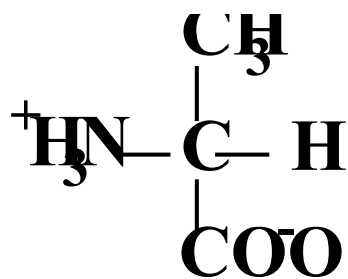
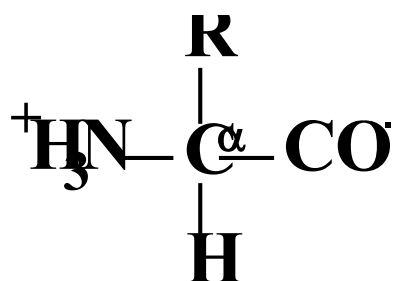
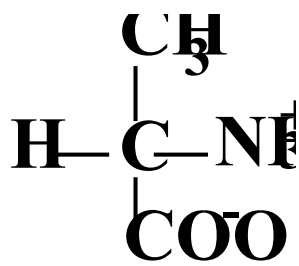


3. Aminokyseliny

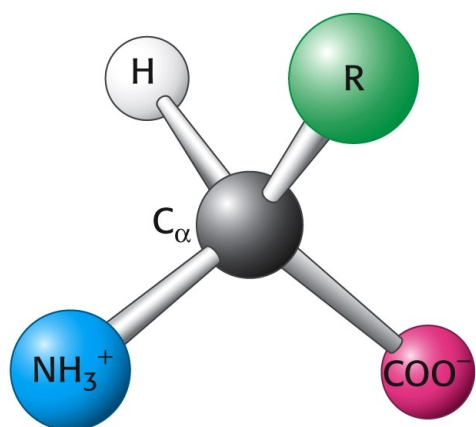
Základní struktura aminokyselin



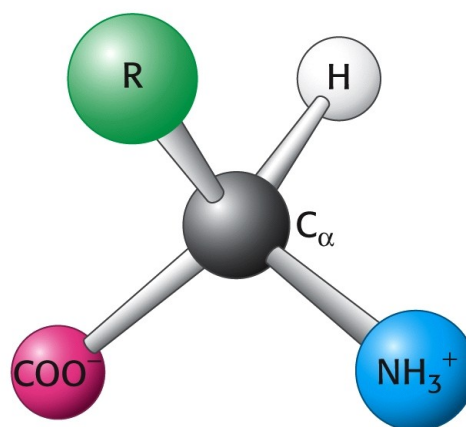
L -alanin



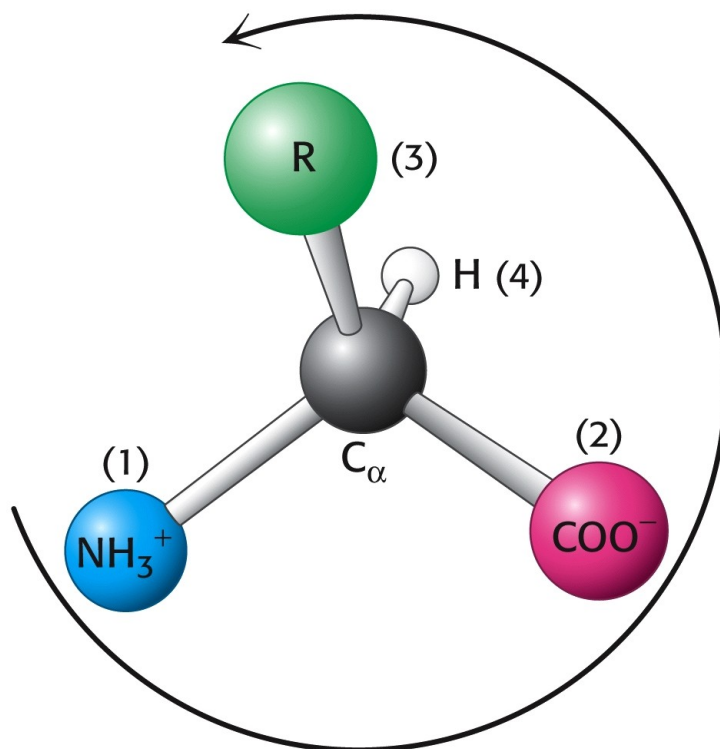
D-alani



L isomer



D isomer



Absolutní konfigurace

Gly (G) není chirální

