TCA CYCLE

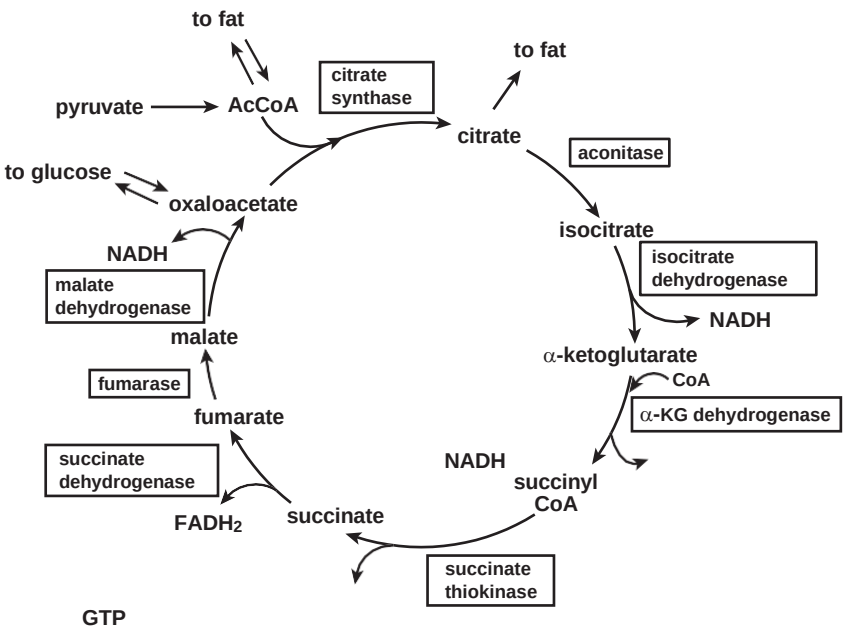

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Figure 1-1 The Tricarboxylic Acid (TCA) Cycle

TCA CYCLE[1] (see Fig. 1-1.)

Function: To burn the acetyl-CoA made from fat, glucose, or protein in order to make ATP in cooperation with oxidative phosphorylation.

Location: All cells with mitochondria.

Connections: *From glycolysis* through acetyl-CoA.
Pyruvate makes oxaloacetate and malate through the anaplerotic reactions.
To b *oxidation* through acetyl-CoA.
To amino acid degradation through acetyl-CoA and various intermediates of the cycle.

Regulation: Supply and demand of TCA cycle.
Availability of NAD^+ and FAD as substrates.
Inhibition by NADH.
High-energy signals turn *off*.
Low-energy signals turn *on*.

ATP yield: Pyruvate ī 15ATP
Acetyl-CoA ī 12ATP

Equations:

$$\text{Pyruvate} + GDP + P_i + 3NAD^+ + FAD \;\bar{\imath}\; 3CO_2 + GTP + 3NADH + FADH_2 + 3H^+$$

$$\text{Acetyl-CoA} + GDP + P_i + 2NAD^+ + FAD \;\bar{\imath}\; 2CO_2 + GTP + 2NADH + FADH_2 + 2H^+$$

[1] The tricarboxylic acid cycle is also known as the Krebs cycle or the citric acid cycle.