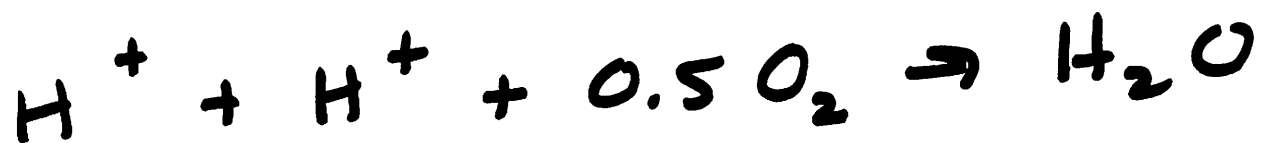
chemiosmosis

90%
of ATP
in eukaryotes

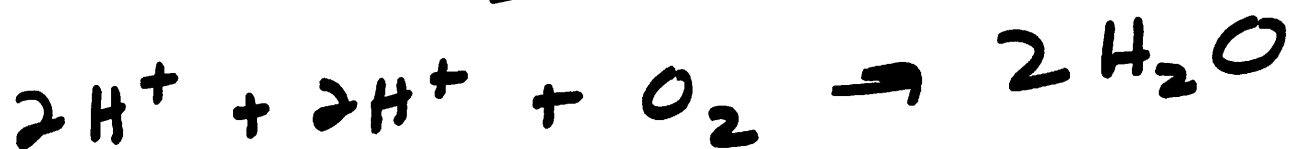


??

It's a proportion, not an absolute amount



or



or

