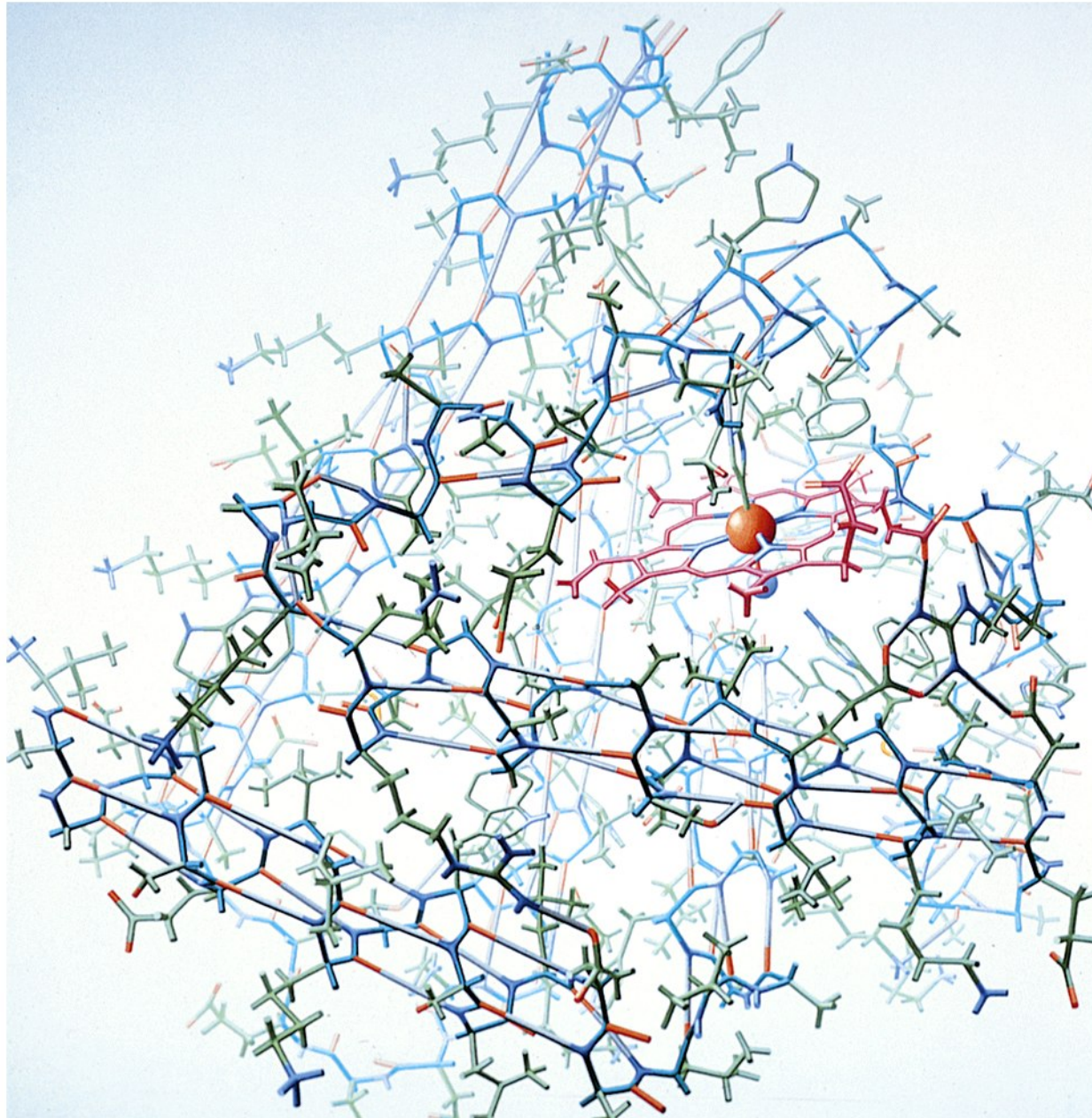
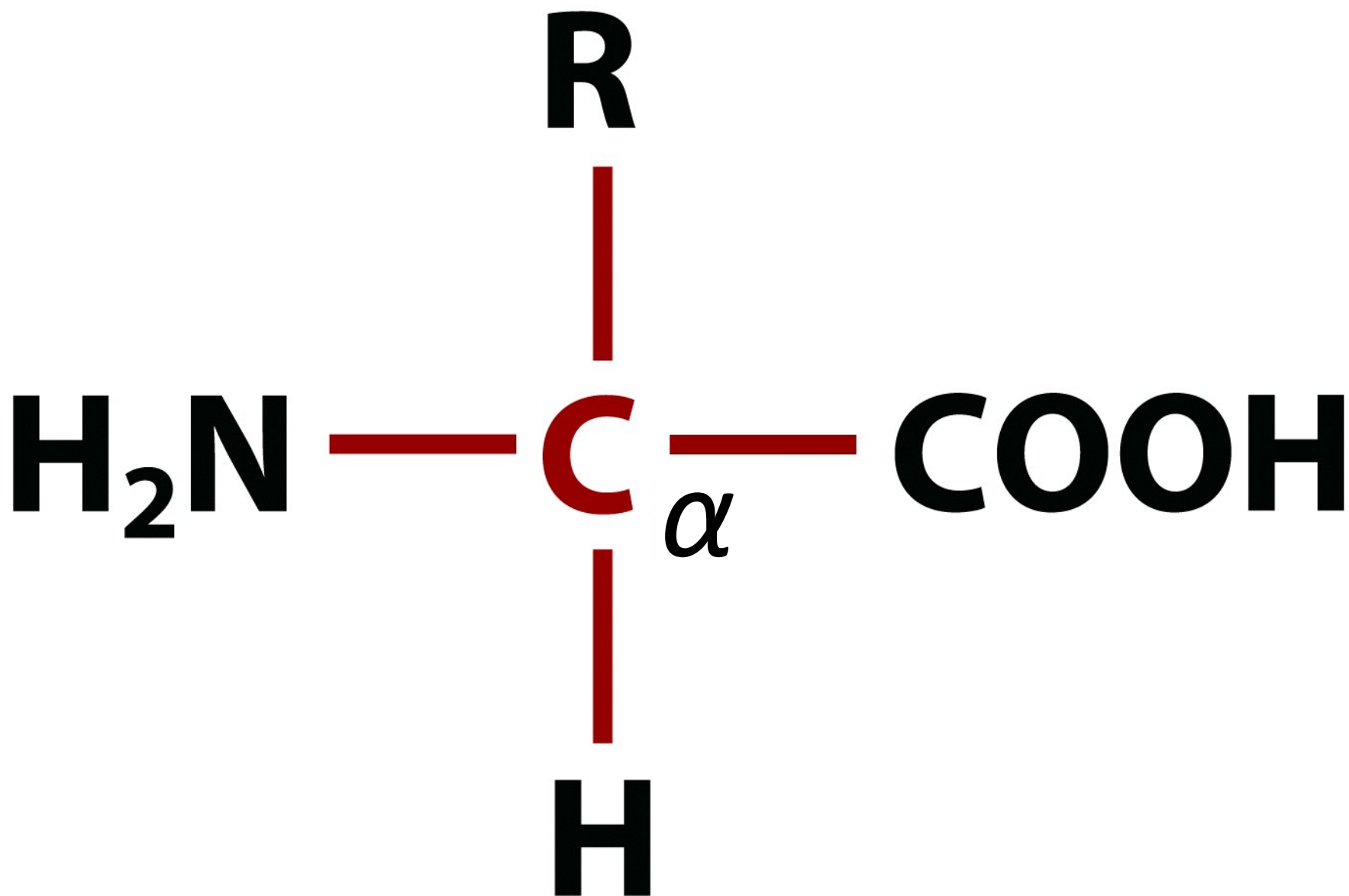


