

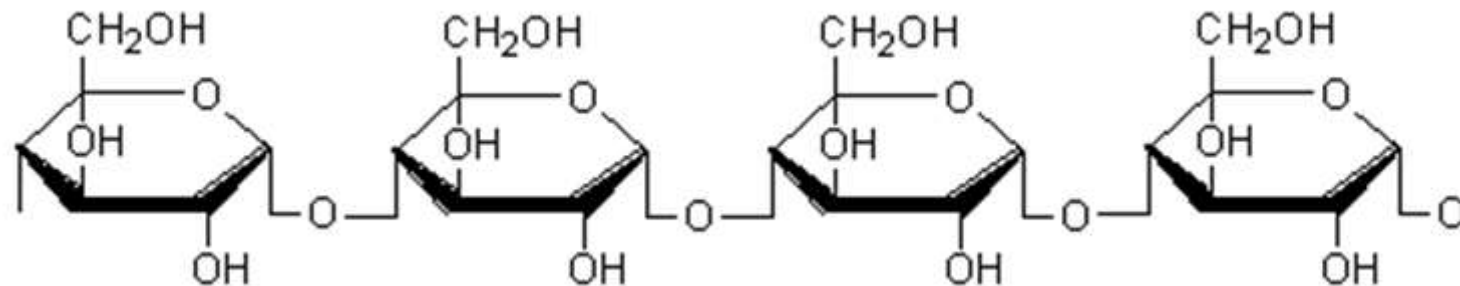
Classification of polysaccharide

Homopolysaccharide

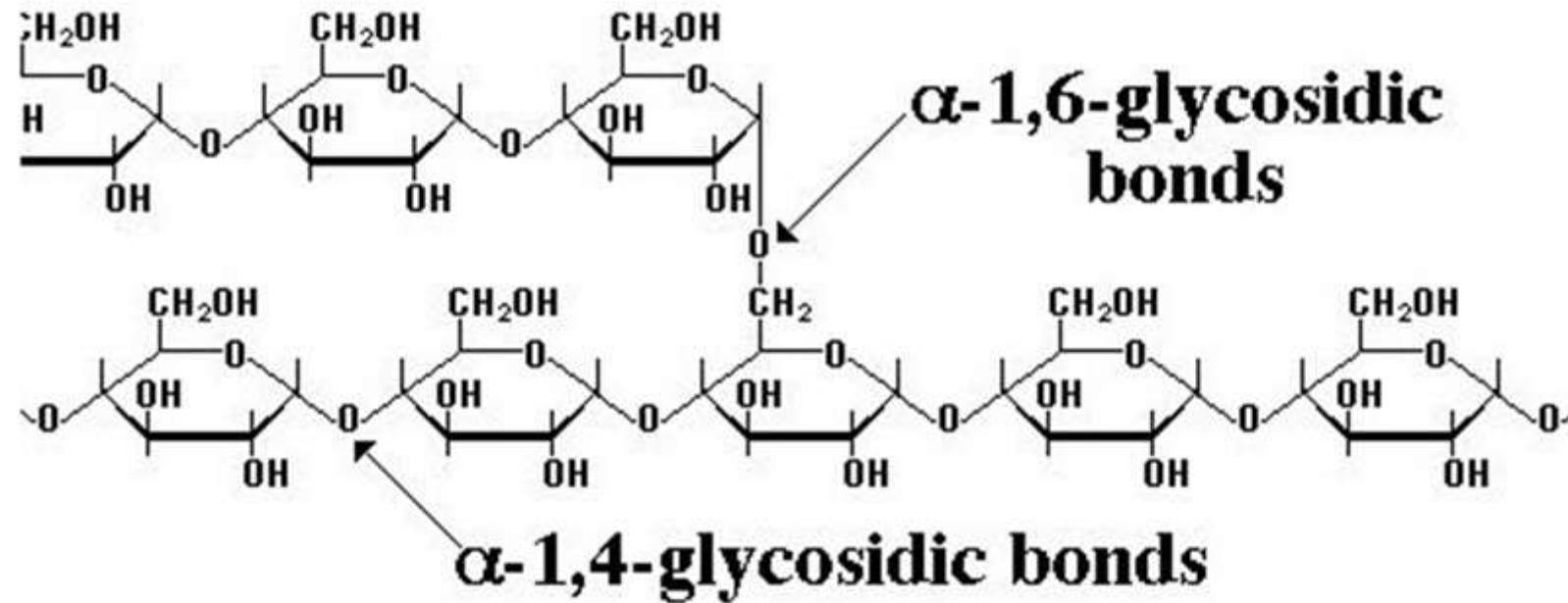
Starch

- Reserve food for plants
- Consist of two components amylose and amylopectin

Amylose



Amylopectin



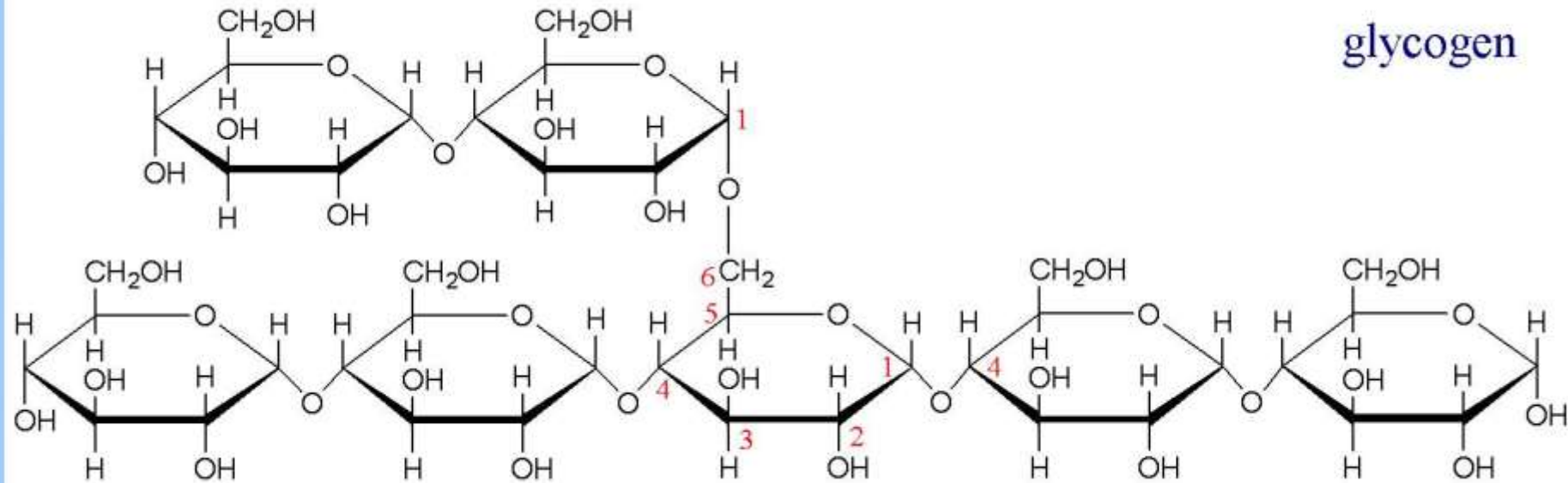
Properties of starch

- White amorphous powder lack sweetness
- Insoluble in water, alcohol in room temperature
- Broken down to dextrin's at high temperature which gives stiffness to clothes.
- Amylose gives blue colour with iodine. Amylopectin gives purple colour.
- Hydrolyzed by acid to glucose

