



Facolta' di Farmacia

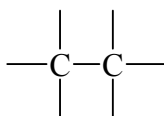
Corso di Chimica Farmaceutica e Tossicologica I (A-L)

Prof. Romano Silvestri

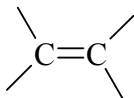
Nomenclatura di composti eterociclici

Principali gruppi funzionali

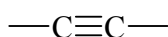
1. Alcani



2. Alcheni



3. Alchini

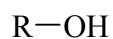


4. Alogenuri alchilici

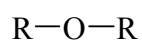


X = F, Cl, Br, I

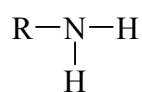
5. Alcoli



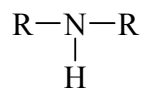
6. Eteri



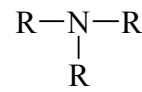
7. Ammine



primaria

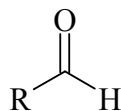


secondaria

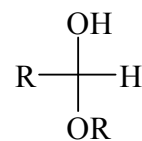


terziaria

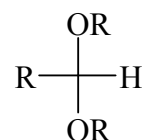
8. Aldeidi



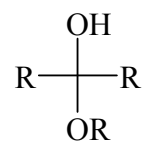
emiacetale



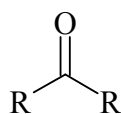
acetale



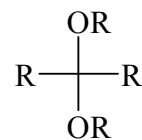
emichetale



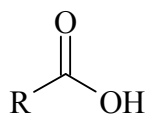
9. Chetoni



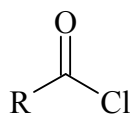
chetale



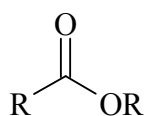
10. Acidi carbossilici



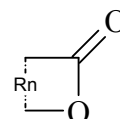
11. Cloruri acidi



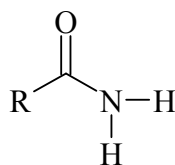
12. Esteri



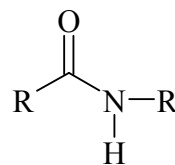
lattone



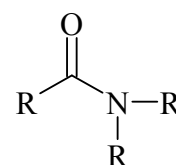
13. Ammidi



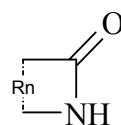
primaria



secondaria

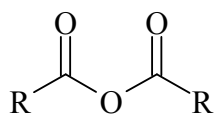


terziaria

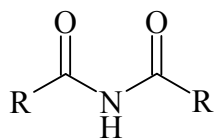


lattame

14. Anidridi



15. Immidi



Nomenclatura IUPAC di composti organici

Radice + Desinenza + Suffisso

- 1. Scegliere la struttura base**
- 2. Identificare i sostituenti e le relative posizioni**
- 3. Assegnare il nome alla struttura base**
- 4. Assegnare il nome ai sostituenti**
- 5. Scrivere il nome della struttura di base preceduto dal nome dei sostituenti**

Scelta della catena lineare prioritaria

1.1 Identificare il gruppo funzionale prioritario secondo la seguente scala di priorità:



1.2 Identificare la catena lineare che a partire dal gruppo funzionale prioritario soddisfi in ordine decrescente di priorità le seguenti condizioni:

- contenga il maggior numero di atomi di funzioni
- contenga il maggior numero di sostituenti
- contenga il maggior numero di atomi di carbonio

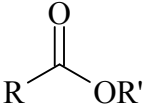
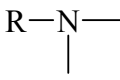
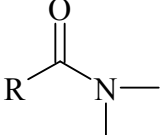
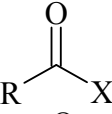
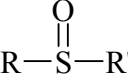
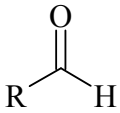
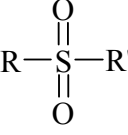
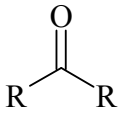
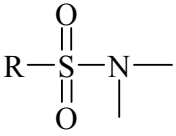
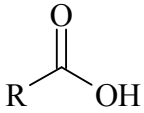
Nome radice