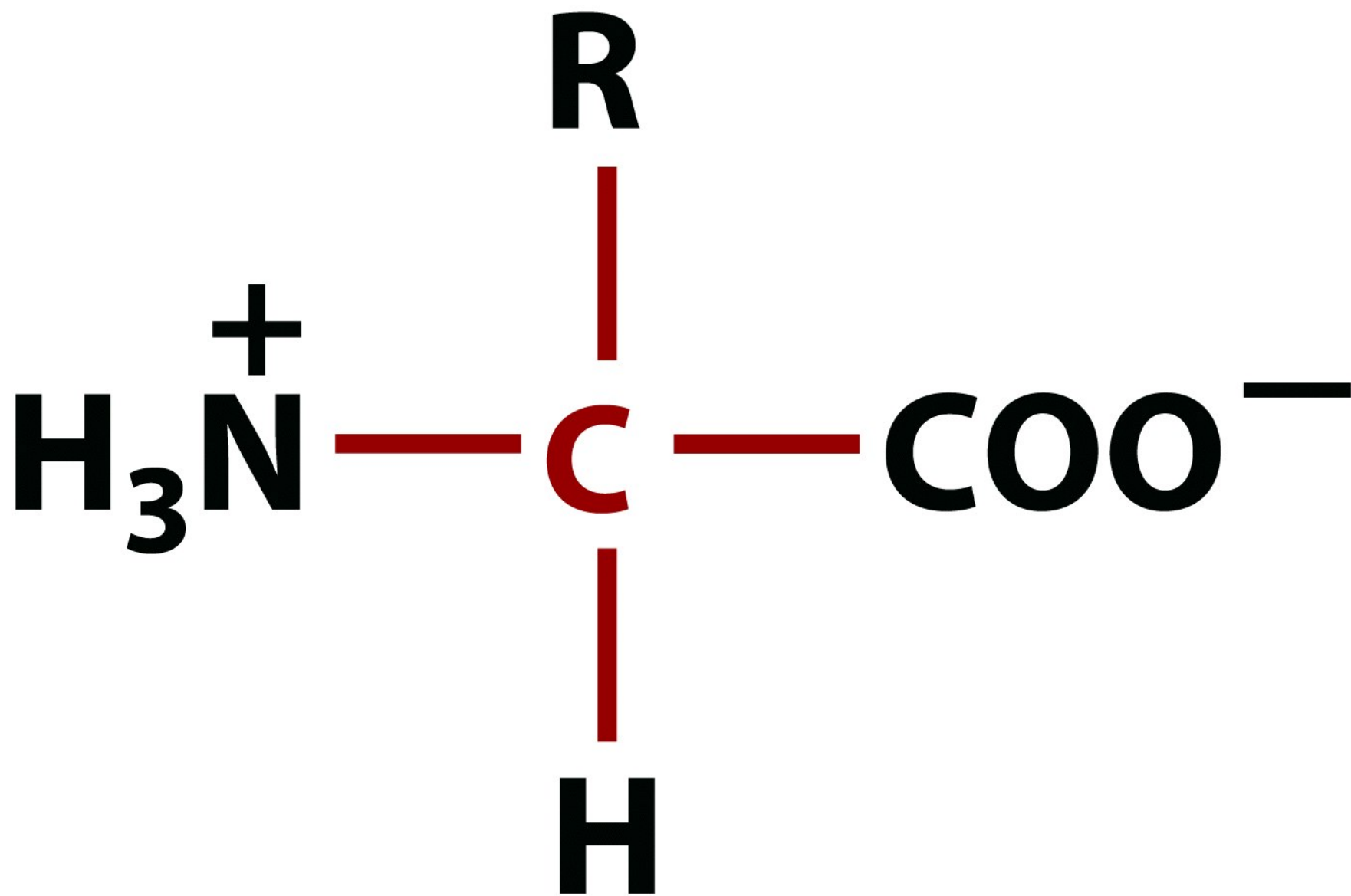
TEMA

- **Los aminoácidos como constituyentes de las proteínas.**
- **Estructura y propiedades de los aminoácidos.**
- **Aminoácidos no proteicos.**

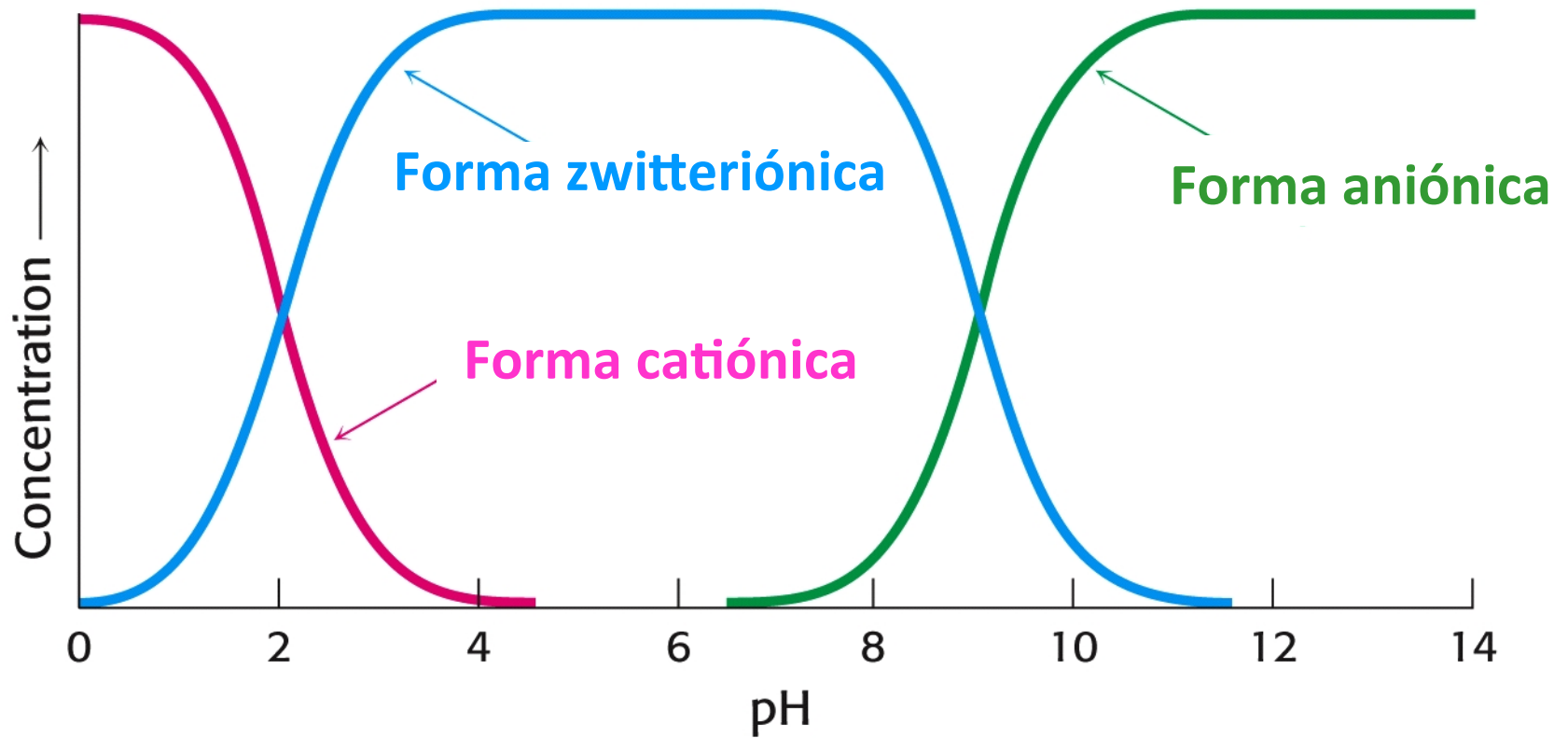
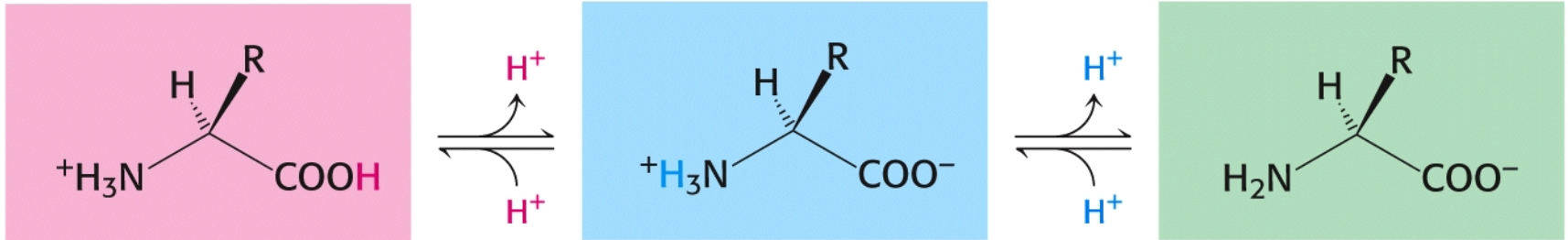