Glycogen

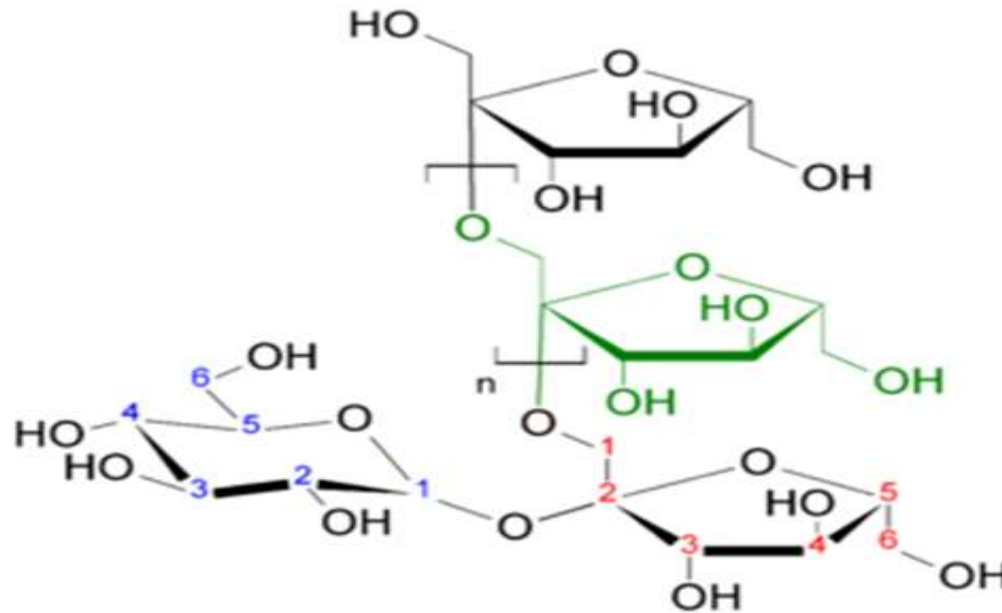
- Reserve food for animals
- Stored in liver and muscles
- Resembles amylopectin structure
- Gives red color with iodine
- Hydrolyzed with acid to give glucose

glycogen



Inulin

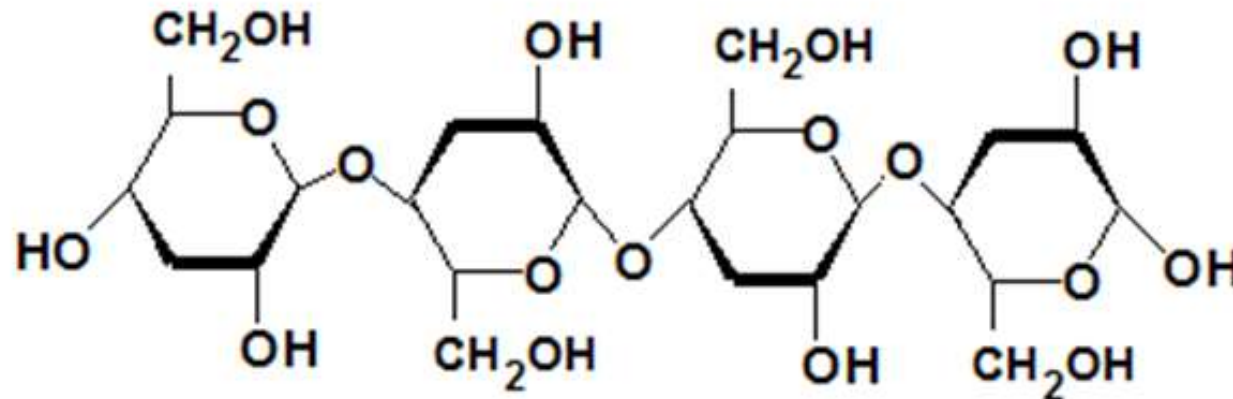
- Stored form of carbohydrate in certain plants which does not have starch as reserved food.
- Stored in tubers and roots.



