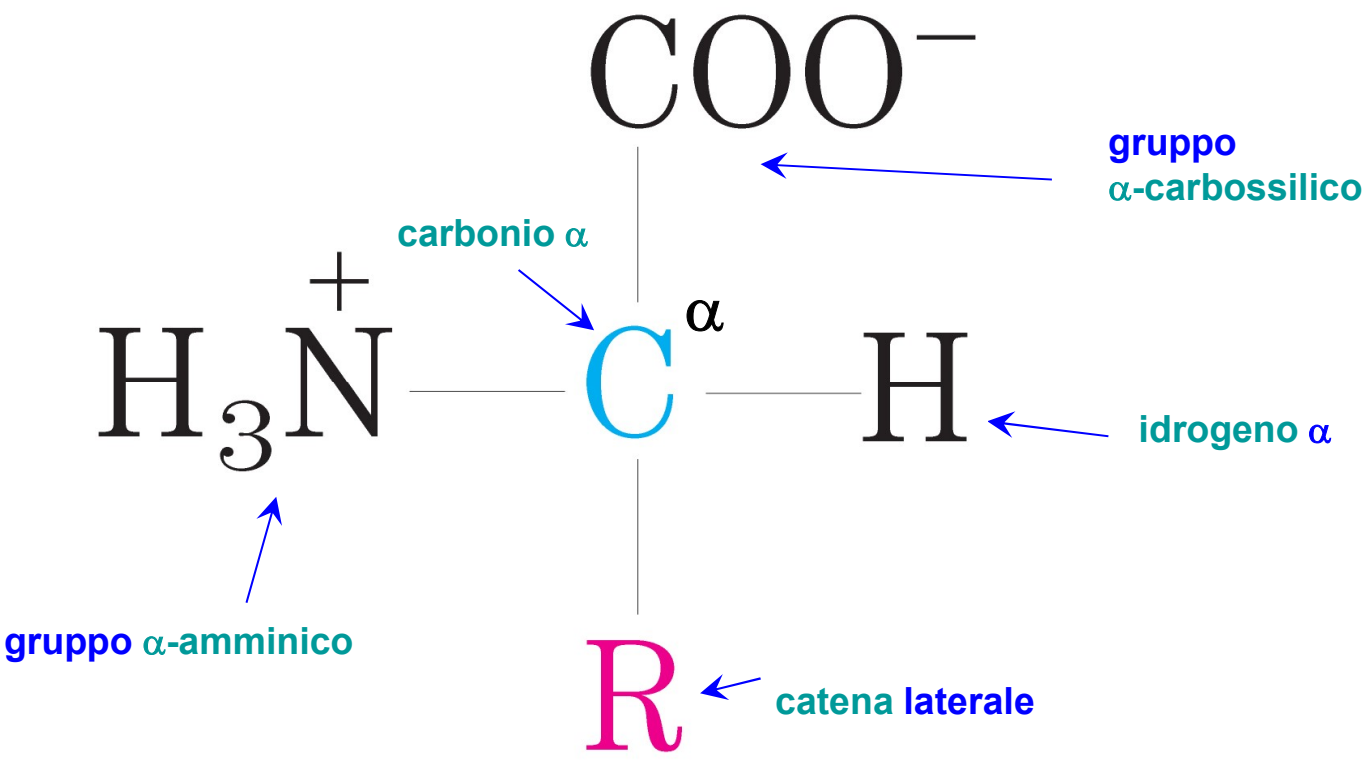
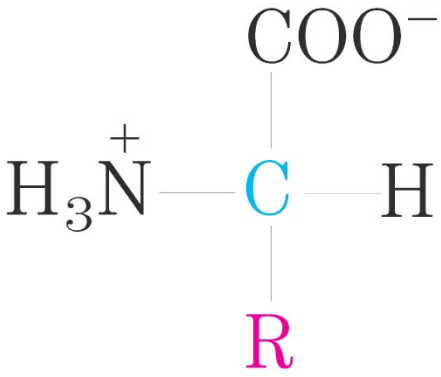
Cap.3

