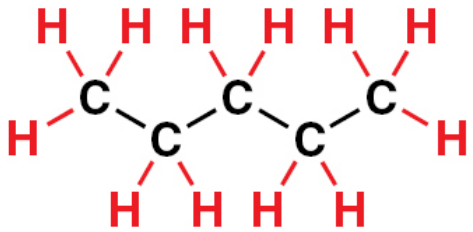
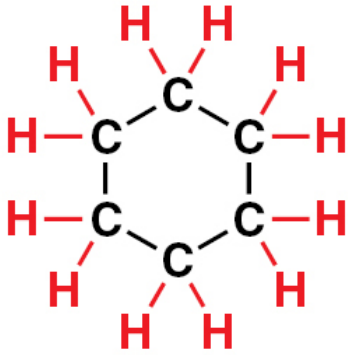
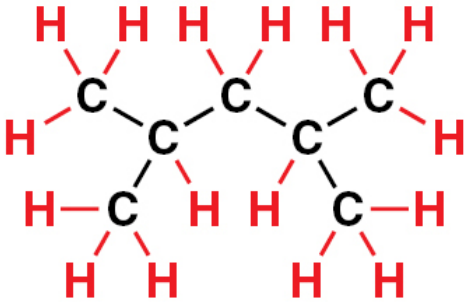
note sulle strutture organiche



a chain

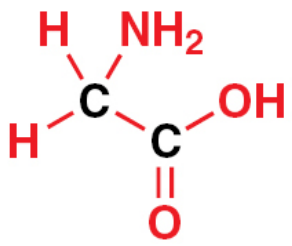


a ring

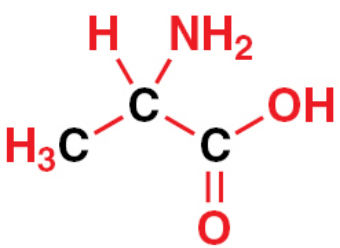


a branched chain

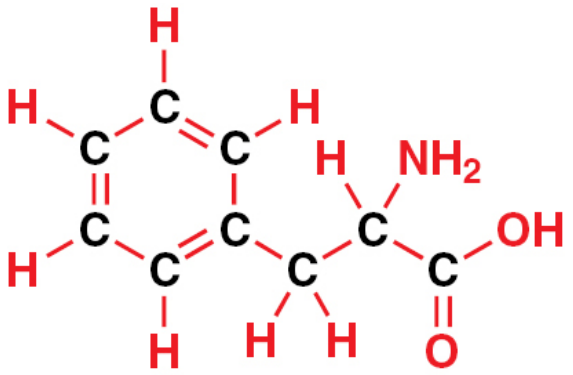
esempi di scheletro carbonioso di molecole organiche



glycine

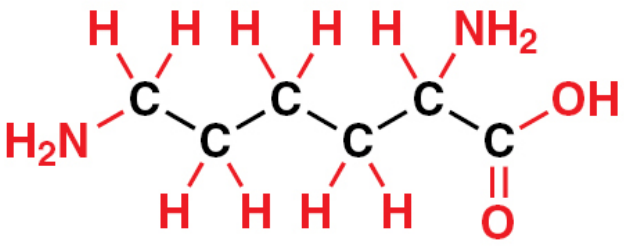


alanine

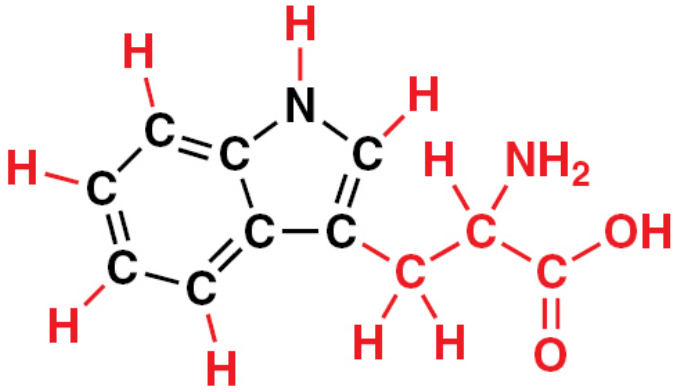


phenylalanine

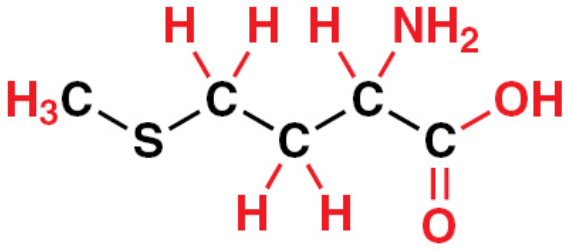
lo scheletro di atomi di C è il supporto dei gruppi funzionali (amminico e carbossilico per gli amminoacidi rappresentati)



