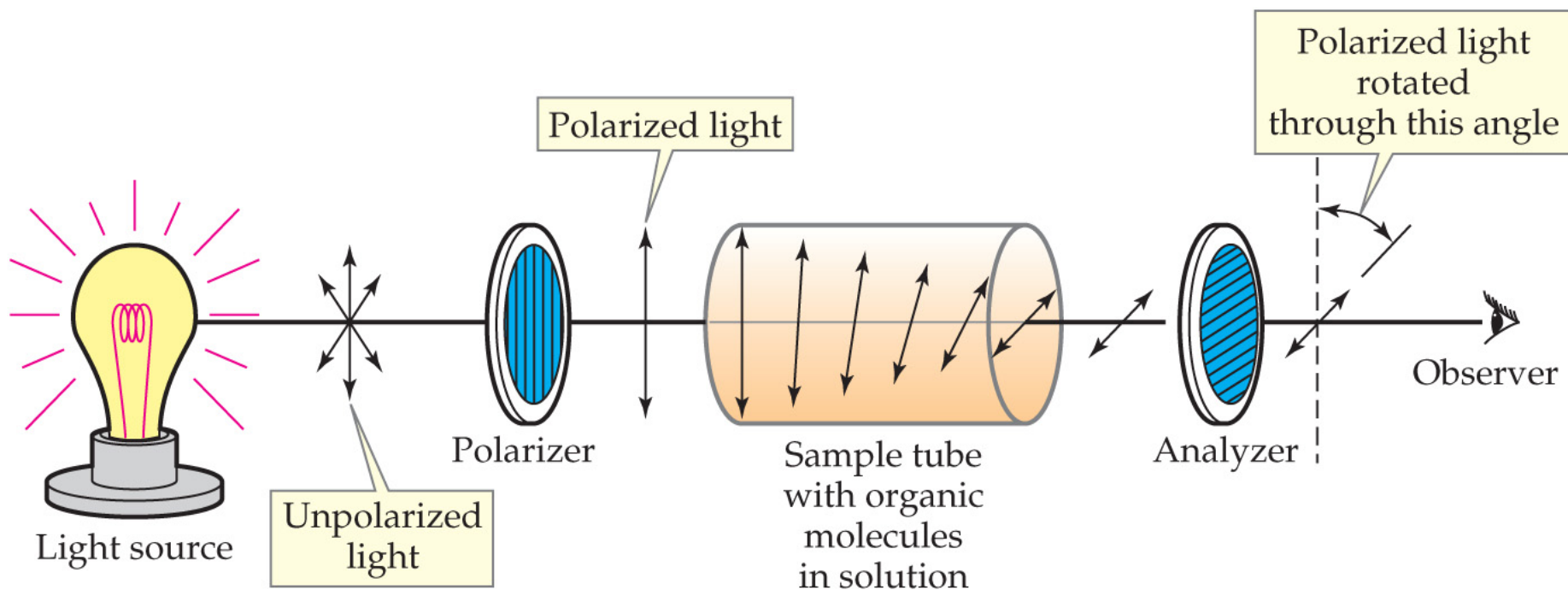
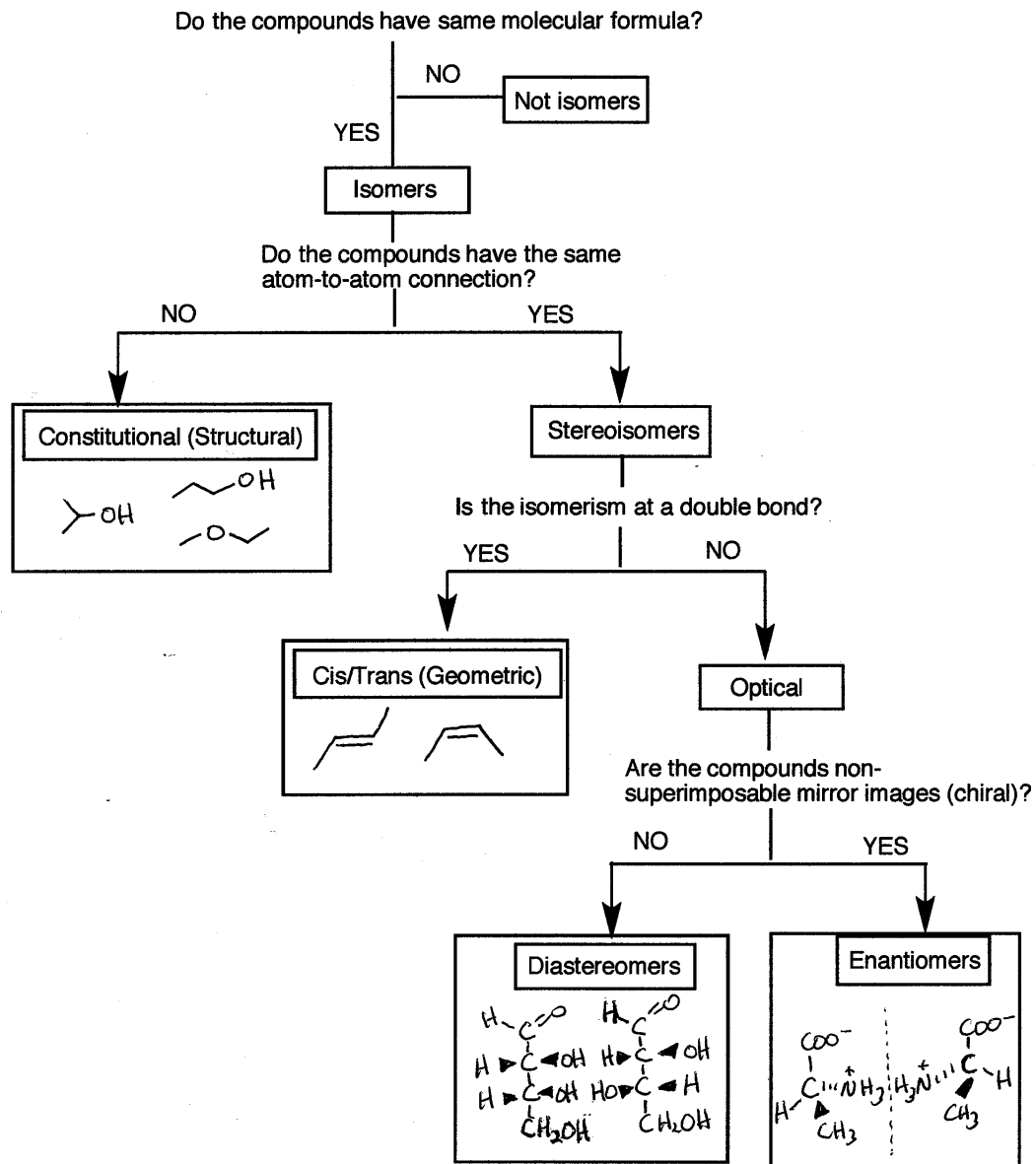


