



FIGURE 21-1 Reactions of the citric acid cycle. The reactants and products of this catalytic cycle are boxed. The pyruvate → acetyl-CoA reaction (top) supplies the cycle's substrate via carbohydrate metabolism but is not considered to be part of the cycle. The bracketed compounds are enzyme-bound

intermediates. An isotopic label at C4 of oxaloacetate (*) becomes C1 of α-ketoglutarate and is released as CO₂ in Reaction 4. An isotopic label at C1 of acetyl-CoA (†) becomes C5 of α-ketoglutarate and is scrambled in Reaction 5 between C1 and C4 of succinate (1/2†). See the Animated Figures