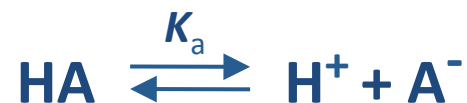
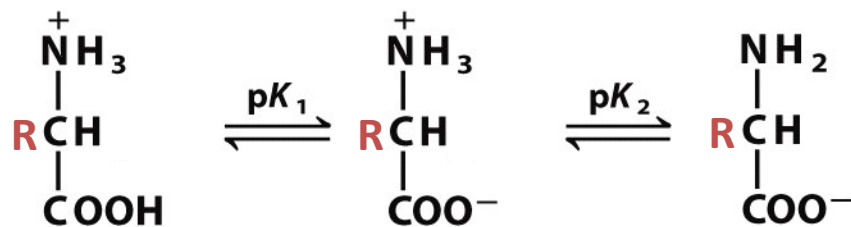
Dibujo
de la
Estructura 3D
de la
Mioglobina





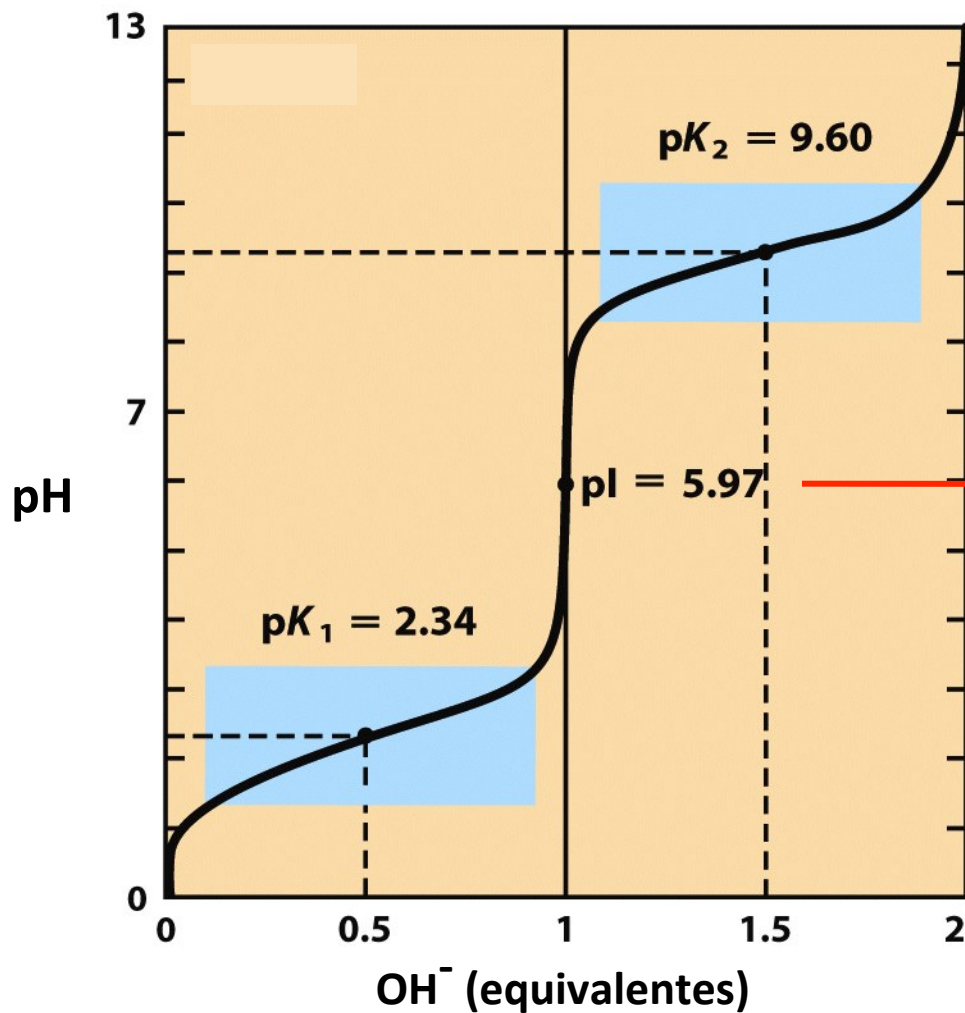
zwitterión





Ec. de Henderson-Hasselbalch

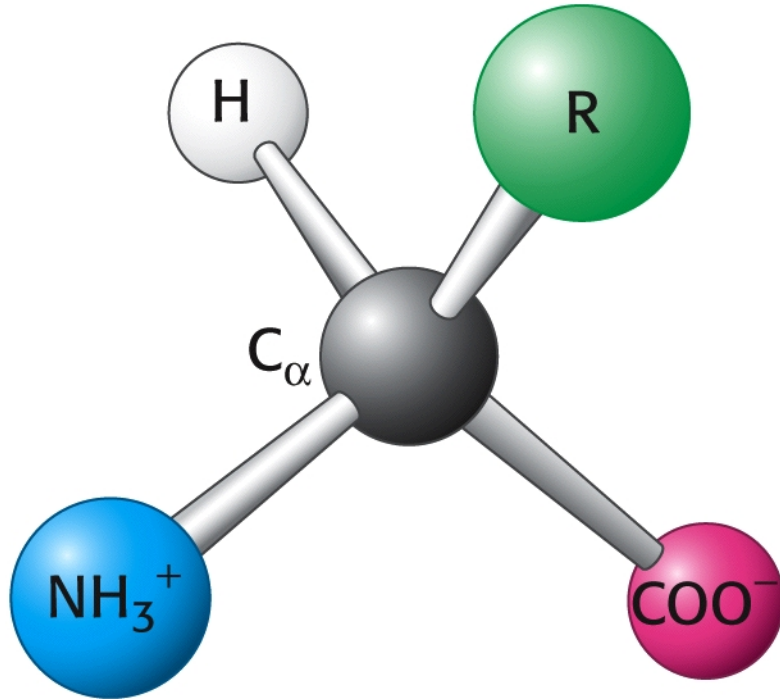
$$\text{pH} = \text{p}K_a + \log ([\text{A}^-]/[\text{HA}])$$



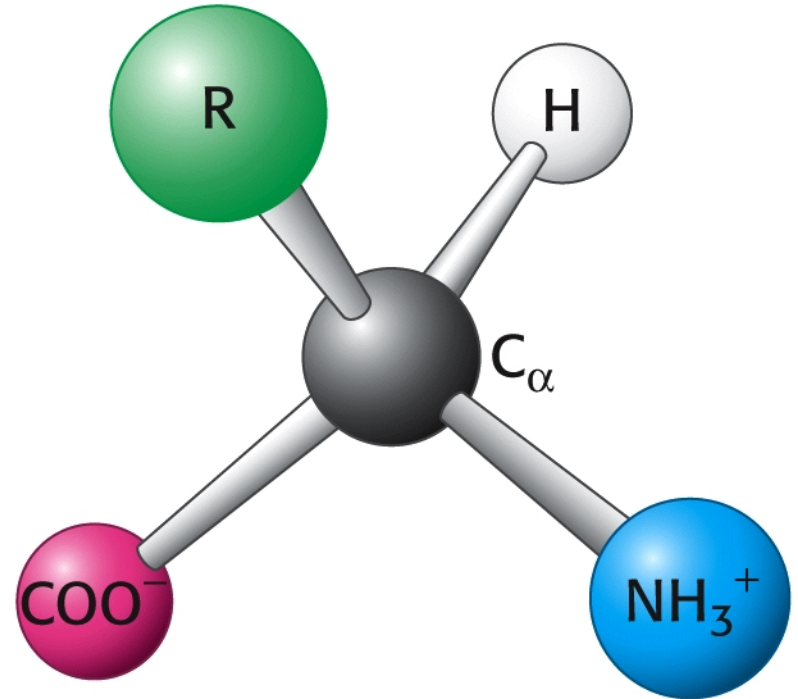
$$\text{pI} = (\text{p}K_1 + \text{p}K_2)/2$$