Ch21: Carbohydrates

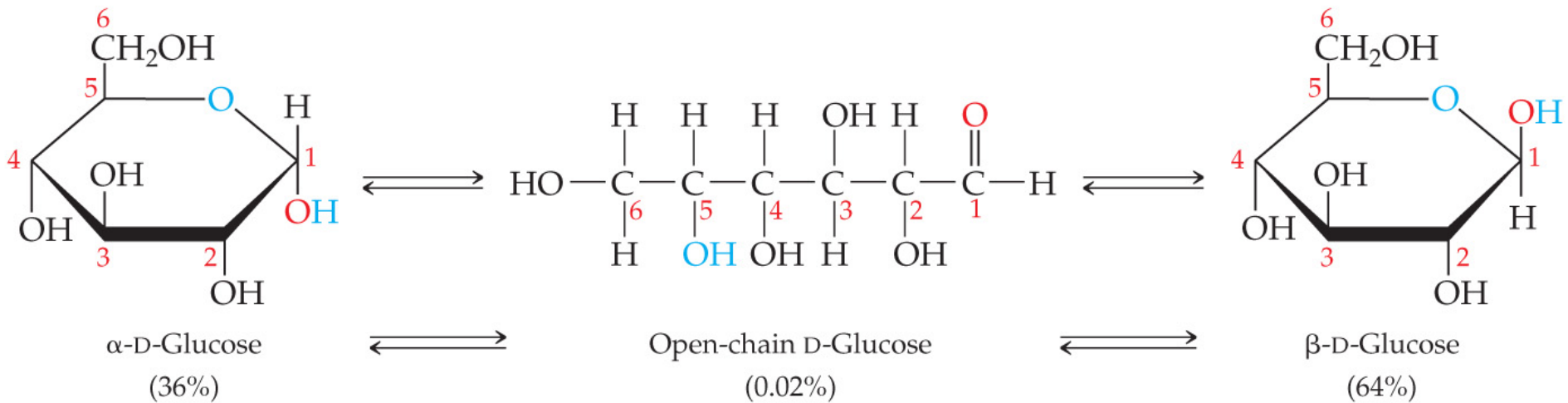
Polarimeter for Determining Optical Activity



