(11) **Today**

Chap 3: Amino Acids, Peptides, and Proteins

Next Class (12)

Chap 3: Amino Acids, Peptides, and Proteins

(13) **Second Class from Today**

Chap 3: Amino Acids, Peptides, and Proteins

Third Class from Today (14)

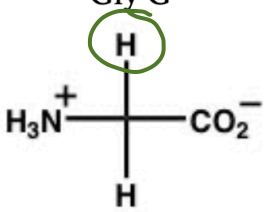
Chap 3: Amino Acids, Peptides, and Proteins

Biochem Test 1 on Wed. Feb 26, one week from today
Chap 1 (skipping 1.4) Chap 2, and Chap 3.1 - 3.2.1

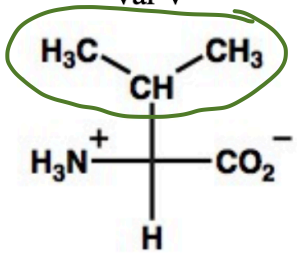
Amino Acid Side Chains: Non-polar

Section 3.1.3 - 3.1.5

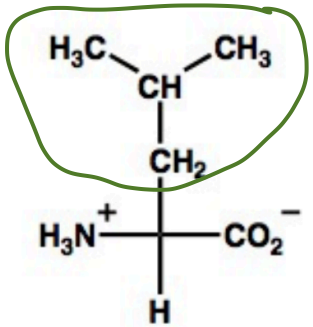
glycine
Gly G



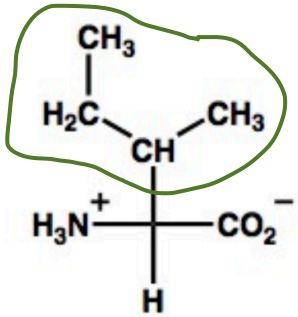
valine
Val V



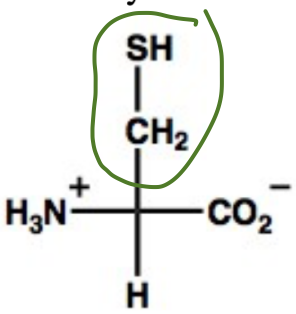
leucine
Leu L



isoleucine
Ile I



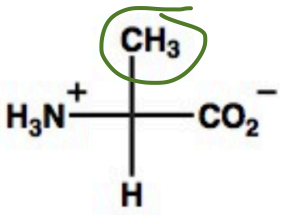
cysteine
Cys C



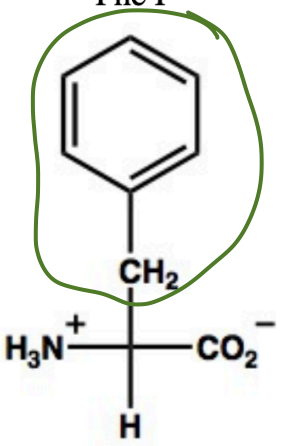
hydrocarbon side chains make these side chains nonpolar