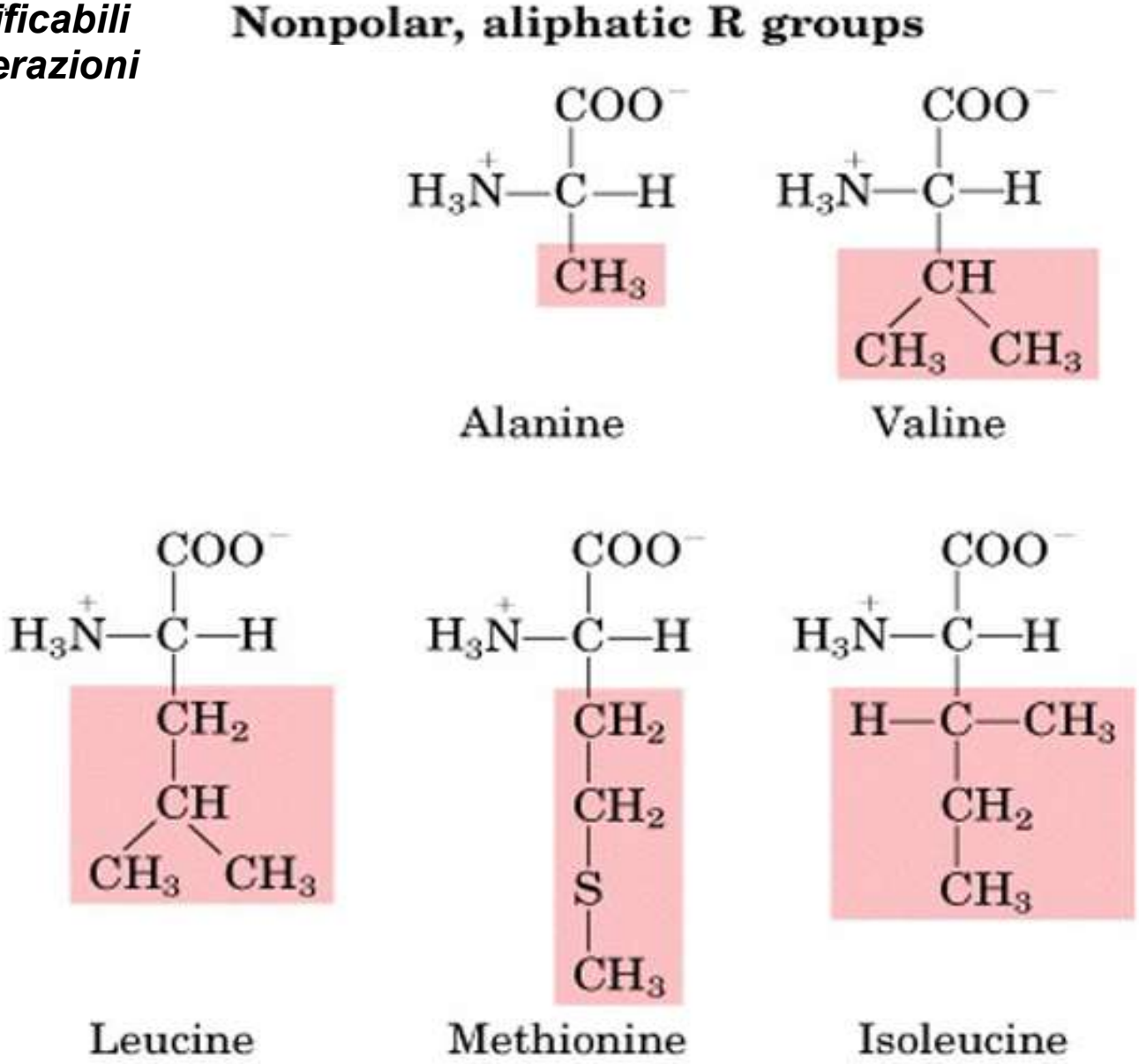
AMMINOACIDI



amminoacidi con catene laterali alifatiche

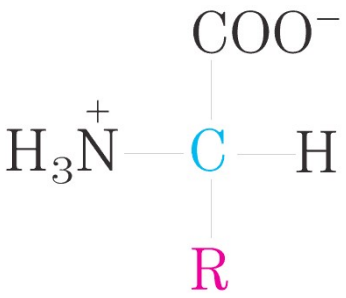
catene laterali chimicamente inerti e quindi non modificabili partecipano solo ad interazioni idrofobiche e vdW

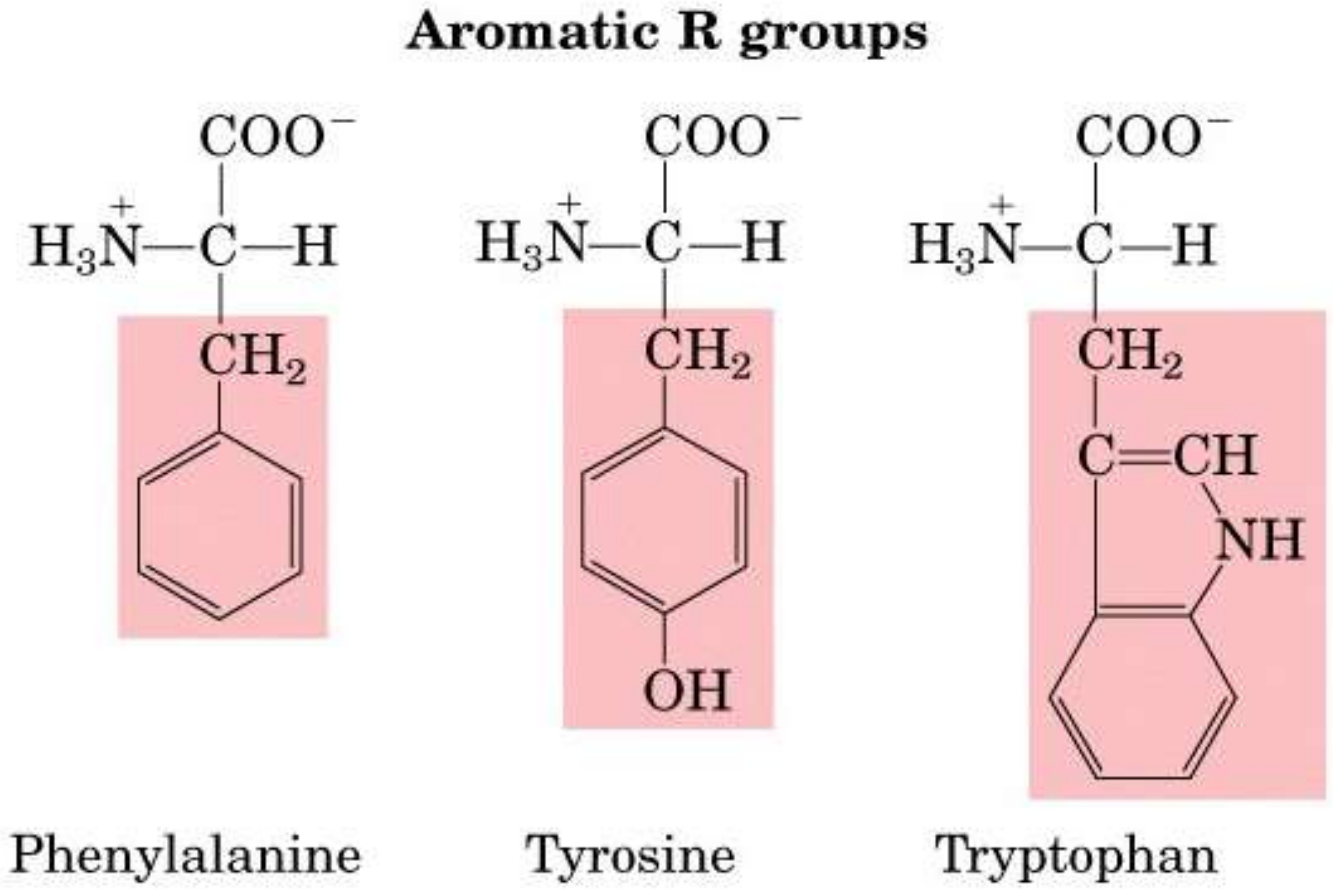


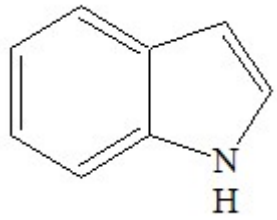


amminoacidi con catene laterali aromatiche

- ***partecipano ad interazioni idrofobiche.***
- ***Tyr e Trp partecipano a legami-H***



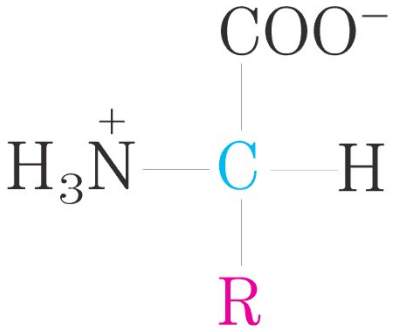


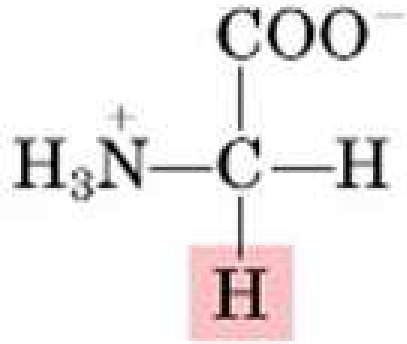


INDOLO

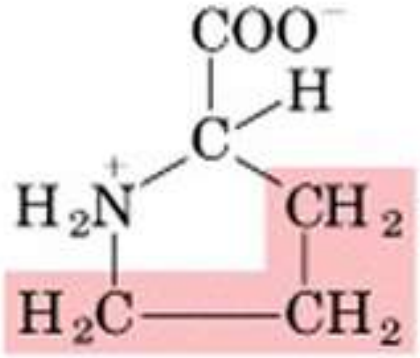
amminoacidi con catene laterali polari neutre