- β 2,1 glycosidic linkages of fructose units
- white insoluble in water at room temperature but soluble in warm water
- no color with Iodine
- hydrolysis yields fructose

Cellulose

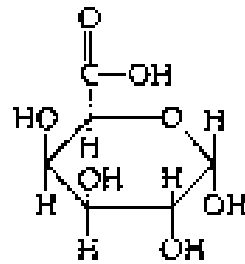
- abundant extracellular polysaccharide of plant
- occurs in cell walls of plants
- resembles structure of amylose except the glucose units are linked by β 1,4 glycosidic linkages



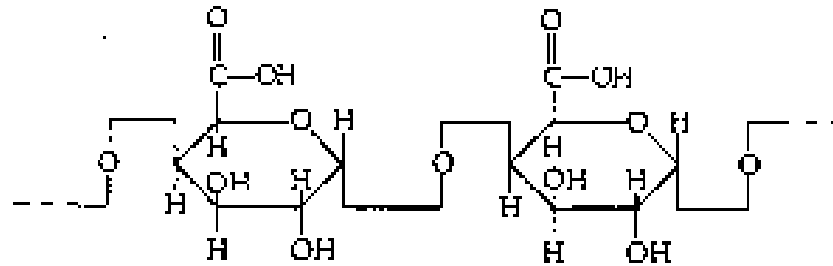
- white solid insoluble in water
- no color with Iodine
- cellulose is not digested by humans
- hydrolyzed to glucose with strong acids or base
- -Cotton paper are made from cellulose

Pectin

- Present in fruits as a jelling agent
- Made of α -D-galacturonic acid with β 1,4 linkage



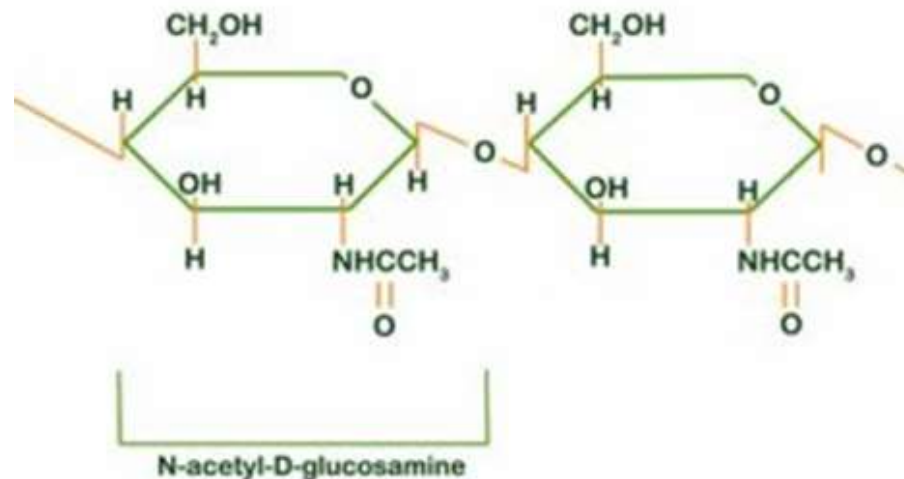
(a) GALACTURONIC ACID



(b) PECTIC ACID

Chitin

- Found in fungi crabs and insects
- Exoskeleton of arthodopods
- N acetyl glucose amine units joined by b 1,4 linkages



