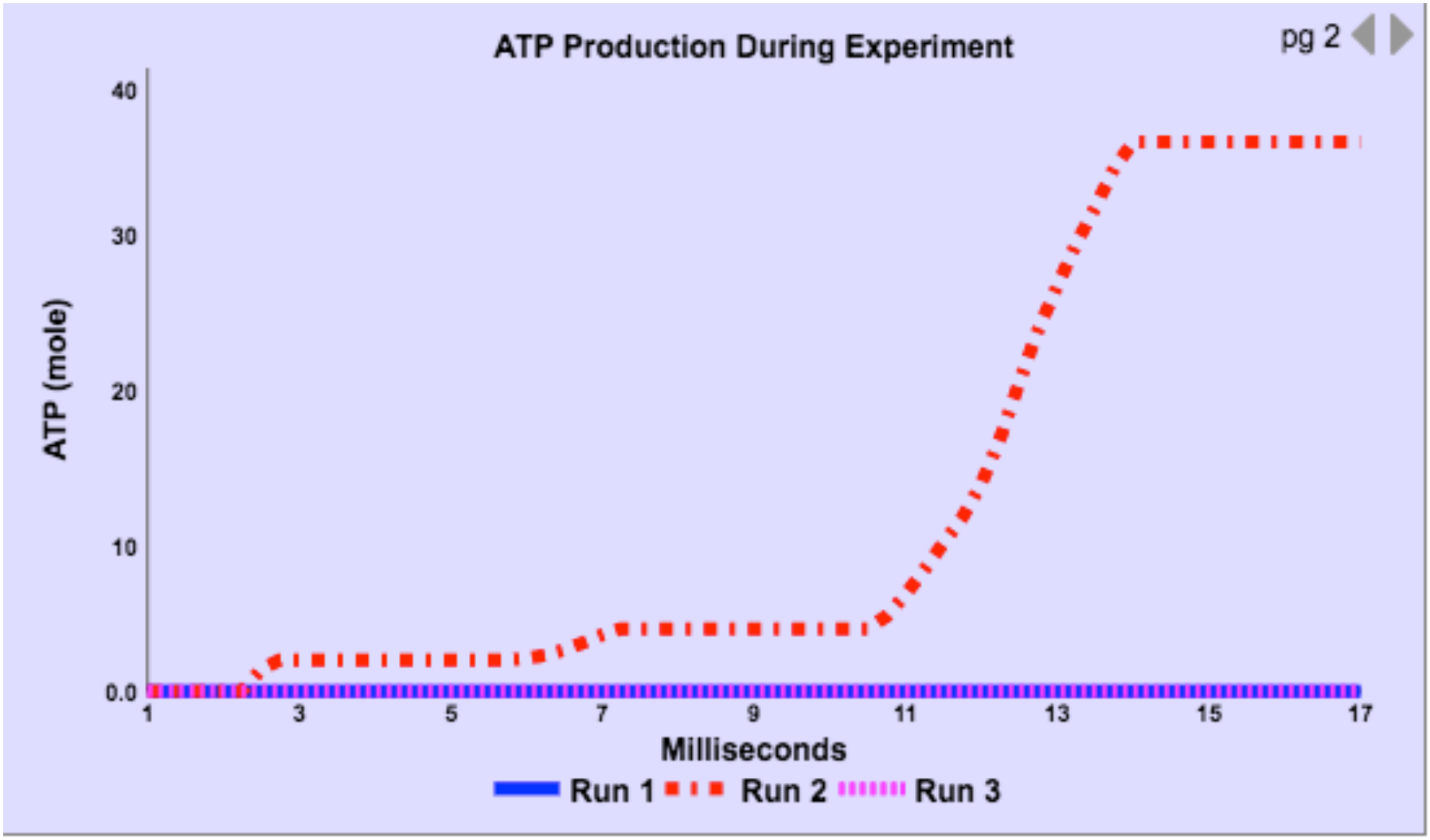
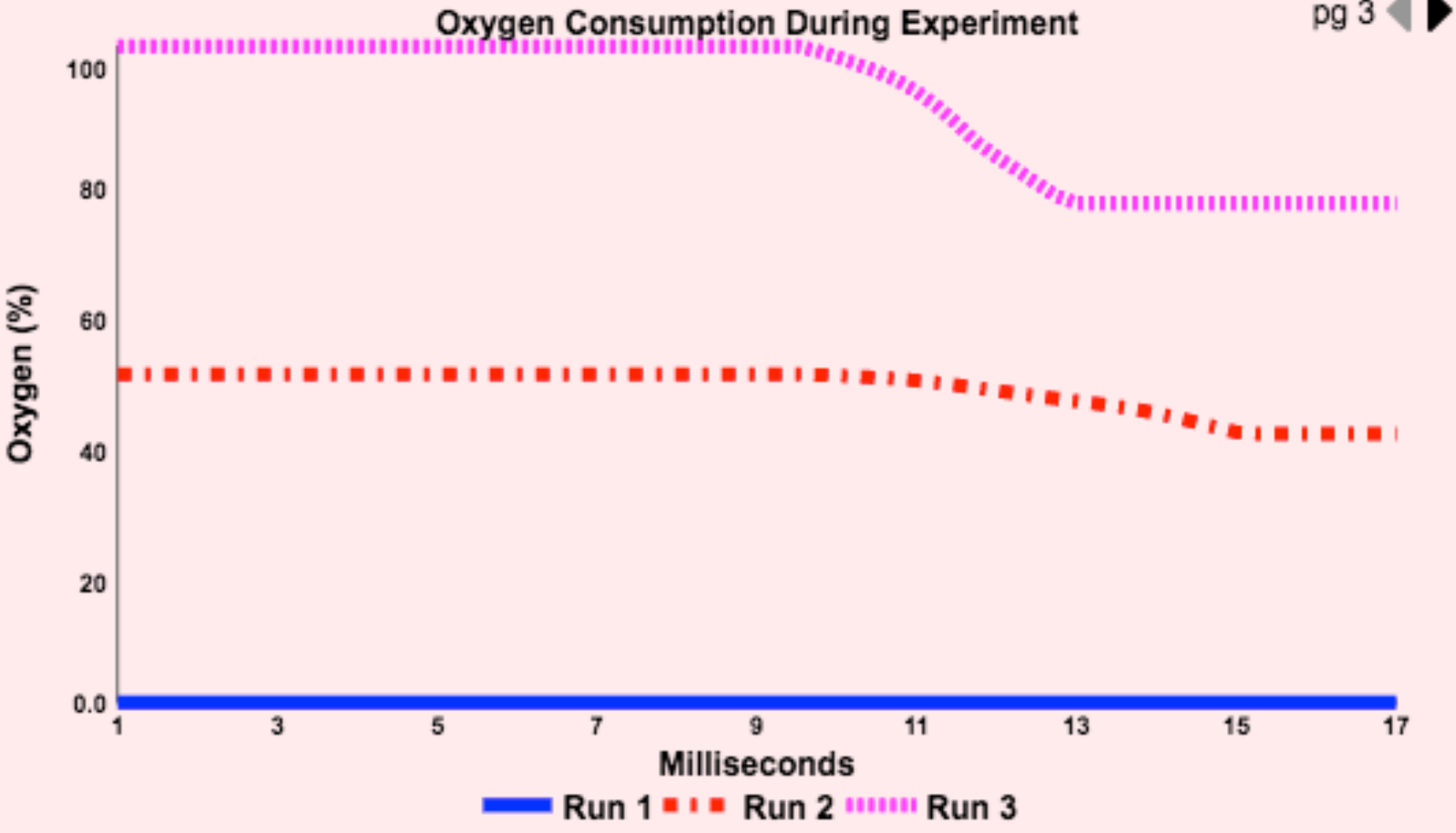

