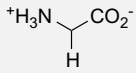
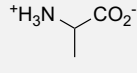


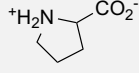
### Nonpolar, Aliphatic



**Glycine**  
(gly, G)

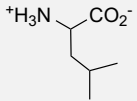


**Alanine**  
(ala, A)

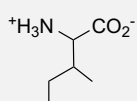


**Proline**  
(pro, P)

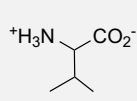
### Branched-chain



**Valine**  
(val, V)

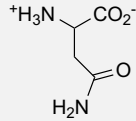


**Leucine**  
(leu, L)

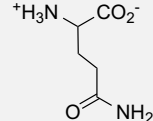


**Isoleucine**  
(ile, I)

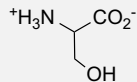
### Polar, Uncharged



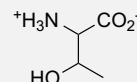
**Asparagine**  
(asn, N)



**Glutamine**  
(gln, Q)

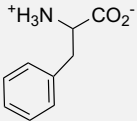


**Serine**  
(ser, S)

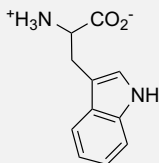


**Threonine**  
(thr, T)

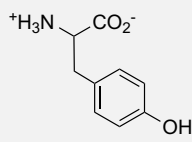
### Aromatic



**Phenylalanine**  
(phe, F)

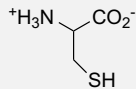


**Tryptophan**  
(trp, W)

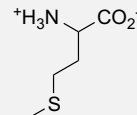


**Tyrosine**  
(tyr, Y)  
pKa = 10.46

### Sulfur-Containing

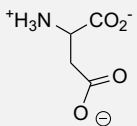


**Cysteine**  
(cys, C)  
pKa = 8.37

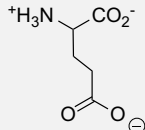


**Methionine**  
(met, M)

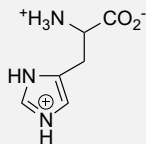
### Charged



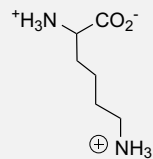
**Aspartic Acid**  
(asp, D)  
pKa = 3.90



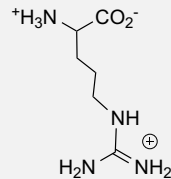
**Glutamic Acid**  
(glu, E)  
pKa = 4.07



**Histidine**  
(his, H)  
pKa = 6.04



**Lysine**  
(lys, K)  
pKa = 10.54



**Arginine**  
(arg, R)  
pKa = 12.48

Negative, Acidic

Positive, Basic