hydrophobic ... don't interact well with H_2O

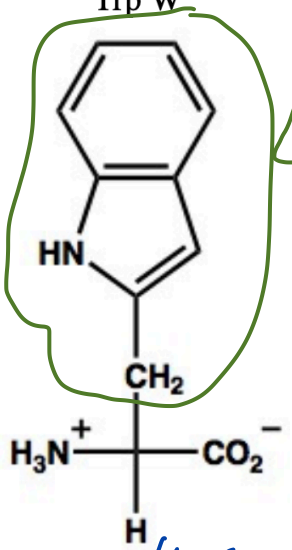
alanine
Ala A



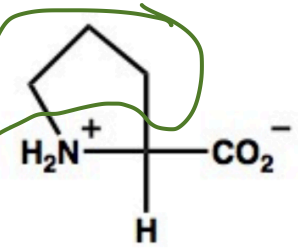
phenylalanine
Phe F



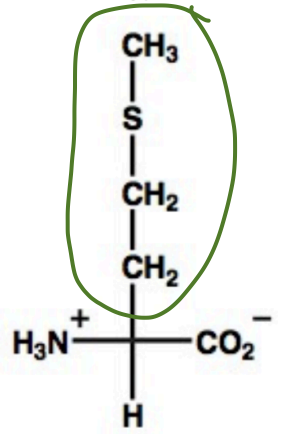
tryptophan
Trp W



proline
Pro P



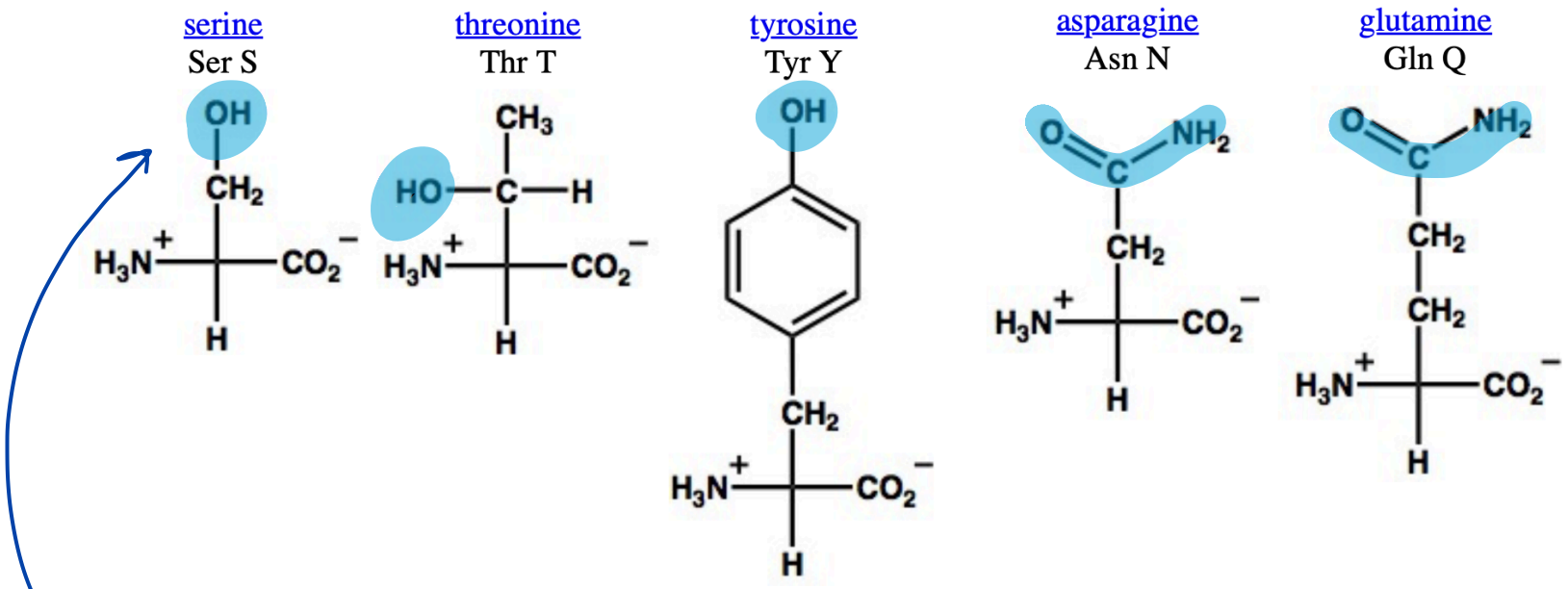
methionine
Met M



prefer to interact with other nonpolar molecules

Amino Acid Side Chains: Polar

Section 3.1.3 - 3.1.5

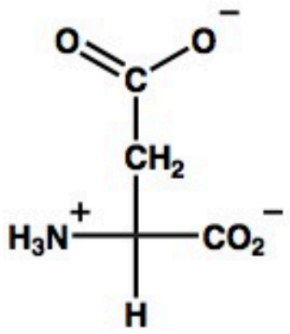


polar OH's (alcohol) and $\overset{O}{\overset{\|}{C}}-NH_2$ (amide) functional groups