ATP Production During Experiment
ATP (mole)
40
30
20
10
0.0
1
3
5
7
9
11
13
15
17
Milliseconds
Run 1
Run 2
Run 3

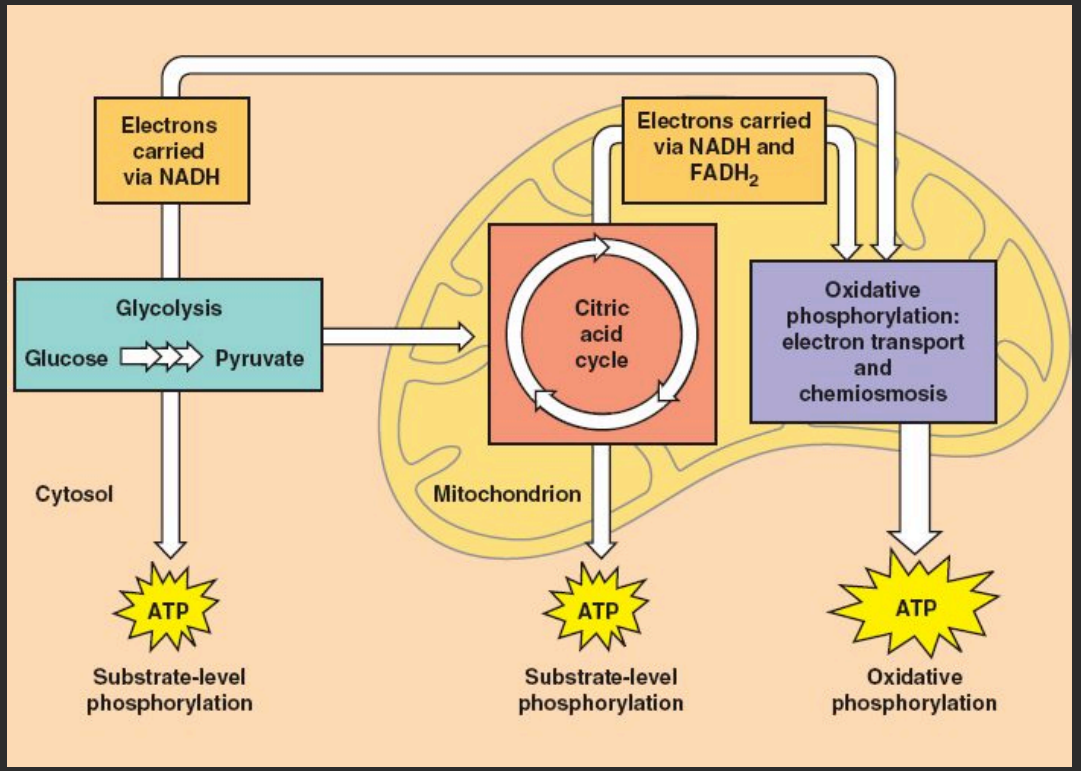

Oxygen Consumption During Experiment
Oxygen (%)
100
80
60
40
20
0.0
1
3
5
7
9
11
13
15
17
Milliseconds
Run 1
Run 2
Run 3