Cn = alc	C5 = pent	C10 = dec	C15 = pentadec
C1 = met	C6 = es	C11 = undec	C16 = esadec
C2 = et	C7 = ept	C12 = dodec	C17 = eptadec
C3 = prop	C8 = oct	C13 = tridec	C18 = octadec
C4 = but	C9 = non	C14 = tetradec	C19 = nonadec

Nome desinenza

Tutti i C saturi	an
Doppi legami	en
Tripli legami	in

Nomenclatura suffisso

<i>Struttura</i>	<i>Suffisso</i>	<i>Struttura</i>	<i>Suffisso</i>
R-H	o, e		oato di R'
R-OH	olo	R-SO ₃ H	acido solfonico
	ammina	R-SO ₂ H	acido solfinico
R-SH	tiolo	R-SOH	acido solfenico
R-S-R	solfuro		ammide oica
R=N-R	immina		alogenuro di oile
R≡N	nitrile		solfossido
	ale		solfone
	one		solfonammide
	acido oico		

Nomenclatura sostituenti

I sostituenti vanno immediatamente preceduti dall'indice numerico dell'atomo di carbonio cui sono legati

Sostituenti e funzioni uguali vanno accorpati e preceduti dal termine che ne identifica il numero: **di**, **tri**, **tetra**, ecc..

Sostituenti complessi vanno inseriti fra parentesi

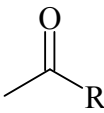
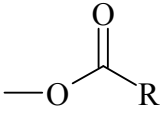
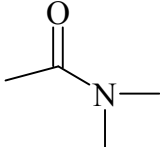
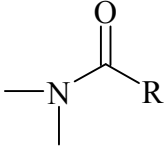

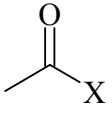
Eternatomi di composti ciclici non aromatici vano indicati dai seguenti termini:

Ossigeno: **oxa**
Azoto: **aza**
Zolfo: **tia**

Per i sostituenti di tipo idrocarburecola nomenclatura è la seguente:

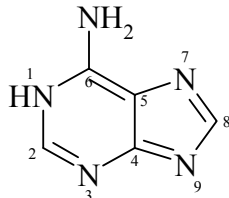
Radice: numero di atomi di carbonio
Desinenza: solo in saturazioni
Suffisso: *il*, quando il legame è semplice
iliden, quando il legame è doppio

Nomenclatura sostituenti eteroatomici

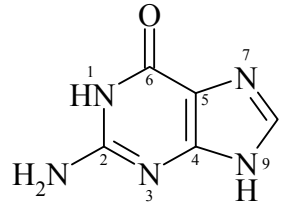
<i>Struttura</i>	<i>Suffisso</i>	<i>Struttura</i>	<i>Suffisso</i>
—OH	idrossi	—NO ₃	nitrato
—N— 	ammino	—NO	nitroso
—SH	mercapto		(alc) ossi
—S—R	(alchil)tio	—COOH	carbossi
—=N—	immino	—COOR'	carbossi (alchil) carb (alc) ossi
—≡N	ciano		(alc) oil ossi
=O	oxo		carbamoil
—O—R	alcossi		carbossiammido
	eossi		alocarbonil
—X	alo fluoro, cloro, bromo, iodo	—SO ₃ H	sulfo
—NO ₂	nitro	—SO ₂ H	sulfino
—N ₃	azido		