Isomer Types

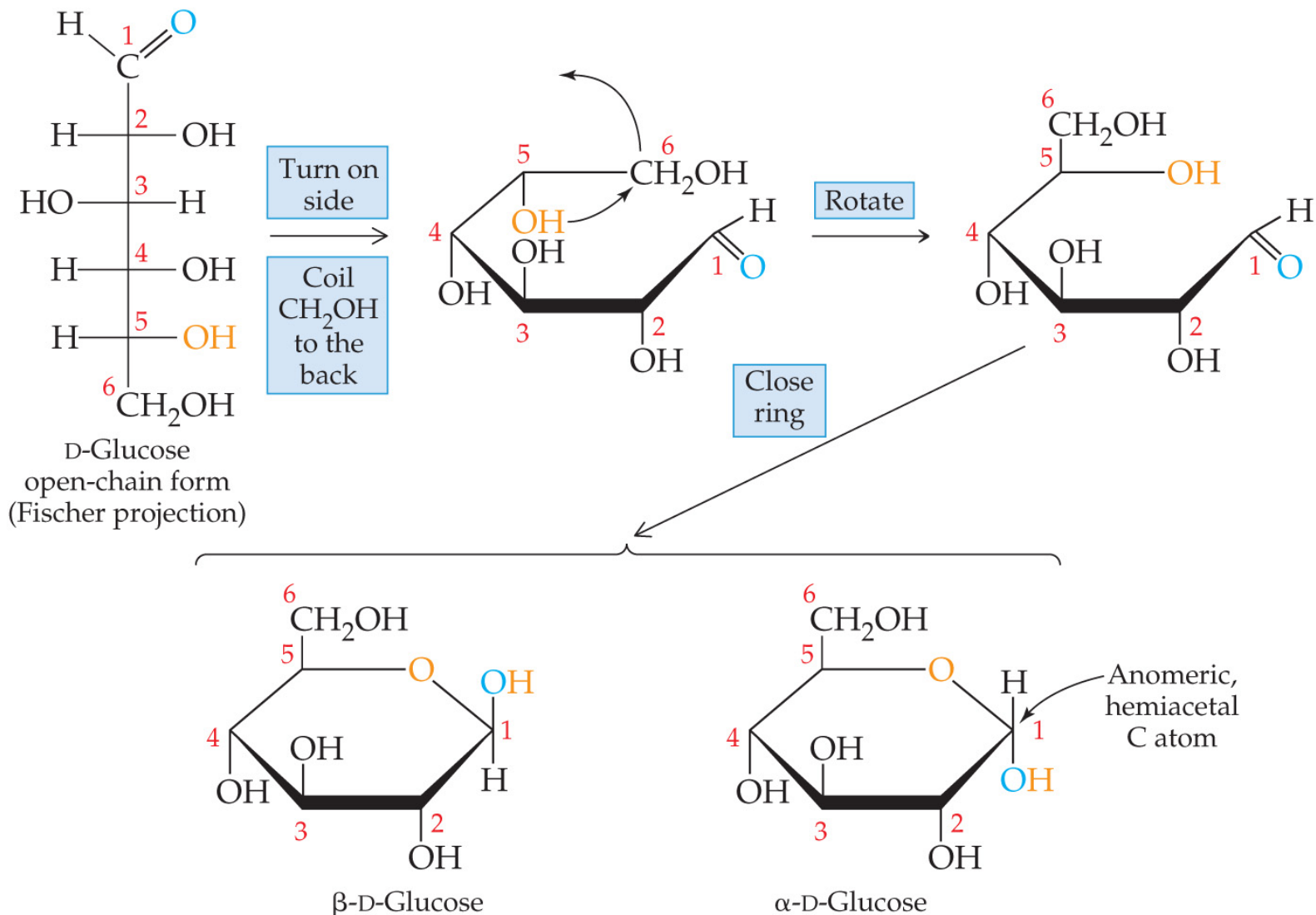


Mutarotation of D-Glucose

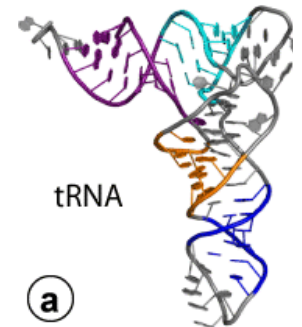
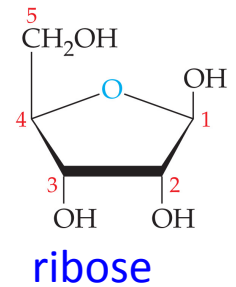
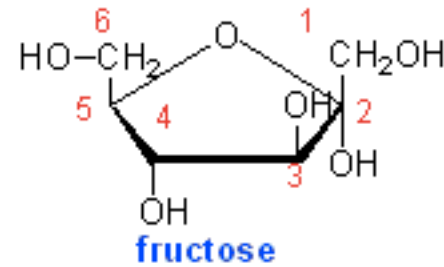
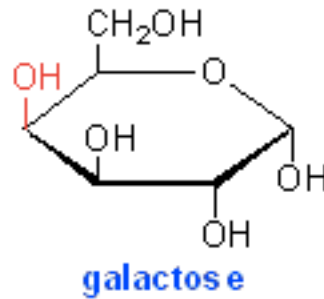
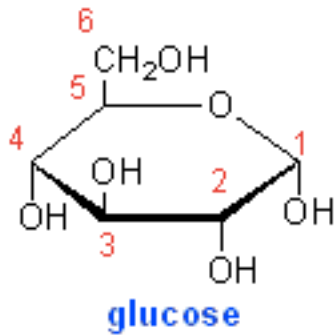
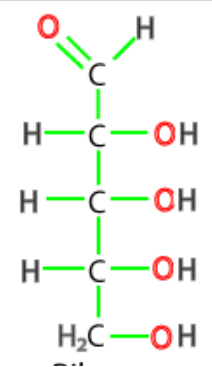
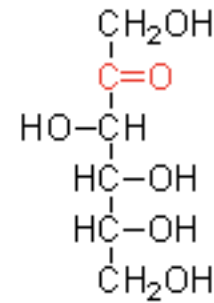
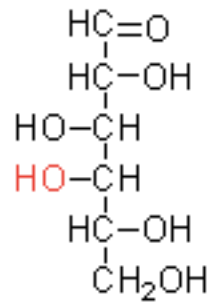
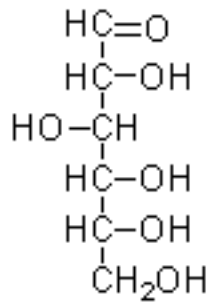