Cys (C) je v absolutní konfiguraci *R*

Ile (I) a Thr (T) mají dvě chirální centra.

L-Ile ($2S,3S$) ..., existují dva enantiomery diastereoizomerní k alloisoleucinu ($2R,3S$)

L-Thr ($2S,3R$)..., existují dva enantiomery, které jsou diastereoizomerní k allothreoninu ($2R,3R$).

Všechny ostatní L-aminokyseliny jsou *S* !!

ACIDOBAZICKÉ VLASTNOSTI

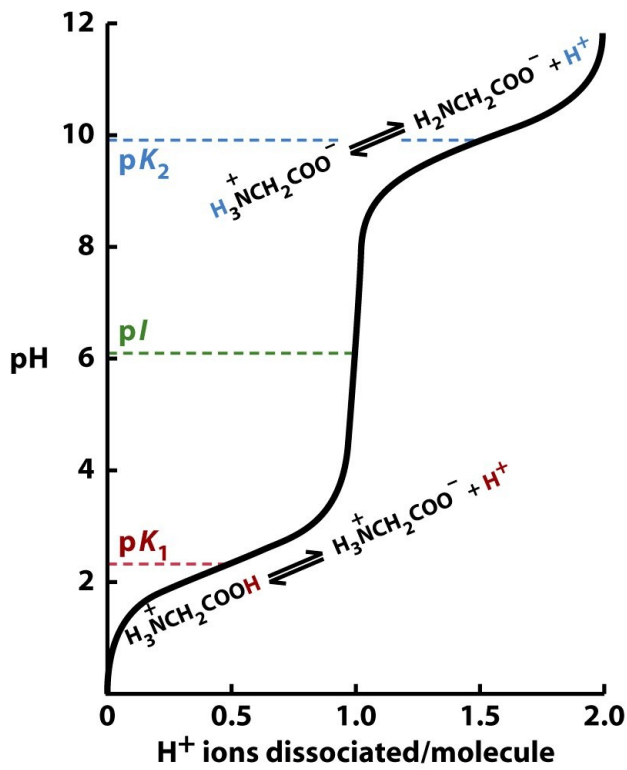
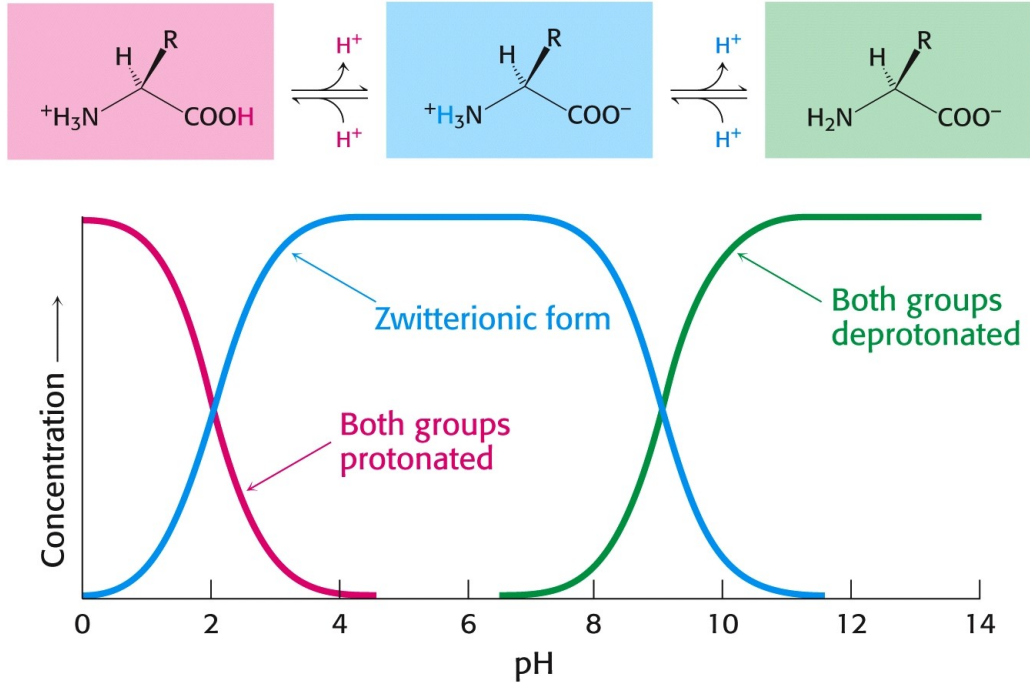