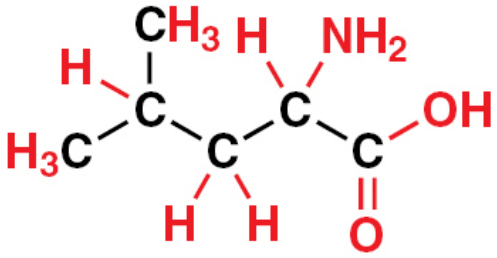
lysine



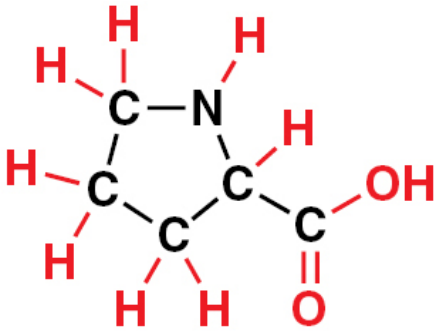
tryptophan



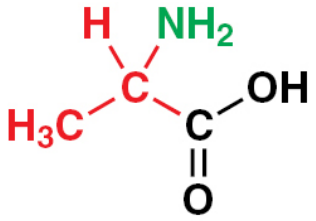
methionine



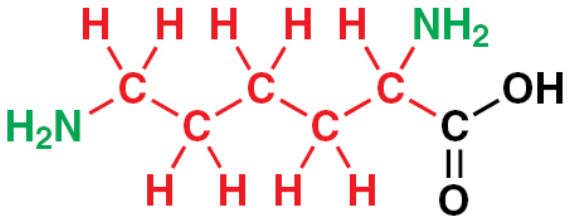
leucine



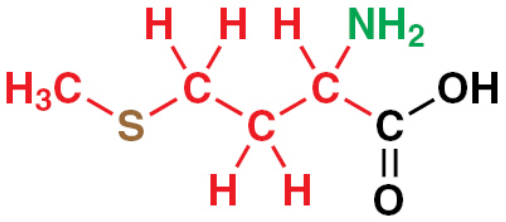
proline



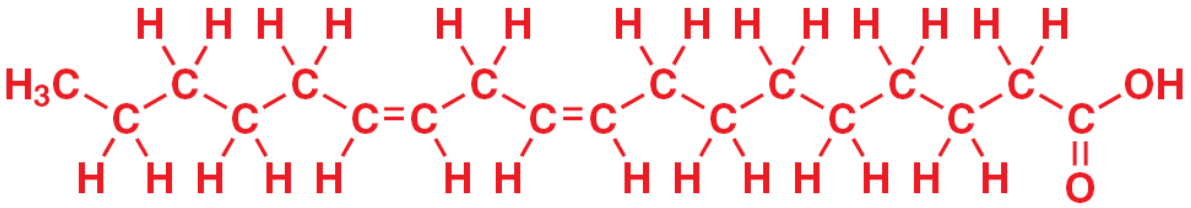
alanine
contains just the amino and carboxylic acid functional groups



lysine
has an additional amino group



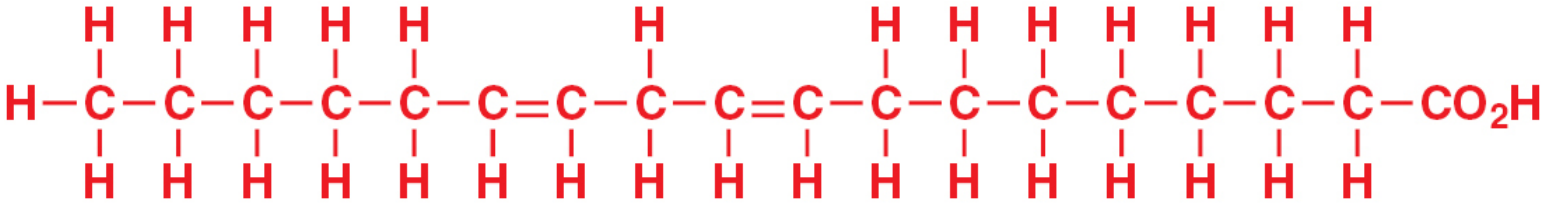
methionine
also has a sulfide functional group



linoleic acid

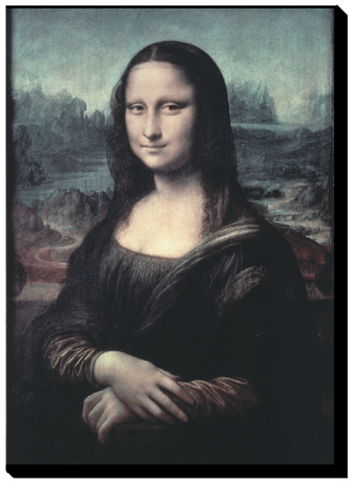
$CH_3CH_2CH_2CH_2CH{=}CHCH_2CH{=}CHCH_2CH_2CH_2CH_2CH_2CH_2CH_2CO_2H$

linoleic acid



linoleic acid

tre modi per disegnare la stessa struttura molecolare

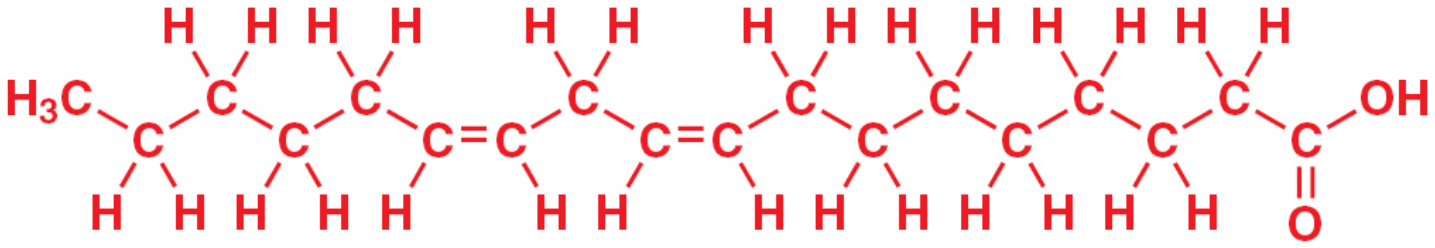


1

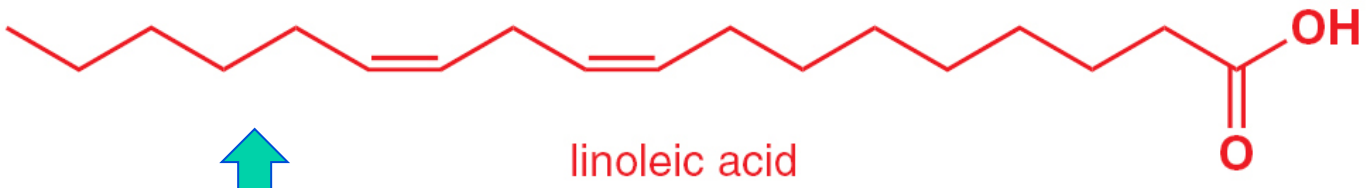
2

3

nel disegnare una struttura molecolare ricorda di seguire criteri di essenzialità e chiarezza

