

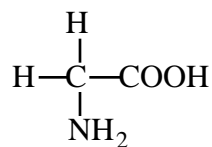
A list of tricks to help you remember the amino acids

Structures

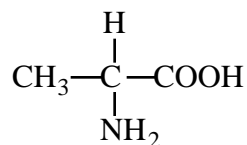
Names (letter code)

Side chain features/description

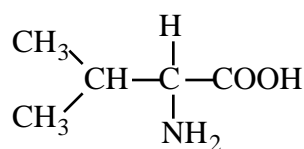
Aliphatic



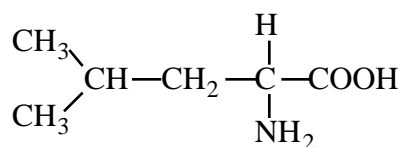
Glycine (G) hydrogen for R, most simple, optically inactive



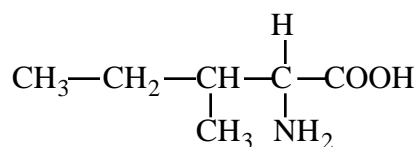
Alanine (A) *methyl* for R, a simple functional group to start just like "A" (in alanine) starts the alphabet



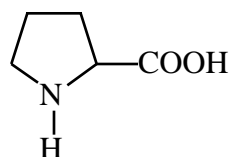
Valine (V) simple again, but shaped like the "V" in its name



Leucine (L) valine extended by one *methylene*

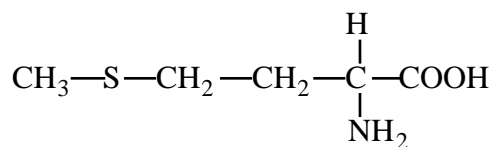


Isoleucine (I) *lopsided* valine....?

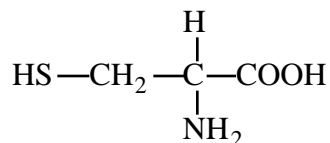


Proline (P) 3 carbon chain to proline's own nitrogen, structurally "special" and found in turns

Sulfur-containing

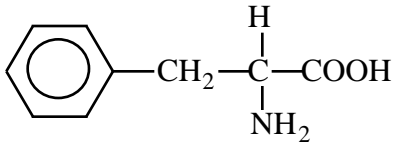


Methionine (M) special - starts every protein, 3 carbons with a thioether; *methyl-blocked* sulfhydryl...?

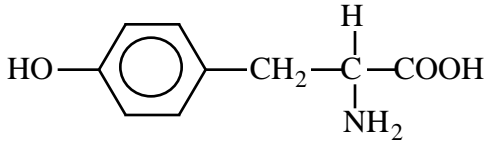


Cysteine (C) "*sulfhydryl* alanine," reactive, can form disulfides

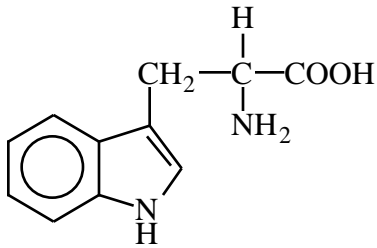
Aromatic



Phenylalanine (F) alanine with a phenol group which you KNOW is aromatic, the “Y” in *phenyl* can remind you which 3 amino acids with names beginning with T (the “T”s) are aromatics

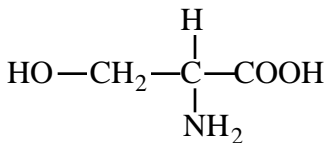


Tyrosine (Y) *hydroxylated* phenylalanine, one of 3 “T”s that has “Y” in its name so it is an aromatic

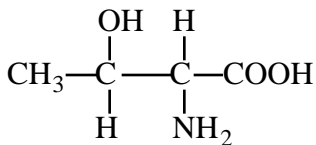


Tryptophan (W) one of 3 “T”s with a “Y” so it is aromatic, will “tryp” you up because it is hard to remember, has a 3 carbon start to N (or *indole* ring on *methylene*)

Aliphatic hydroxyl

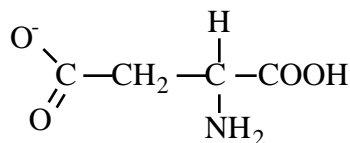


Serine (S) “*hydroxyl* alanine”



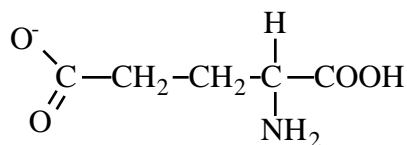
Threonine (T) one of 3 “T”s, without “Y” so aliphatic (also its symbol is the first letter of its name like the other aliphatics), its “threo” parts are *methyl, hydroxyl*, and hydrogen on a single C

Acidic - negative charges



Aspartate (D)

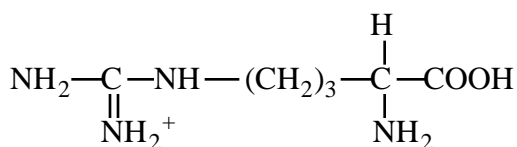
“*carboxyl* alanine” with acidic nature noted by suffix “*ate*”, the alphabetical ordering of the first letter of their names correlates with an increase in length of side chain



Glutamate (E)

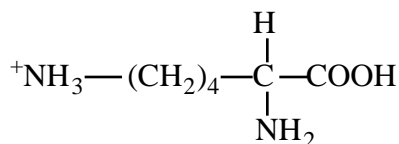
aspartate plus one *methylene*, G is after A

Basic - positive charges



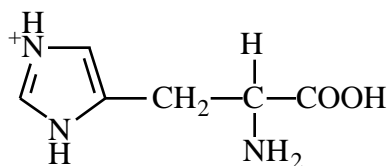
Arginine (R)

3 carbon chain linked to a C full of only N's (no H's & C has 4 bonds) through an N



Lysine (K)

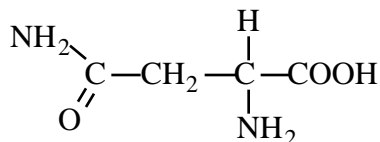
3 carbon chain plus one methylene to amino, it lies (“Lys”) about the 3 carbon trend



Histidine (H)

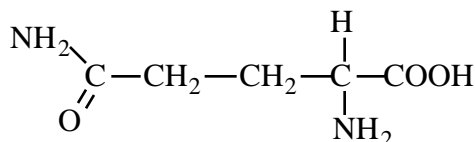
3 carbons to N and loop back through C ‘n’ N

Amide derivatives of acids - loose OH for NH₂ to loose charge



Asparagine (N)

amide derivative of aspartate



Glutamine (Q)

amide derivative of glutamate

For 3-D visualization, see: http://chemistry.gsu.edu/glactone/PDB/Amino_Acids/aa.html
For RasMol download, see: <http://www.umass.edu/microbio/rasmol/>