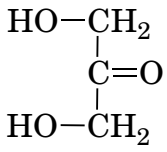
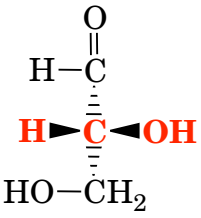
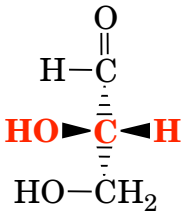
Carbohydrate Nomenclature and Chemistry



Dihydroxyacetone



D-Glyceraldehyde



L-Glyceraldehyde

Aldose:

Ketose:

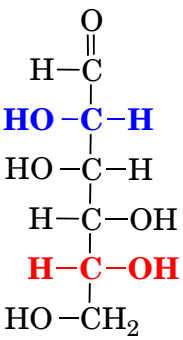
Triose:

Pentose:

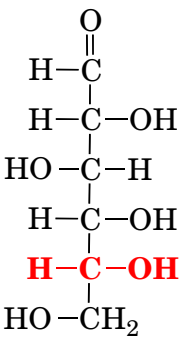
Hexose:

Epimers:

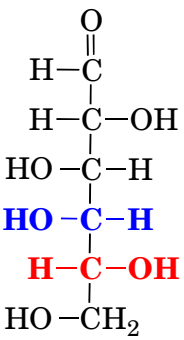
Biologically important hexoses:



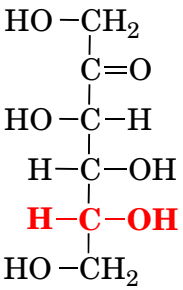
D-Mannose



D-Glucose

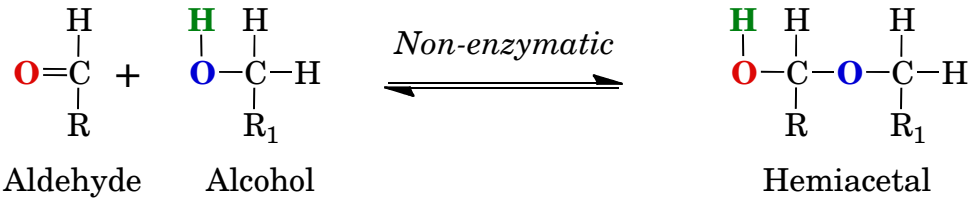


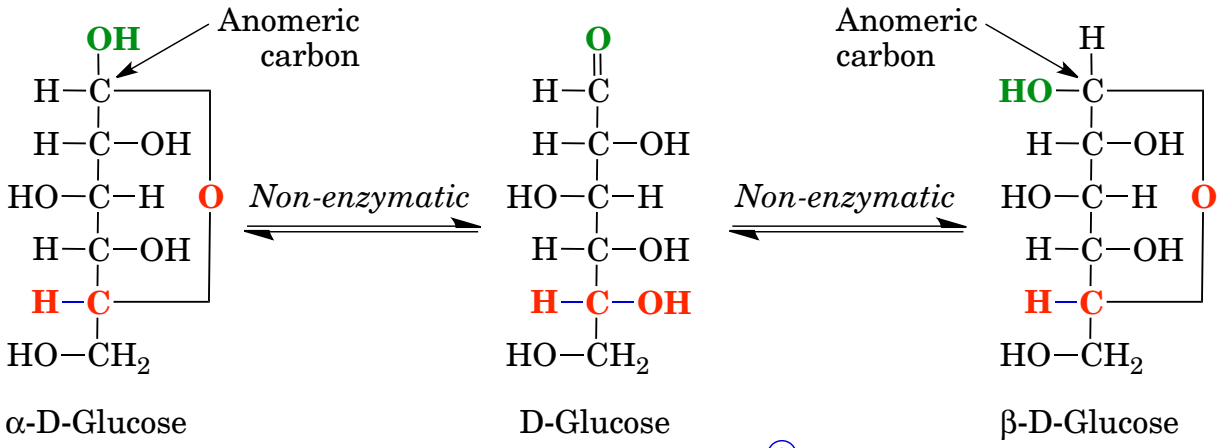
D-Galactose

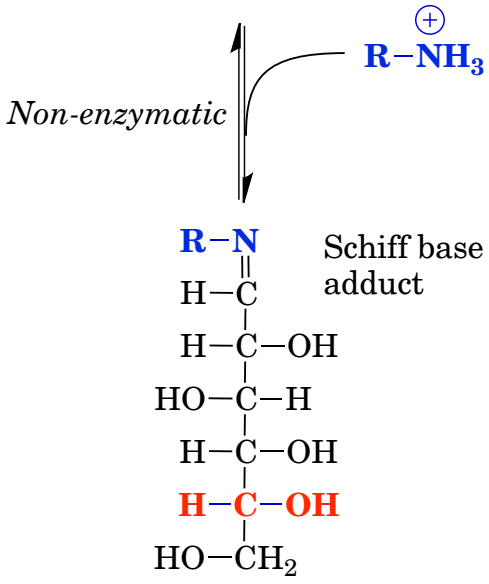


D-Fructose

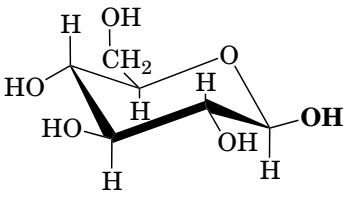
Reactions


Non-enzymatic
Aldehyde
Alcohol
Hemiacetal

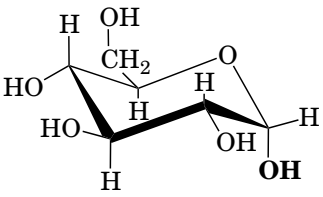

Anomeric carbon
Non-enzymatic
Non-enzymatic
Anomeric carbon
α-D-Glucose
D-Glucose
β-D-Glucose


Non-enzymatic
Schiff base adduct

Cyclic forms and representations

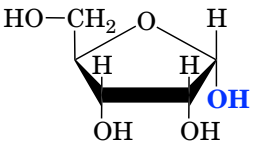


β-D-Glucose
(chair representation)

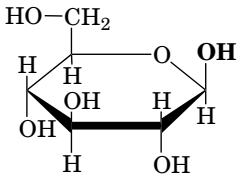


α-D-Glucose
(chair representation)

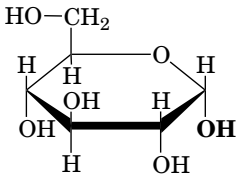
α-D-Ribose



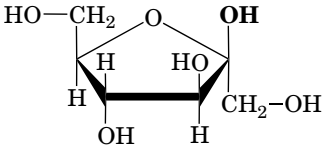
α-D-Ribose



β-D-Glucose
(Haworth representation)

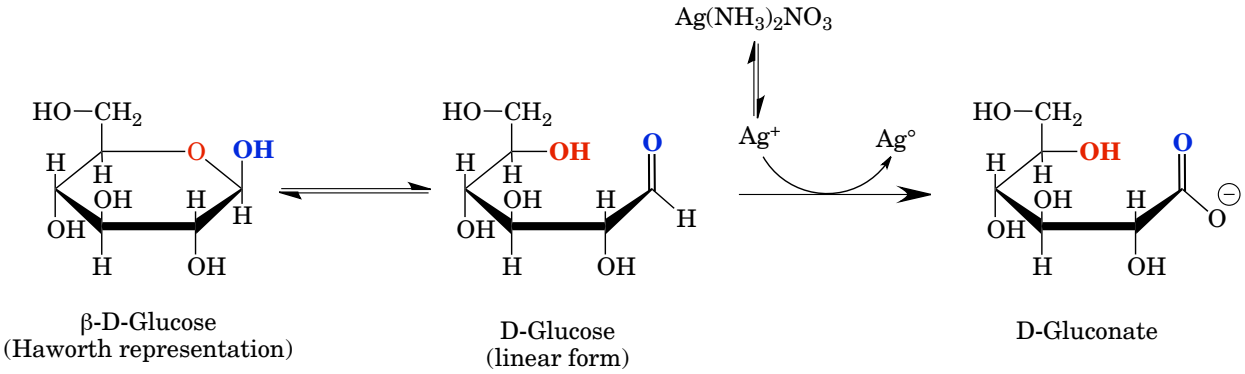


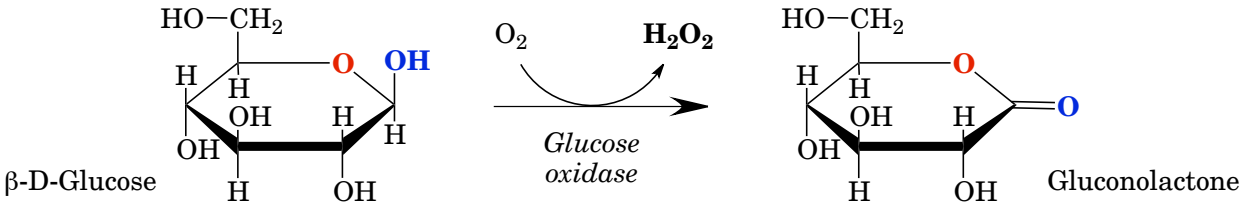
α-D-Glucose
(Haworth representation)