Eterocicli biologicamente importanti

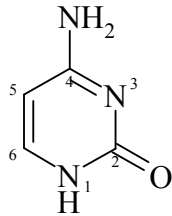
❖ Basi degli acidi nucleici



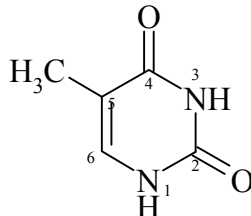
Adenina



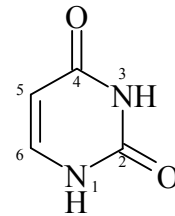
Guanina



Citosina

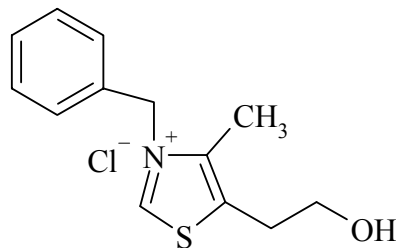


Timina

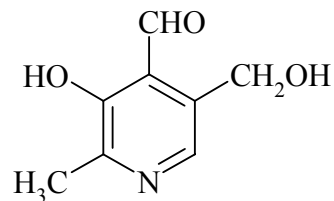


Uracile

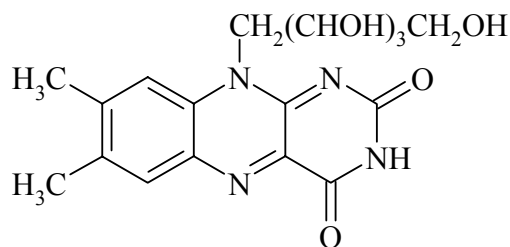
❖ Vitamine



Tiamina
Vitamina B1



Piridossale
Vitamina B6



Riboflavina
Vitamina B2

Nomenclatura di composti eterociclici

Prefissi caratteristici per nomi di sostituzione

(Sistema di Hantzsch-Widman)

<i>Elemento</i>	<i>Prefisso</i>
Ossigeno	ossa-
Azoto	aza-
Zolfo	tia-
Fosforo	fosfa-
Silicio	sil-

Radici usate nella nomenclatura dei composti eterociclici

(Sistema di Hantzsch-Widman)

<i>No. atomi anello</i>	<i>Anelli con azoto</i>		<i>Anelli senza azoto</i>	
	<i>Insaturi</i>	<i>Saturi</i>	<i>Insaturi</i>	<i>Saturi</i>
3	-irina	-iridina	-irene	-irano
4	-ete	-etidina	-ete	-etano
5	-olo	-olidina	-olo	-olano
6	-ina	-	-ino	-ano
7	-epina	-	-epino	-epano
8	-ocina	-	-ocino	-ocano
9	-onina	-	-onino	-onano
10	-ecina	-	-ecino	-ecano

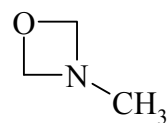
Esempi di nomenclatura di composti eterociclici