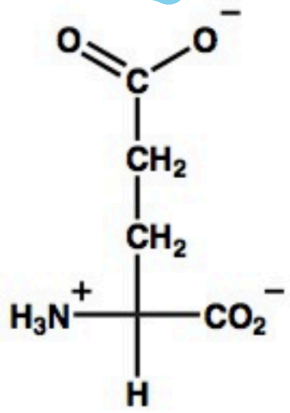
hydrophilic

as determined in their uncharged state

aspartate
Asp D

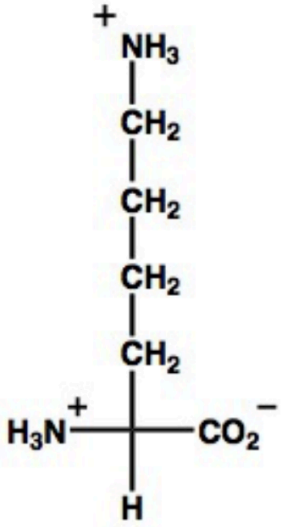


glutamate
Glu E

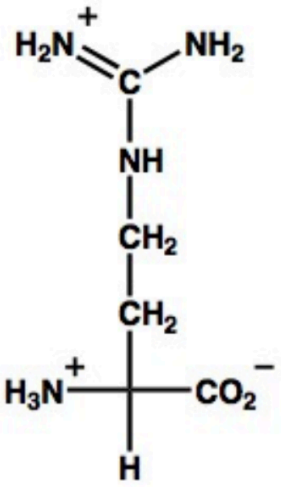


Negatively charged

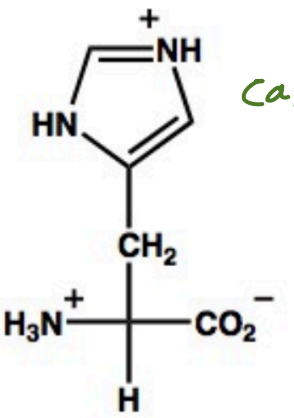
lysine
Lys K



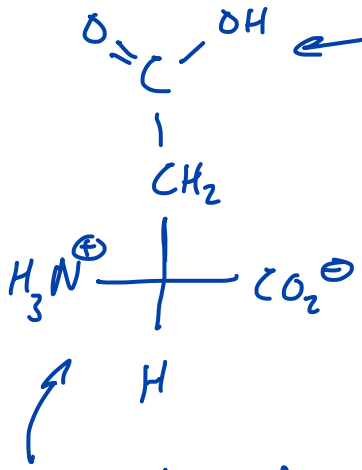
arginine
Arg R



histidine
His H

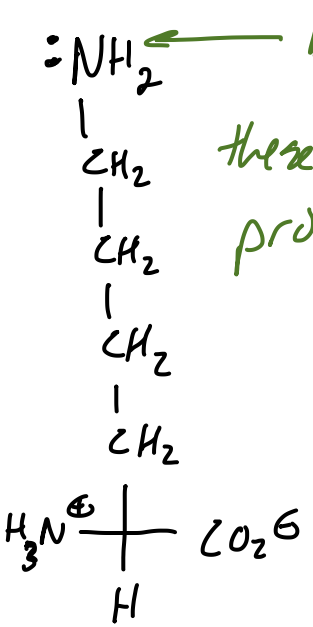


cationic



← acid

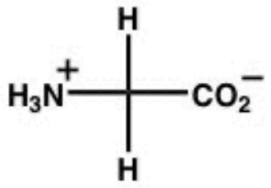
typically deprotonated so when doing acid base chem the carboxylate version acts as a weak base



← basic nitrogen

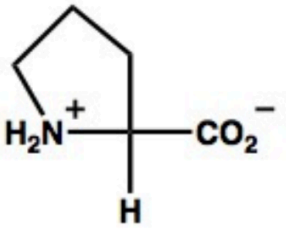
these are typically protonated

glycine
Gly G



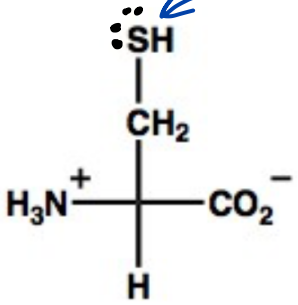
achiral amino acid
super small ... flexible

