Ugp1p is a UDP-glucose pyrophosphorylasewhich catalyzes the reversible formation of UDP-glucose from glucose 1-phosphate and UTP. UDP-glucose serves as a glucosyl donor in several metabolic pathways including the biosynthesis of glycogen and trehalose, the formation of cell wall beta-glucans and glucomannoproteins, protein N-glycosylation, and galactose entry into glycolysis. Expression of UGP1 appears to be inhibited by Pho85p through Pho4p. Overexpression during growth on galactose results in slower growth, increased sensitivity to calcofluor white, and increased protein glycosylation, as compared to wild type. A ten-fold reduction in Ugp1p activity results in a multi-budding phenotype, increased resistance to zymolyase, decreased glycogen and cell wall beta-glucan levels, and increased sensitivity to cell wall interfering drugs. Ugp1 null mutants are inviable. UDP-glucose pyrophosphorylase is conserved across many species, and yeast Ugp1p is similar to orthologs in cow, human, and potato tuber. Yeast Ugp1p complements the defects of an E. coli mutant strain defective for UDP-glucose pyrophosphorylase. Overexpression of either Ugp1p or human UDP-glucose pyrophosphorylasecomplements the growth defects of a gal7 null mutant on galactose, suggesting that increased expression of hUGP2 in humans could alleviate poor outcomes in patients with classic galactosemia.