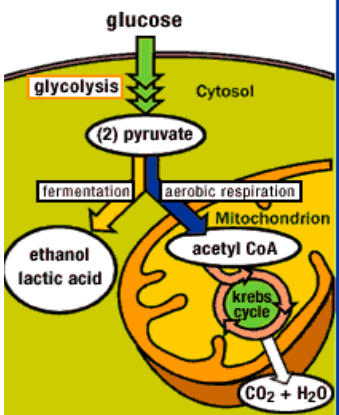
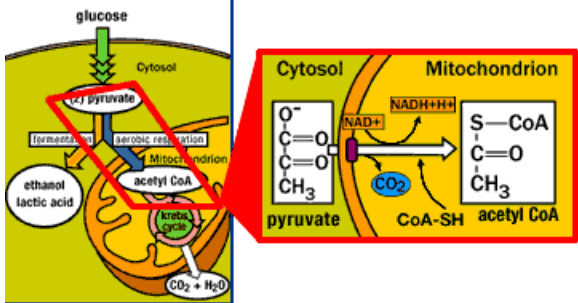


# Biology Lecture Notes

## The Acetyl CoA Step

### >> Key Concepts:

- After **pyruvate** is produced from glycolysis, it enters the mitochondria to begin **aerobic respiration**.
- Aerobic respiration begins with the conversion of pyruvate to **acetyl CoA**. This conversion takes place in three steps: **decarboxylation**, the reduction of  $\text{NAD}^+$ , and the attachment of coenzyme A.

	<p>Some organisms that have no mitochondria or no access to oxygen will undergo <b>fermentation</b> and produce ethanol or lactic acid in the cytosol of the cell.</p> <p>Those that do have mitochondria and access to oxygen will undergo <b>aerobic respiration</b>. Aerobic respiration takes place in the mitochondria and requires the presence of oxygen.</p>
 <p>Acetyl CoA is the key for proceeding with aerobic respiration in the mitochondria (and releasing more energy from glucose).</p>	<p>Aerobic respiration begins with the conversion of <b>pyruvate</b> into <b>acetyl CoA</b>.</p> <p>This conversion begins with the <b>decarboxylation</b> (removal of <math>\text{CO}_2</math>) of pyruvate. A transfer of electrons then takes place, which results in the reduction of <math>\text{NAD}^+</math> to <math>\text{NADH} + \text{H}^+</math>. Finally, coenzyme A (a B vitamin derivative) is added to the molecule to produce acetyl CoA.</p> <p>The addition of coenzyme A energizes the molecule and makes it more unstable. When a molecule is unstable, it is more prone to react and release energy; thus, this step has prepared the glucose derivative for more energy release.</p>