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.Extracellular trehalose is degraded by Ath1p, which was originally predicted to be a vacuolar protein, but has since been experimentally shown to localize mainly in the periplasmic space, with a small fraction also occurring in the cell wall. ATH1 does not appear to be stress-induced. Deletion of ATH1 results in complete loss of acid trehalase activity and an inability to use trehalose as a carbon source.