Figure 4-8 Fundamentals of Biochemistry, 2/e
© 2006 John Wiley & Sons

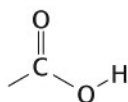
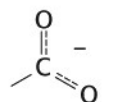
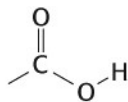
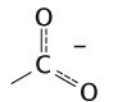
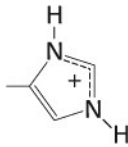
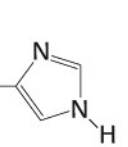
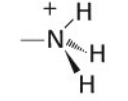
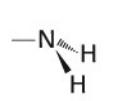
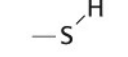
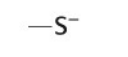
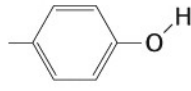
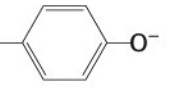
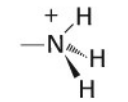
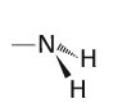
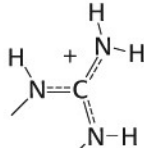
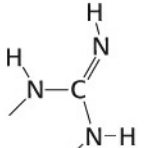
Izoelektrický bod

$$pI = \frac{pK_{COOH} + pK_{NH_2}}{2}$$

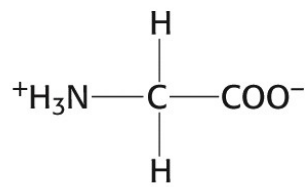
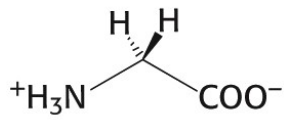
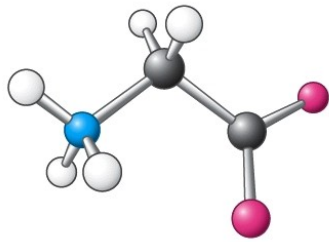
Tabulka pK

Skupina	pK	Skupina	pK	Skupina	pK
α COOH	1.8 - 2.5	β COOH	3.9	γ COOH	4.1
α NH ₂	9 - 10	ϵ NH ₂	10.8	guanidin	12.5
imidazol	6.0	SH	8.3	OH	10.1

