

Chapter Ten: Cellular Respiration

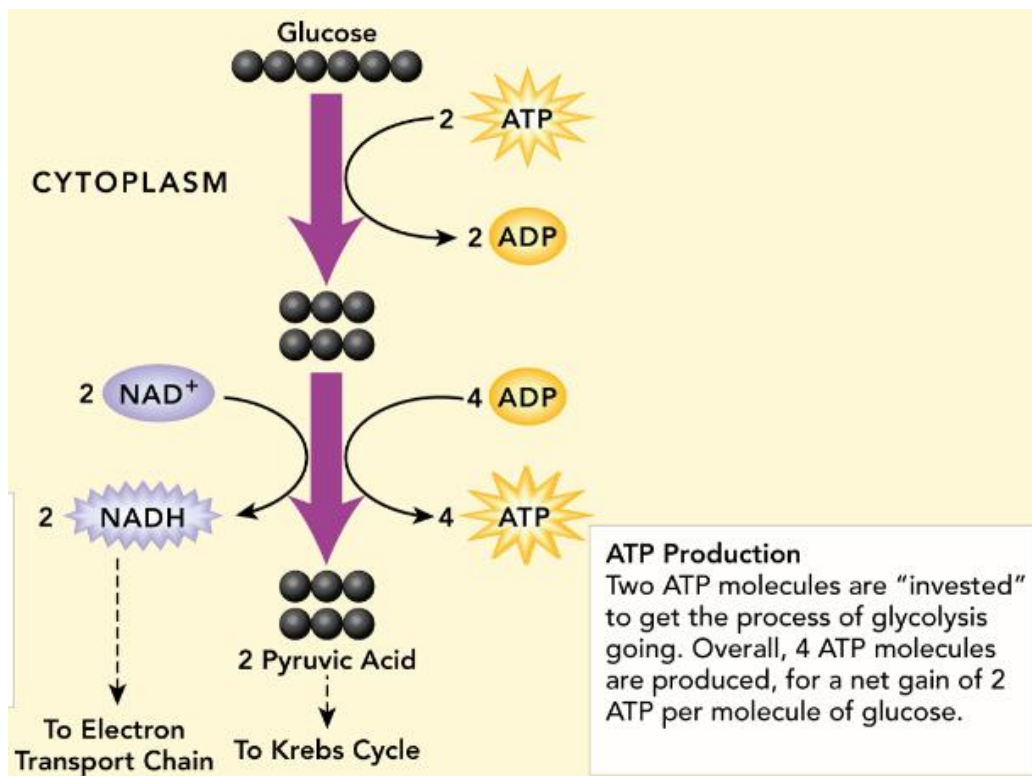
Lesson 10.2: The Process of Cellular Respiration

All food burns. Some foods just have too much water while others don't have enough. This means that there is plenty of energy in food!

3 stages of cellular respiration:

1. **Glycolysis:** means “sugar-breaking”

- One molecule of glucose is transformed into two molecules of pyruvic acid
- Anerobic process – doesn't use oxygen
- Occurs in the cytoplasm



d.