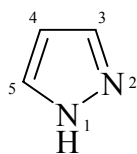
Ossirano



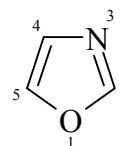
Diazirina



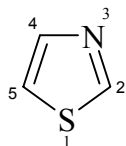
3-Metil-1,3-ossazetidina



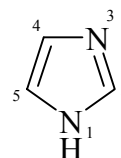
1,2-diazolo



1,3-ossazolo



1,3-tiazolo



1,3-diazolo

Idrocarburi ciclici

- *Saturi*

Ciclopropano



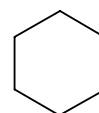
Ciclobutano



Ciclopentano



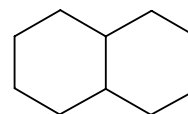
Cicloesano



Spiropentano



Decalina



- *Insaturi*

Ciclopropene



Ciclobutene



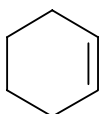
Ciclopentene



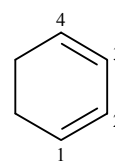
Ciclopentadiene



Cicloesene

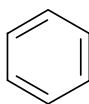


1,3-Cicloesadiene

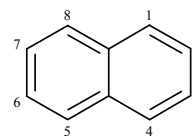


Idrocarburi ciclici

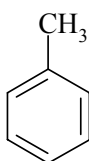
Benzene



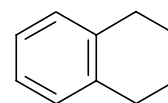
Naftalene



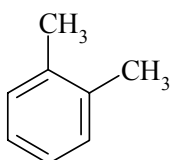
Toluene



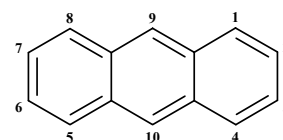
Tetralina



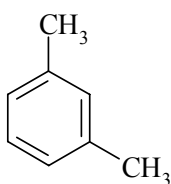
***o*-xilene**



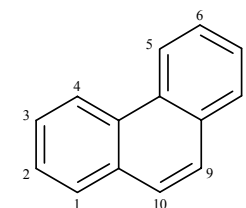
Antracene



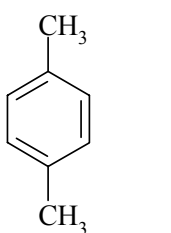
***m*-xilene**



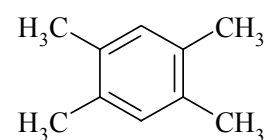
Fenantrene



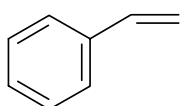
***p*-xilene**



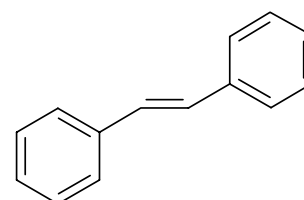
Mesitilene



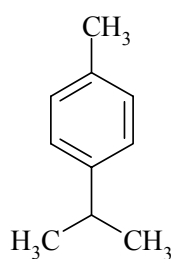
Stirene



***trans*-stilbene**

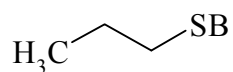


***p*-Cimene**

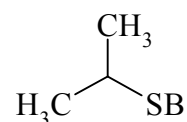


Sostituenti idrocarburici

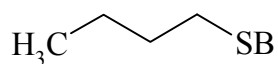
***n*-Propile**



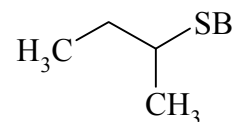
Isopropile



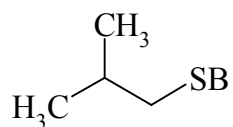
***n*-Butile**



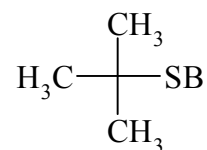