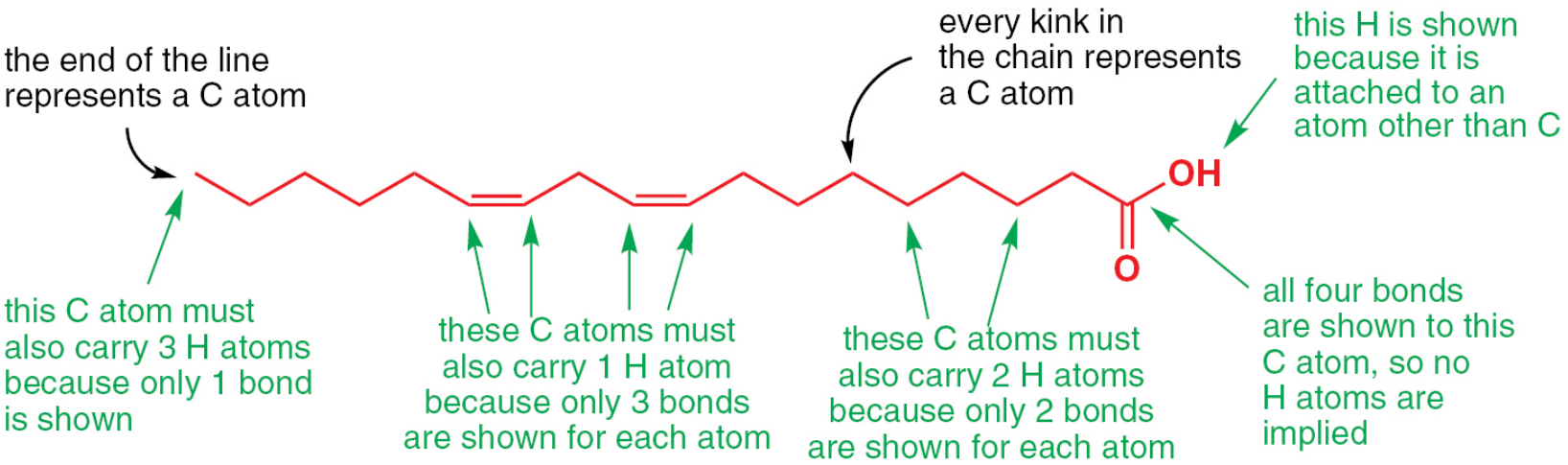


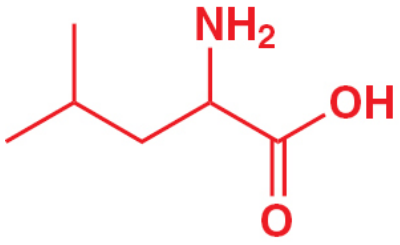
linoleic acid



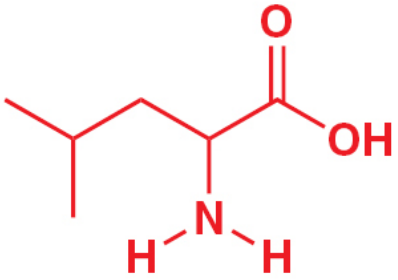
linoleic acid

struttura chiara ed essenziale

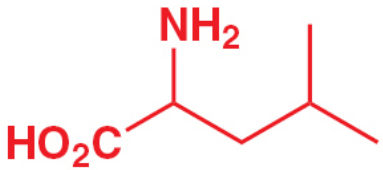




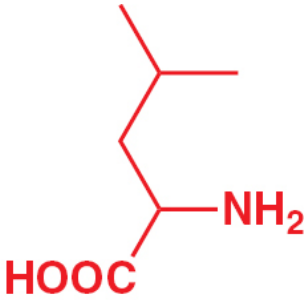
leucine



leucine

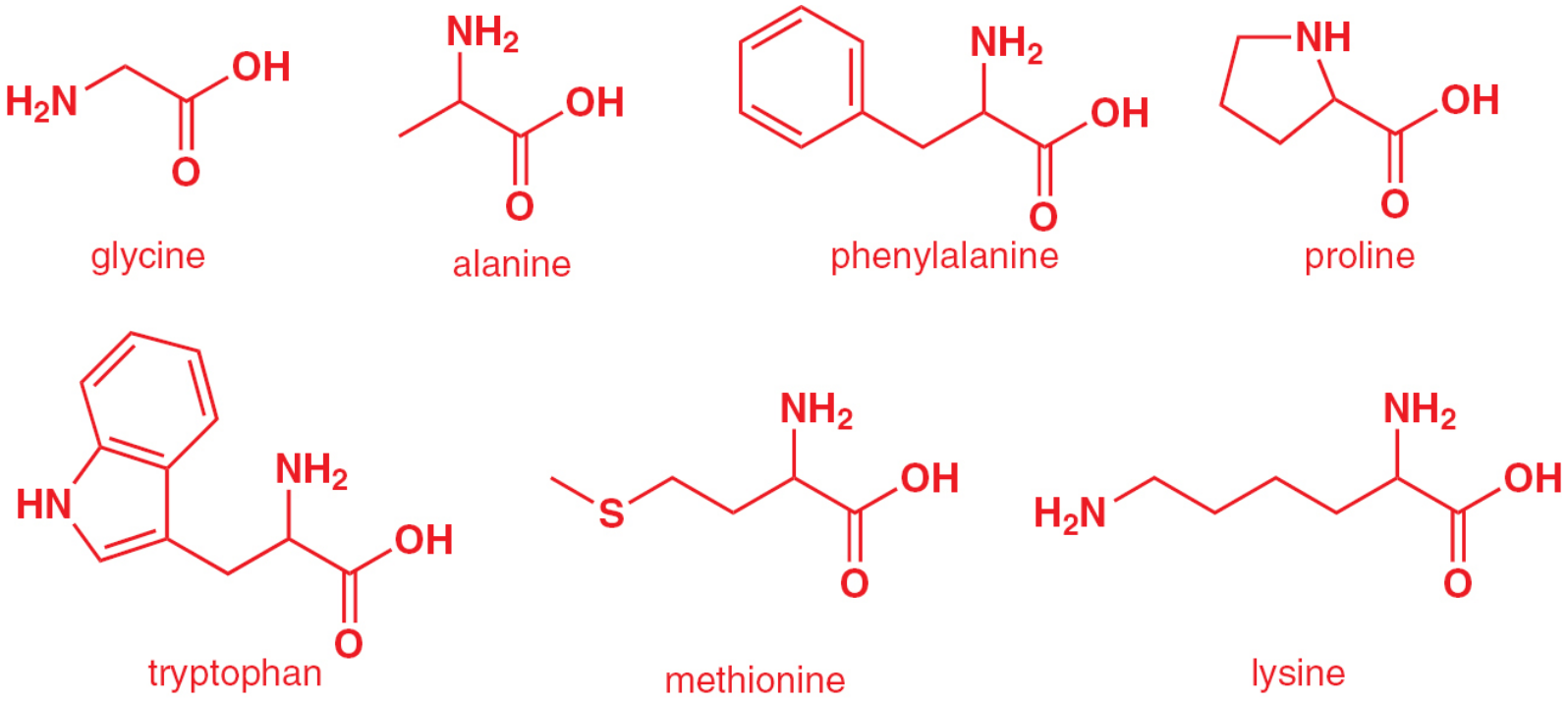


leucine

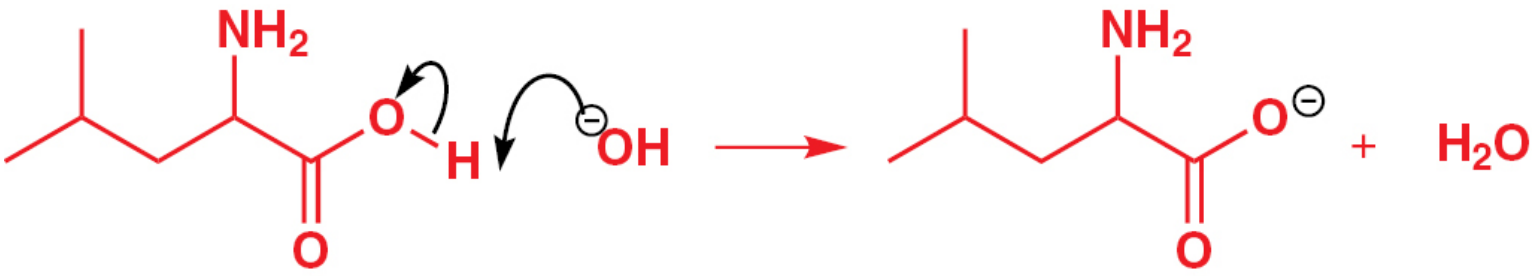


leucine

stesso amminoacido rappresentato da 4 strutture equivalenti (a parte l'orientazione e il modo con cui sono esplicitati i gruppi funzionali)



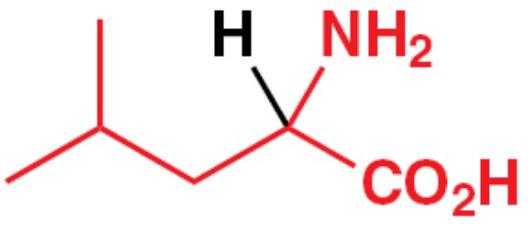
amminoacidi disegnati in modo chiaro ed essenziale con i gruppi funzionali evidenti



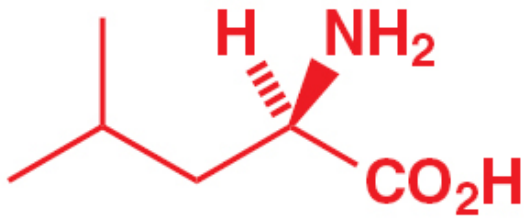
una reazione acido-base tra il gruppo funzionale acido carbossilico e l'anione ossidrilico: il legame O-H viene evidenziato per chiarezza (la carica negativa viene inclusa in un cerchietto affinchè sia maggiormente in evidenza

una reazione acido-base tra il gruppo funzionale amminico e il catione idrossonio: il legame N-H viene evidenziato per chiarezza (la carica positiva viene inclusa in un cerchietto affinchè sia maggiormente in evidenza

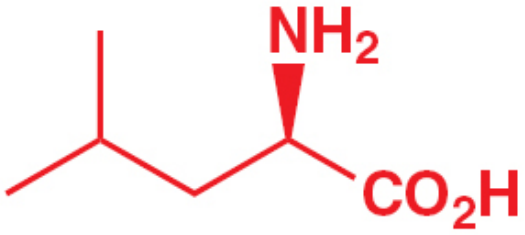
1



2



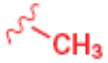
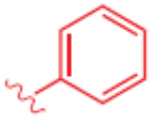
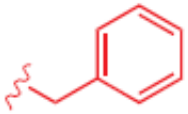
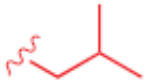
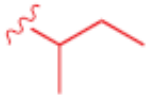
3