Cellular Respiration takes place in mitochondria

1. Glycolysis/ Anaerobic

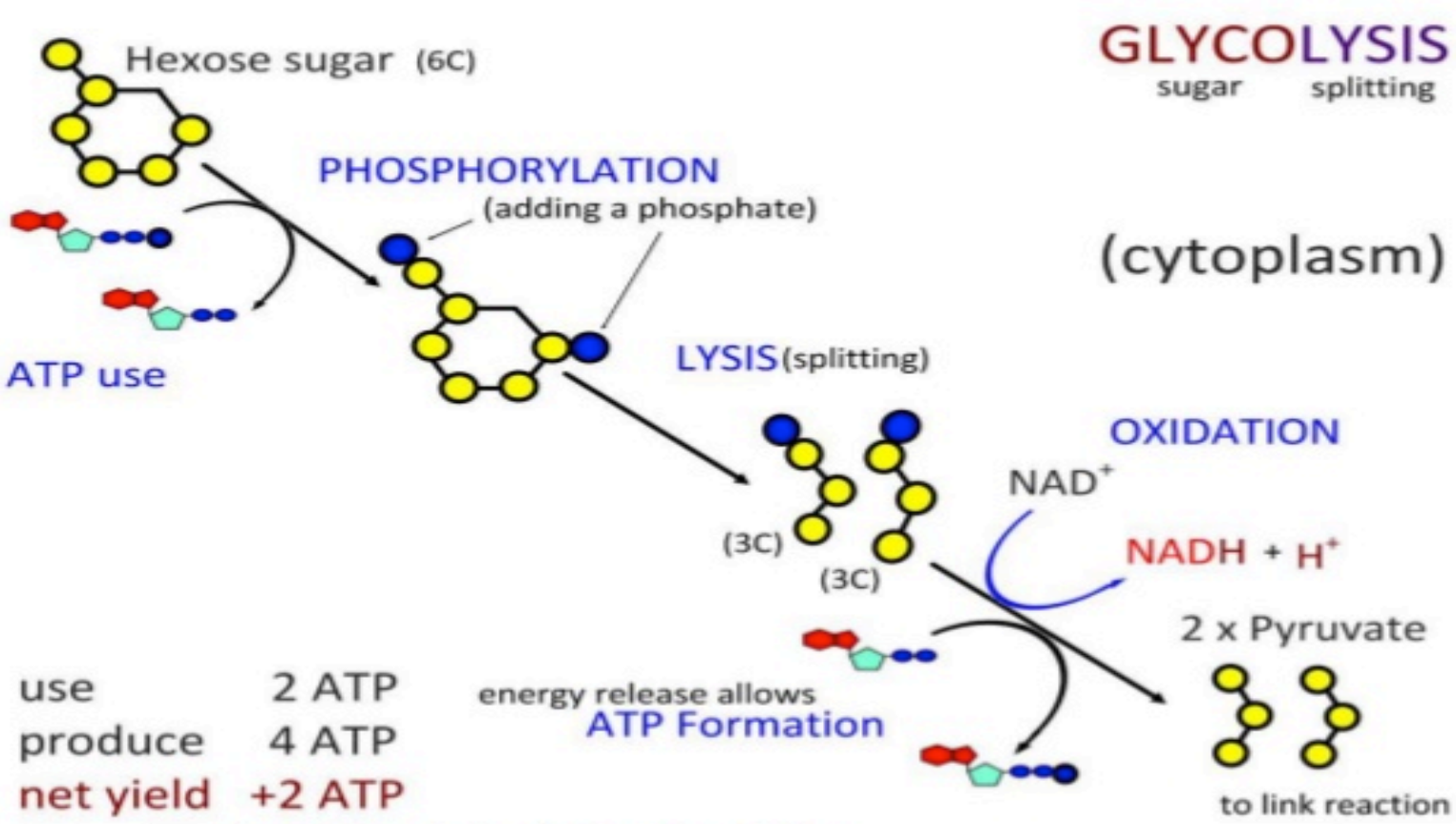
Aerobic respiration (when O_2 is present)

1. Link Reaction
2. The Krebs Cycle (Citric Acid Cycle)
3. Electron Transport



8.2.U3 In glycolysis, glucose is converted to pyruvate in the cytoplasm.
8.2.U4 Glycolysis gives a small net gain of ATP without the use of oxygen.