- ***importanti caratteristiche strutturali (flessibilità/rigidità)***
- ***non reattive***



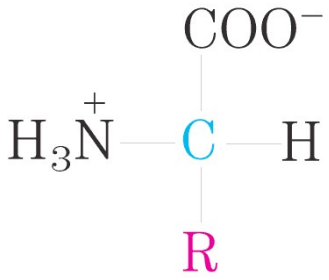


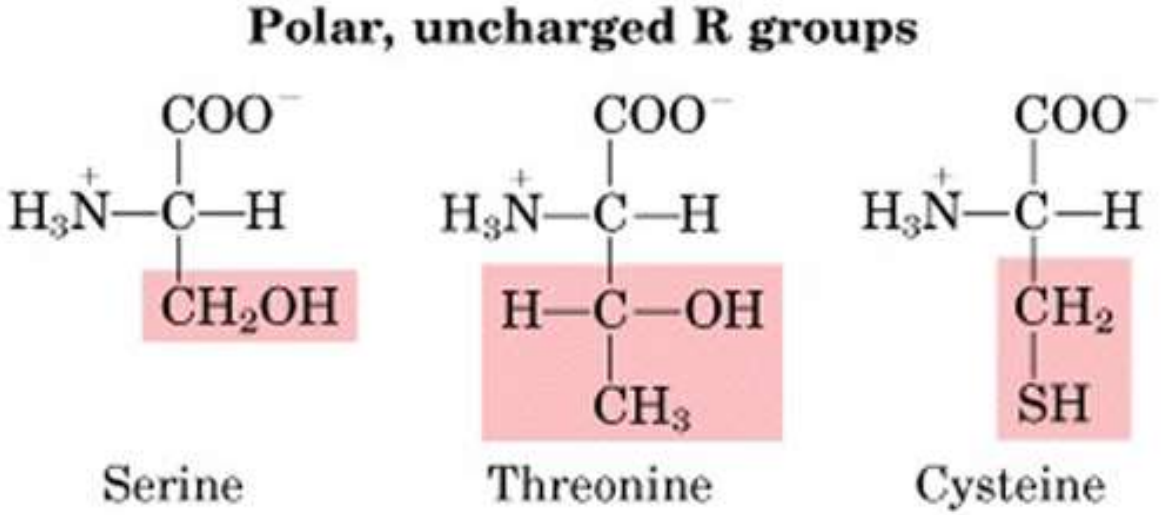
Glycine



Proline

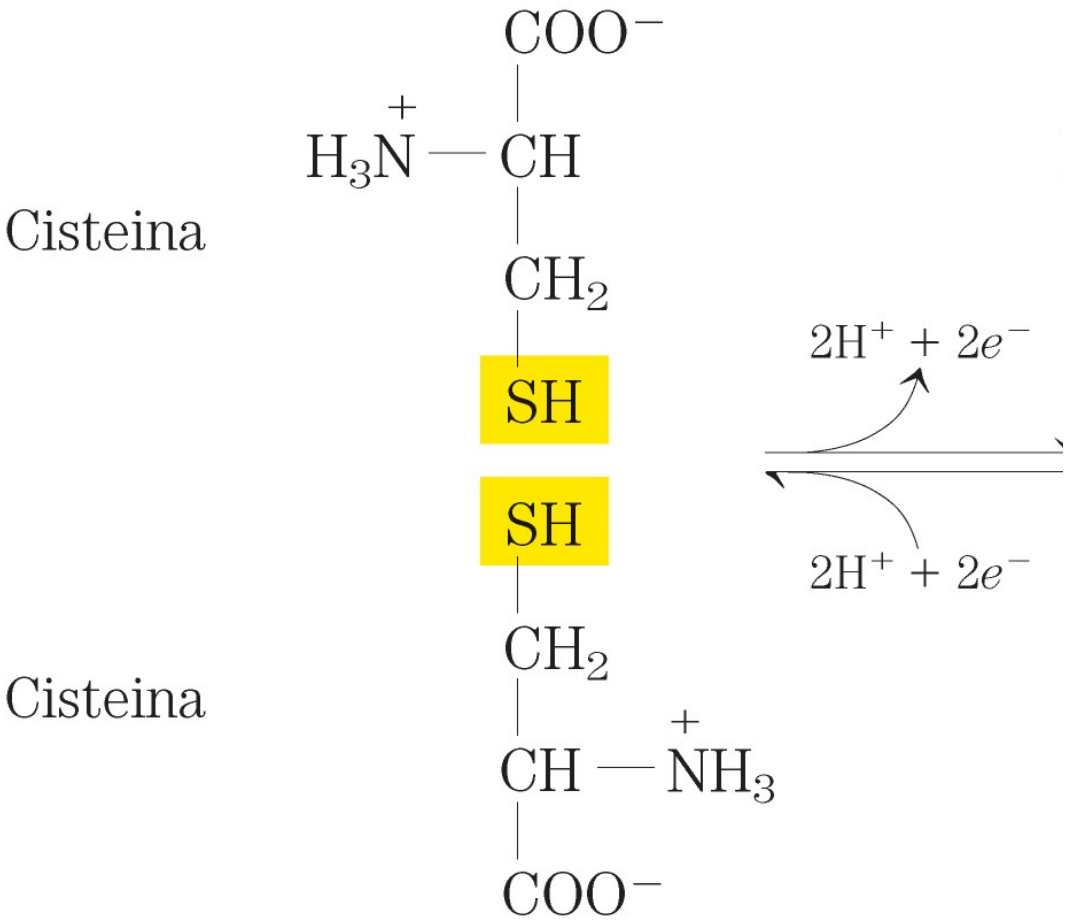
amminoacidi con catene laterali polari, non cariche (idrofiliche)