TABLE 3.1 Typical pK_a values of ionizable groups in proteins

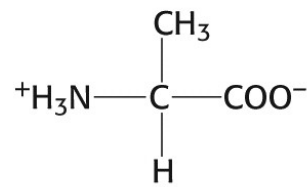
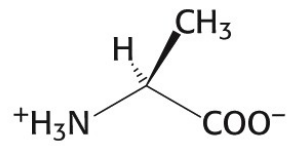
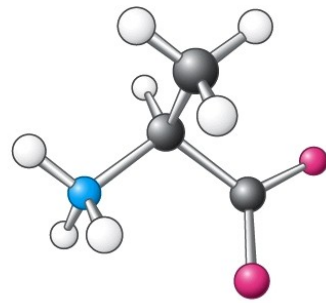
Group	Acid	\rightleftharpoons	Base	Typical pK_a^*
Terminal α -carboxyl group		\rightleftharpoons		3.1
Aspartic acid Glutamic acid		\rightleftharpoons		4.1
Histidine		\rightleftharpoons		6.0
Terminal α -amino group		\rightleftharpoons		8.0
Cysteine		\rightleftharpoons		8.3
Tyrosine		\rightleftharpoons		10.9
Lysine		\rightleftharpoons		10.8
Arginine		\rightleftharpoons		12.5

**Glycine
(Gly, G)**

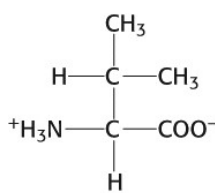
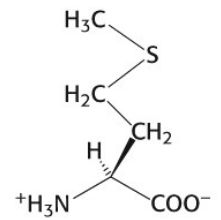
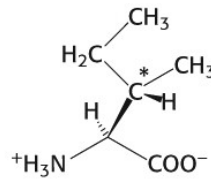
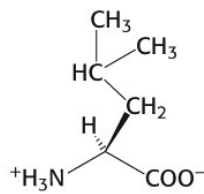
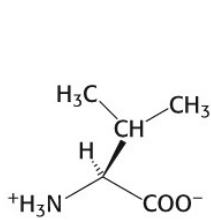
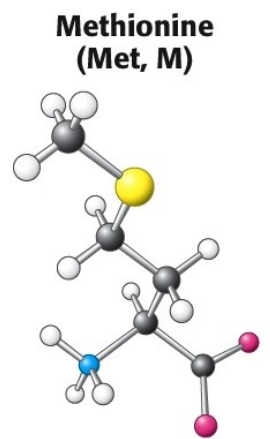
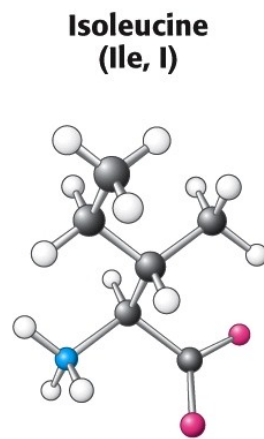
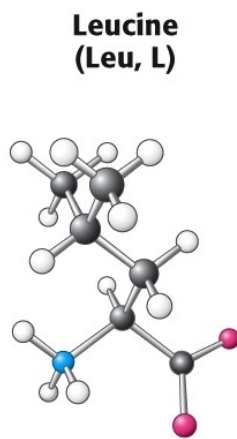
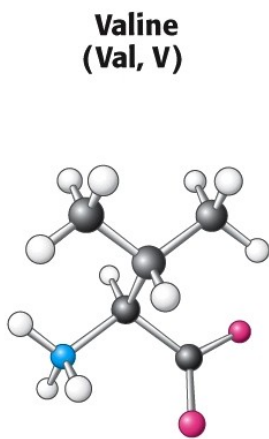