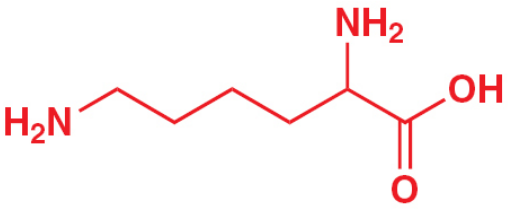
1. rappresentazione "bidimensionale"
2) e 3) sono rappresentazioni che indicano la disposizione nello spazio dei sostituenti all'atomo di C che porta i gruppi funzionali amminico e carbossilico (triangolo pieno=verso di noi; tratteggio=dentro il piano del foglio; linea piena=sul piano del foglio)

a section of the structure of polythene

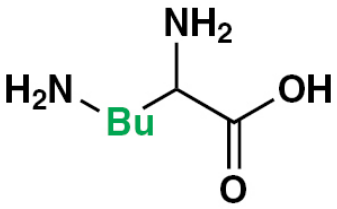
rappresentazione a zig-zag di una catena carboniosa

R	alkyl		***t*-Bu**	*tert*-butyl	
Me	methyl		**Ar**	aryl	any aromatic ring
Et	ethyl		**Ph**	phenyl	
Pr (*n*-Pr)	propyl		**Bn**	benzyl	
Bu (*n*-Bu)	butyl		**Ac**	acetyl	
***i*-Pr**	isopropyl			vinyl	
***i*-Bu**	isobutyl			allyl	
s-Bu	*sec*-butyl		**X**	halide	F, Cl, Br or I

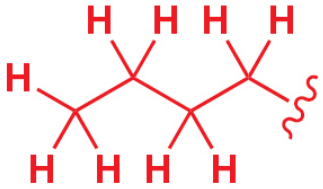
da ricordare



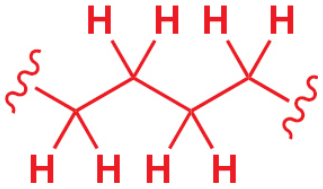
lysine



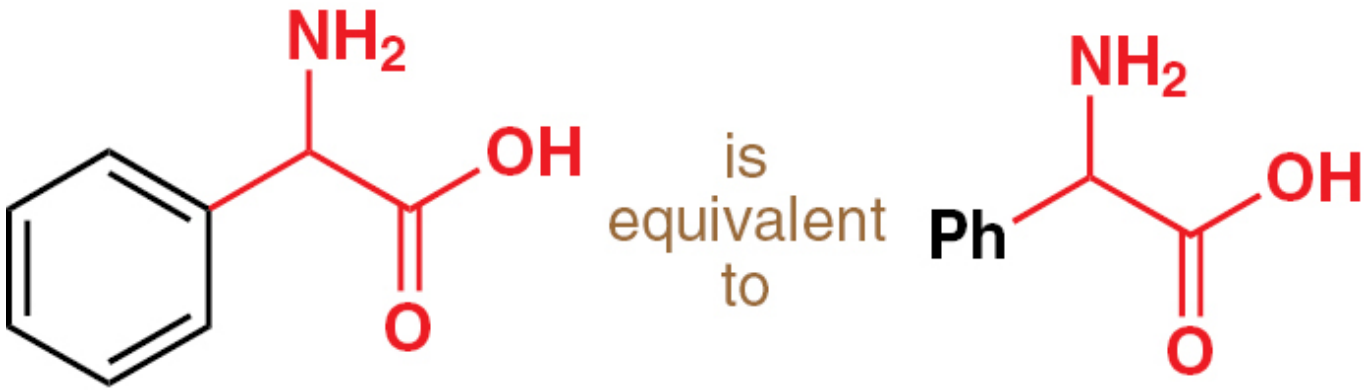
3 NOT CORRECT

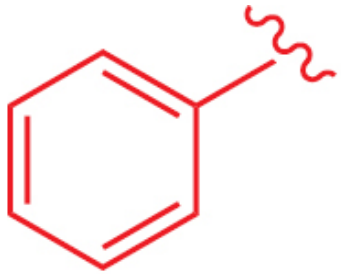


4 C_4H_9 = Bu

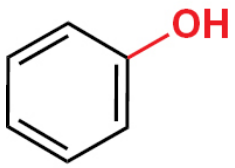


5 C_4H_8 NOT Bu

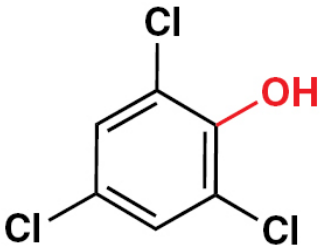




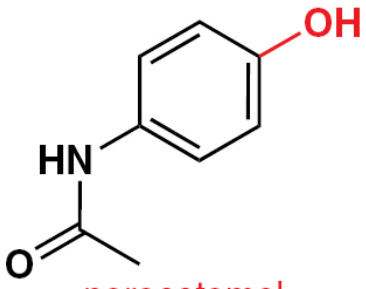
the phenyl group, Ph



PhOH =
phenol

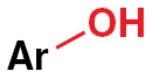


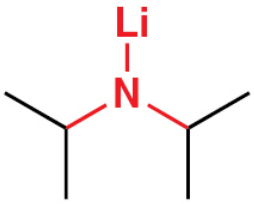
2,4,6-trichlorophenol



paracetamol

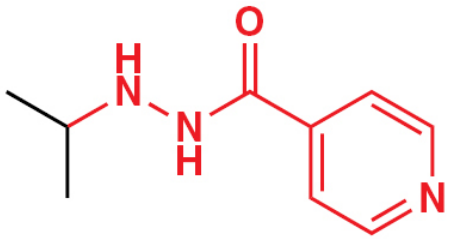
=



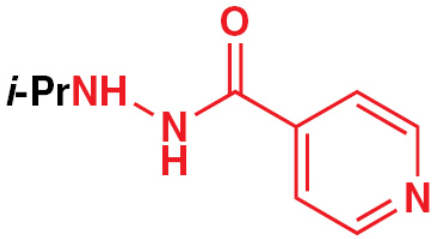


lithium diisopropylamide (LDA)

