

that when CO<sub>2</sub> is released, no H<sup>+</sup> is given off during NAD<sup>+</sup> reduction, thereby maintaining the charge balance of these reactions. The generation of GTP shown in reaction TCA-5 is characteristic of animal mitochondria. In bacterial cells and plant mitochondria, ATP is formed directly.

carboxyl groups of oxaloacetate that give rise to CO<sub>2</sub> in steps TCA-3 and TCA-4. Five of the reactions are oxidations, with NAD<sup>+</sup> as the electron acceptor in four reactions (PDH, TCA-3, TCA-4, and TCA-8) and FAD as the electron acceptor in one case (TCA-6). The reduced form of the coenzyme is shown in purple in each case. Note

Figure 10-8 The Tricarboxylic Acid (TCA) Cycle. The two carbon atoms of pyruvate that enter the cycle via acetyl CoA are shown in pink in citrate and subsequent molecules until they are randomized by the symmetry of the fumarate molecule. as CO<sub>2</sub> is shown in gray, as are the two

