

AMINO ACIDS

Mays Aljundi ✓

Biochemistry ✓

وَلَا تَحْسِبَنَّ الَّذِينَ قُتِلُوا فِي سَبِيلِ اللَّهِ أَمْوَاتًا بَلْ أَحْيَاءٌ عِنْدَ رَبِّهِمْ يُرْزَقُونَ

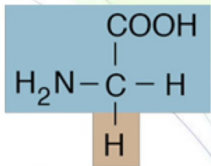
Basically the classification takes into consideration the characteristics of the **R group** only:

→ **Non polar:**

Grandma Always Visits Lebanon In May For Tala's party

Glycine Alanine Valine Leucine Isoleucine Methionine F like ph, phenylalanine Tryptophan proline

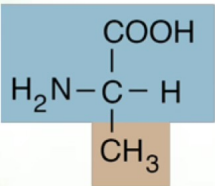
① Glycine (Gly):



Glycine (gly)

- ① Simplest amino acid since it has H in the R group
- ② Achiral (The only one)
- ③ Derivative of acetic acid

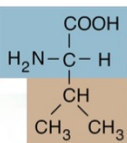
② Alanine (Ala):



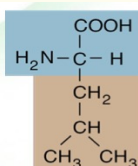
Alanine (ala)

- ① Aliphatic (R group is a hydrocarbon chain)
- ② 2nd simplest amino acid that contains CH_3

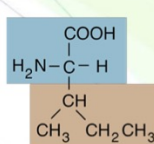
③ Valine (Val), Leucine (Leu), Isoleucine (Ile):



Valine (val)*



Leucine (leu)*



Isoleucine (ile)*

For all:

- ① Branched
- ② We get them from diet
- ③ Leu + Ile are constitutional isomers

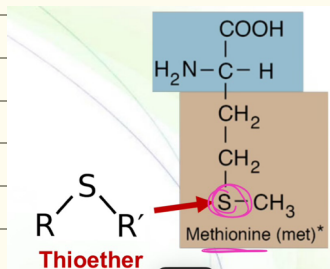
واحد من المركبات تغير مكانه
ولكن نفس الـ Formula

① 2CH_3 with CH

② Same as valine
but add CH_2 before
CH

③ Same as valine
but add CH_2 next
to CH_3

④ Methionine (Met):



① Thio = sulfur

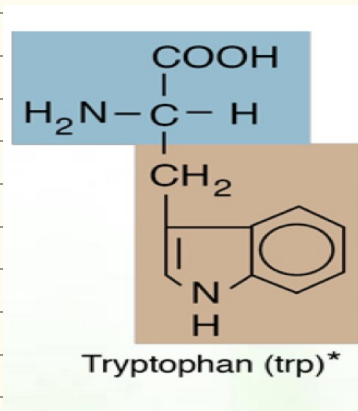
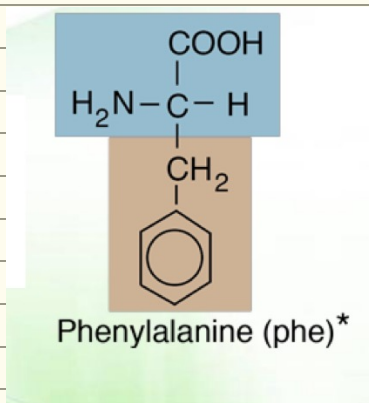
② one of the 2 amino acids that have sulfur in their R group

③ Not reactive since sulfur atom is internal

④ It contains 2CH₂, S, CH₃

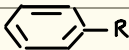
⑤ It can form S-Adenosyl-L-Methionine (SAM) → Serves as a methyl donor in reactions

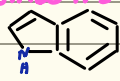
⑤ phenylalanine (phe) , Tryptophan (Trp):



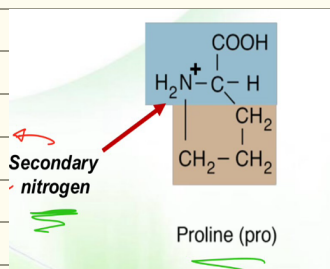
For both:

① Aromatic amino acids

① Contains phenyl ring 
② Large and hydrophobic
③ CH₂, phenyl ring

① Largest amino acid since its R group has 2 rings
② It contains indole 
③ CH₂, indole ring

⑤ proline (pro):



① The only cyclic amino acid [not only the R-group]

② The only amino acid that contains secondary nitrogen

③ Rigid

④ 3CH₂

“اللهم إني أعوذ بك من شر ما عملت، ومن شر ما لم أعمل”

positively charged:

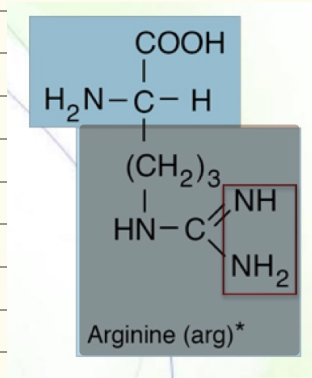
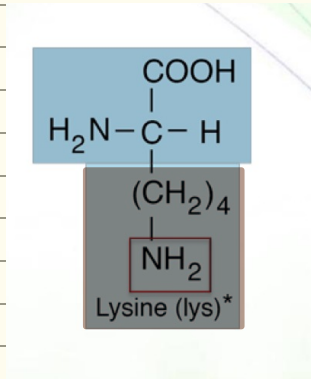
Aryam Loves Horses

↓
Arginine

↓
Lysine

↓
Histidine

① Lysine (Lys) / Arginine (Arg):