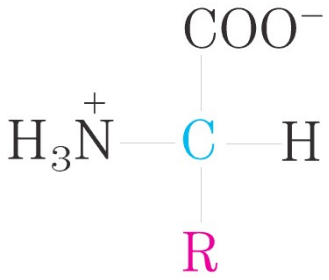


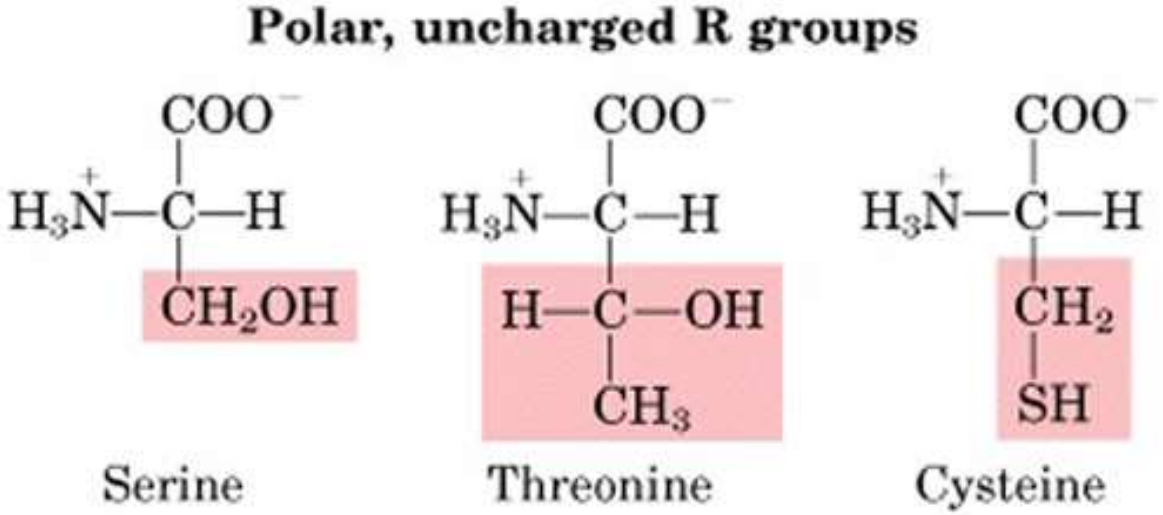
- *le catene laterali sono polari e idrofiliche*
- *partecipano alla formazione di legami-H*

- ***le catene laterali di Cys sono polari e partecipano alla formazione di legami covalenti (ponti disolfuro) strutturalmente importanti***

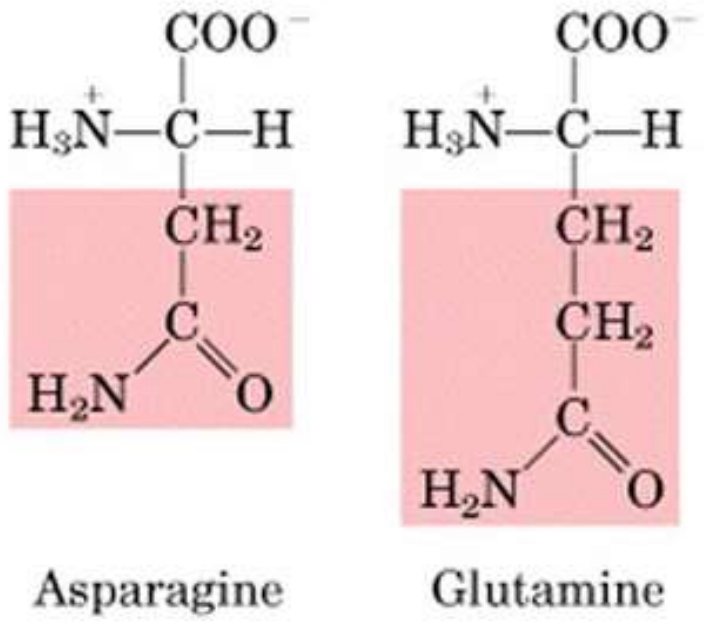


amminoacidi con catene laterali polari, non cariche (idrofiliche)



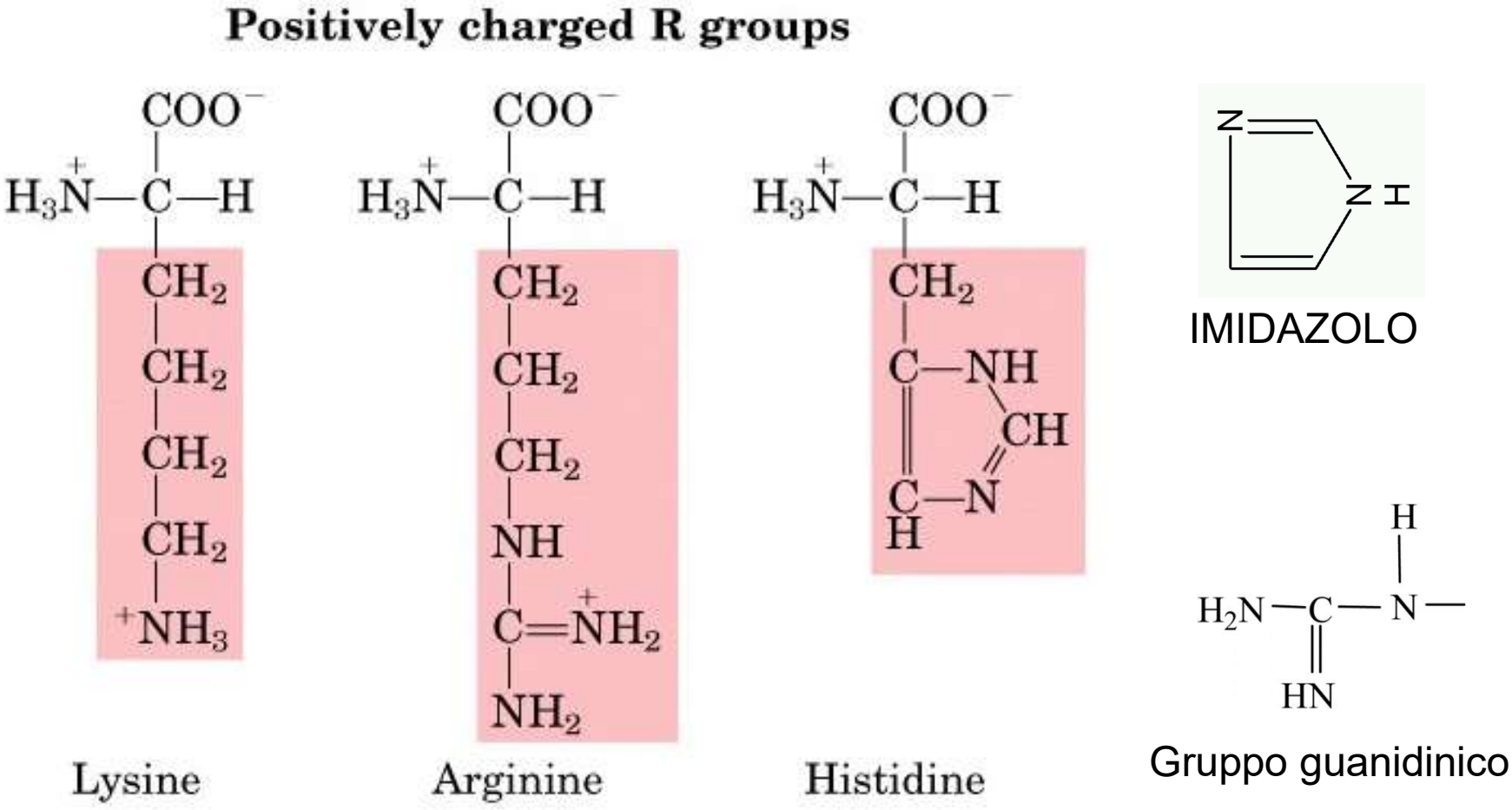


- *le catene laterali sono polari e idrofiliche*
- *partecipano alla formazione di legami-H*