e. ATP = Adenosine triphosphate

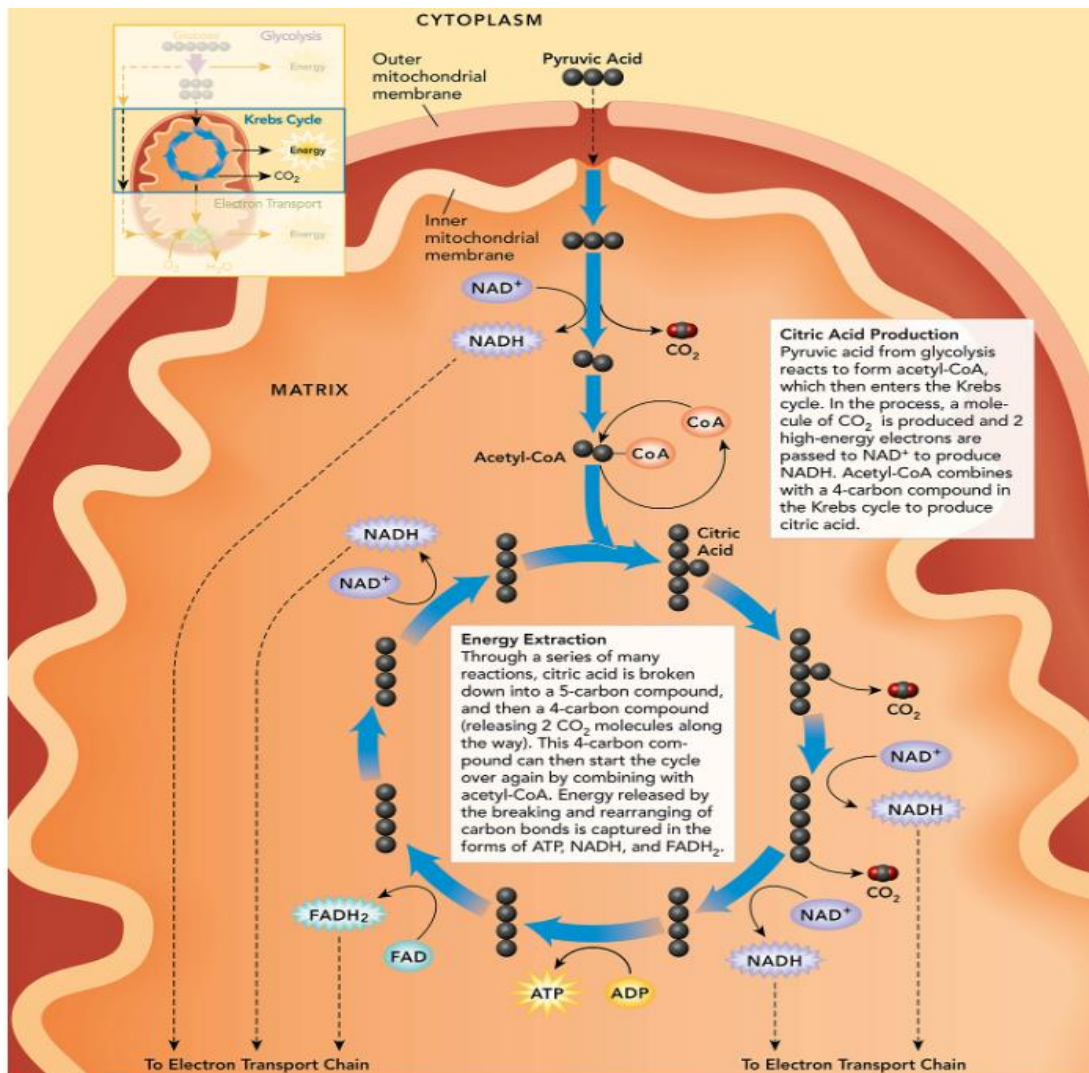
f. ADP = Adenosine diphosphate

g. Process is fast and can produce thousands of ATP in a few milliseconds

h. 2 ATPs are used to start and 4 ATPs are produced

2. The Krebs Cycle

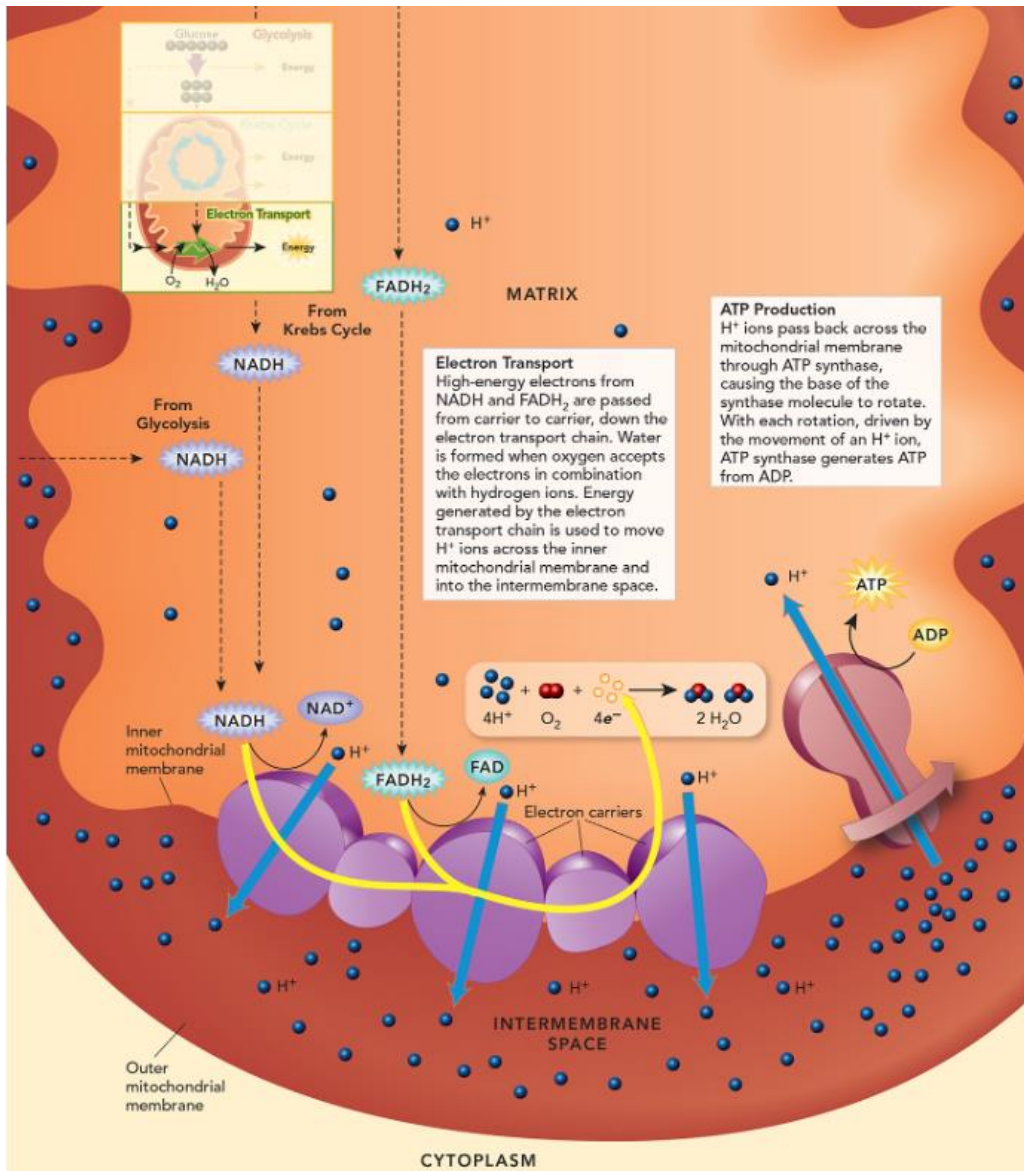
- Named for Hans Krebs
- Pyruvic acid is broken down into carbon dioxide in a series of energy-extracting reactions
- Known as the citric acid cycle because citric acid is the first compound formed in this series of reactions
- Occurs in the mitochondria.
- Matrix: the innermost compartment of the mitochondrion and the site of the Krebs cycle reactions



- The carbon dioxide produced diffuses out of the mitochondria, out of the cell, into the bloodstream where it is exhaled.
- The ATP molecules made are used immediately to power cellular activities

3. Electron transport

- Uses high-energy electrons from glycolysis and the Krebs cycle to synthesize ATP from ADP.
- There is a buildup of H^+ ions in the intermembrane space. This buildup flows through ATP synthase which generates ATP from ADP. Water is also produced here.
- In this process, the cell produces a range of ATP from 30-34.



- Your body is fairly efficient when generating ATP. About 36% of the total energy is used to produce ATP. The remaining percentage is used to heat your body keeping it at a constant temperature.