Punto Isoeléctrico

Esteroisomería en los α -aminoácidos

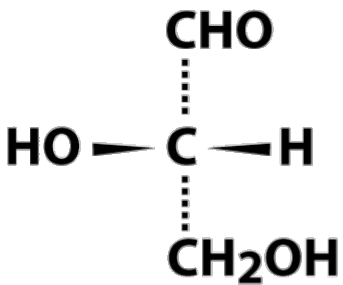


Isómero L

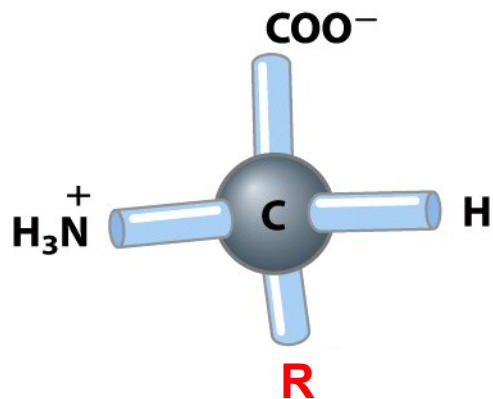


Isómero D

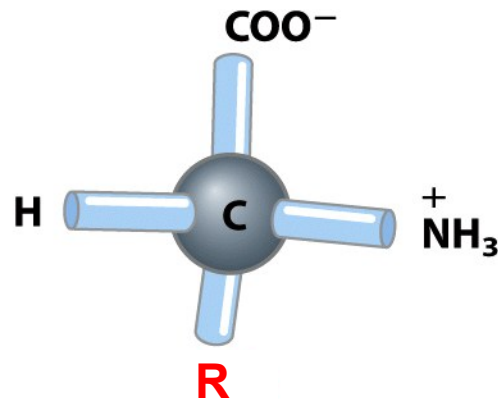
Espejo



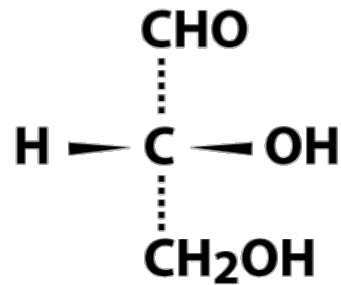
L-Gliceraldehido



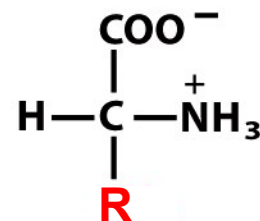
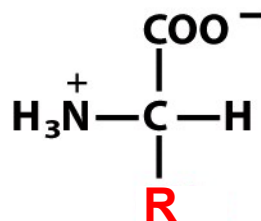
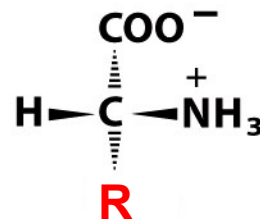
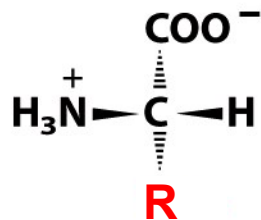
L-Aminoácido



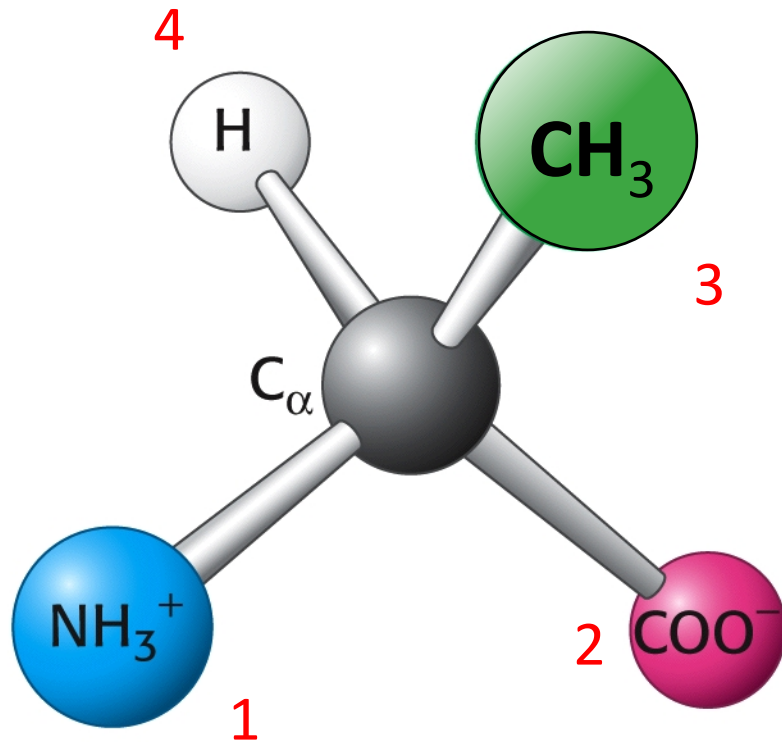
D-Aminoácido



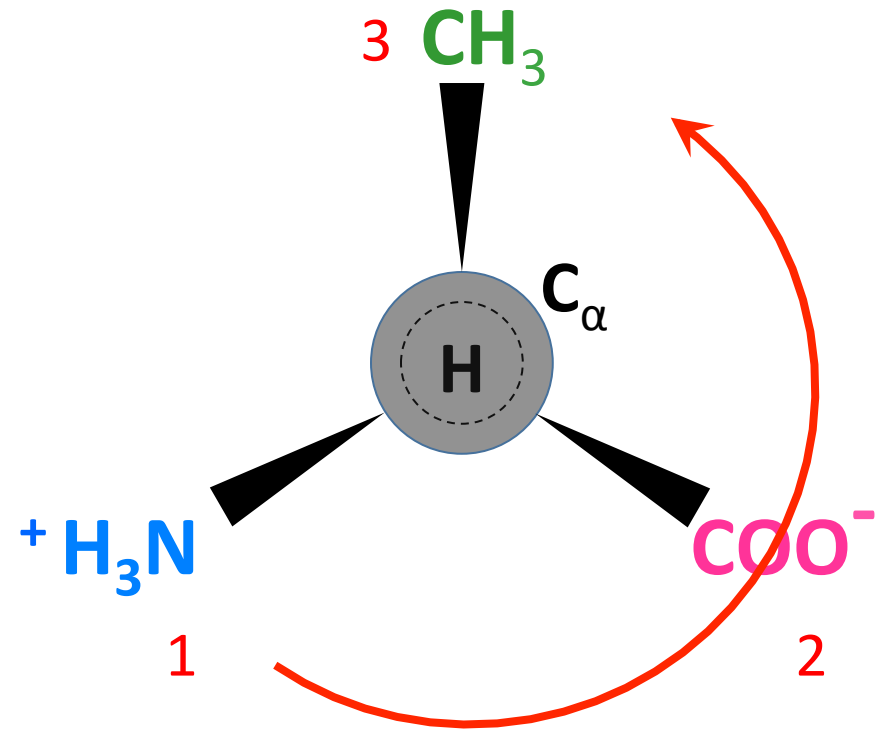
D-Gliceraldehido



Esteroisomería en los α -aminoácidos



L- alanina



S- alanina

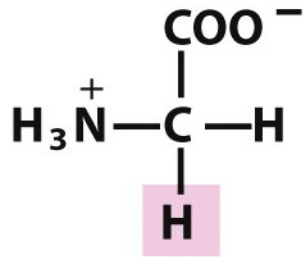


20 Aminoácidos proteicos

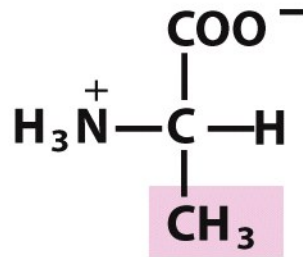
Aminoácido	Código 3 letras	Código 1 letra	Aminoácido	Código 3 letras	Código 1 letra
Alanina	Ala	A	Isoleucina	Ile	I
Arginina	Arg	R	Leucina	Leu	L
Asparagina	Asn	N	Lisina	Lys	K
Aspartato	Asp	D	Metionina	Met	M
Cisteína	Cys	C	Prolina	Pro	P
Fenilalanina	Phe	F	Serina	Ser	S
Glicocola	Gly	G	Tirosina	Tyr	Y
Glutamato	Glu	E	Treonina	Thr	T
Glutamina	Gln	Q	Triptófano	Trp	W
Histidina	His	H	Valina	Val	V

Aminoácidos proteicos

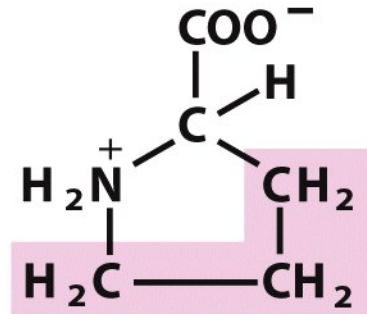
Cadena lateral R: Alifática, No Polar



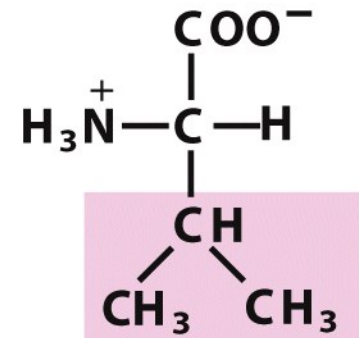
Glicocola
(Gly , **G**)