**Glycine
(Gly, G)**

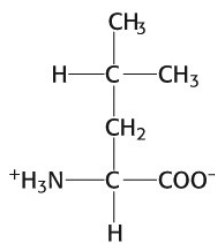
**Alanine
(Ala, A)**



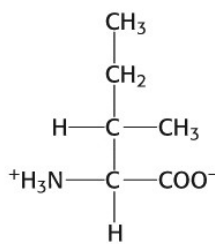
**Alanine
(Ala, A)**



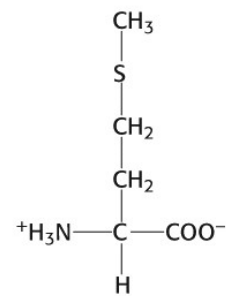
**Valine
(Val, V)**



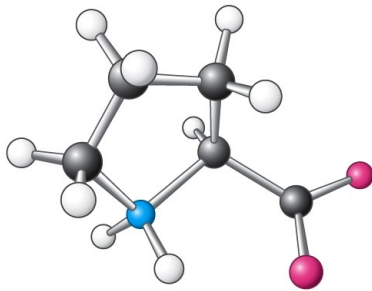
**Leucine
(Leu, L)**



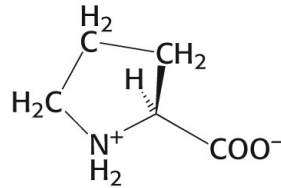
**Isoleucine
(Ile, I)**



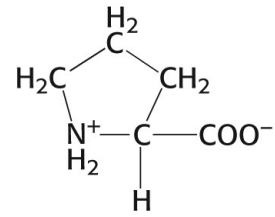
**Methionine
(Met, M)**



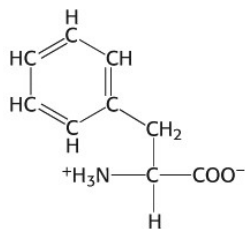
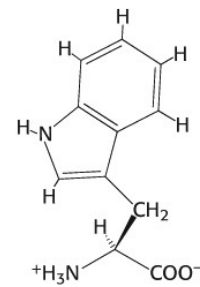
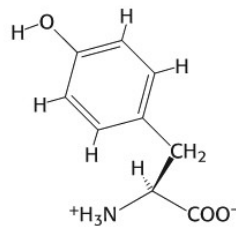
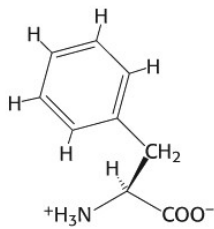
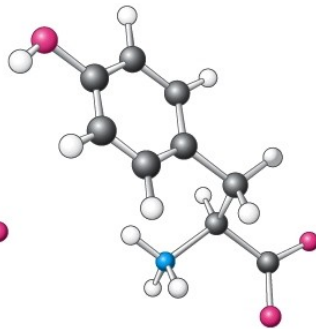
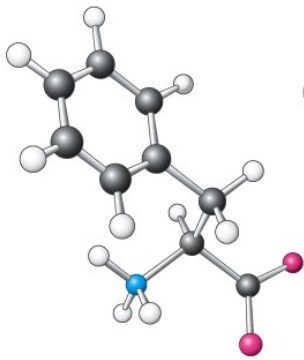
**Phenylalanine
(Phe, F)**



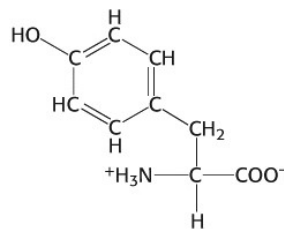
Proline



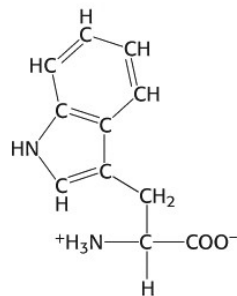
**Tryptophan
(Trp, W)**



**Phenylalanine
(Phe, F)**

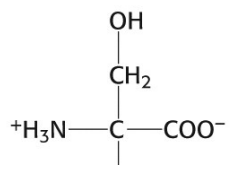
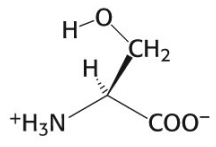
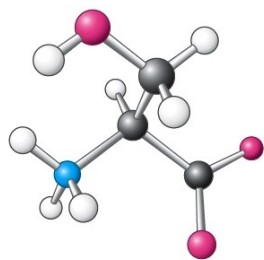


