Trehalose is a storage carbohydrate that can either be synthesized by the cell or obtained from the external environment, and is converted by trehalase with water into two glucose molecules. S. cerevisiae has two trehalase enzymes, an acid trehalase encoded by ATH1and a neutral trehalase encoded by NTH1. A third locus, NTH2, is 77% identical to NTH1, but does not appear to encode a trehalase activity, or be involved in trehalose catabolism, since an nth2 null mutant exhibits normal levels of neutral trehalase activity and trehalose.NTH1 is induced by various stresses including exposure to heat, hydrogen peroxide, or cycloheximide. Nth1p is a cytoplasmic homodimer required for the hydrolysis of intracellular trehalose, and is involved in thermotolerance through a mechanism that does not appear to correspond to trehalose abundance. Phosphorylation by Cdc28p has been predicted to activate Nth1p. Deletion of NTH1 results in complete loss of neutral trehalase activity, accumulation of internal trehalose, and heat sensitivity.