***sec*-Butile**



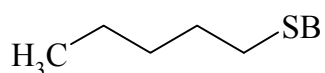
Isobutile



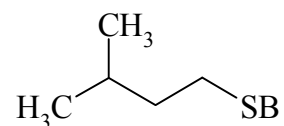
***t*-Butile**



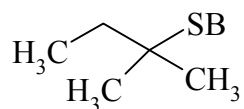
***n*-Pentile
(*n*-amile)**



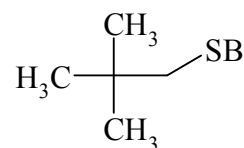
**Isopentile
(isoamile)**



***t*-Pentile
(*t*-amile)**

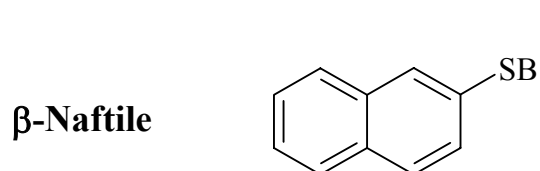
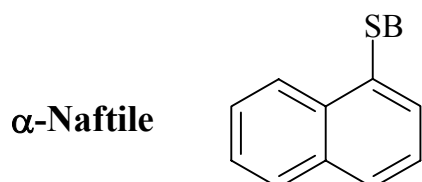
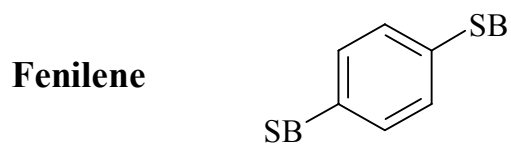
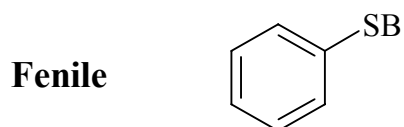
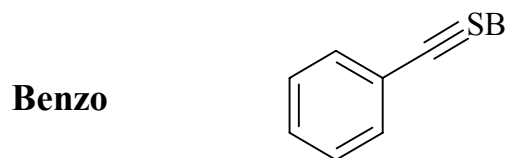
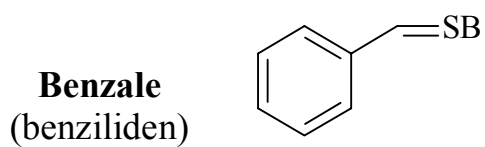
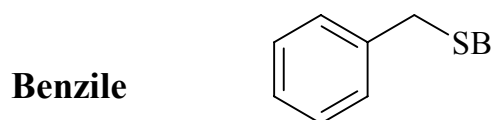
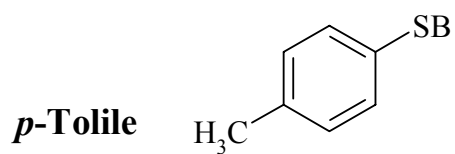
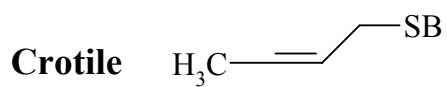


Neopentile



SB: Struttura base

Sostituenti idrocarburici



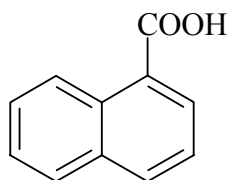
SB: Struttura base

Acidi carbossilici

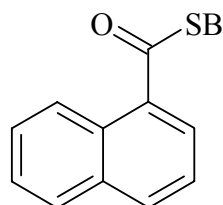
Acidi

Gruppi acilici o aroilici

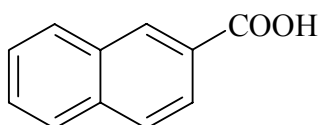
<i>Struttura</i>	<i>Nome</i>	<i>Struttura</i>	<i>Nome</i>
HCOOH	Acido formico	HCO-	Formile
CH ₃ COOH	Acido acetico	CH ₃ CO-	Acetile
CH ₃ CH ₂ COOH	Acido propionico	CH ₃ CH ₂ CO-	Propionile
CH ₃ (CH ₂) ₂ COOH	Acido <i>n</i> -butirrico	CH ₃ (CH ₂) ₂ CO-	<i>n</i> -butirile
(CH ₃) ₂ CHCOOH	Acido isobutirrico	(CH ₃) ₂ CHCO-	Isobutirile
CH ₃ (CH ₂) ₃ COOH	Acido valerico	CH ₃ (CH ₂) ₃ CO-	<i>n</i> -Valerile
(CH ₃) ₂ CHCH ₂ COOH	Acido isovalerico	(CH ₃) ₂ CHCH ₂ CO-	Isovalerile
(CH ₃) ₃ CCOOH	Acido pivalico	(CH ₃) ₃ CCO-	Pivalile
CH ₂ =CHCOOH	Acido acrilico	CH ₂ =CHCO-	Acriloile
CH ₃ CH=CHCOOH	Acido crotonico	CH ₃ CH=CHCO-	Crotonile
C ₆ H ₅ COOH	Acido benzoico	C ₆ H ₅ CO-	Benzoile
C ₆ H ₅ CH=CHCOOH	Acido cinnamico	C ₆ H ₅ CH=CHCO-	Cinnamoile
C ₆ H ₅ CH ₂ COOH	Acido fenilacetico	C ₆ H ₅ CH ₂ CO-	Fenilacetile



