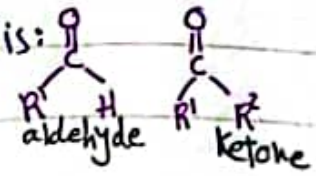
① monosaccharides:- basic unit of "CHO" Like: glucose, galactose fructose.

② disaccharides :- Two monosacchrids "covalant linked" by glycosidic bond
Like sucrose, مكون من → glucose, fructose

③ Polysaccharides:- polymeric molecules (adj) → Long chains of monosaccharides Linkby glycosidic bonds like :- Starch, Cellulose, glycogen

"Monosaccharides" classified to number of carbone atoms { Trioses 3, Tetroses 4, Pentoses 5, hexoses 6 } OR by Chemical nature of the carbonyl grob "C=O" The carbonyl group is: 

* the grape or blood sugar is hexoaldose or aldohexose :- D-glucose
* the fruit sugar :- hexoketose or ketohexose :- fructose

Isomerization: molecules with same molecular formula but different Chemical structures.

① atoms and functional bind together in different ways Like glucose, fructose.

② molecules with same molecular formula but diffemt Chemical structu

① Constitutional "structural"

* Chiral * (غير متطابق) ↔ *Achiral* (متطابق)

★ enantiomers :- Steroisomers, mirror img but not superimposable.

② Steroisomers :- differ in configuration of atoms in space rather than the order of atomic connectivity

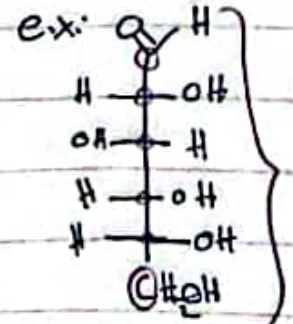
Chiral carbon → 4 different groups of atoms

the number of steroisomers 2^n and n = number of chiral Centers

D/L monosaccharides
على حسب مكان OH + إذا في أكثر من OH
اخذ أبعد OH عن CH_2OH:

D: يمين L: يسار

and we used nomenclature system to assign the configurations in sugars and amino acids

e.x: 

n.u. Steroisomers: 2^4

* most naturally occurring sugars are D isomer

In Love

PaperN Things "monosaccharides" 1.2 تاريخ

* enantiomers are optically active and can rotate the Polarized light [clockwise or counter clockwise]

if enantiomers rotates the light clockwise it is labele (+) والعكس صح

Dextrose → D-glucose (الإسم التجاري له)   Laevulose → D-frauctose (الإسم التجاري له)

* Racemic mixture "net rotation is zero" *

Epimers: steroisomers that differ in the configurations of atoms only one chiral center thy are not mirror imge isomers " يعني عند كربونة وحدة يكونو معكوسين بالمرايا

* Glucose and galactose are C4 epimers
* Grucose and mannose are C2 epimers

Fisher Projection is Linear form and haworth Projection is cycli.

* متى نحدد إذا ألفا أو بيتا؟ مكان تغيير الـ OH إذا تحت ألفا وإذا فوق بيتا

| Sugars with six-memberane ring is Pyranoses like glucoPyranose
| Supars with five-memberane is Furanoses like fructo furanose

* hexose or Pentose can exist in Pyranoses and furanoses forms "the most stable rings"
* glucose and fructose are mostly Pyranoses and Furanose is ribose
* Haworth Projection is 3D way.
* Anomers * are pair of steroisomers that differ in spatial arrangement of atoms

Conformers: The monosaccharides is tetrahedral. The Pyranoses Take on either Chair or Boat and α is less stable than β due to steric repulsion

* Sugar modification"

① Aldonic acids:- oxidation of aldehyde (C1) to carboxylic acid as:- D-gluconic acid

Uses:- gluconate "the salt of gluconic acid", Calcium gluconate solution (I.V) : cardioprotective agent in patients with hight blood level of K^+

Aldonic acids ↳ eg. D-gluconic acids
Uronic acids ↳ D-glucuronic acids
Alditols ↳ D-ribitol, D-glycerol, D-sorbitol

Deoxy sugars ↳ β-D-2-deoxyribose

amino sugars ↳ rebuild cartilage in osteoarthritis and osteoporosis.