During N-linked glycosylation of proteins, oligosaccharide chains are assembled on the carrier molecule dolichyl pyrophosphate in the following order: 2 molecules of N-acetylglucosamine, 9 molecules of mannose, and 3 molecules of glucose. These 14-residue oligosaccharide cores are then transferred to asparagine residues on nascent polypeptide chains in the endoplasmic reticulum. As proteins progress through the Golgi apparatus, the oligosaccharide cores are modified by trimming and extension to generate a diverse array of glycosylated proteins. ROT2, also known as GLS2, encodes for the catalytic subunit of glucosidase II, a lumenal enzyme of the ER. After Cwh41premoves the most distal glucose from N-linked oligosaccharides, Rot2p trims the two remaining glucose moieties previously added by Alg8p and Alg6p. Humanand rat glucosidase II each consist of two subunits: a catalytic alpha subunit, which is the homolog of ROT2, and a beta subunit whose putative role is to target the enzyme to the ER. GTB1 encodes for the yeast glucosidase II beta subunit.involved in glycogen metabolism.) Mutants lacking Rot2p have no detectable growth defectbut have reduced levels of beta-1,6-glucanand elevated levels of chitinin the cell walls. In mutants lacking Rot2p, removal of the outermost glucose from N-linked oligosaccharides proceeds at normal rates, and one mannose moiety is removed at greatly reduced rates. Also drastically slowed is the degradation of misfolded glycosylated proteins.