**Tyrosine
(Tyr, Y)**

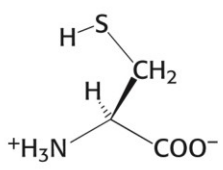
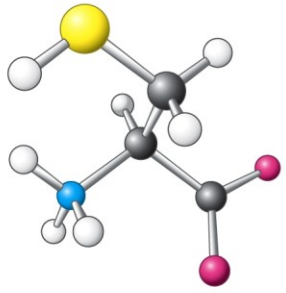
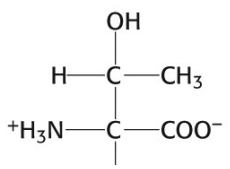
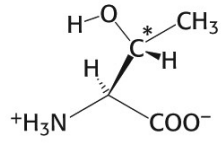
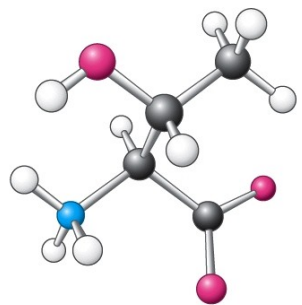


**Tryptophan
(Trp, W)**

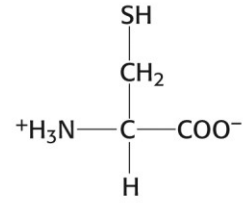
Serine
(Ser, S)



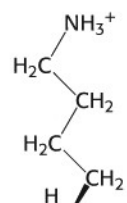
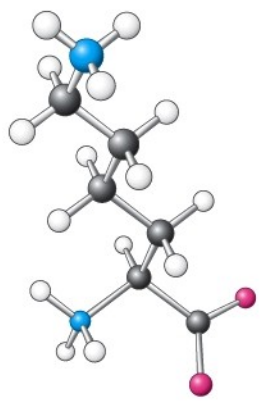
Threonine
(Thr, T)



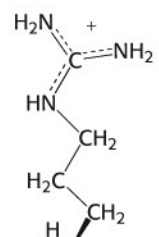
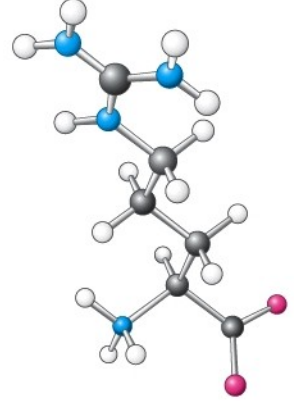
Cysteine
(Cys, C)



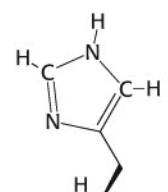
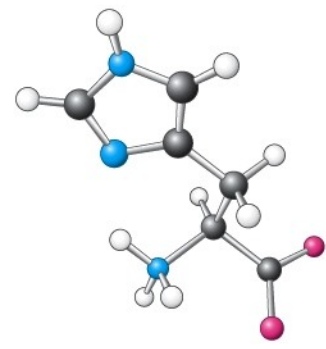
Lysine
(Lys, K)



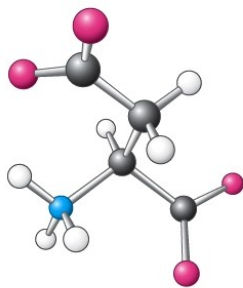
Arginine
(Arg, R)



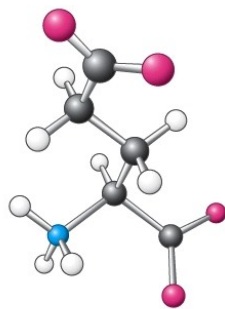
Histidine
(His, H)