Glycolysis is the splitting of glucose into pyruvate

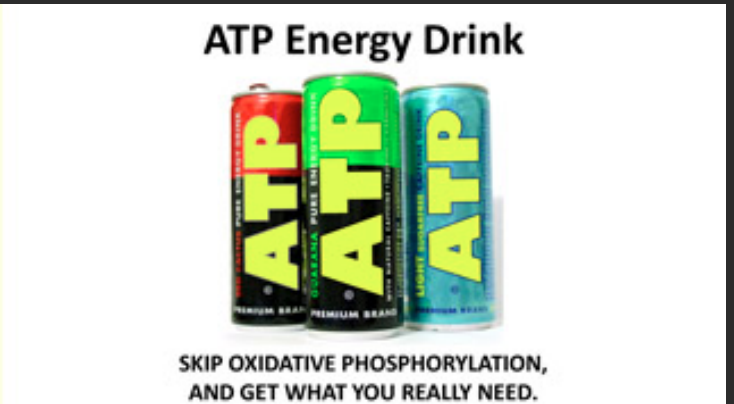


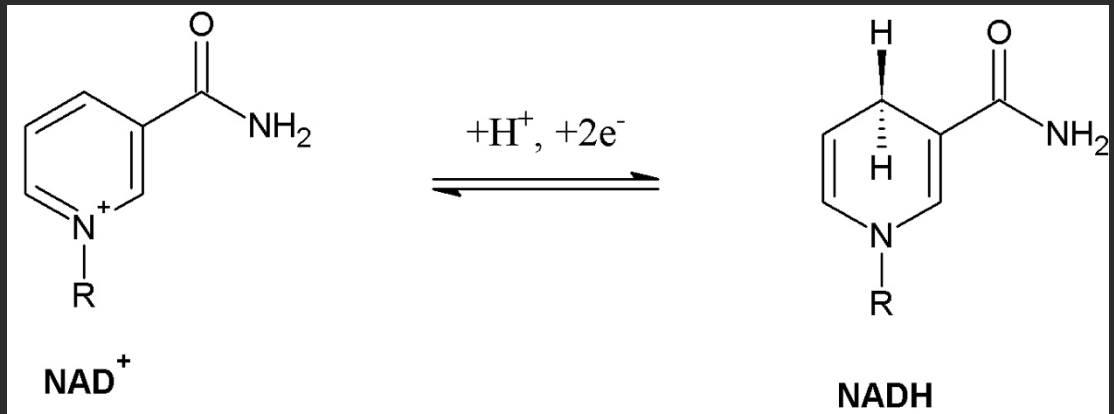
1.Glycolysis

NADH (reduced)

Pyruvate (3 carbon molecules X2)

4 ATP (2 replace the two used, 2 are available as free energy)





2. Link Reaction

8.2U5 pyruvate is decarboxylated and oxidized (loses C and H and e-)

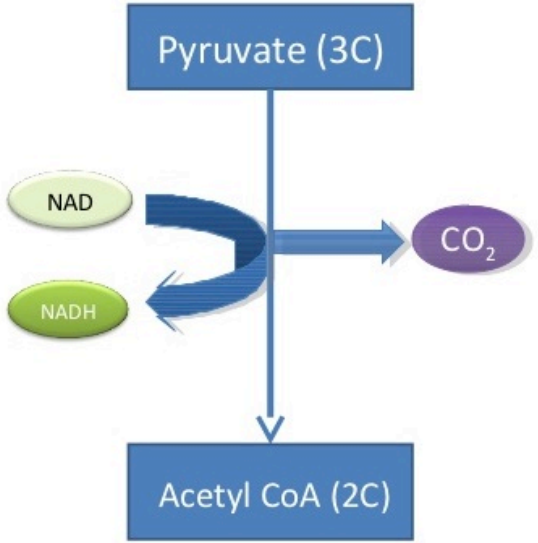
8.2U6 Pyruvate → acetyl coenzyme A

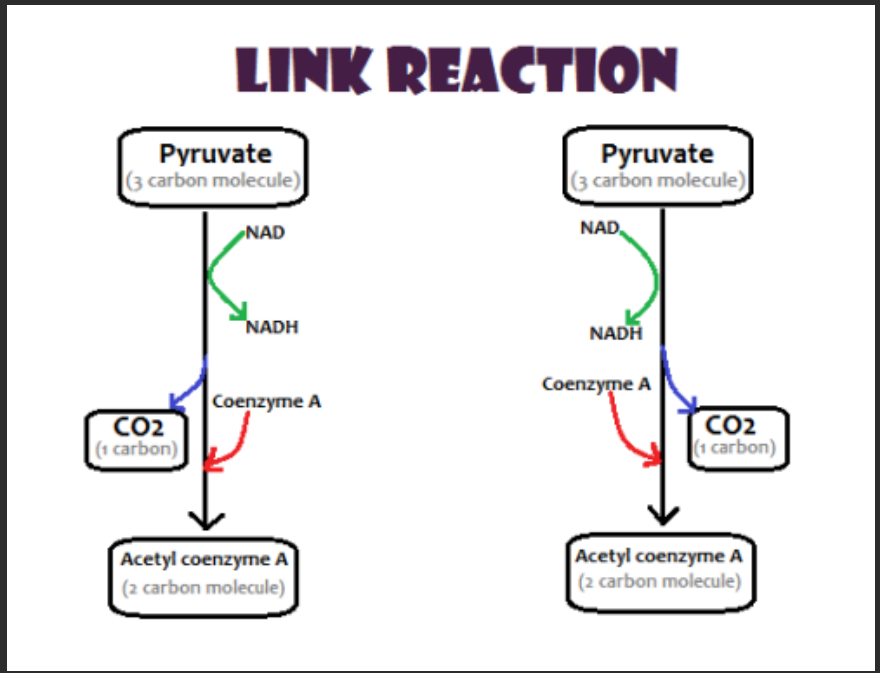
Link reaction

This reaction transports the Pyruvate made in the cytoplasm into the mitochondria, forming Acetyl-CoA.

The Acetyl-CoA will then go into the Krebs cycle, which takes place in the mitochondria.

