FMT1 encodes methionyl-tRNA formyltransferase, which catalyzes the formylation of initiator Met-tRNA. In yeast mitochondria, as in eubacteria and mitochondria from other eukaryotes, protein synthesis initiates with formylmethionine; eukaryotic cytosolic protein synthesis initiates with methionine. Although there is no formylation of the initiator Met-tRNA in cells lacking FMT1, the cells are viable and show normal mitochondrial protein synthesis and function. Methionyl-tRNA formyltransferases have been identified in many prokaryotes and eukaryotes. The structure of the E. coli enzyme has been determined; a gene encoding mitochondrial methionyl-tRNA formyltransferase has been cloned from bovine liver.