amminoacidi con catene laterali basiche

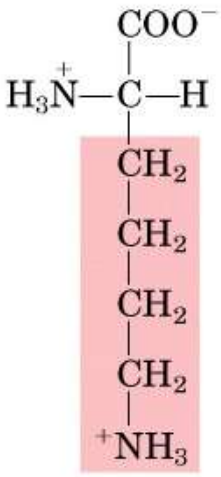
- ***catene laterali polari cariche positivamente (R,K, per H dipende dal pH)***
- ***partecipano ad interazioni elettrostatiche***



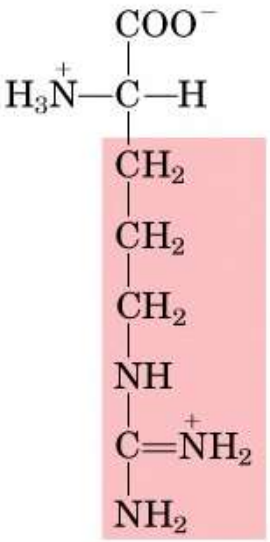
IMIDAZOLO

Gruppo guanidinico

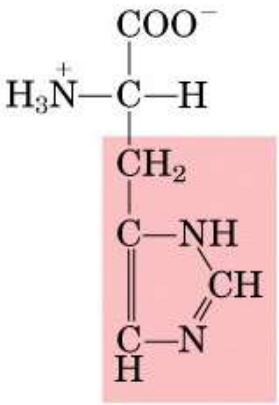
Positively charged R groups



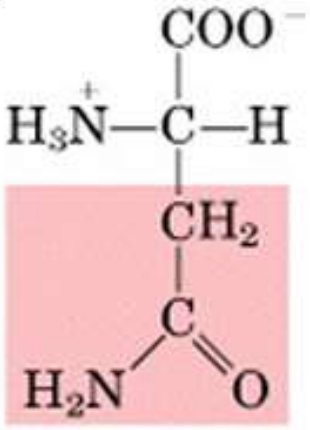
Lysine



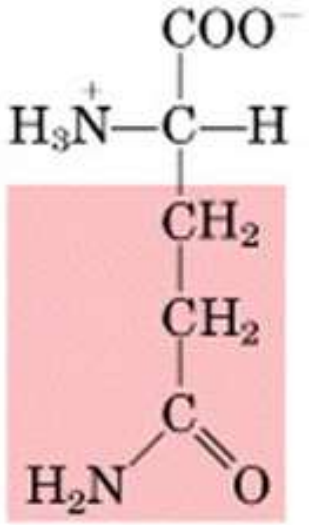
Arginine



Histidine



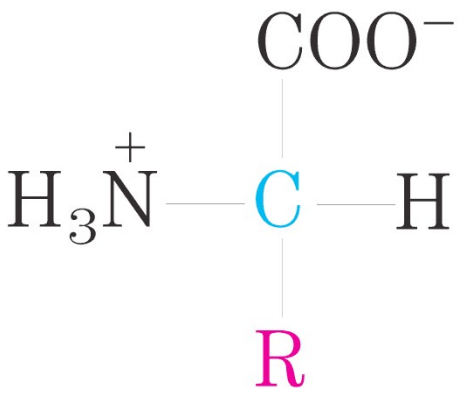
Asparagine

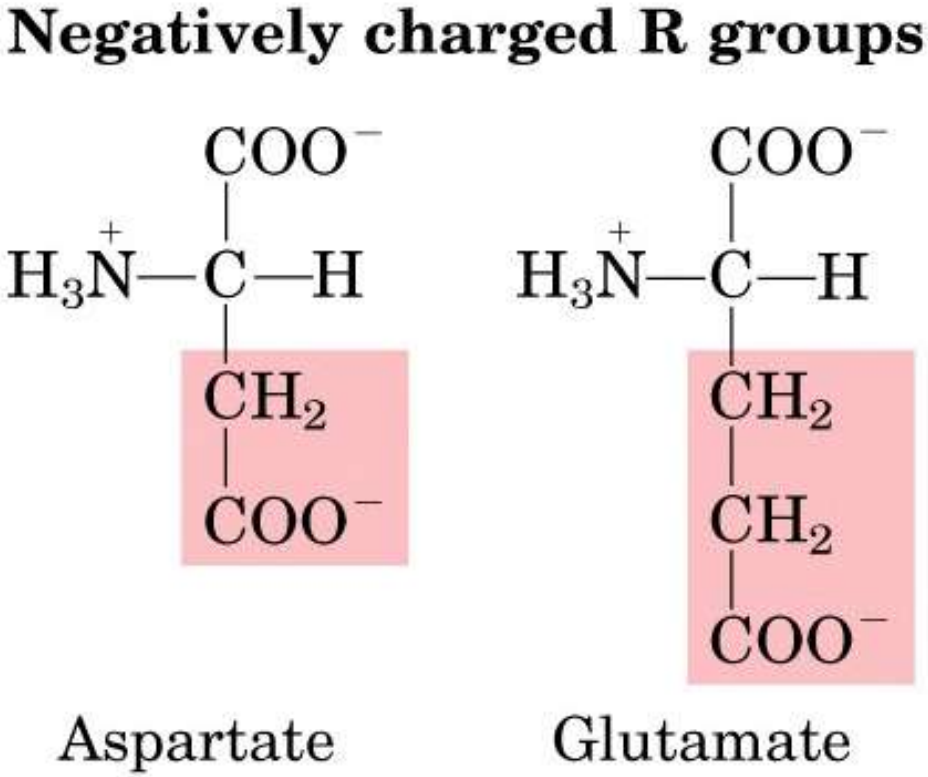


Glutamine

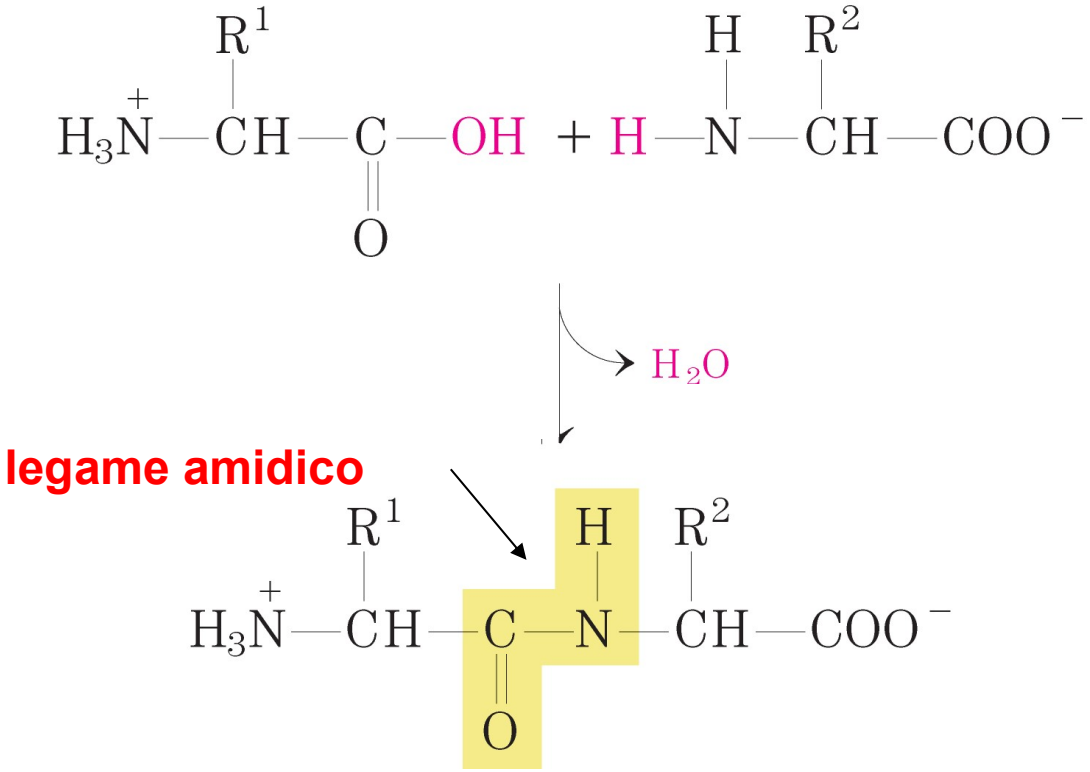
amminoacidi con catene laterali acidiche

- ***catene laterali polari cariche negativamente (anioniche)***
- ***partecipano ad interazioni elettrostatiche***