proline
Pro P



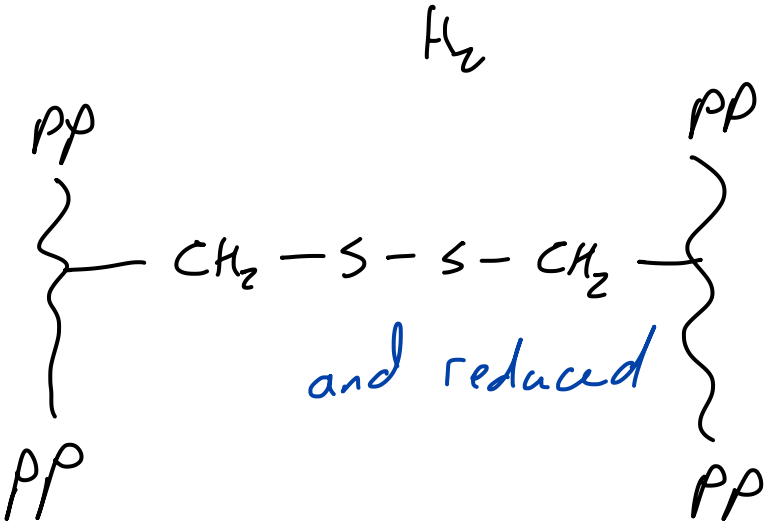
not flexible
often causes abrupt changes in structure
kinks in 2° structures

cysteine
Cys C



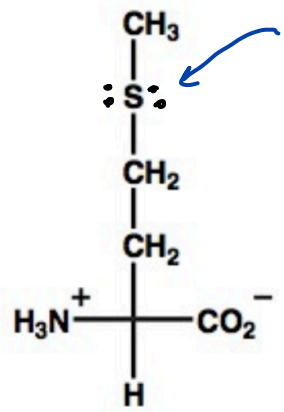
nucleophilic S atom

reversibly oxidized



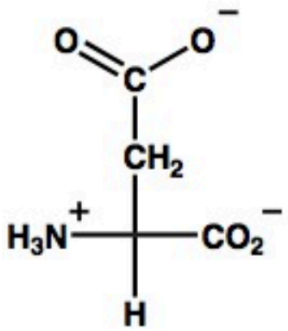
and reduced

methionine
Met M

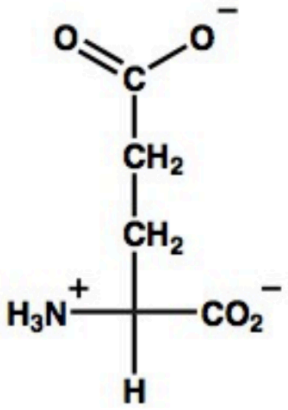


nucleophilic S atom

aspartate
Asp D



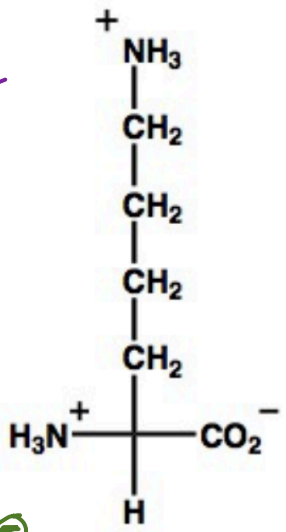
glutamate
Glu E



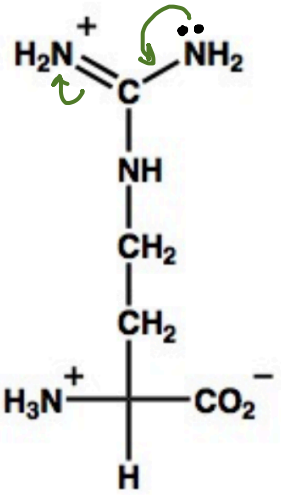
do the same thing
just diffrent length
side chains

This resonance contributor shows us that these N atoms are more e⁻ rich than other N atom