Predominant form
in crystal

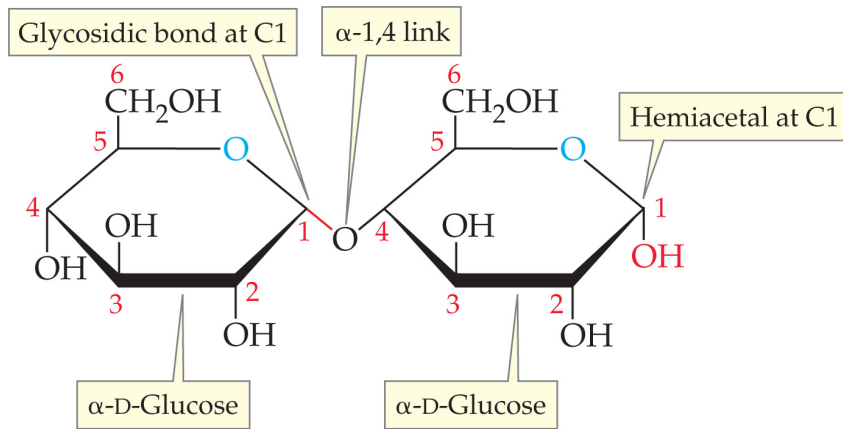
From Fischer (straight-chain) to Haworth (cyclic)