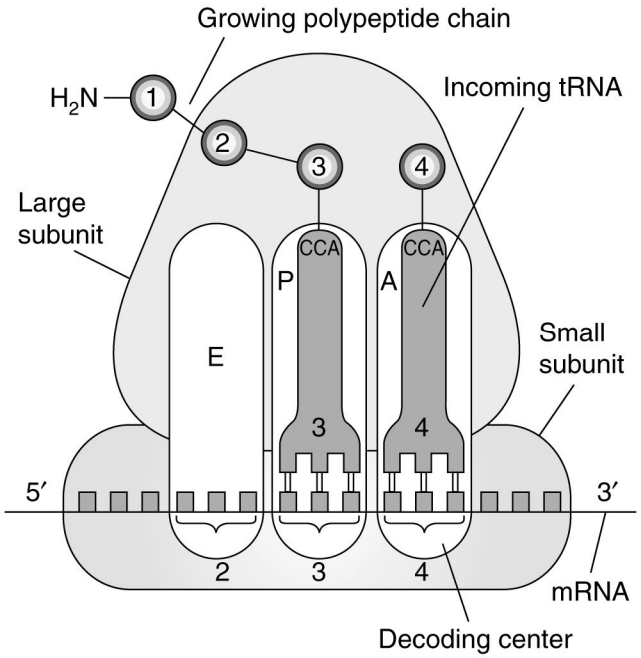


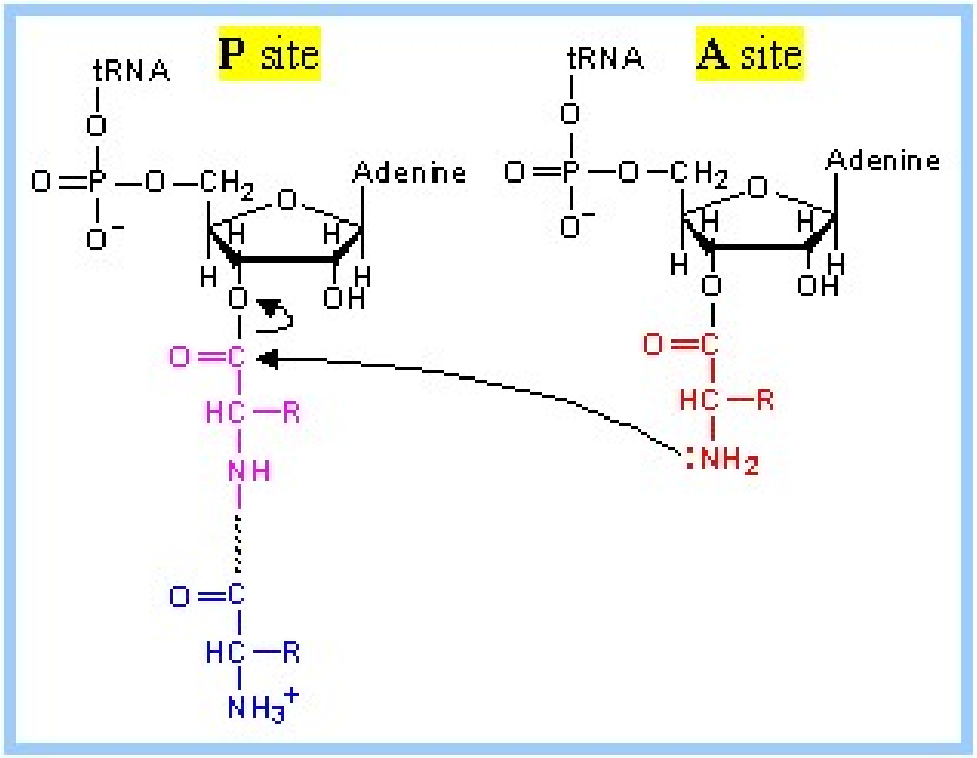
Il LEGAME PEPTIDICO

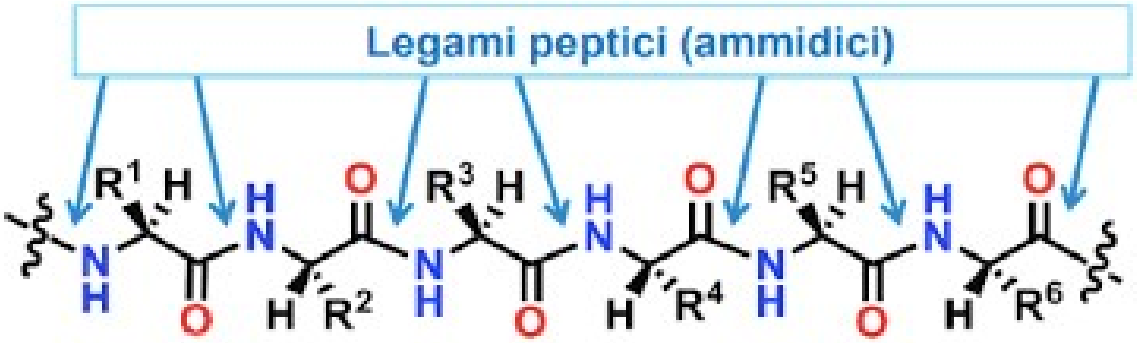


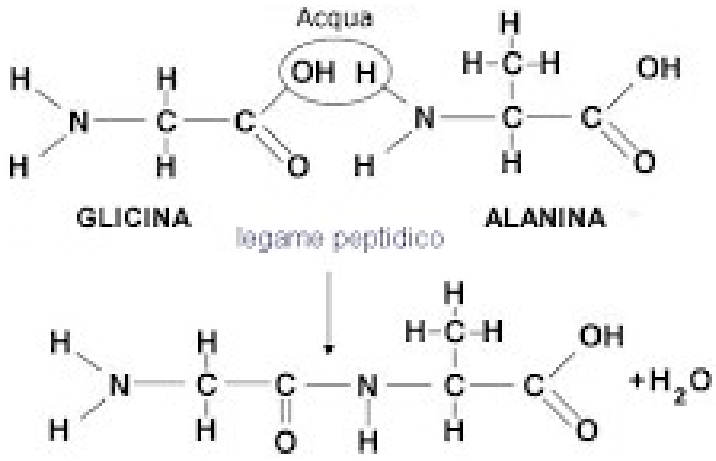
Per convenzione il legame peptidico viene scritto con l'aa che ha il gruppo amminico libero a sinistra e l'aa che ha il gruppo COOH libero a destra.

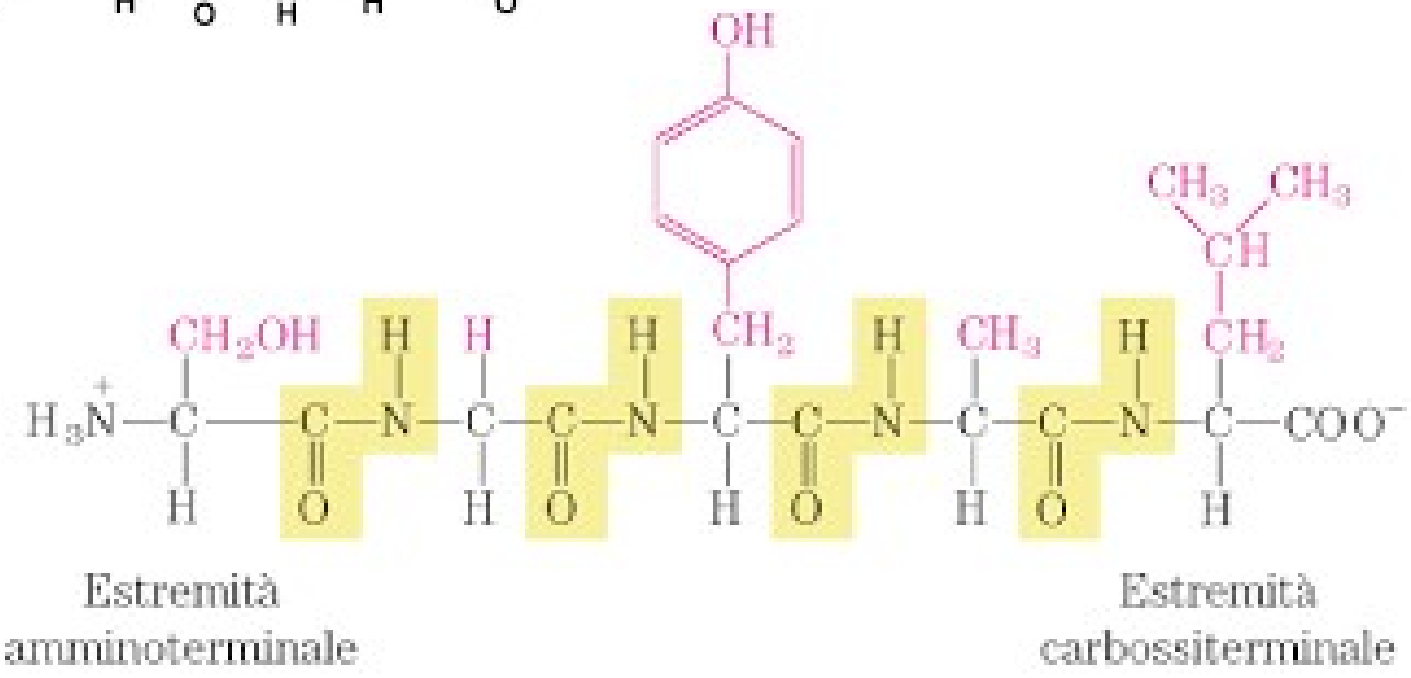
I due aa vengono definiti rispettivamente *amminoacido N-terminale* e *amminoacido C-terminale*


Growing polypeptide chain
H_2N
1
2
3
4
Incoming tRNA
Large subunit
CCA
CCA
P
A
E
Small subunit
3
4
5′
3′
2
3
4
mRNA
Decoding center


P site
A site
tRNA
tRNA
Adenine
Adenine
O=C
HC—R
NH
NH2
NH3+

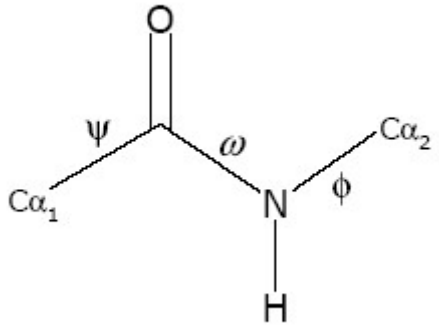

Legami peptici (ammidici)