Since there were 2 pyruvates formed in glycolysis, 2 Acetyl CoA's are formed in total





3. Krebs Cycle

8.2U7: Oxidation of acetyl groups and reduction of NAD and FAD releasing carbon dioxide.

Location: Mitochondrial matrix

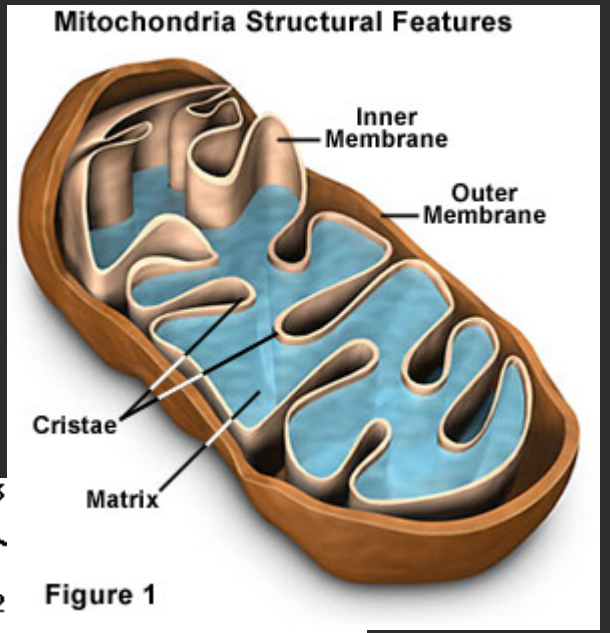
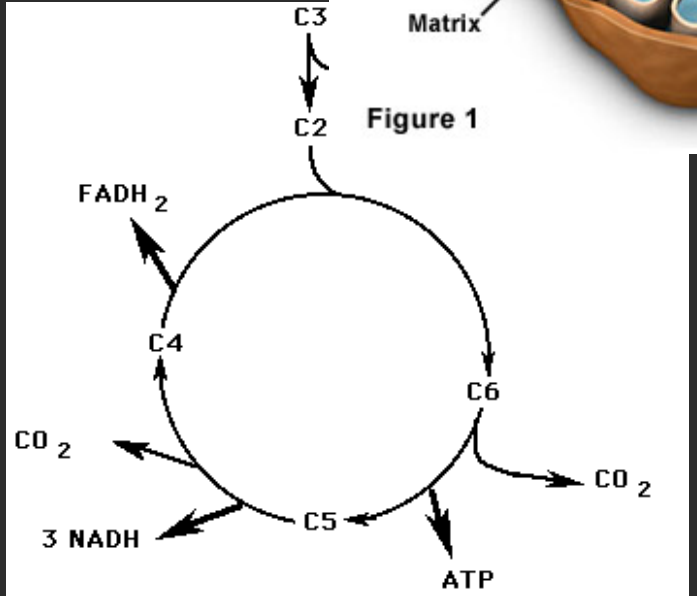


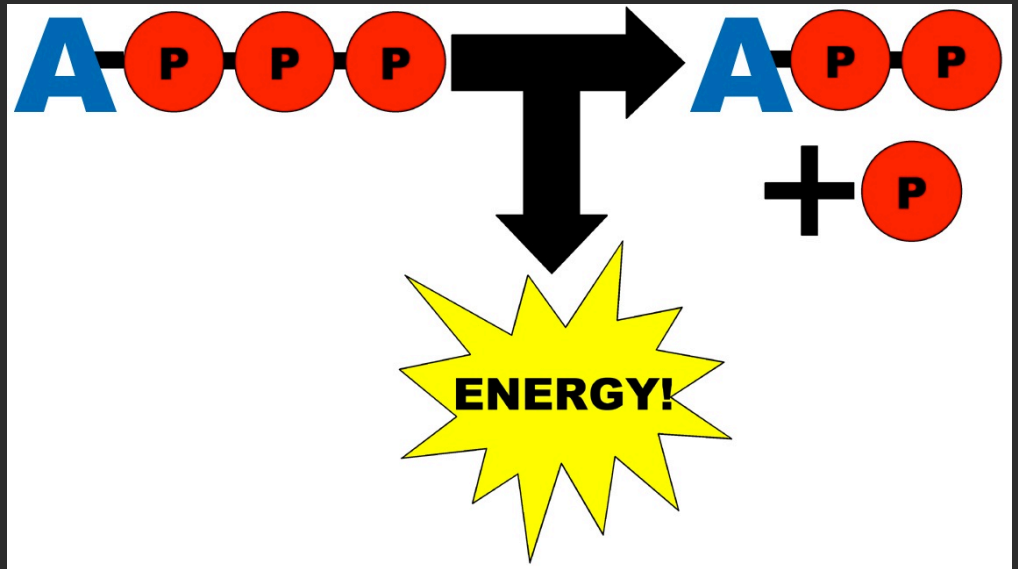
Figure 1

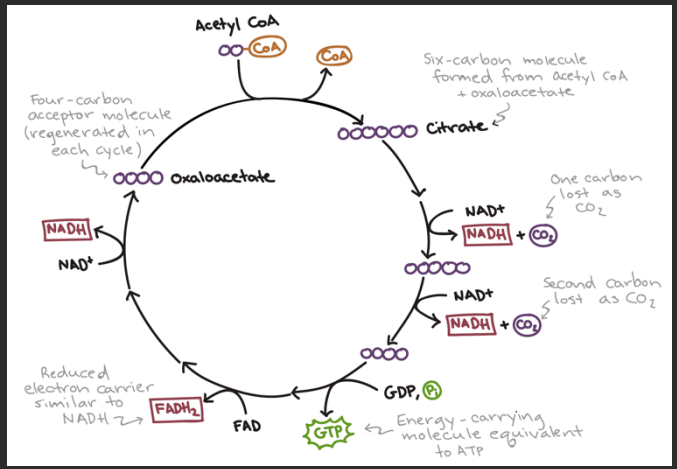


End goals of Krebs?