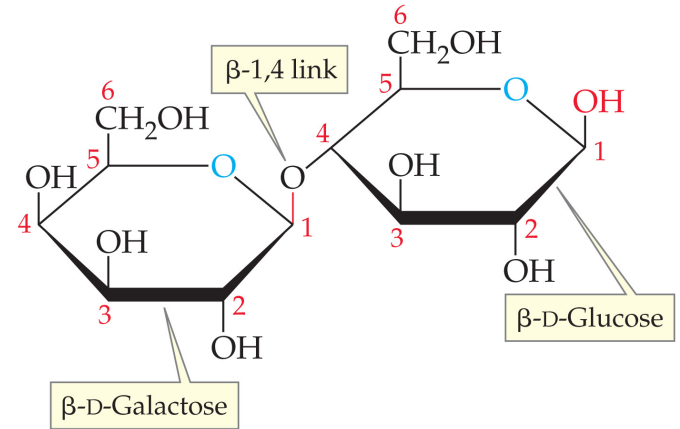
Common Monosaccharides



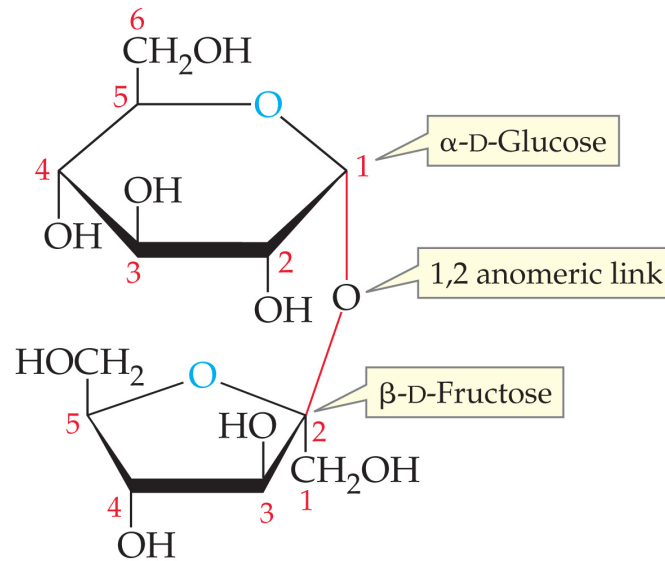
Common Disaccharides



Maltose