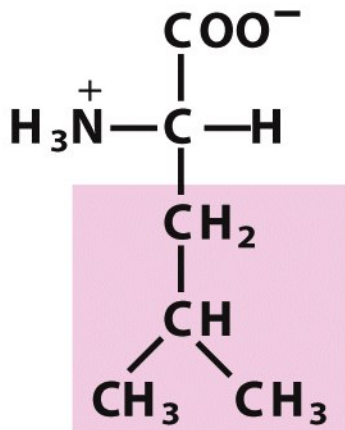
Alanina
(Ala , **A**)



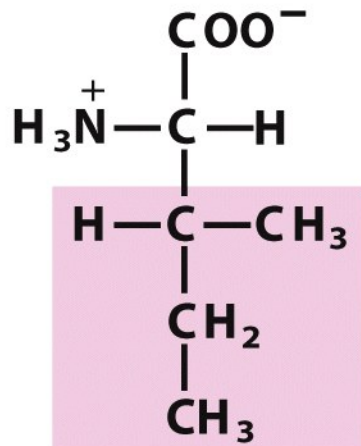
Prolina
(Pro , **P**)



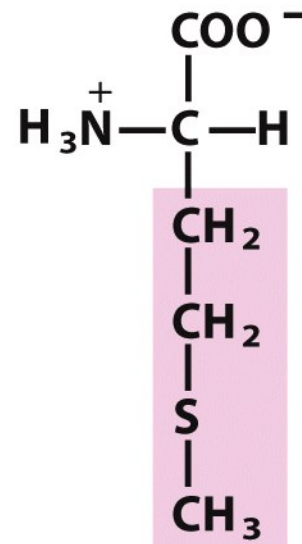
Valina
(Val , **V**)



Leucina
(Leu , **L**)



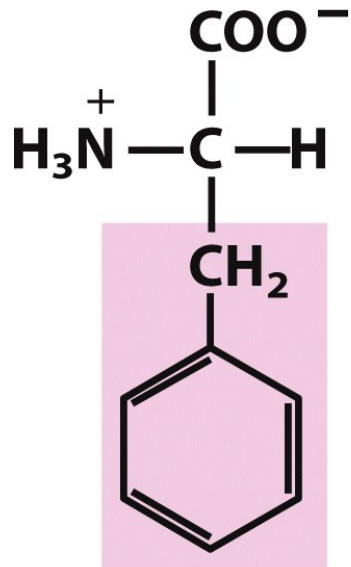
Isoleucina
(Ile , **I**)



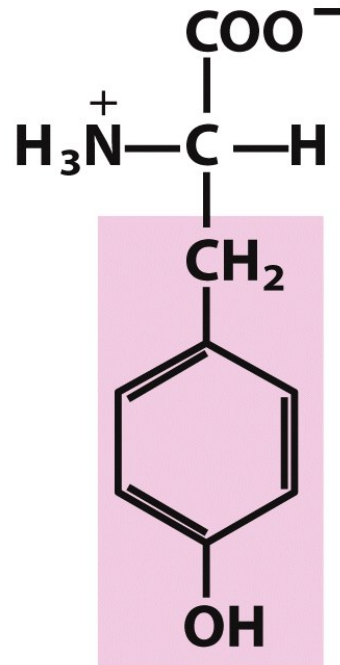
Metionina
(Met , **M**)

Aminoácidos proteicos

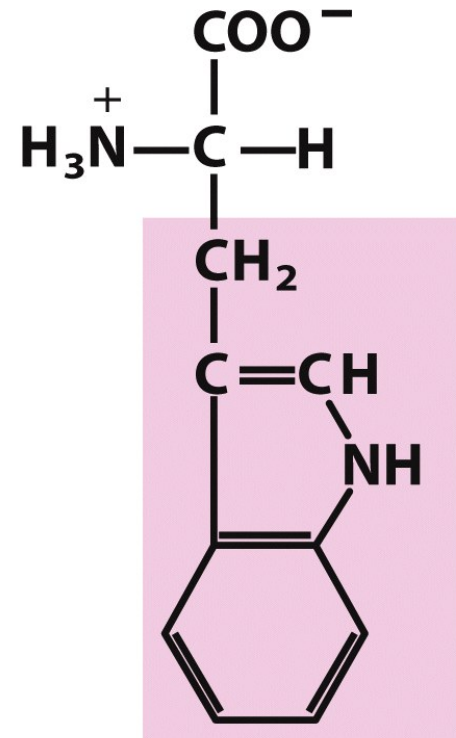
Cadena lateral R: Aromática



Fenilalanina
(Phe , **F**)

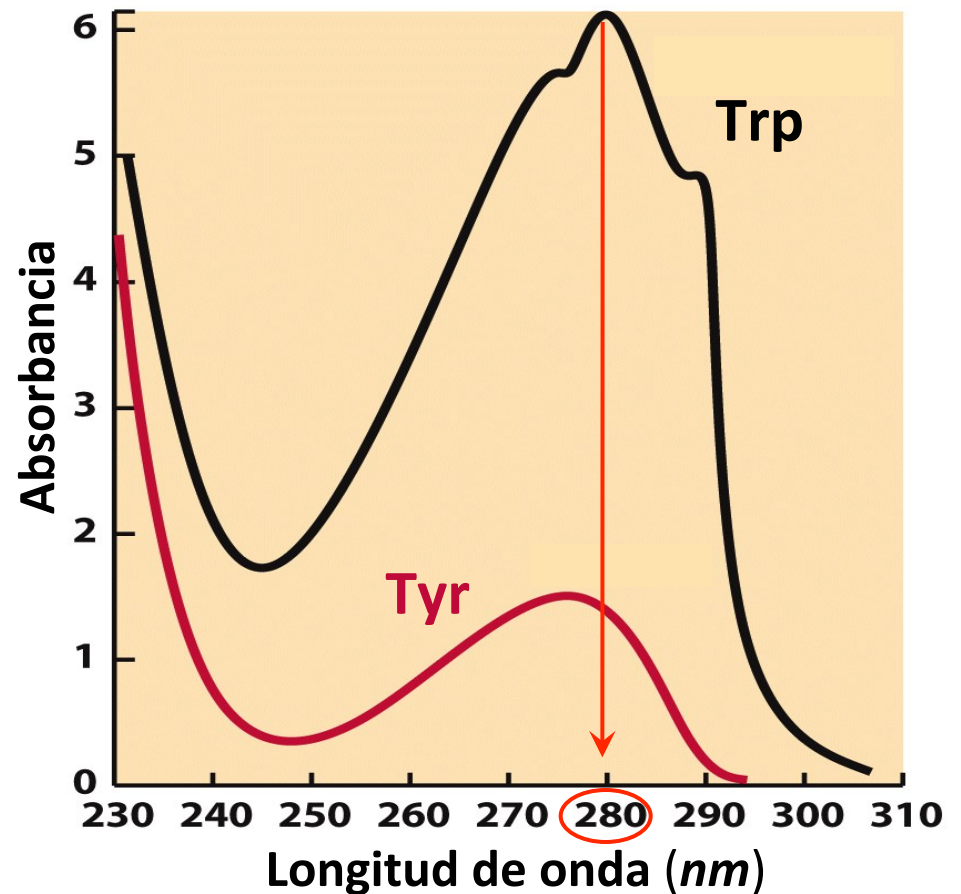
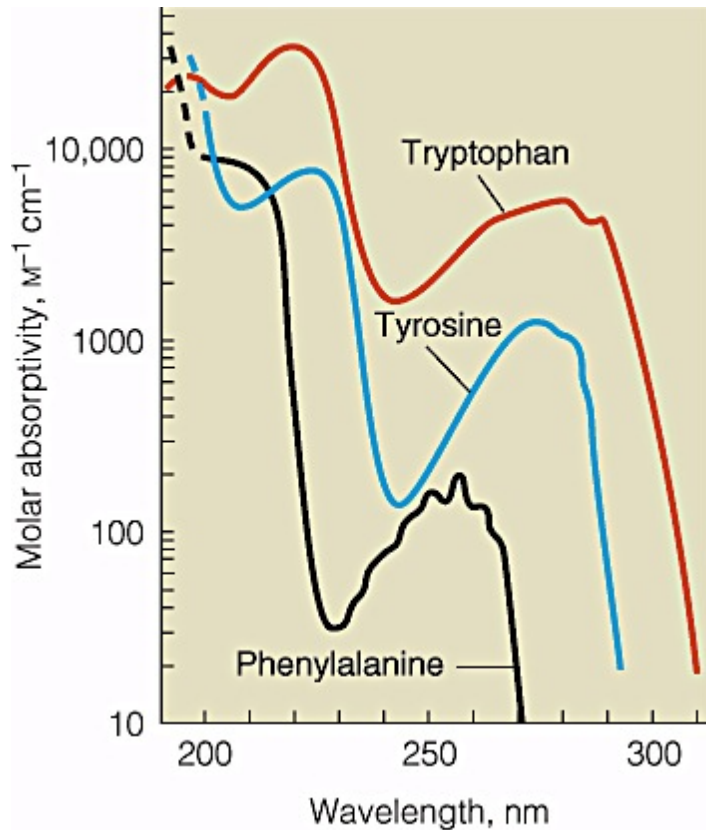
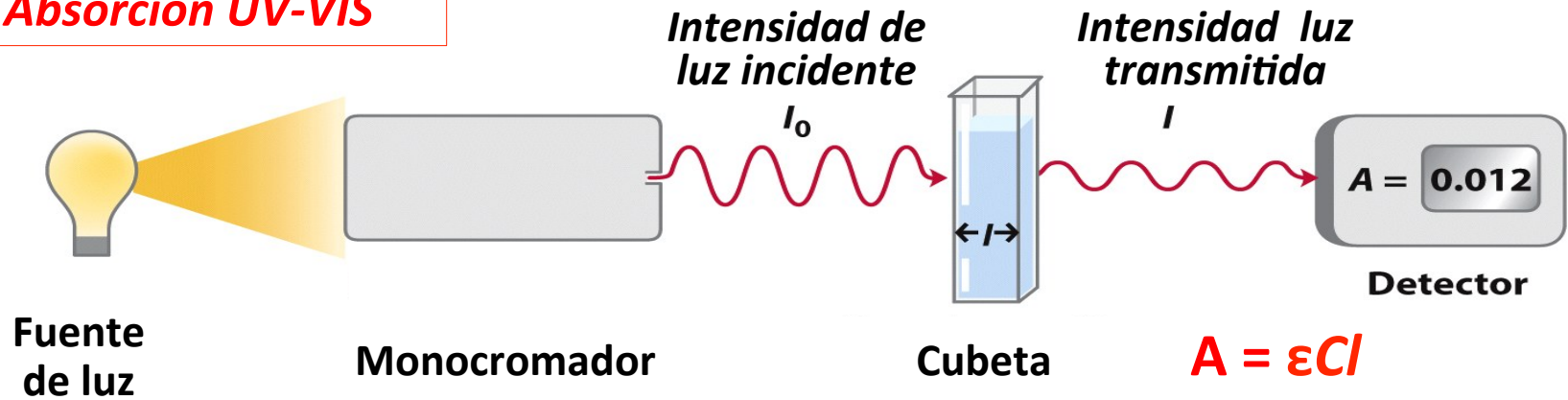