is equivalent to LiN*i*-Pr_2

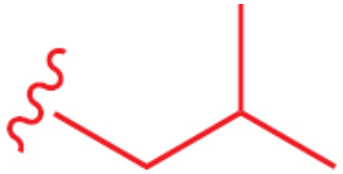


is equi-valent to

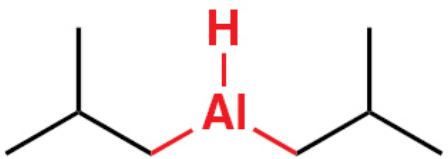


iproniazid

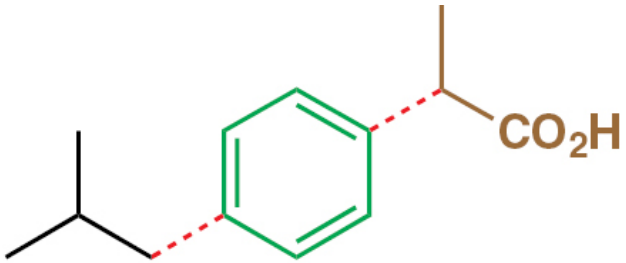
isopropile



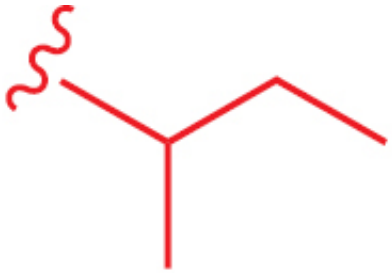
the isobutyl group
i-Bu



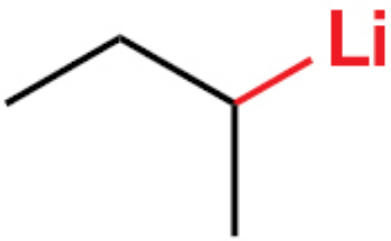
diisobutyl aluminium hydride (DIBAL)
is equivalent to **HAl*i*-Bu$_2$**