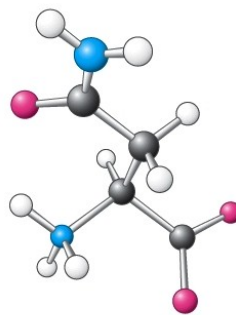
**Aspartate
(Asp, D)**



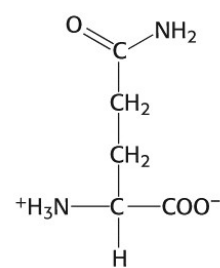
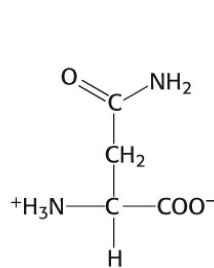
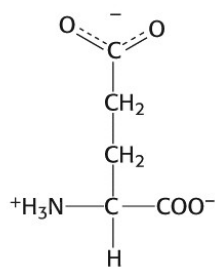
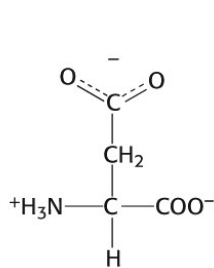
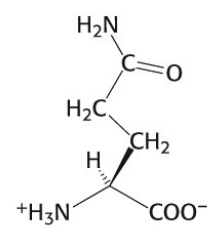
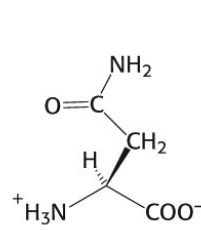
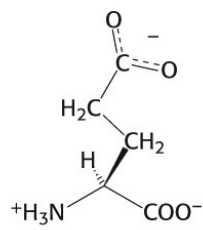
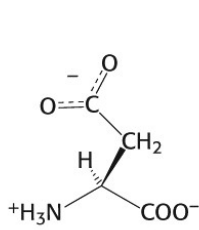
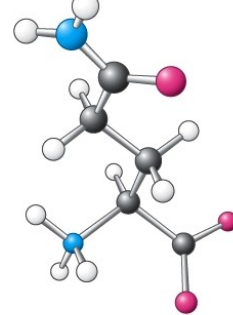
**Glutamate
(Glu, E)**



