

METHYLMALONIC ACIDURIA

Marc E. Tischler, PhD;
University of Arizona

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- methylmalonyl-coenzyme A (methylmalonyl-CoA) is formed during the breakdown of some amino acids (i.e., isoleucine, valine, methionine, threonine) and fatty acids that contain an odd number of carbons (small fraction of total) (Figure 1)
- methylmalonyl-CoA is further metabolized:
 - methylmalonyl-CoA mutase produces succinyl-CoA and requires a modified form of vitamin B₁₂ (adenosyl-B₁₂)
 - succinyl-CoA enters the **citric acid cycle** whose function is primarily to produce usable energy in the cell
- deficiency of **methylmalonyl-CoA mutase** prevents the metabolism of methylmalonyl-CoA leading to excessive formation of **methylmalonic acid**
 - excessive methylmalonic acid is excreted in the urine causing **methylmalonic aciduria**
 - potentially life-threatening because it creates an acidic condition (**acidosis**)
- treatment:
 - restricting intake of the 4 amino acids
 - neutralizing the acidosis
 - providing vitamin B₁₂ to potentially boost the activity of methylmalonyl-CoA mutase