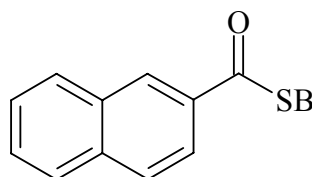
Acido α -naftoico



α -Naftoile



Acido β -naftoico



β -Naftoile

SB: Struttura base

Acidi dicarbossilici

Nome

Struttura



Acido ossalico



Acido malonico



Acido succinico



Acido glutarico



Acido adipico



Acido pimelico



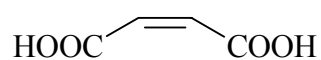
Acido suberico



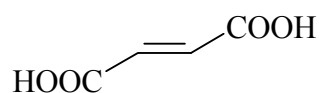
Acido azelaico



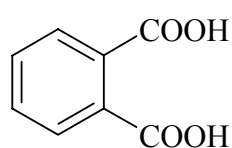
Acido sebacico



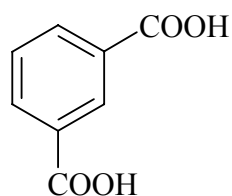
Acido maleico



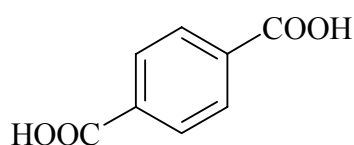
Acido fumarico



Acido ftalico

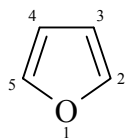


Acido isoftalico

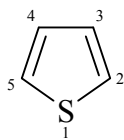


Acido tereftalico

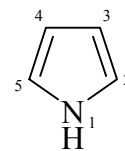
Eterocicli a 5 termini



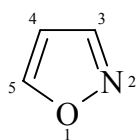
Furano



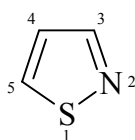
Tiofene



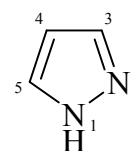
Pirrolo



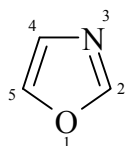
Isossazolo



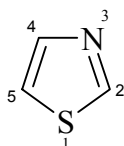
Isotiazolo



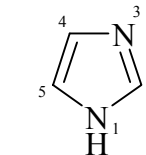
Pirazolo



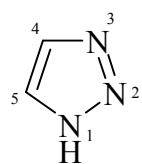
Ossazolo



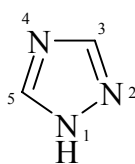
Tiazolo



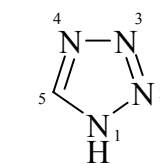
Imidazolo



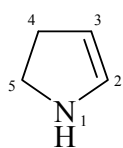
1,2,3-Triazolo



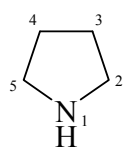
1,2,4-Triazolo



Tetrazolo

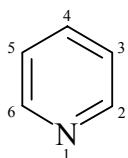


2,3-Pirrolina

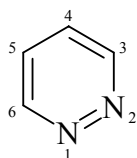


Pirrolidina

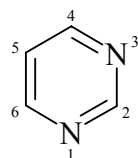
Eterocicli a 6 termini



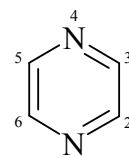
Piridina



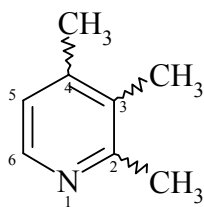
Piridazina



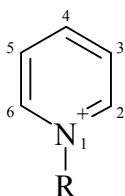
Pirimidina



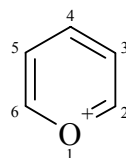
Pirazina



