About glutamate biosynthesis from glutamineYeast cells contain 3 pathways for the synthesis of glutamate. Two pathways are mediated by two isoforms of glutamate dehydrogenase, encoded by GDH1 and GDH3. The third pathway is driven by the combined activities of glutamine synthetase and glutamate synthase, encoded by GLN1 and GLT1, respectively. Gln1p catalyzes amination of glutamate to form glutamine; Glt1p then transfers the amide group of glutamine to 2-oxoglutarate, generating two molecules of glutamate. Glutamate synthase, also referred to as GOGAT, is a trimer of three Glt1p subunits. Expression of the GLT1 gene is modulated by glutamate-mediated repression and by Gln3p/Gcn4p-mediated activation, depending upon the availability of nitrogen and glutamate in the medium. In amino acid starvation conditions, GLT1 expression is activated to a moderate degree by Gcn4p.