UDP-N-acetyl-D-glucosamineis the source of the first two GlcNAc moieties added during N-linked glycosylation of proteins and provides GlcNAc for synthesis of GPI anchors. In yeast, it is synthesized from fructose-6-phosphateby the consecutive action of Gfa1p, Gna1p, Pcm1p, and Qri1p, although a different pathwayis used in bacteria. UDP-GlcNAc is also the building block from which chitin, a linear polymer of beta-1,4-N-acetylglucosamine, is constructed. Chitin is a component of the cell wall deposited as a ring around the neck of the growing bud during cell division. Bud scars, the remnants of the chitinous primary septum seen on the surface of mother cells after division, are the primary repository of chitin.QRI1, also known as UAP1, encodes UDP-N-acetylglucosamine pyrophosphorylase, which synthesizes UDP-GlcNAc from GlcNAc-1-P and UTP. GlcNAc-1-P is synthesized by Pcm1p. QRI1 is an essential gene; conditional depletion of Qri1p allows cells to continue to divide for four to five generations, but they have an abnormal, swollen appearance and are prone to bursting. Qri1p can also synthesize UDP-Glc from Glc-1-P, but not in sufficient amounts to replace Ugp1p, which provides most of the cellular UDP-Glc. Both humanand Candida albicans UAP1 complement deletion of QRI1.