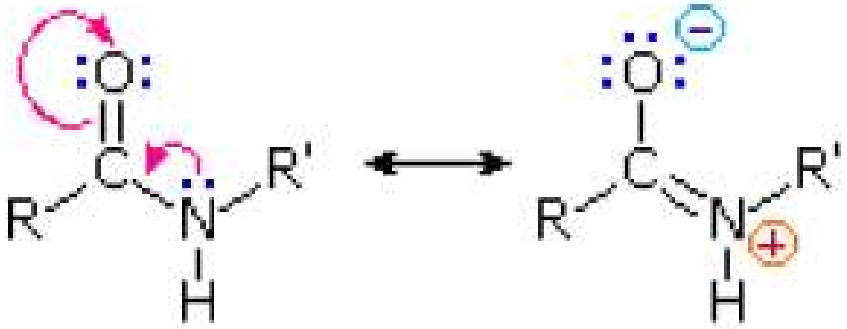


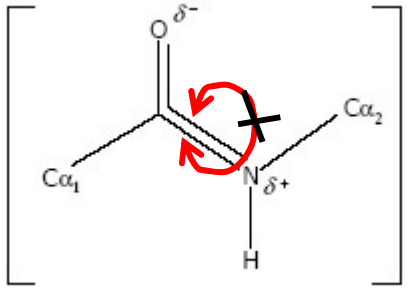
Ser Gly Tyr Ala Leu

A causa della distribuzione degli elettroni il legame peptidico ha specifiche proprietà geometriche:

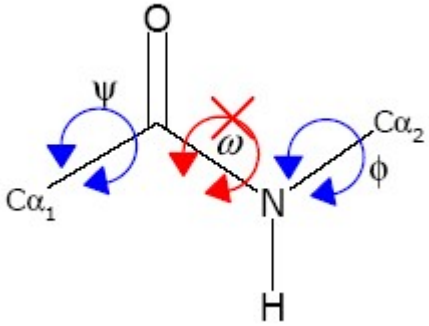


Stabilizzazione per risonanza





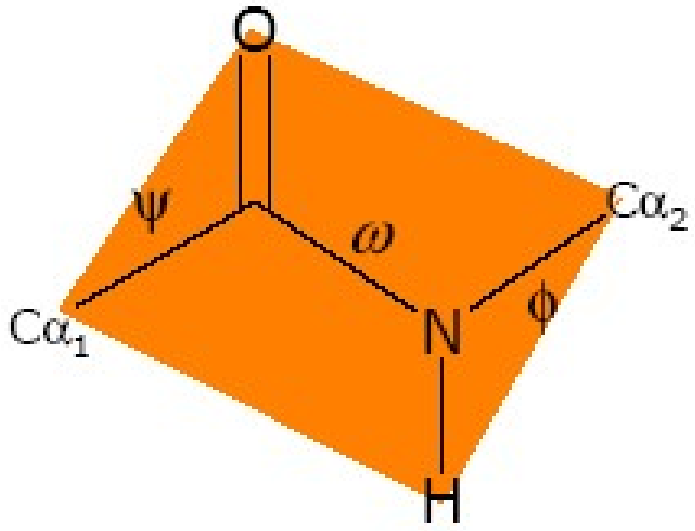
– Non vi è libera rotazione intorno al legame C-N



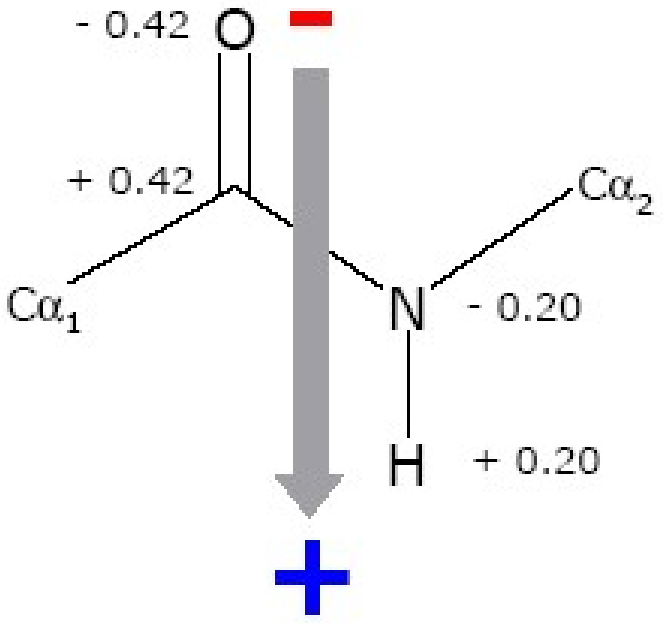
– Vi è libera rotazione solo intorno ai legami ϕ e ψ.

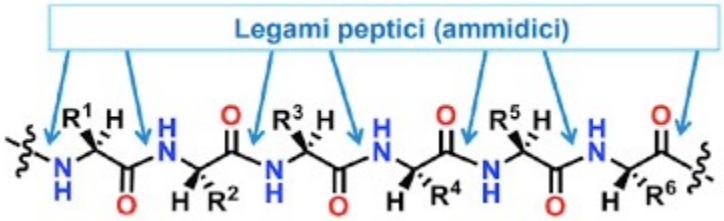
A causa della distribuzione degli elettroni il legame peptidico ha specifiche proprietà geometriche:

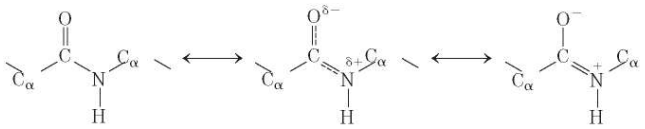
– È planare.



– È dipolare.

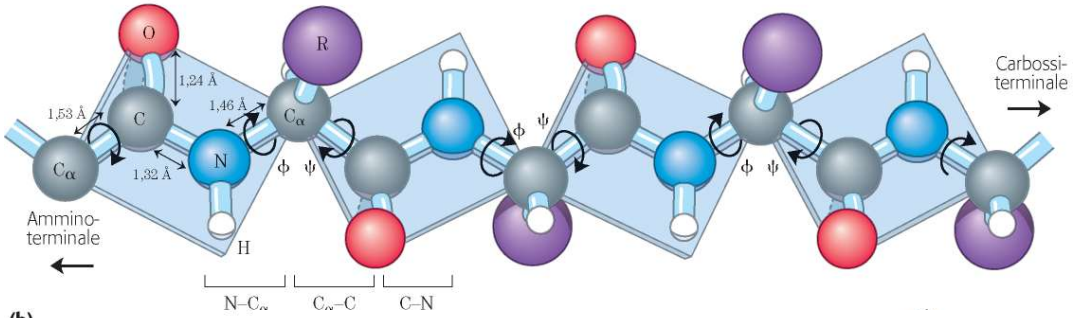






L'ossigeno carbossilico ha una parziale carica negativa e l'azoto ammidico una parziale carica positiva, per cui si genera un piccolo dipolo elettrico. Praticamente tutti i legami delle proteine hanno questa configurazione trans; un'eccezione è mostrata nella Figura 4.8b.

(a)



(b)

Dipeptide: peptide formato dall'unione di due aa;
tripeptide: peptide formato dall'unione di tre aa; ...etc

In genere:

Oligopeptide (pochi aa) polipeptide (molti aa…)