Ibuprofen

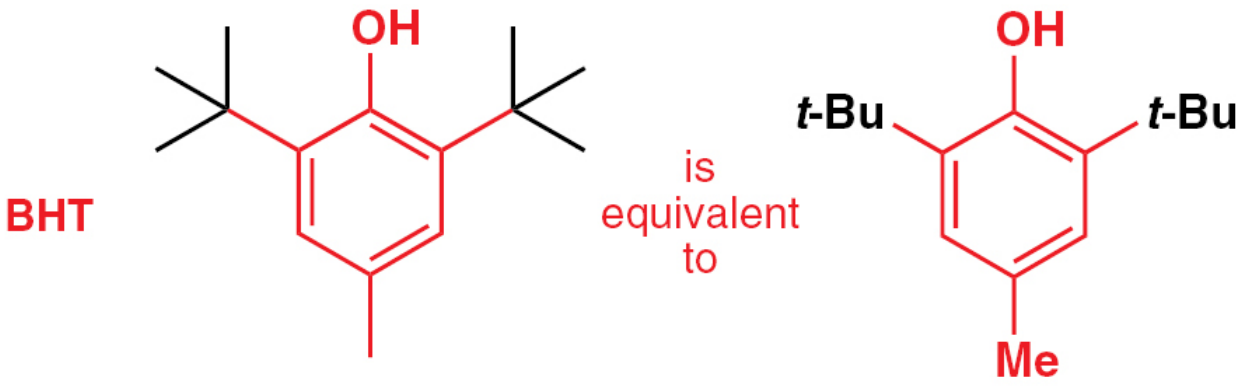


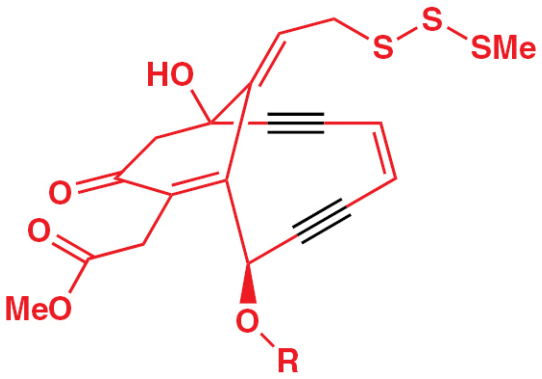
the *sec*-butyl group, *s*-Bu



is equivalent to ***s*-BuLi**

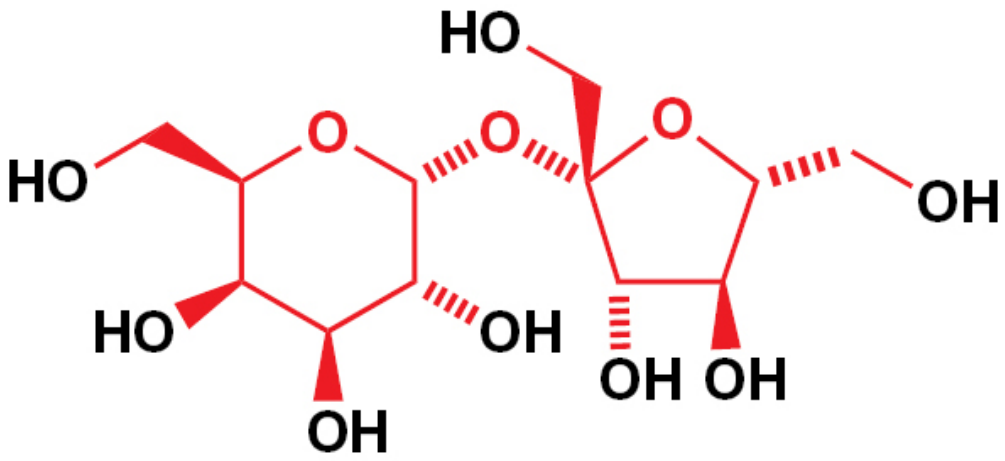
the *tert*-butyl
group *t*-Bu





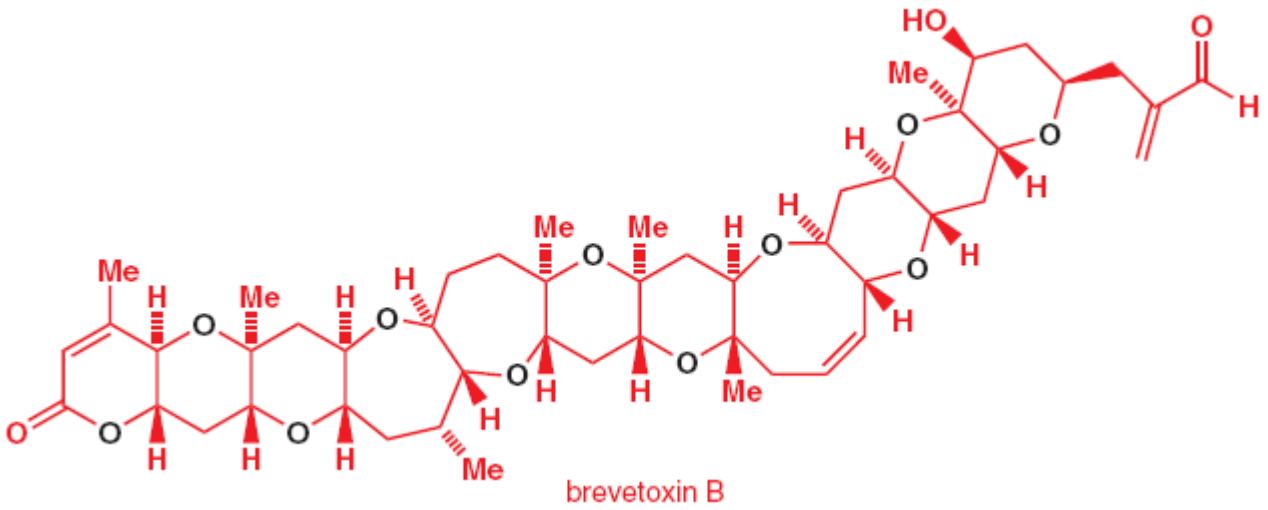
calicheamicin
(R = a string of sugar molecules)

esercizio: riconosci i gruppi funzionali nella molecola



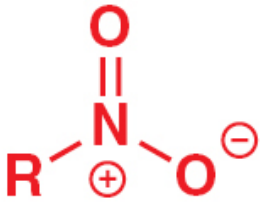
sucrose

esercizio: riconosci i gruppi funzionali nella molecola



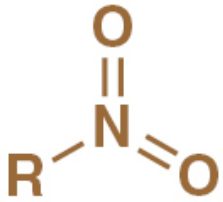
brevetoxin B

esercizio: riconosci i gruppi funzionali nella molecola

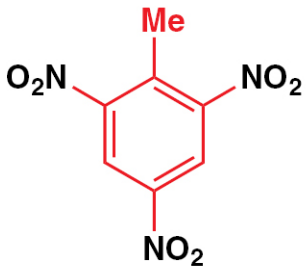


the nitro group

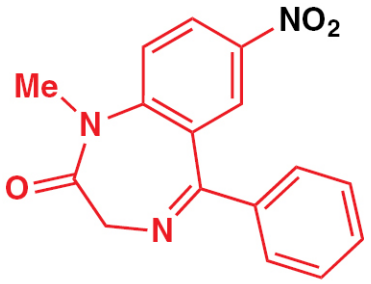
nitrogen cannot have five bonds!