IN: acetyl coA from link reaction

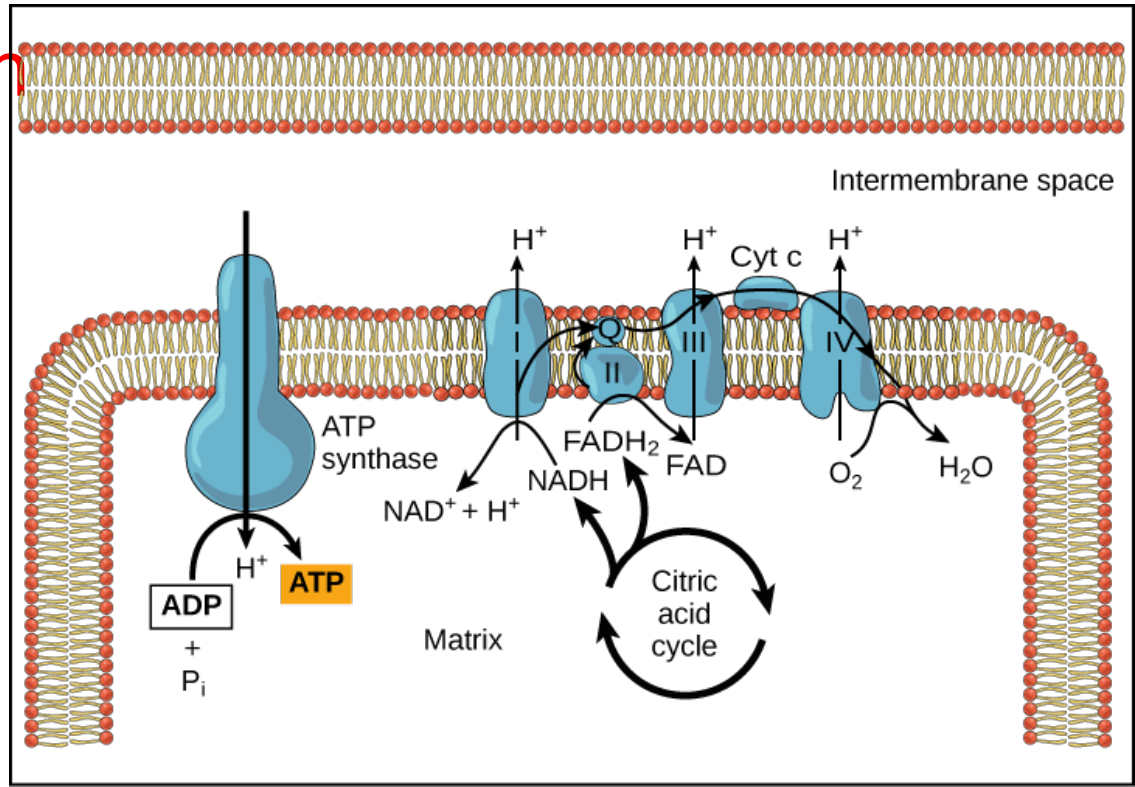
OUT: ATP, 2 reduced NAD, 2 $FADH_2$ that can drive oxidative phosphorylation (MORE ATP)