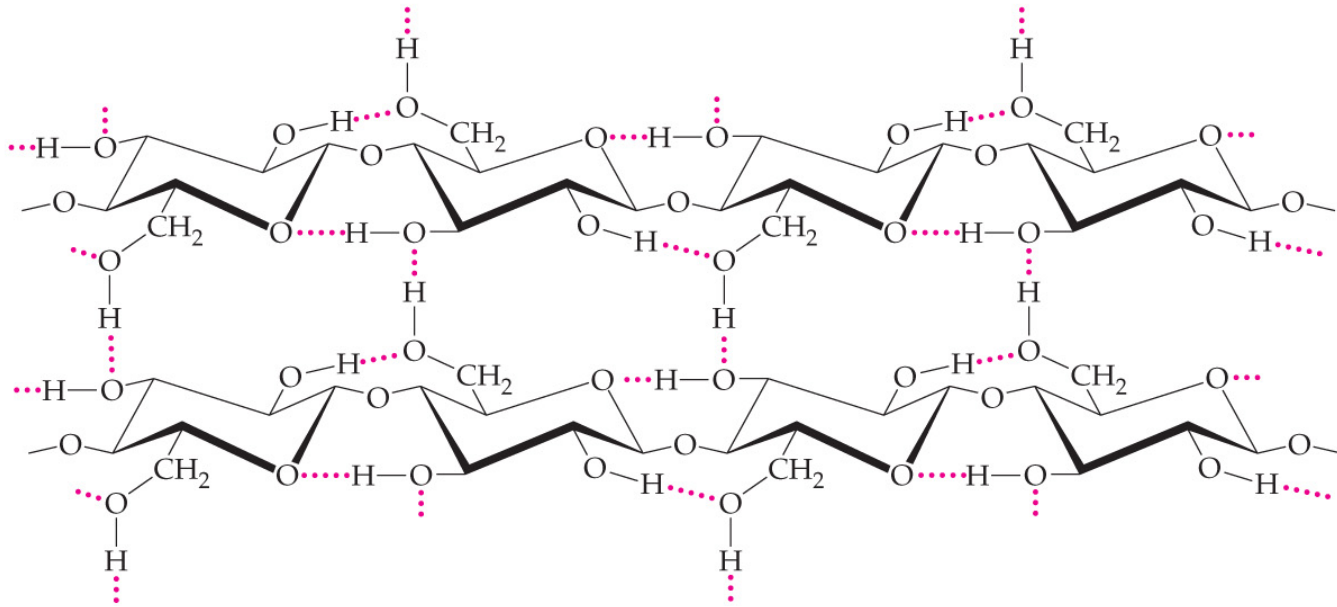
Lactose



Sucrose

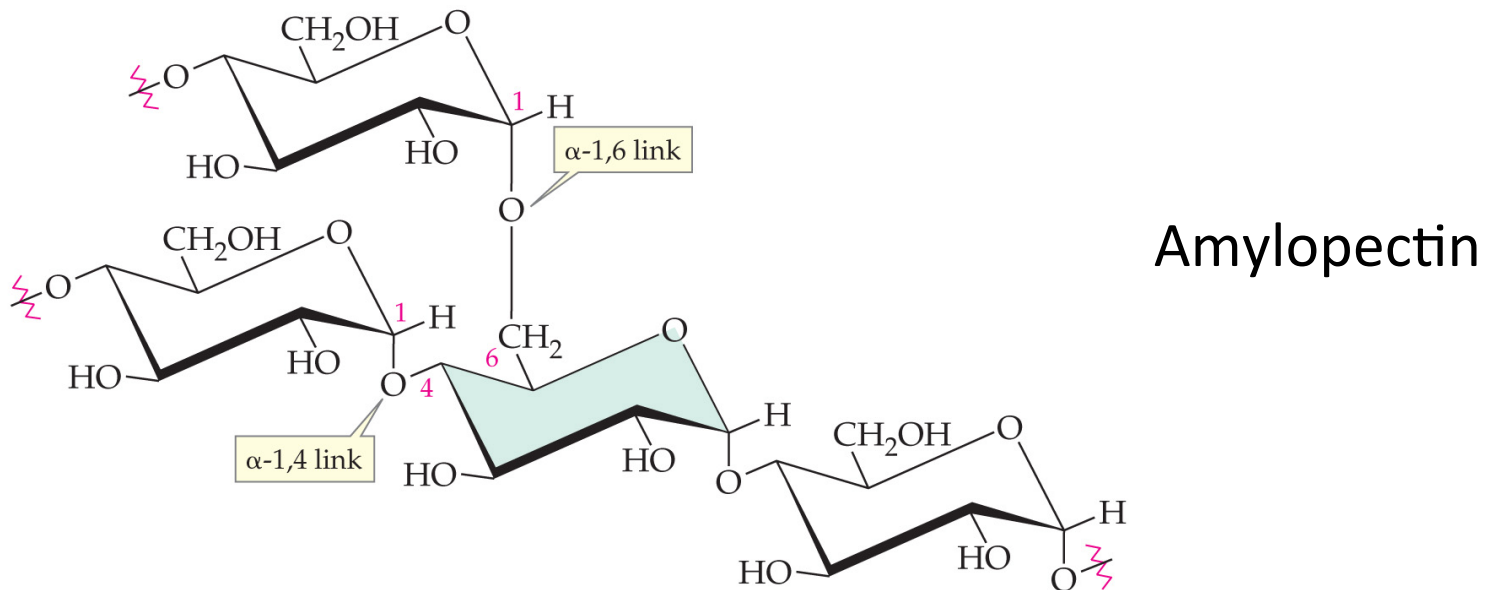
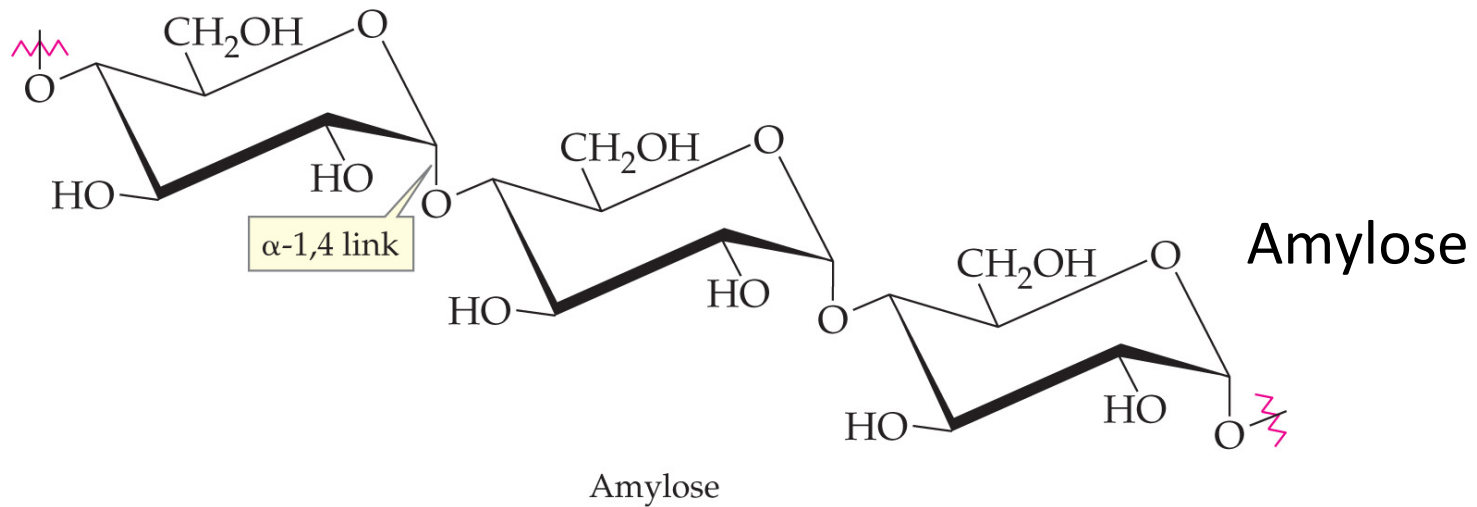
Common Polysaccharide: Cellulose

Cellulose



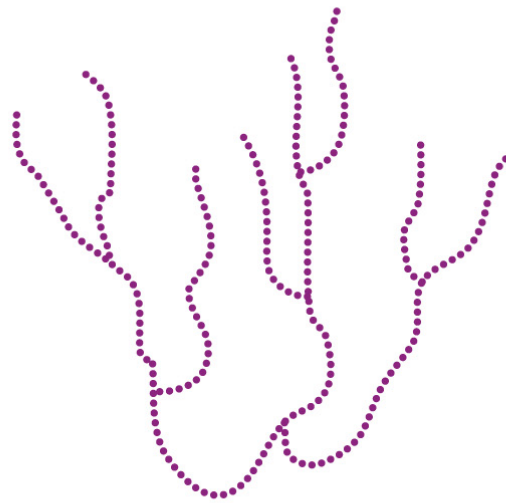
Note chair conformation of monosaccharides

