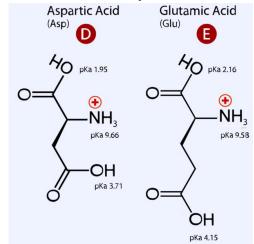
Table of the 20 Common Amino Acids (Drawn in the Conjugate Acid Forms)

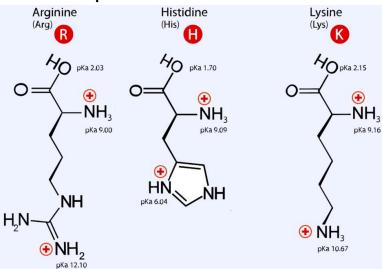
Neutral (polar) R Groups

Serine **Threonine Asparagine** Glutamine (Ser) S (Gln) (Asn) (Thr) Q pKa 2.20 pKa 2.16 pKa 2.18 pKa 2.13 **%**O 0= 0= O=0= pKa 8.76 pKa 8.96 pKa 9.00 pKa 9.05 NH₃ NH₃ NH₃ $\cdot NH_3$ **(+) ①** • • 0 OHO= $\dot{N}H_2$ $\dot{N}H_2$

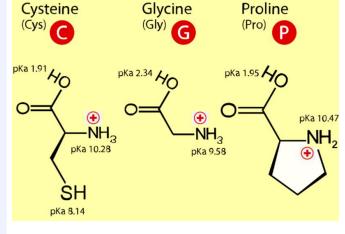
Acidic R Groups



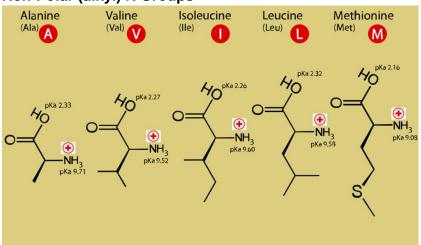
Basic R Groups



Unusual R Groups (selenocysteine not included)



Non-Polar (alkyl) R Groups



Non-Polar (aromatic) R Groups