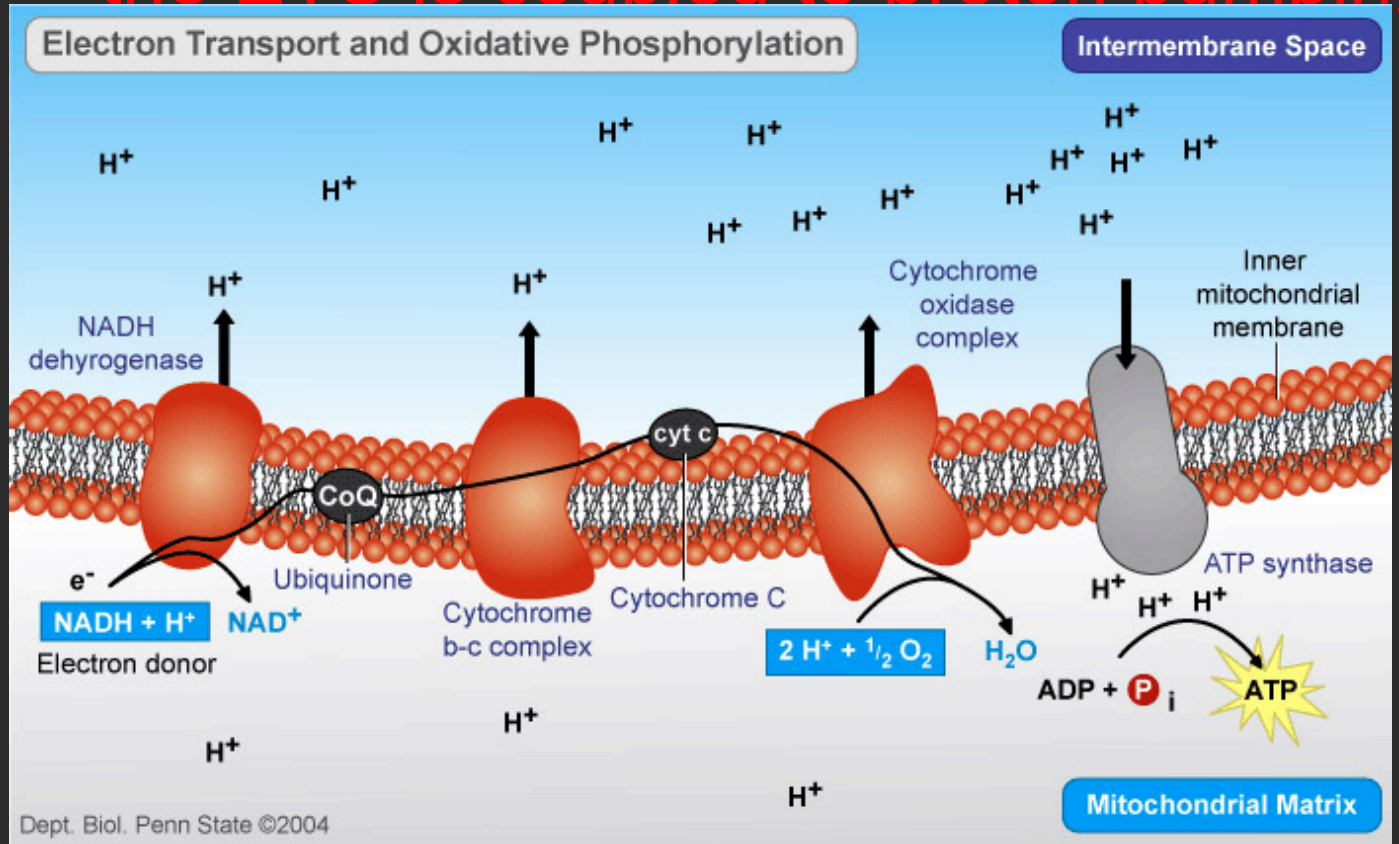


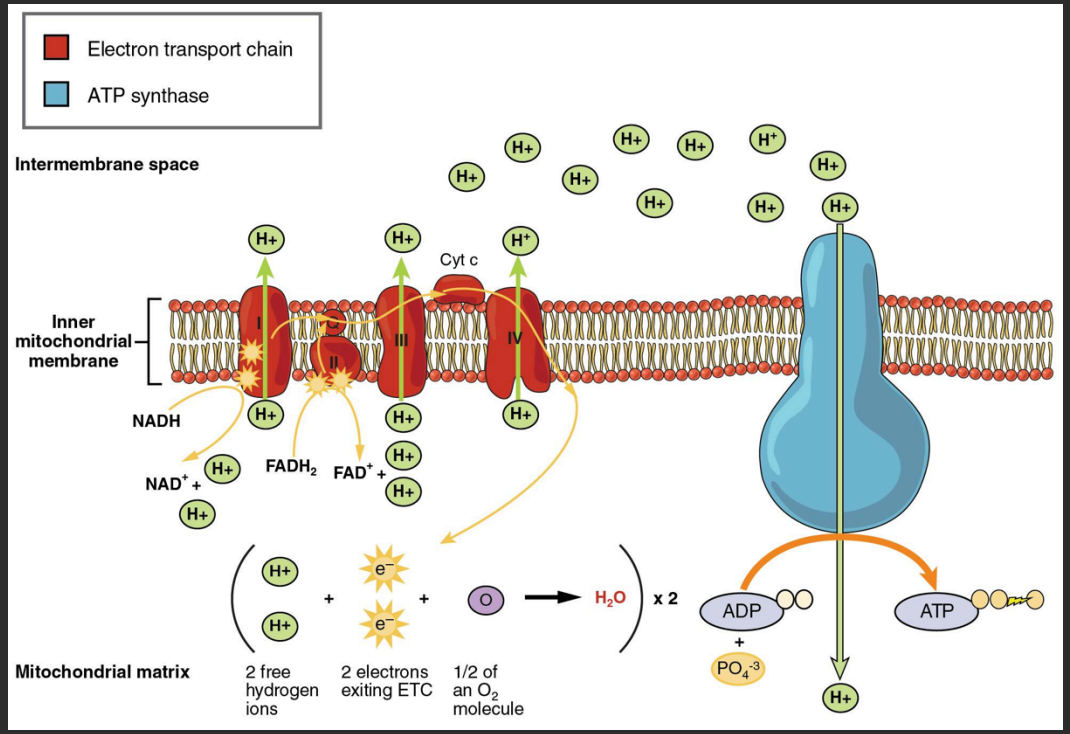
3 ½ : Oxidative phosphorylation makes ATP

8.2U8 Energy released by oxidation reaction is carried to the cristae of the inner mitochondrial membrane by reduced NAD and FAD



