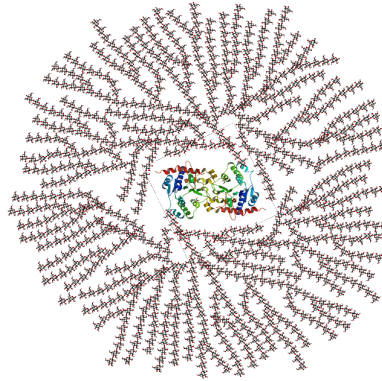
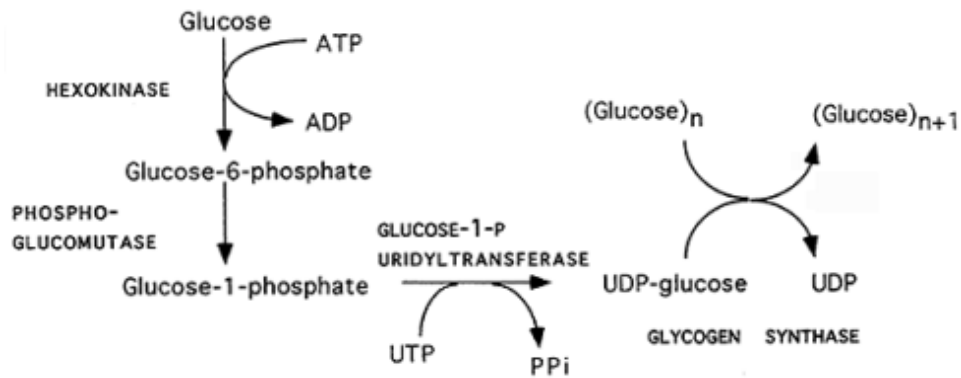


CONCEPT: GLYCOGEN METABOLISM

- Glycogen – highly branched glucose polymer that uses $\alpha(1\rightarrow4)$ glycosidic linkages, with $\alpha(1\rightarrow6)$ branch points
 - Sugar chains tend to be about 12-14 subunits long
 - Glycogenin – protein core of glycogen; the first sugars are hooked onto Y residues



- Glycogen synthase – enzyme that catalyzes the synthesis of glycogen
 - It's a synthase, so it doesn't use NTPs; instead uses UDP-glucose, and UDP is released from reaction
 - Elongates at the nonreducing end of the sugar, ultimately forming chains about 12-14 subunits long
 - GSK3 normally phosphorylates, and inactivates, glycogen synthase
 - Insulin inhibits GSK3, thereby activating glycogen synthase
 - Protein phosphatase 1 dephosphorylates glycogen synthase, activating it
 - Stimulated by insulin, glucose 6-phosphate, and glucose; inhibited by glucagon and epinephrine



- Branching enzyme transfers 6-10 subunits of the chain formed by glycogen synthase onto the 6 position of glucose