incorrect structure for the nitro group

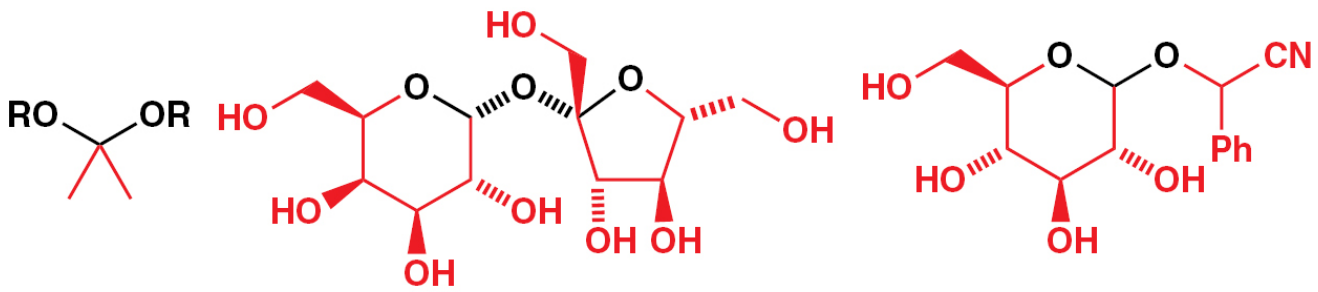


TNT

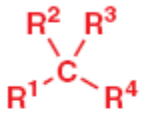
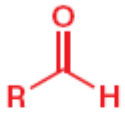
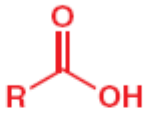
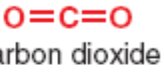
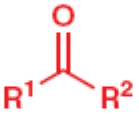
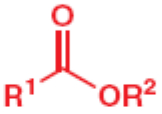
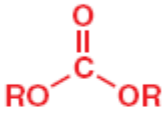
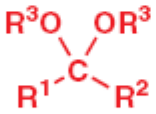
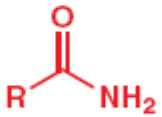
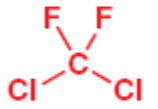
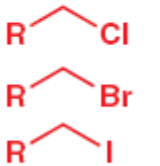
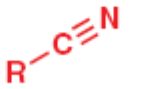
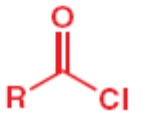


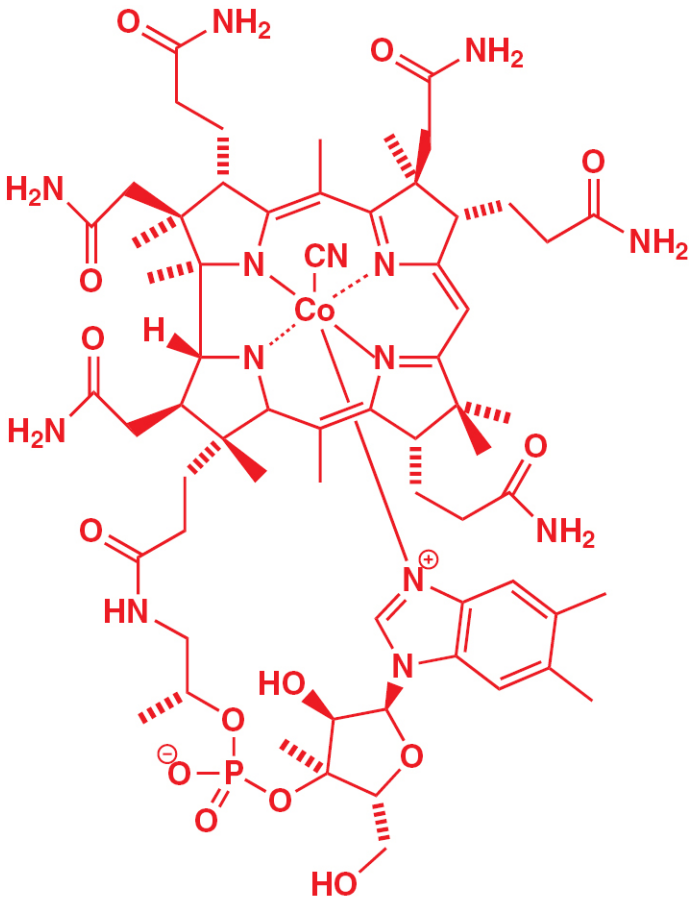
nitrazepam

il gruppo nitro



an acetal sucrose laetrile

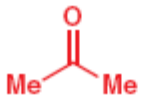
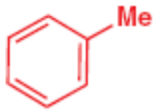
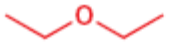
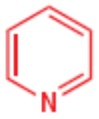
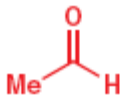
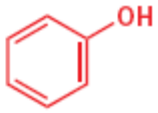
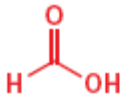
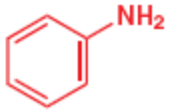
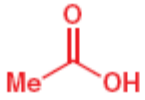
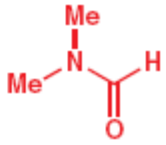
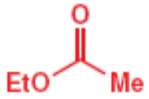
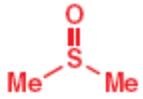
Zero bonds to heteroatoms: alkane oxidation level	One bond to heteroatoms: alcohol oxidation level	Two bonds to heteroatoms: aldehyde oxidation level	Three bonds to heteroatoms: carboxylic acid oxidation level	Four bonds to heteroatoms: carbon dioxide oxidation level
 alkanes	 alcohols	 aldehydes	 carboxylic acids	 carbon dioxide
	 ethers	 ketones	 esters	 carbonates
	 amines	 acetals	 amides	 tetrahalo compounds
	 alkyl halides	 alkynes	 nitriles	
	 alkenes		 acyl chlorides	



vitamin B_{12}, or...

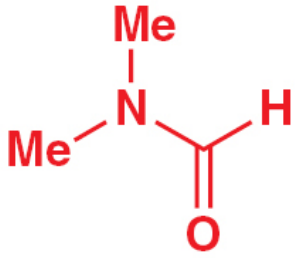
esercizio: riconosci i gruppi funzionali nella molecola

Important structures to learn

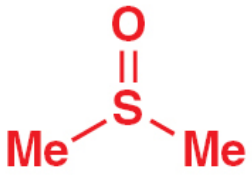
acetone		toluene	
ether or diethyl-ether		pyridine	
acetaldehyde		phenol	
formic acid		aniline	
acetic acid or AcOH		THF or tetrahydrofuran	
benzene		DMF, Me_2NCHO, or dimethylformamide	
ethyl acetate or EtOAc		DMSO	

da ricordare

THF
(TetraHydroFuran)



DMF
(DiMethylFormamide)



DMSO
(DiMethylSulfOxide)

solventi comuni