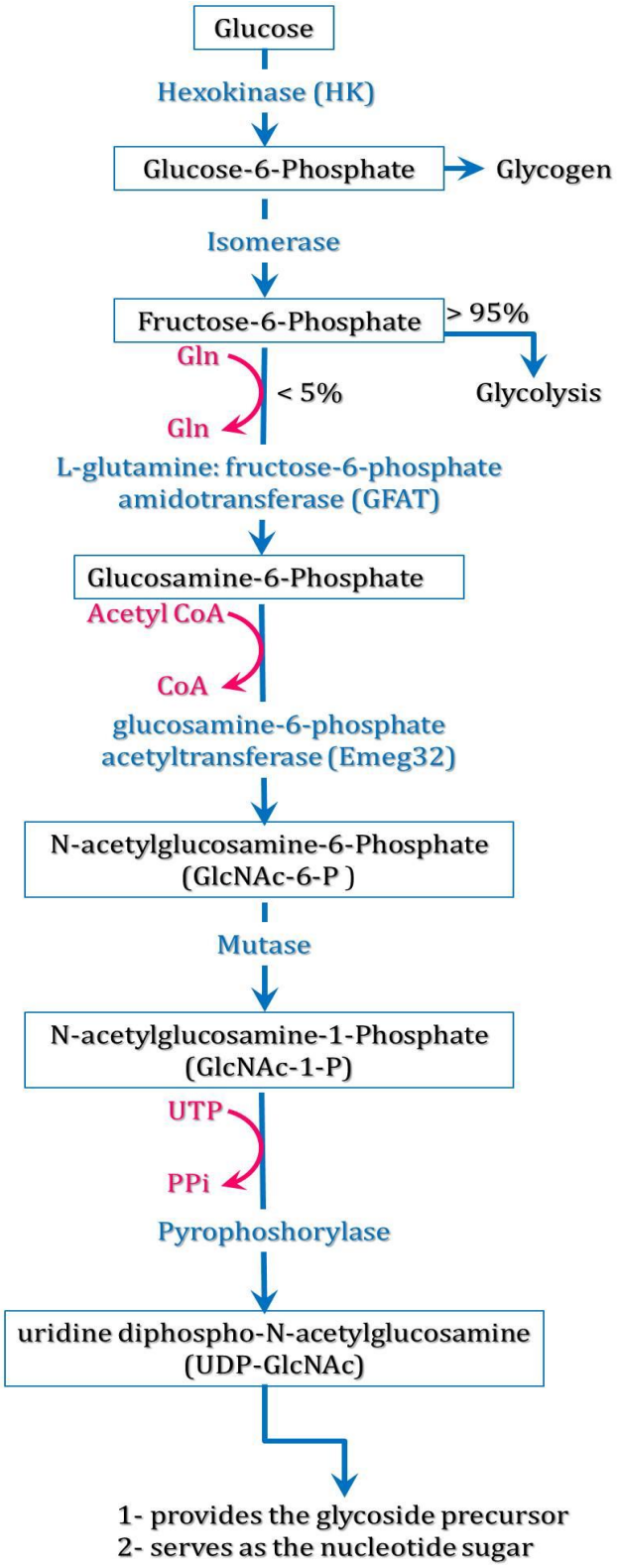

Figure 1.6 Hexosamine biosynthetic pathway. Adapted and modified from (Ngoh *et al.* 2010).

1.4.4.1 Hexosamine biosynthetic pathway

Glucose is phosphorylated by the enzyme hexokinase. Phosphorylated glucose will enter glycogen synthetic pathway or will be converted by the enzyme glucose-6-phosphate isomerase to fructose-6-phosphate. More than 95% of fructose-6-phosphate may enter glycolysis, whereas less than 5% of glucose uptake enters the hexosamine biosynthetic pathway for glucose metabolism. Fructose-6-phosphate is converted by (L-glutamine: fructose-6-phosphate amidotransferase) (GFAT) the rate-limiting enzyme. This reaction results in the production of glucosamine 6-phosphate, which is followed by the acetylation of gluocsamine-6-phosphate by the enzyme (glucosamine-6-phosphate acetyl transferase) ending in the production of N-acetylglucosamine-6-phoshate.