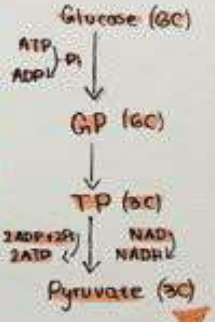
RESPIRATION

Aerobic Respiration

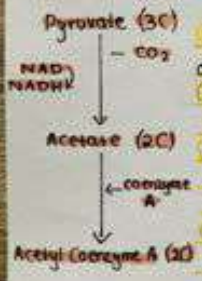
$C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2O + ATP$

Glycolysis

1. ATP hydrolase breaks down 2 ATP into ADP + Pi
2. Pi is used to phosphorylate glucose → glucose phosphate
3. GP splits into 2 molecules of TP
4. Redox reactions TP → pyruvate
   - NAD → NADH
   - TP $\xrightarrow{\text{oxidised}}$ pyruvate
5. Redox reactions release energy which is used to form ATP from ADP + Pi



Link Reaction

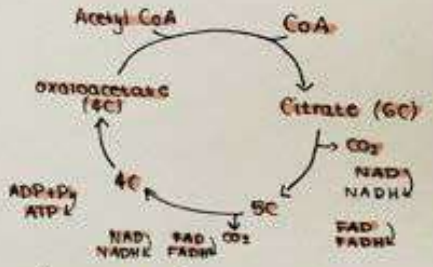


1. Pyruvate is actively transported across 2 membranes into matrix
2. CO_2 is removed from pyruvate
   - ↳ decarboxylation
3. Redox reactions occur:
   - Pyruvate oxidised → acetate
   - NAD reduced → NADH
4. Coenzyme A combines with acetyl to form acetyl coenzyme A (acetyl CoA)

Krebs Cycle

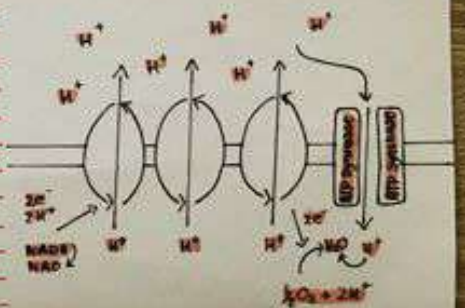
1. Acetyl CoA combines with a 4C oxaloacetate to form a 6C citrate
2. ↳ This releases coenzyme A which is reused in link reaction
3. 6C is decarboxylated → 5C
4. NAD and FAD coenzymes are reduced
5. Oxaloacetate is regenerated
   - 5C decarboxylated → 4C

Redox reactions occur producing NADH + FADH → release energy to produce ATP



Oxidative phosphorylation

1. NADH/FADH release H^+ (oxidised) and electrons
2. Electrons are transferred along the ETC in a series of redox reactions → energy released is used to pump H^+ across cristae into intermembrane
3. This creates concentration gradient so protons diffuse out through ATP synthase and activate it
4. ATP synthase phosphorylates ADP to ATP
5. Oxygen combines with e^-s + H^+ to form water. Oxygen is reduced



Anaerobic Respiration

In plants / yeast

In animals