CCA1 was first identified as a temperature sensitive mutant with elevated steady-state levels of some unstable mRNAs at the restrictive temperature. It encodes the ATP:tRNA nucleotidyl transferase, which adds 3'CCA termini to tRNAs. The stabilization of otherwise unstable transcripts in CCA1 mutants is probably due to a slowing of translational elongation that results from the presence of incompletely processed tRNAs. There are three in-frame ATGs at the start of the CCA1 gene, which result in the production of three isoforms, one located prodominantly in the mitochondria, the other two in both the nucleus and cytoplasm. For technical reasons, SGD sequence annotation currently includes only the longest form of CCA1. CCA1 has identifiable homologs in S. pombe, E. coli, and Arabidopsis.