Tirosina
(Tyr , **Y**)



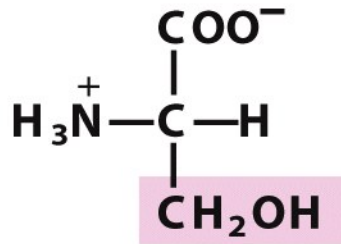
Triptófano
(Trp , **W**)

Espectrofotometría Absorción UV-VIS

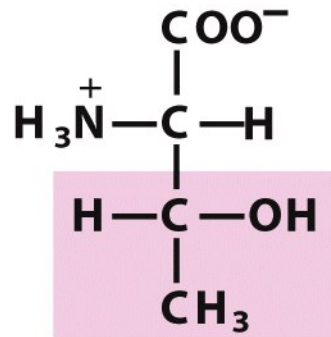


Aminoácidos proteicos

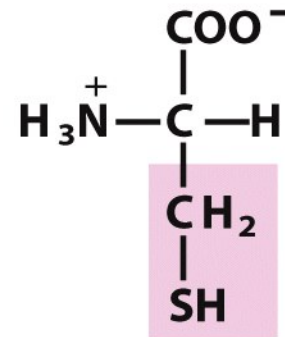
Cadena lateral R: Polar sin carga



Serina
(Ser, **S**)

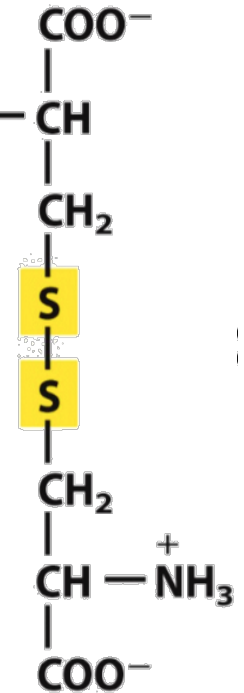
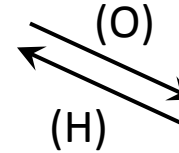


Treonina
(Thr, **T**)

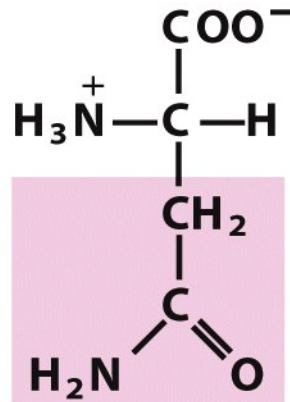


Cisteína
(Cys, **C**)

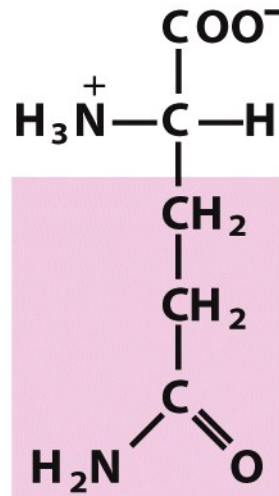
x2



Cistina
(Cys -S-S-Cys)



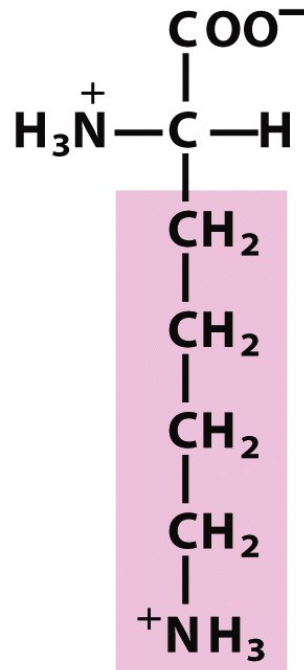
Asparagina
(Asn, **N**)



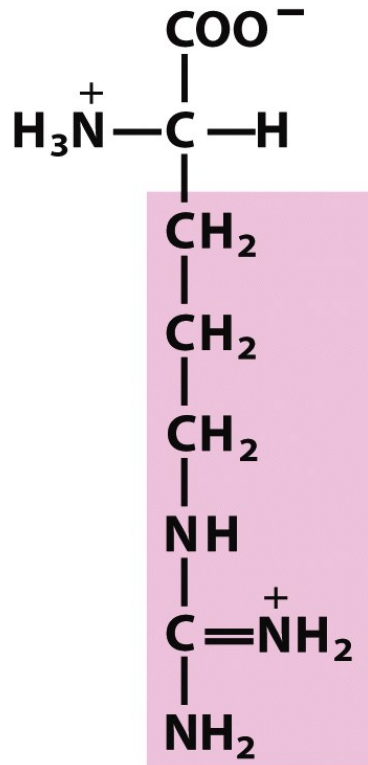
Glutamina
(Gln, **Q**)

Aminoácidos proteicos

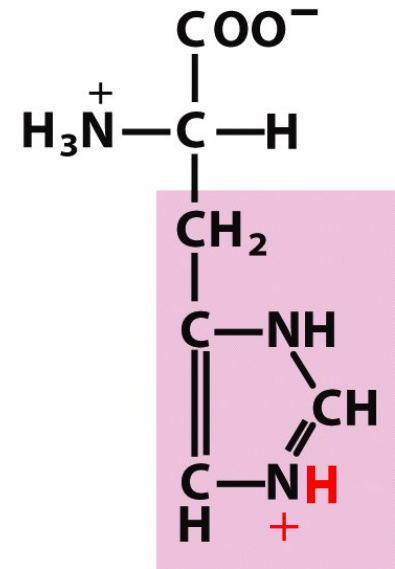
Cadena lateral R: Polar con carga positiva



