ATE1 encodes a cytoplasmic arginyl transferase, responsible for transferring an L-arginyl residue from a tRNA to the N-terminus of a protein. Proteins with aspartate or glutamate as their N-terminal residues can act as acceptors for this posttranslational protein modification. The transferred arginine acts as a destabilizing residue, subjecting the acceptor protein to the ubiquitin-dependent proteolysis of the N-end rule pathway. Cells that lack Ate1p are viable, but are unable to degrade those substrates of the N-end rule pathway that are usually processed by the arginyl transferase. Homologs of the yeast arginyl transferase exist in mouse, human, Arabidopsis, and Drosophila.