Ard1p is part of an N-terminal acetyl transferase; it acts in a complex with Nat1p to catalyze the cotranslational N-terminal acetylation of many yeast proteins. Three N-terminal acetyl transferases have been identified in yeast: Nat1p/Ard1p, Nat3p, and Mak3p. These enzymes are responsible for the N-terminal modification of more than half of yeast proteins. Nat1p/Ard1p transfers an acetyl group from acetyl coenzyme A to the alpha-amino group of Ser, Ala, Gly, or Thr N-terminal residues. Because Ard1p, Nat3p, and Mak3p share significant sequence similarity, it has recently been suggested that Ard1p may be the catalytic subunit of the Nat1p/Ard1p complex. Mutations in ARD1 cause slow growth, failure to enter stationary phase, and defects in sporulation. Cells lacking Nat1p or Ard1p show derepression of silent mating type loci; overexpression of Sir1p, a silent information regulator, can suppress this derepression phenotype. ARD1 is also a modifier of position effect at telomeres; in ard1 mutants transcriptional repression is no longer seen near telomeres. These mutant phenotypes suggest that the Nat1p/Ard1p complex may modify proteins important for silenced chromatin structure and function. The human gene, whose product shows 40% identity to Ard1p, has been identified on the X chromosome .