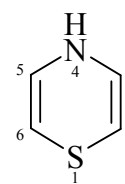
α,β,γ -Picolina



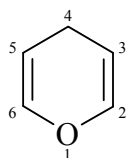
Ione piridinio



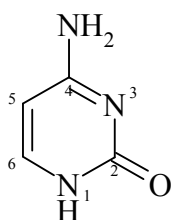
Ione pirilio



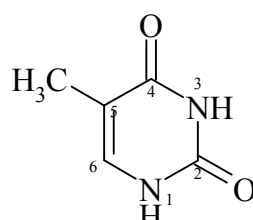
Paratiazina



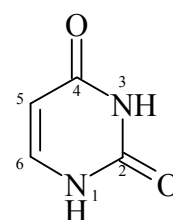
Pirano



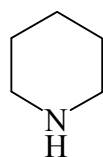
Citosina



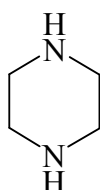
Timina



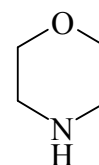
Uracile



Piperidina

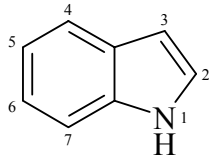


Piperazina

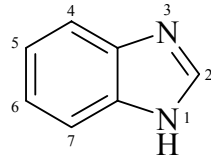


Morfolina

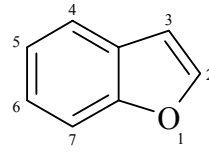
Eterocicli condensati



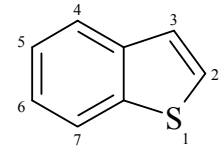
Indolo



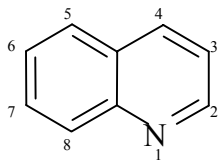
Benzimidazolo



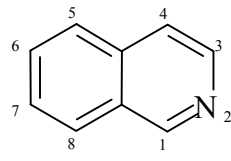
Benzofurano



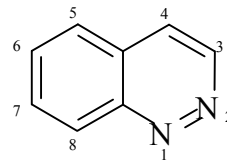
Benzotiofene



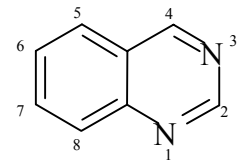
Chinolina



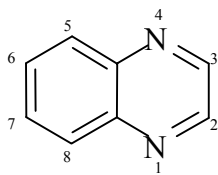
Isochinolina



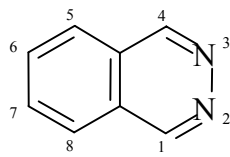
Cinnolina



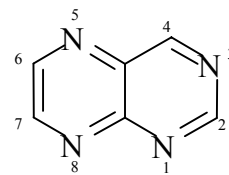
Chinazolina



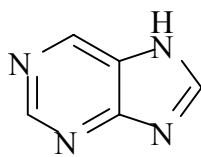
Chinossalina



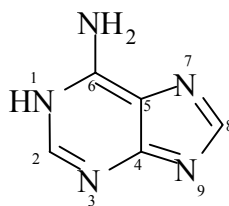
Ftalazina



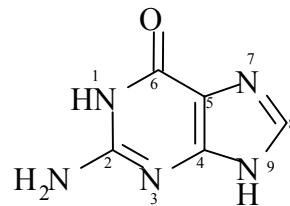
Pterina



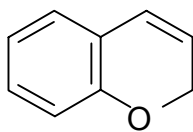
Purina



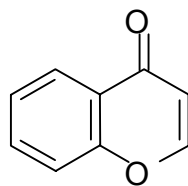
Adenina



Guanina

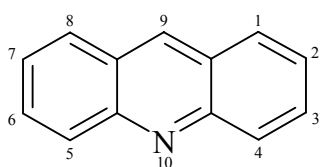


Cromene

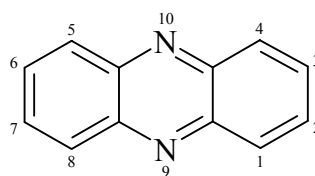


Cromone

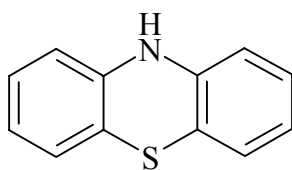
Eterocicli condensati



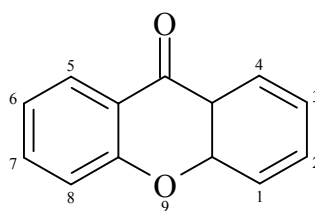
Acridina



Fenazina



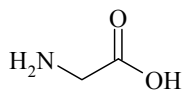
Fenotiazina



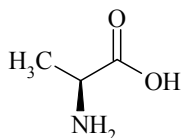
Xantone

Amminoacidi

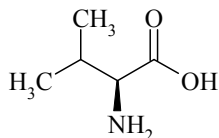
L-amminoacidi: struttura e nomenclatura:



