SAM1 and SAM2 encode S-adenosylmethioninesynthetases), which catalyze the biosynthesis of AdoMet from methionine and ATP. AdoMet is involved in the methylation of proteins, RNAs, and lipidsas well as in the biosynthesis of biotinand polyamines. AdoMet is believed to participate in more reactions than any other cofactor with the exception of ATP.Mutations in SAM1 or SAM2 do not affect growth; however, a sam1 sam2 double mutant results in AdoMet auxotrophy. Although SAM1 and SAM2 encode functionally equlvalent AdoMet synthetases, they are regulated differently. Both SAM1 and SAM2 are repressed by excess AdoMet, but expression of SAM2 increases during growth, which overrides the AdoMet-mediated repression. In addition, SAM2 is repressed by the addition of myo-inositol and choline, similar to a number of genes encoding enzymes involved in phospholipid biosynthesis. In contrast, SAM1 is not subject to the inositol-choline regulation suggesting that SAM2, but not SAM1, may be involved in phospholipid biosynthesis.AdoMet synthetase is well conserved through evolution. In humans, deficiency in AdoMet synthetase results in the metabolic disease, hypermethioninemia.