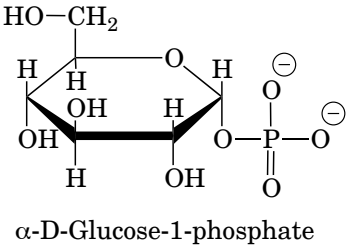
β-D-Fructose

Detecting Carbohydrates ("Reducing sugars")

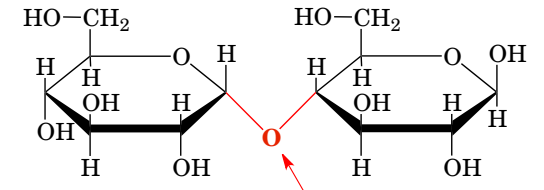




A non-reducing sugar

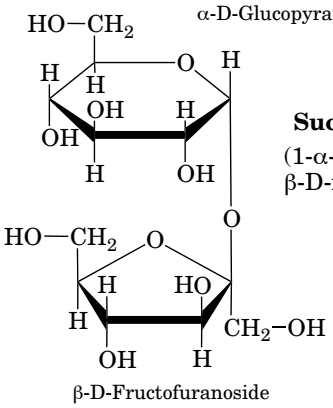


Disaccharides

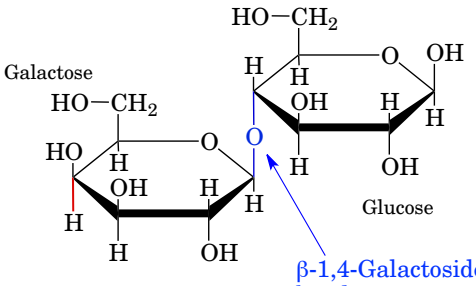


Maltose
(α-D-glucopyranosyl-
1,4-D-glucopyranoside)

α-1,4-Glucoside bond



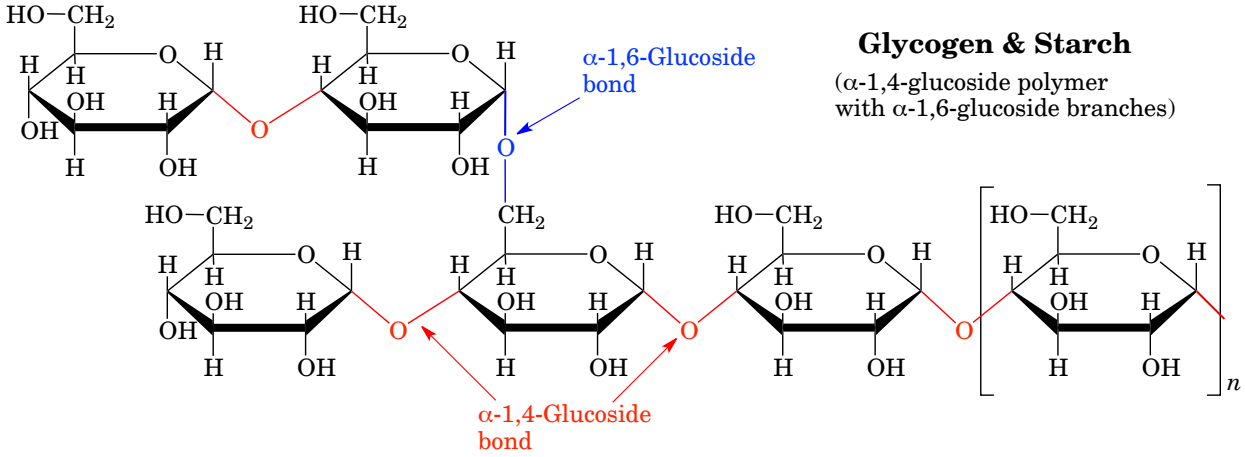
Sucrose
(1-α-D-glucopyranosido-
β-D-fructofuranoside



Lactose
(β-D-galactopyranosyl-
1,4-D-glucopyranoside)