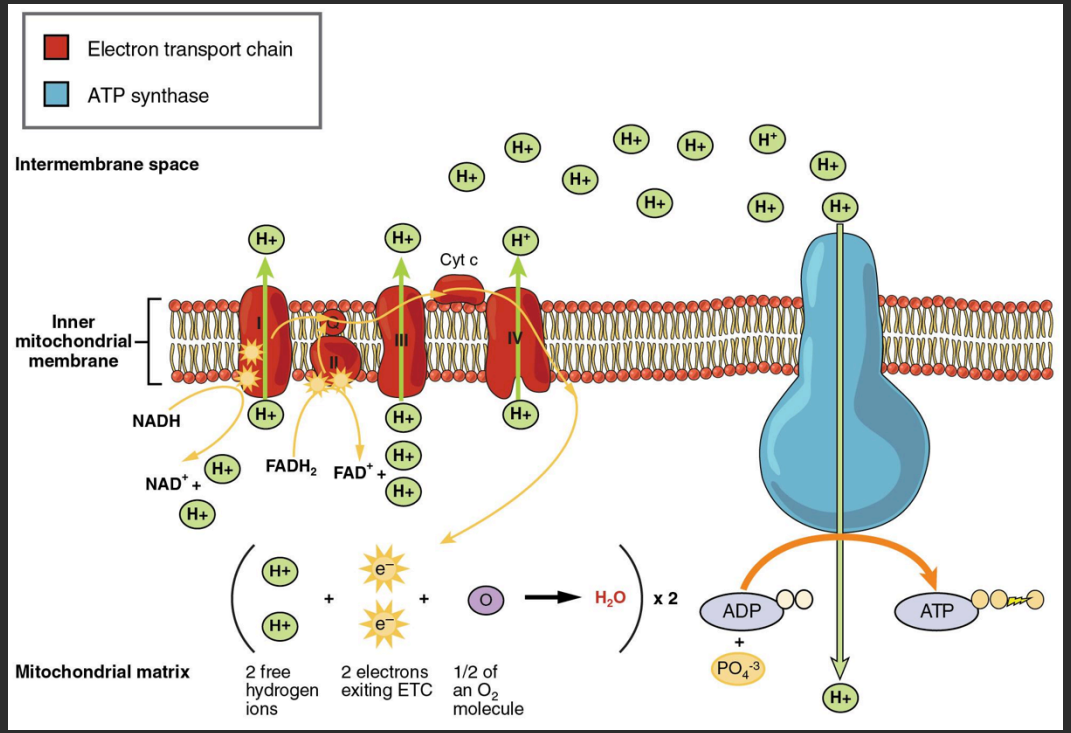
8.2U9 Transfer of electrons between carriers in the ETS is coupled to proton pumping membrane potential

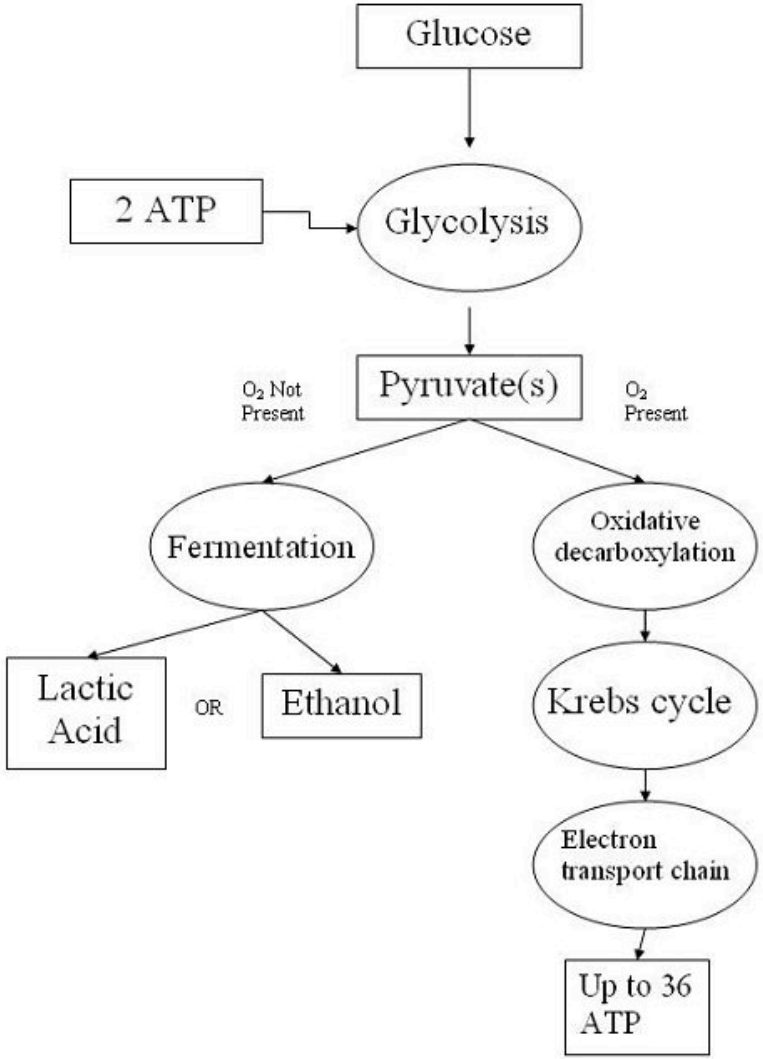




4. 8.2U11 Oxygen is needed to bind with the free protons to form water to maintain the hydrogen gradient

8.2U10 In Chemiosmosis protons diffuses through ATP synthase to generate ATP





https://www.youtube.com/watch?v=b1gEvZzqyxE

Big Picture-- can you diagram this?

What are the products and reactants of all the steps?