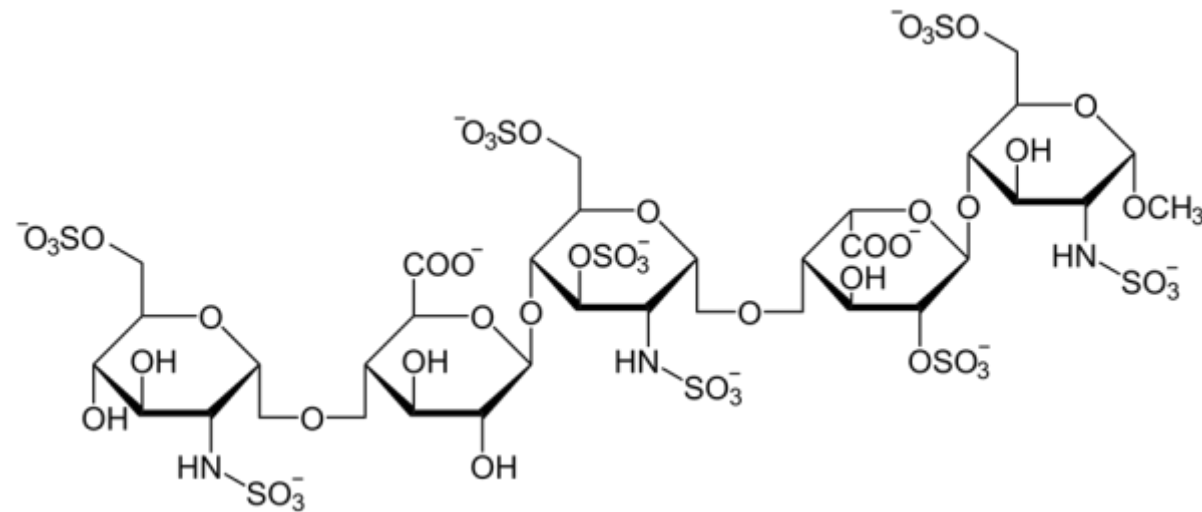
Heteropolysaccharide

Hyaluronic acid

- Found in connective tissues and soft tissues
- Biological lubricant
- Straight chain polymer of D-glucuronic acid and NAG
- Hydrolysis yields equal mixture of glucuronic acid, glucosamine and acetic acid

Heparin

- An anticoagulant
- Composed of d glucuronic acid esterified with sulfate group at c2 and c6 with a 1,4 linkage.

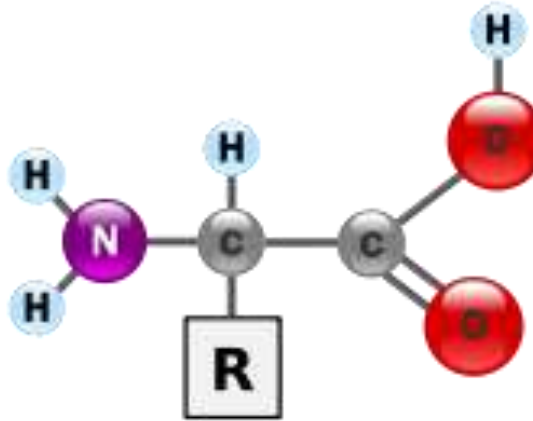


Proteoglycans

- Proteins that are highly glycosylated
- Chondrotin is a proteoglycan
- Found in extracellular matrix

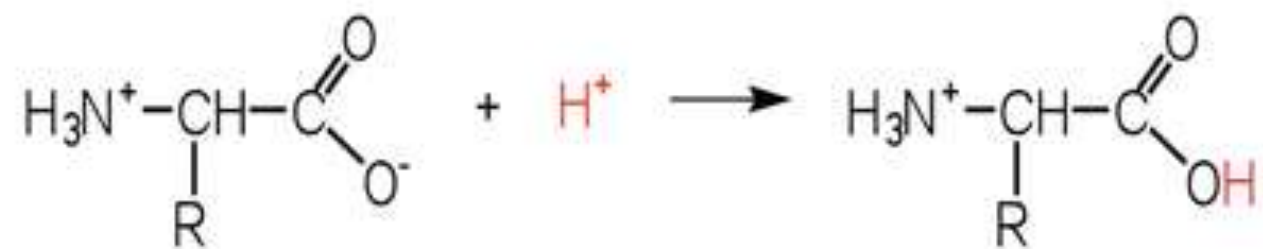
Amino acids and Proteins

- All proteins are polymers by joining monomers called amino acids.
- Building block of proteins.