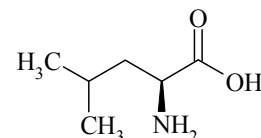
Glicina Gly



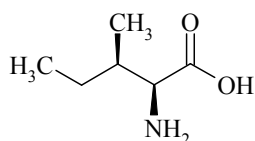
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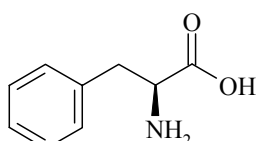
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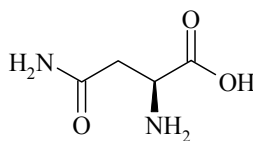
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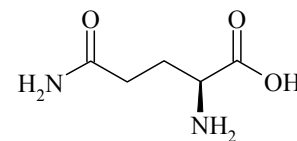
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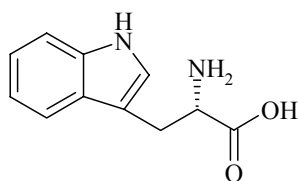
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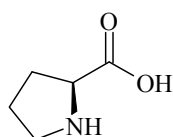
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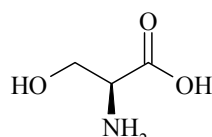
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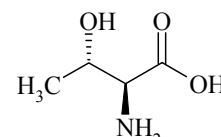
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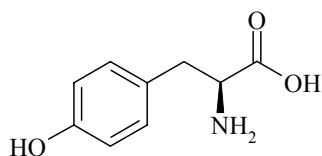
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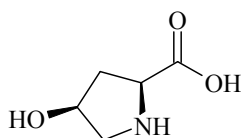
Serina Ser



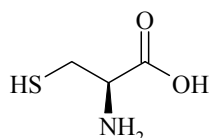
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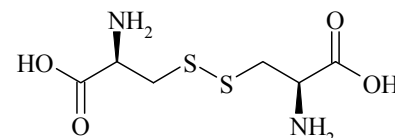
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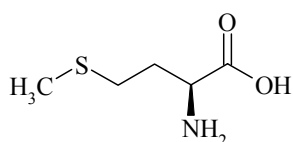
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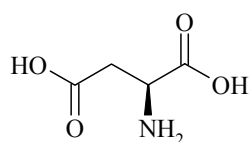
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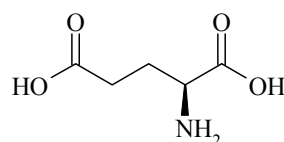
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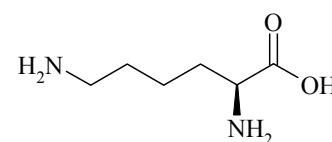
Metionina Met



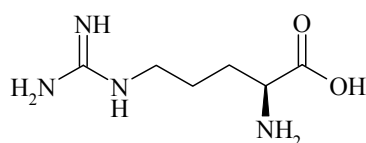
Acido aspartico Asp



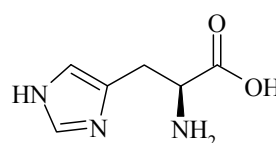
Acido glutammico Glu



Lisina Lys



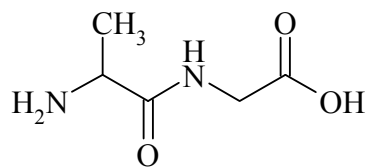
Arginina Arg



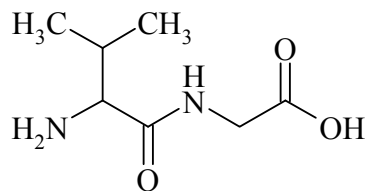
Istidina His

In una proteina il primo amminoacido viene scritto a partire dall'estremità *N-terminale*

Ala-Gly



Val-Gly



Val-Gly-Tyr