Common Polysaccharide: Starch

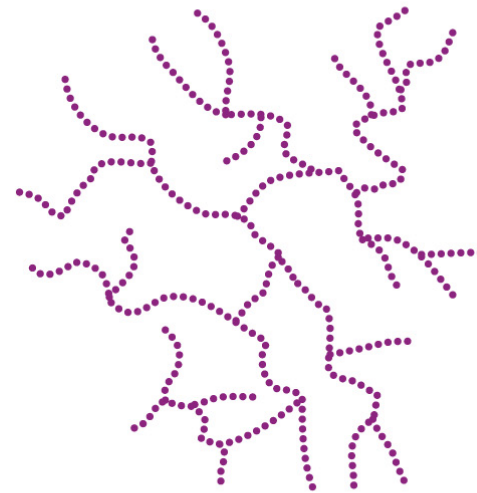


Common Polysaccharide: Glycogen

Comparison of branching in amylopectin and glycogen



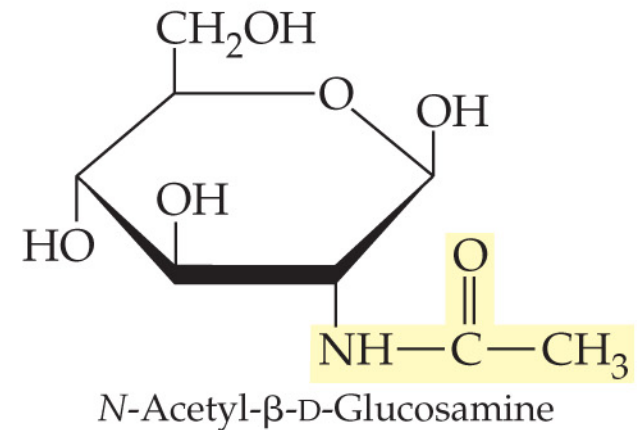
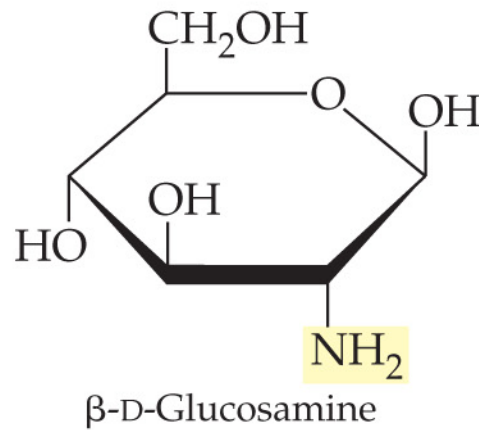
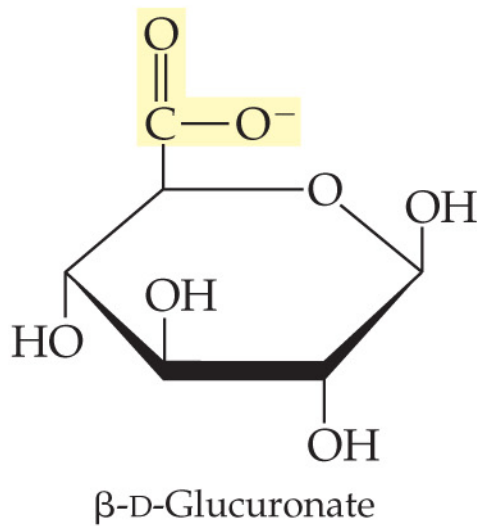
Amylopectin
(in plants)



Glycogen
(in animals)

Modified Carbohydrates

- Polymers or oligomers of modified monosaccharides (often modified glucose molecules)



Modified Carbohydrates

- Chitin: Makes up shells of lobsters, beetles, spiders. Second most abundant polysaccharide in natural world (Cellulose- most abundant). Hard structural polymer composed of *N*-acetyl-D-glucosamine rather than glucose but otherwise identical to cellulose.
- Matrix and fluid for connective tissue: Gel-like, unbranched mucopolysaccharides. Serve as lubricants in joints, tendon, cartilage, eye.
- Heparin: an anticoagulant. Mix of mucopolysaccharides found in liver and lungs
- Glycoproteins: Proteins covalently attached to oligosaccharides that serve as receptors