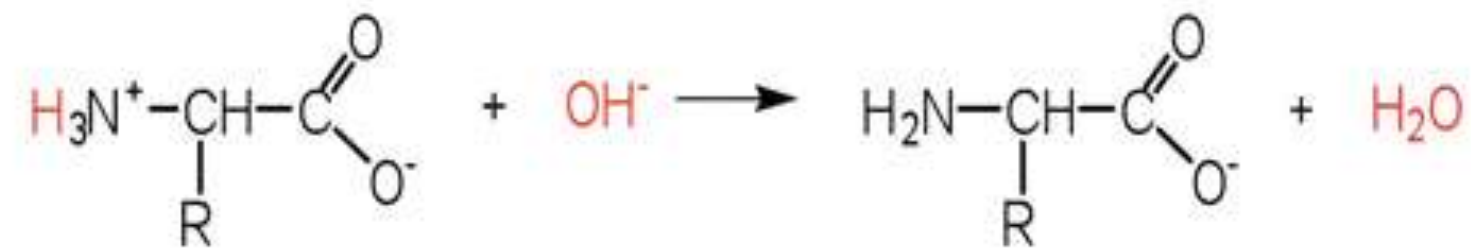


- Has alpha carbon group except glycine all amino acids exist in D and L form.
- Most amino acids present in proteins are L form.
- Colourless crystalline substance.
- 20 L form amino acids are constituent of most proteins.
- Contains both acidic and basic group.
- Amphoteric nature.

Addition of
an acid:



Addition of
a base:

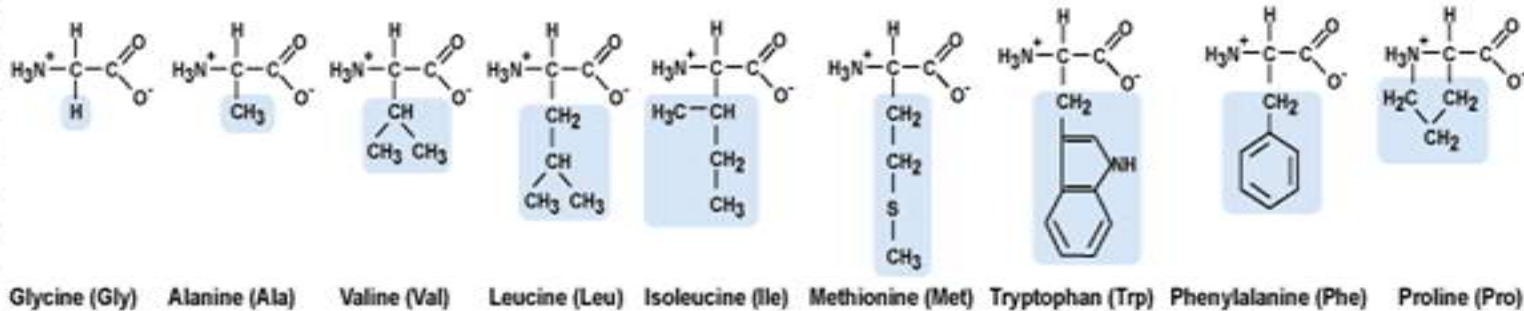


Classification based on side chain

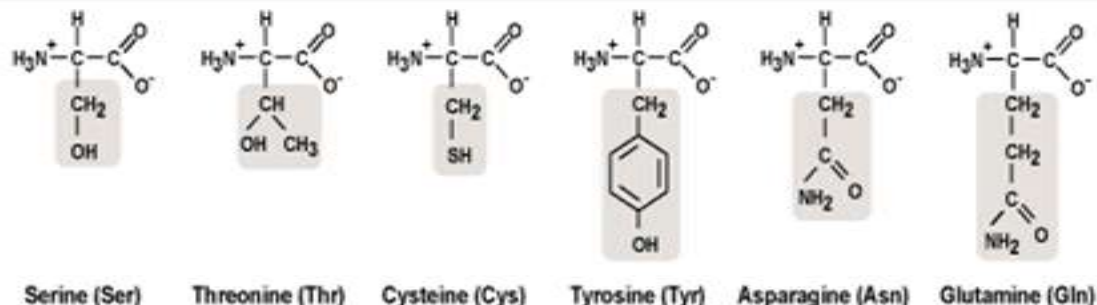
- Simple amino acids – no functional group eg: gly, ala, val, leu, Isoleu
- Hydroxy amino acids – hydroxyl group as side chain eg: ser, thr
- Sul cont amino acids – sul atom in side chain eg: cys, met
- Acidic amino acids – carboxyl group in side chain eg: asp acid, glu acid
- Amide amino acids – one carboxyl group transformed to amide group eg: asp, glu

