PDC1, PDC5, and PDC6 encode three different isozymes of pyruvate decarboxylase, an enzyme which catalyzes the degradation of pyruvate into acetaldehyde and carbon dioxide, as shown here. As the key enzyme in alcoholic fermentation, pyruvate decarboxylase commits the end product of glycolysis, pyruvate, to ethanol production rather than to its other possible major metabolic fates: the TCA cycle/aerobic respirationor gluconeogenesis. PDC1, PDC5, and PDC6 can also decarboxylate other 2-oxo acids such as indolepyruvate and 2-keto-3-methyl-valerate, and this activity contributes to the catabolism of the amino acids isoleucine, phenylalanine, tryptophan, and valine.Pdc1p is the major isozyme and is strongly expressed in actively fermenting yeast cells. The nearly identical Pdc5p also functions during glycolytic fermentation, but is expressed only in the absence of PDC1or under thiamine limitation. Both PDC1 and PDC5 are under PDC autoregulation such that their promoters are activated in the absence of Pdc1p. Expression of PDC1 and PDC5 also requires the transcription factor Pdc2p. The third isozyme, Pdc6p, is not expressed during glucose fermentation and seems to be functional during growth on nonfermentable carbon sources. Transcription of PDC6 is dramatically induced under conditions of sulfur limitation, suggesting that it has a role during sulfur-limited growth. Consistent with this, the PDC6 gene encodes fewer sulfur-containing amino acids than does either PDC1 or PDC5.Pyruvate decarboxylase is conserved among yeast, bacteria and plants and has been well-characterized on both the structural and enzymatic levels. The active enzyme is a homotetramer and requires thiamin diphosphateand Mg++ cofactors.