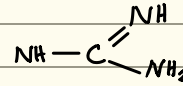


For both:

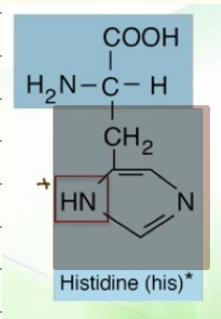
① They are aliphatic

① It ends with primary amino
② $4CH_2$, NH_2

① It ends with guanidinium group
② The double bond is delocalized
③ $3CH_2$, guanidinium



② Histidine (His):

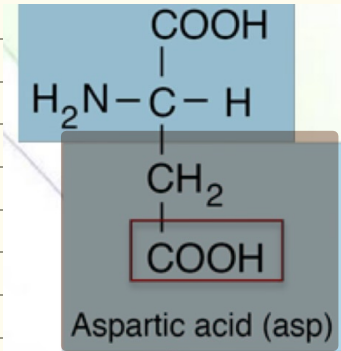


① Contains imidazole
② Aromatic since R has a ring structure

“اللهم إني أسألك الهدى والتقى والعفاف والغنى”

➔ Negatively Charged:

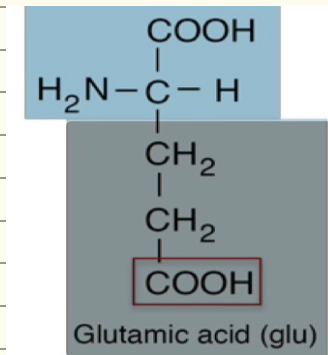
① Aspartic acid (Asp):



- ① R group contains COOH
- ② CH₂ / COOH

➔ ionized (unprotonated) at physiological pH

② Glutamic acid (Glu):



- ① When you see glut then it contains 5 carbons
- ② 2CH₂ / COOH

”يا مقلب القلوب ثبت قلبي على دينك“

polar :

Smart Teachers Can give Answers Tactfully

Serine

Tyrosine

Cysteine

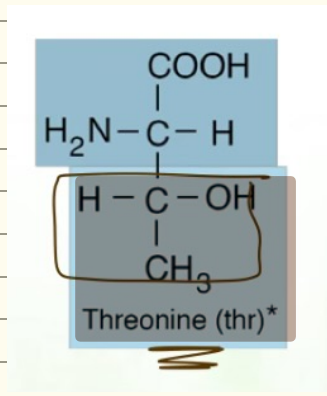
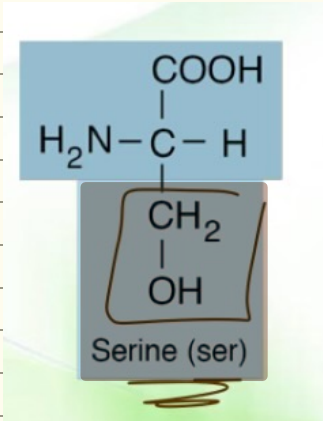
glutamine

Asparagine

Threonine

① Serine (Ser)

Threonine (Thr):



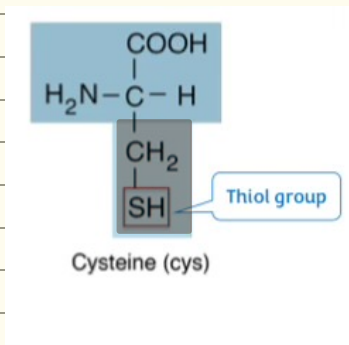
For both:

- ① Aliphatic
- ② Not charged but R group polar
- ③ OH group make them reactive

① CH₂, OH

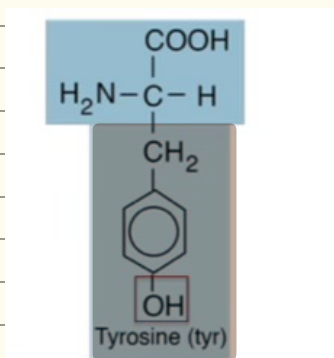
① CH, CH₃, OH

② Cysteine (Cys):



- ① The second amino acid that contains thiol group
- ② The thiol (Sulphydryl) group is reactive

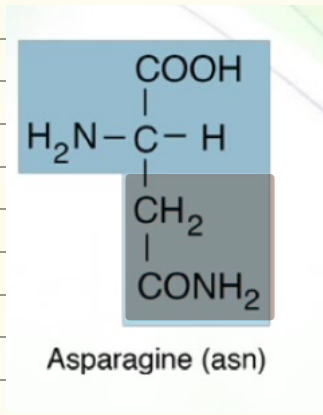
③ Tyrosine (Tyr):



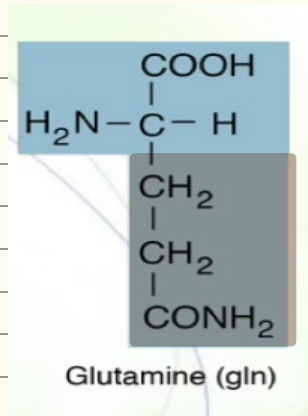
- ① Aromatic ring
- ② Similar to phe with extr OH
- ③ CH₂, , OH

so it is a derived phe

④ Asparagine (Asn) , Glutamine (Gln) :



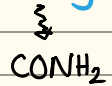
① CH_2 , CONH_2



① 2CH_2 , CONH_2

For both :

- ① They are neutral
- ② They differ from glu, Asp by the carboxamide group



“اللهم ضع في أرضنا بركتها وزينتها وسكنها”