- Basic amino acids – amino group in side chain eg: lys, arg.
- Heterocyclic amino acids – has a ring as side chain which possess atleast one atom other than carbon eg: typ, his, pro.
- Aromatic amino acids – have benzene ring in side chain eg: phe ala, tyr

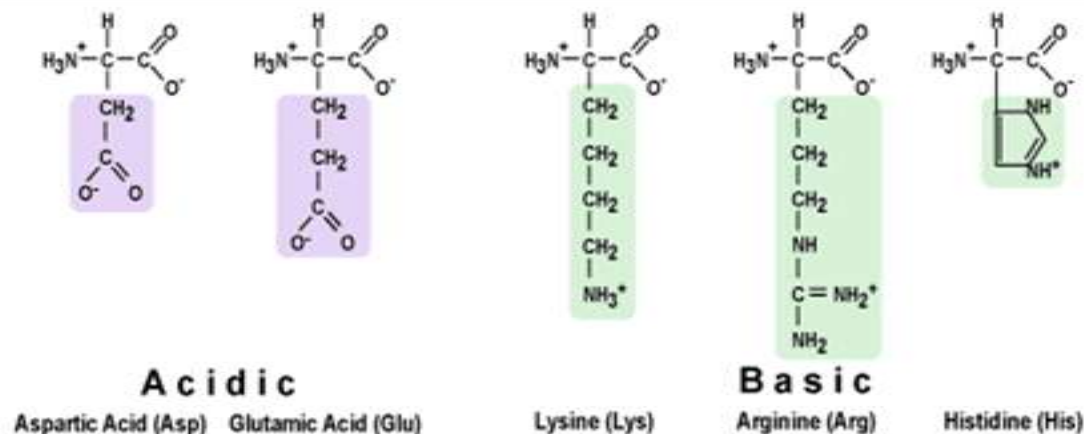
NONPOLAR



POLAR



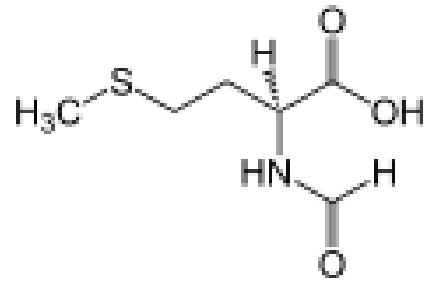
Electrically Charged



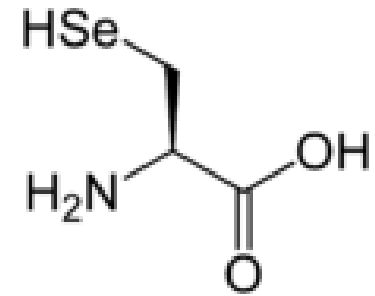
Essential and Non-essential amino acids

- Non protein amino acids are non coded amino acids.
- Over 140 natural amino acids are known and more than 1000 combinations are possible.
- Non coding amino acids are not worthy as they are intermediate in biosynthesis.

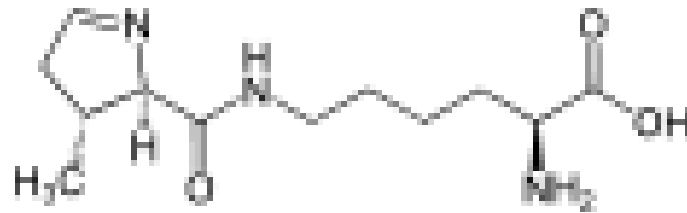
Essential	Conditionally Non-Essential	Non-Essential
Histidine	Arginine	Alanine
Isoleucine	Asparagine	Asparatate
Leucine	Glutamine	Cysteine
Methionine	Glycine	Glutamate
Phenylalanine	Proline	
Threonine	Serine	
Tryptophan	Tyrosine	
Valine		
Lysine		



Formylmethionine



Selenocysteine.



Pyrrollysine.