Lisina
(Lys , **K**)



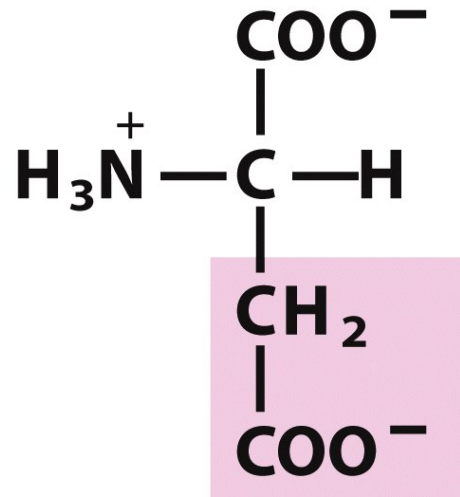
Arginina
(Arg , **R**)



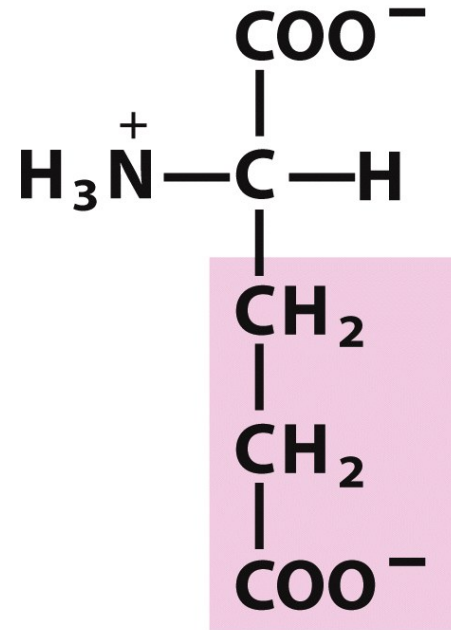
Histidina
(His , **H**)

Aminoácidos proteicos

Cadena lateral R: Polar con carga negativa



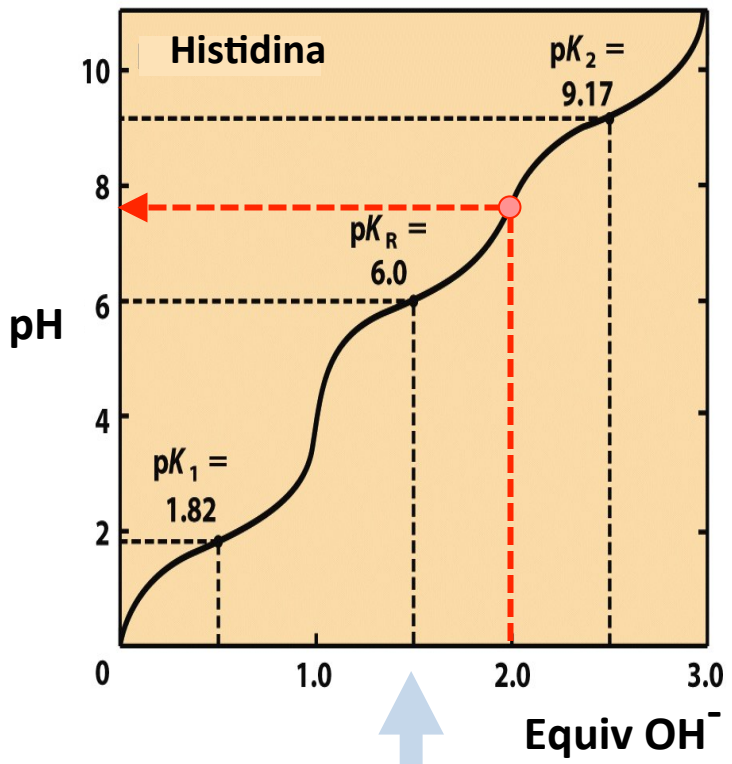
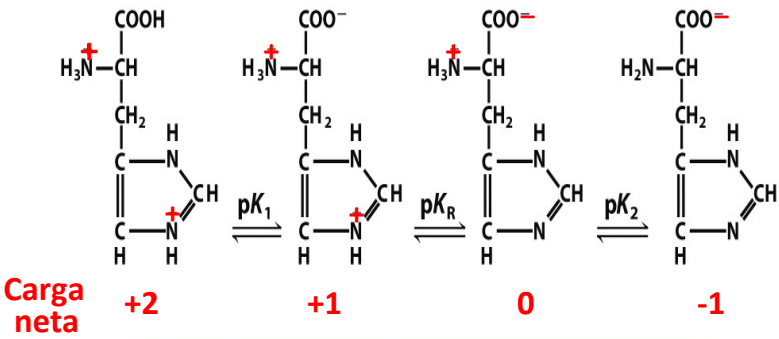
Aspartato
(Asp , **D**)



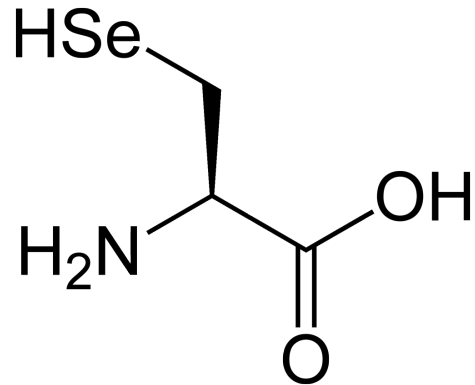
Glutamato
(Glu , **E**)

PROPIEDADES DE LOS AMINOÁCIDOS PROTEICOS

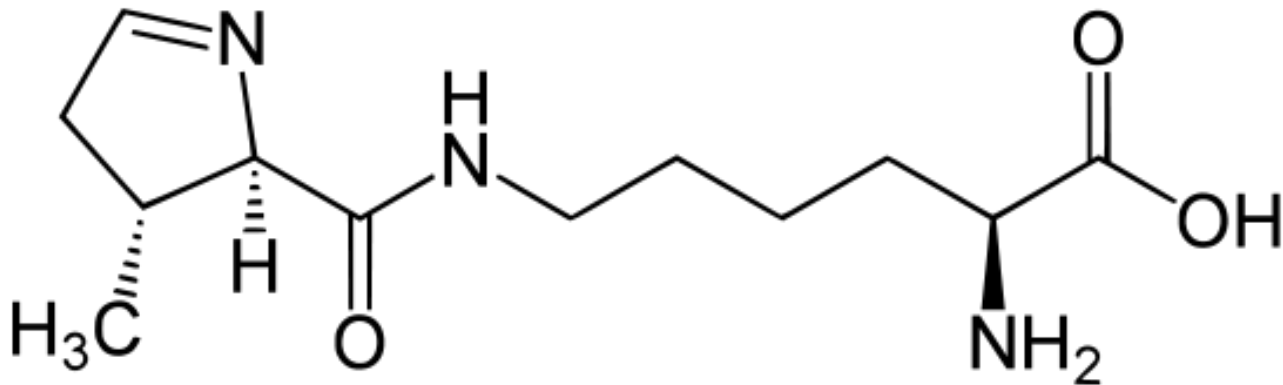
Cadena R	aa	M _r	pK ₁	pK ₂	pK _R	pl	%
ALIFÁTICA NO POLAR	G	75	2,34	9,60		5,97	7,53
	A	89	2,34	9,69		6,01	9,04
	P	115	1,99	10,96		6,48	4,62
	V	117	2,32	9,62		5,97	6,93
	L	131	2,36	9,60		5,98	7,53
	I	131	2,36	9,68		6,02	4,62
	M	149	2,28	9,21		5,74	1,71
AROMÁTICA	F	165	1,83	9,13		5,48	3,51
	Y	181	2,20	9,11	10,07	5,66	3,51
	W	204	2,38	9,39		5,89	1,10
POLAR SIN CARGA	S	105	2,21	9,15		5,68	7,13
	T	119	2,11	9,62		5,87	6,02
	C	121	1,96	10,28	8,18	5,07	2,81
	N	132	2,02	8,80		5,41	4,42
	Q	146	2,17	9,13		5,65	3,92
POLAR CON CARGA +	K	146	2,18	8,95	10,53	9,74	7,03
	H	155	1,82	9,17	6,00	7,59	2,11
	R	174	2,17	9,04	12,48	10,76	4,72
POLAR CON CARGA -	D	133	1,88	9,60	3,65	2,77	5,52
	E	147	2,19	9,67	4,25	3,22	6,22



