HDA1 encodes a histone deacetylase. Covalent modifications of histones, including acetylation and deacetylation, are implicated in transcriptional regulation in yeast and other eukaryotes, and have been reviewed in 8 and 9. Hda1p is part of a complex that also contains Hda3p. A second histone deactylase, Rpd3p, shows sequence similarity to Hda1p but is found in a complex distinct from the complex containing Hda1p; the two complexes affect transcription of distinct, partially overlapping sets of genes. Deletion of HDA1 increases histone acetylation in vivo and increases telomeric repression of transcription. Three more histone deactylases, Hos1p, Hos2p, and Hos3p, have been identified in yeast; they share sequence similarity with Rpd3p and Hda1p but are less well characterized.