β-1,4-Galactoside bond

Polymers

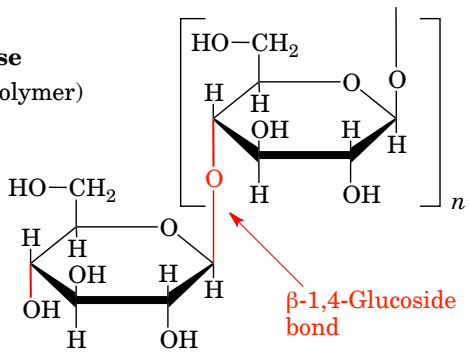


Glycogen & Starch
(α-1,4-glucoside polymer
with α-1,6-glucoside branches)

α-1,6-Glucoside bond

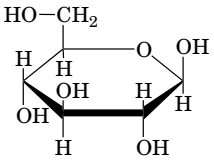
α-1,4-Glucoside bond

Cellulose
(β-1,4-glucoside polymer)

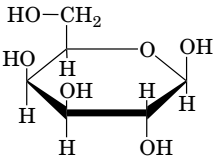


β-1,4-Glucoside bond

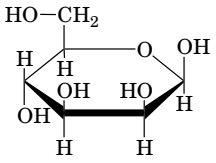
Glycoproteins



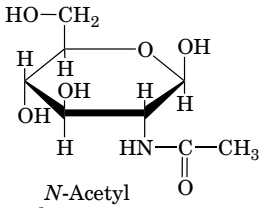
β-D-Glucose



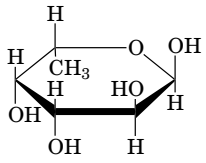
β-D-Galactose



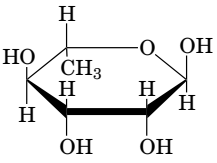
β-D-Mannose



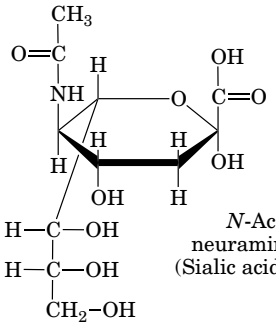
N-Acetyl glucosamine (NAG)



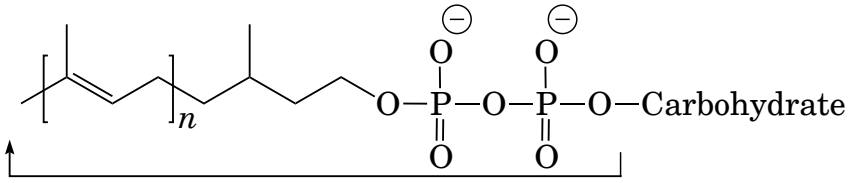
α-L-Fucose



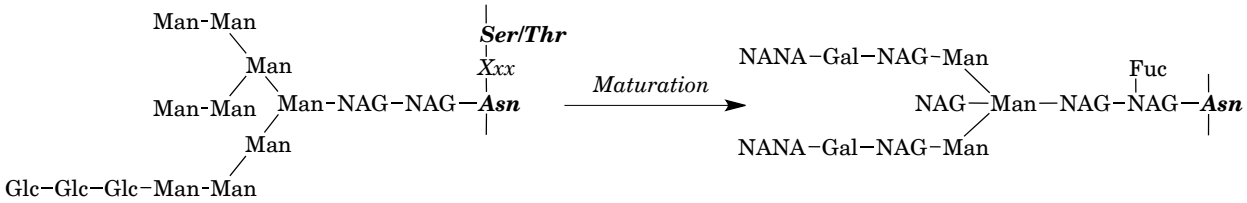
α-L-Rhamnose

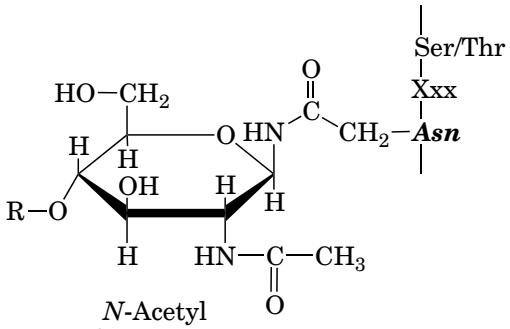


N-Acetyl neuraminic acid (Sialic acid, NANA)

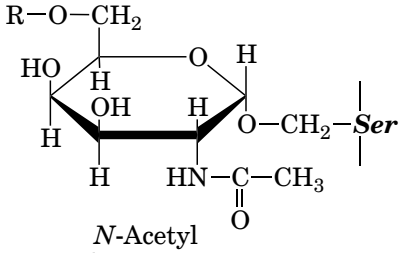


Dolichol pyrophosphate (n = 14 – 24)





N-Acetyl glucosamine (NAG or GlcNAc)



N-Acetyl galactosamine (GalNAc)