Los aminoácidos 21 y 22



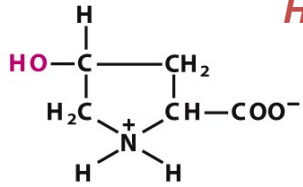
Selenocisteína
(Sec)



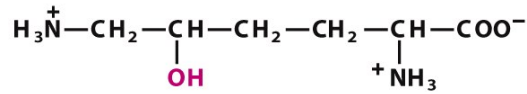
Pirrolisina
(Pyl)

AMINOÁCIDOS PROTEICOS MODIFICADOS

HIDROXILACIÓN

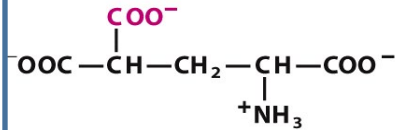


4-hidroxiprolina



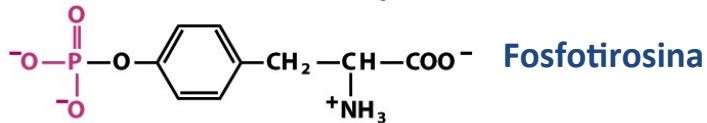
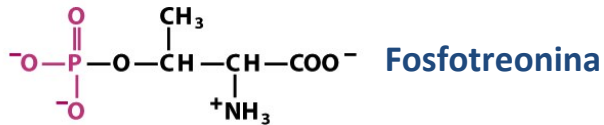
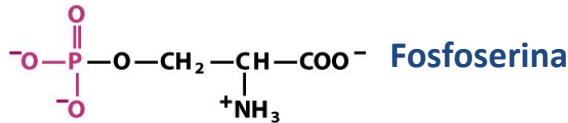
5-hidroxilisina

CARBOXILACIÓN

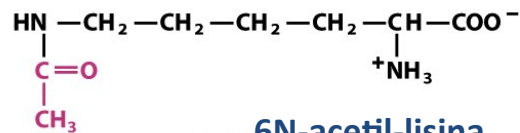


γ -carboxiglutamato

FOSFORILACIÓN

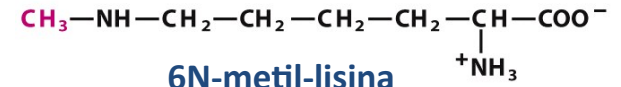


ACILACIÓN

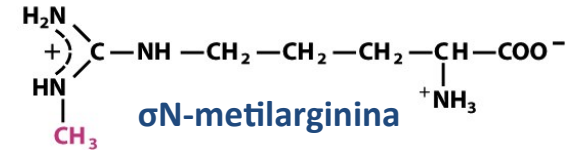


6N-acetil-lisina

METILACIÓN

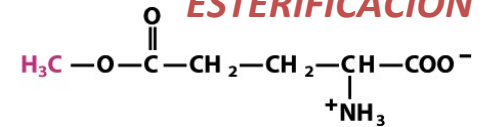


6N-metil-lisina

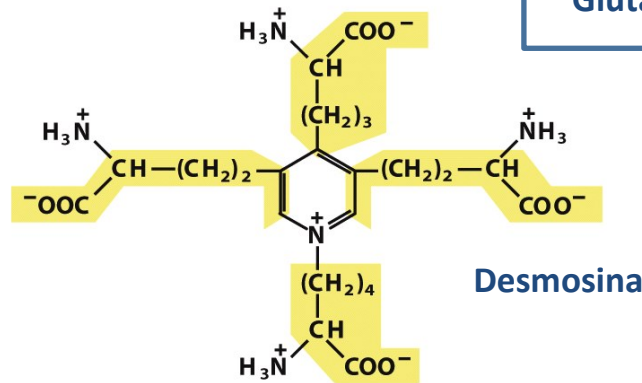


σ N-metilarginina

ESTERIFICACIÓN

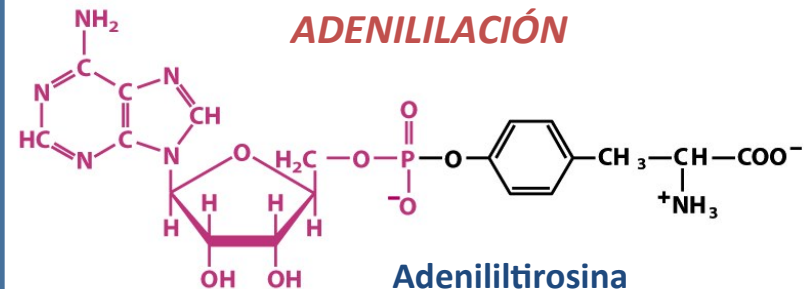


Glutamato metil éster



Desmosina

ADENILILACIÓN



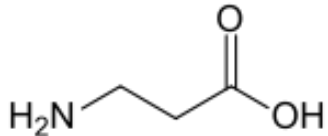
Adenililtirosina

AMINOÁCIDOS NO PROTEICOS

D-aminoácidos:

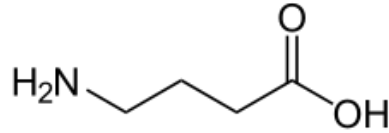
D-alanina, D-glutamato (paredes celulares bacterianas)

D-serina (interviene en neurotransmisión excitadora)



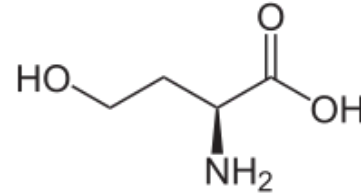
β-alanina

Ác. Pantoténico (vit B₅) -> CoA
Pépt. naturales e.g., carnosina



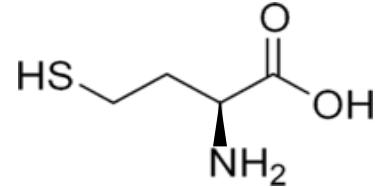
Ác. γ -aminobutírico

Neurotransmitter inhibitor



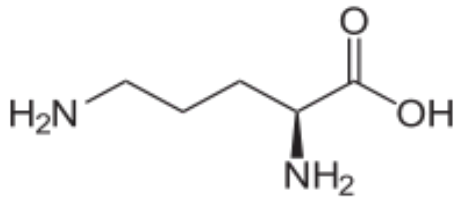
L-homoserina

Intermedio biosíntesis
de Met, Thr, Ile



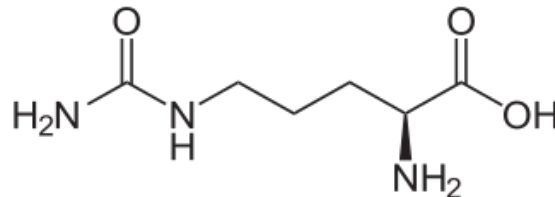
L-homocisteína

Intermedio síntesis Met
en “ciclo metilos activados”



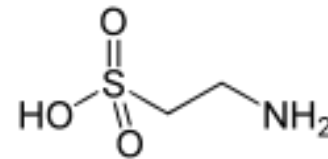
Ornitina

Interm. Ciclo Urea;
Síntesis de Arg



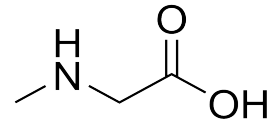
Citrulina

Interm. Ciclo Urea;
Síntesis de Arg
(presente en algunas proteínas
por modificación de Arg)



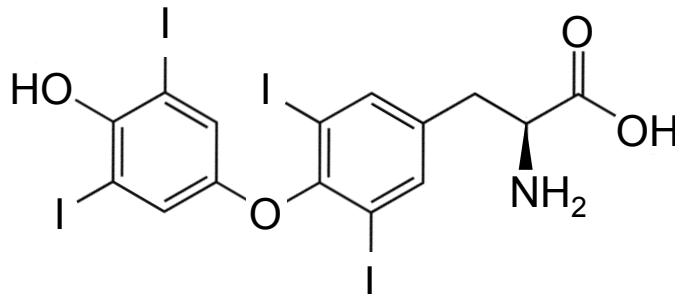
Taurina

Componente de la bilis,
junto con Gly. Múltiples
implicaciones funcionales



Sarcosina

Interm. Metabol.
de Gly y colina.



Tiroxina

Hormona tiroidea,
derivada de la Tyr