**Asparagine
(Asn, N)**



**Glutamine
(Gln, Q)**



**Aspartate
(Asp, D)**

**Glutamate
(Glu, E)**

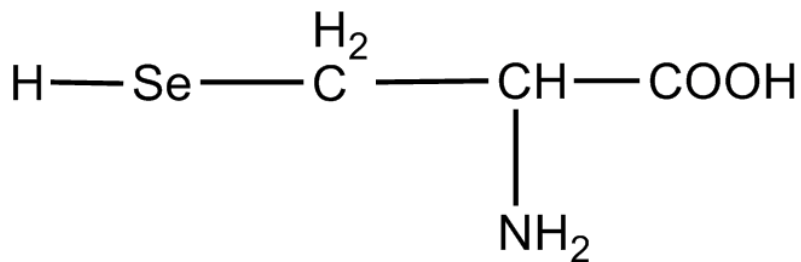
**Asparagine
(Asn, N)**

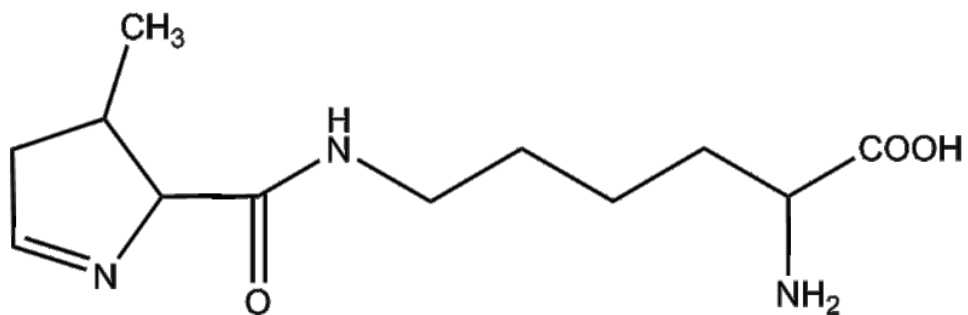
**Glutamine
(Gln, Q)**

TABLE 3.2 Abbreviations for amino acids

Amino acid	Three-letter abbreviation	One-letter abbreviation	Amino acid	Three-letter abbreviation	One-letter abbreviation
Alanine	Ala	A	Methionine	Met	M
Arginine	Arg	R	Phenylalanine	Phe	F
Asparagine	Asn	N	Proline	Pro	P
Aspartic Acid	Asp	D	Serine	Ser	S
Cysteine	Cys	C	Threonine	Thr	T
Glutamine	Gln	Q	Tryptophan	Trp	W
Glutamic Acid	Glu	E	Tyrosine	Tyr	Y
Glycine	Gly	G	Valine	Val	V
Histidine	His	H	Asparagine or aspartic acid	Asx	B
Isoleucine	Ile	I	Glutamine or glutamic acid	Glx	Z
Leucine	Leu	L			
Lysine	Lys	K			

AMK	Symboly		AMK	Symboly	
glycin	Gly	G	methionin	Met	M
alanin	Ala	A	glutamová k.	Glu	E
valin	Val	V	asparagin	Asn	N
leucin	Leu	L	glutamin	Gln	Q
izoleucin	Ile	I	lysin	Lys	K
serin	Ser	S	arginin	Arg	R
threonin	Thr	T	tyrosin	Tyr	Y
cystein	Cys	C	fenylalanin	Phe	F
histidin	His	H	tryptofan	Trp	W
prolin	Pro	P	asparagová k.	Asp	D

**Selenocystein**



Pyrolyzin

β alanin

ornitin a citrulin

γ aminomáselná

antibiotika - azaserin, cykloserin, chloramfenikol

nervové mediátory - DOPA, dopamin, adrenalin

hormony - thyroxin, trijodthyronin



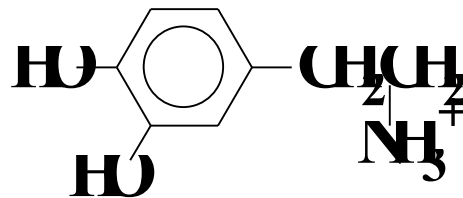
βalanin



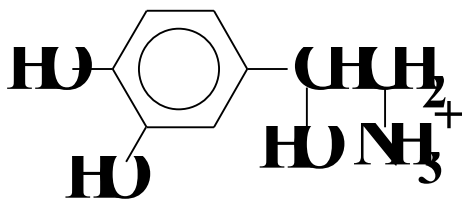
γaminonásečná kyselina



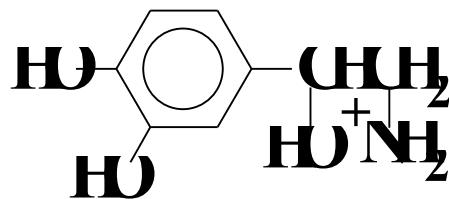
DOPA



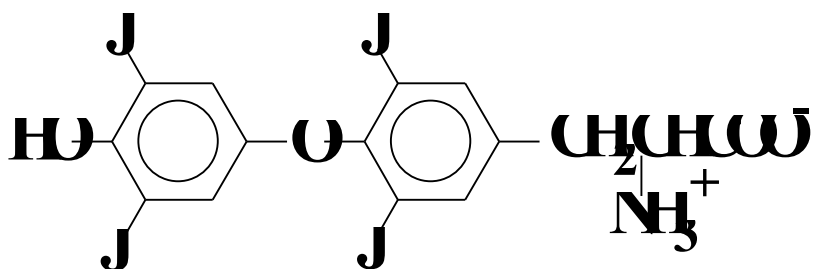
dopamin



noradrenalin



adrenalin



tyrosin
(3,5,3',5'-tetrajodthyronin)