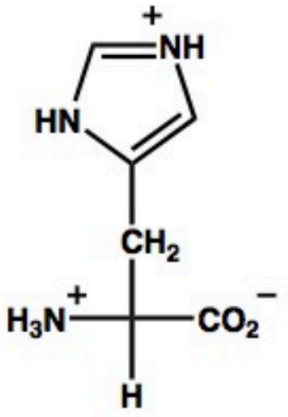
lysine
Lys K



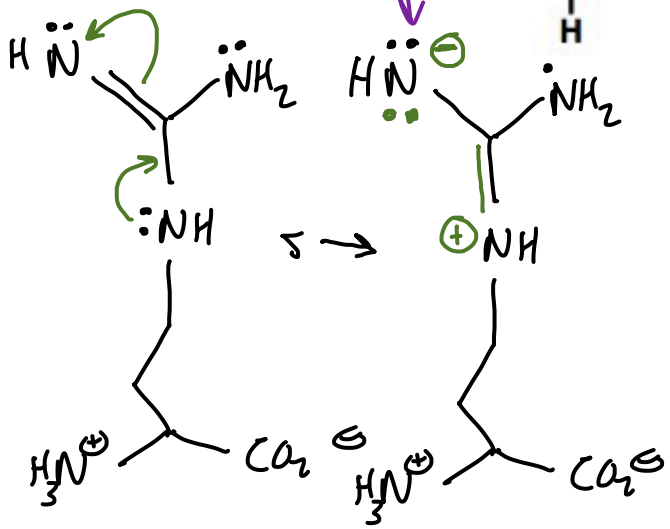
arginine
Arg R



histidine
His H



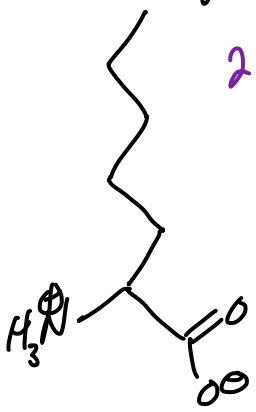
strongest base



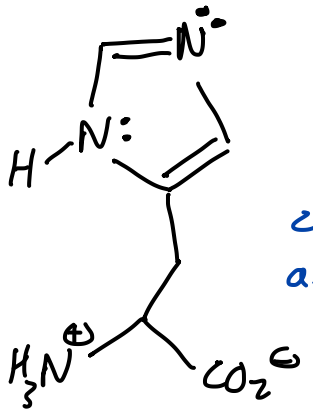
least likely to be in deprotonated state

no resonance contributor to add e⁻ density

25% s



weakest base

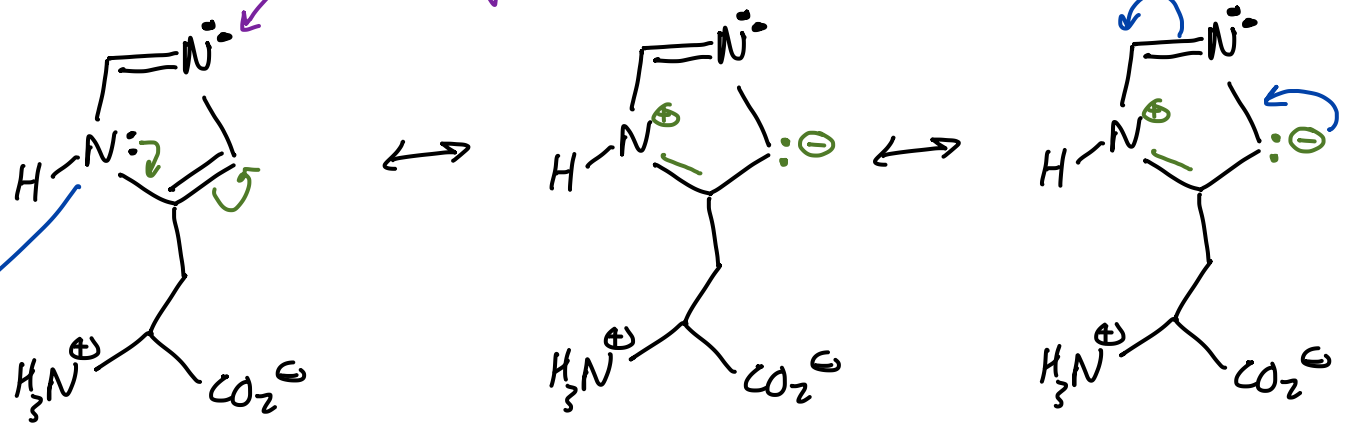


sp² N atom

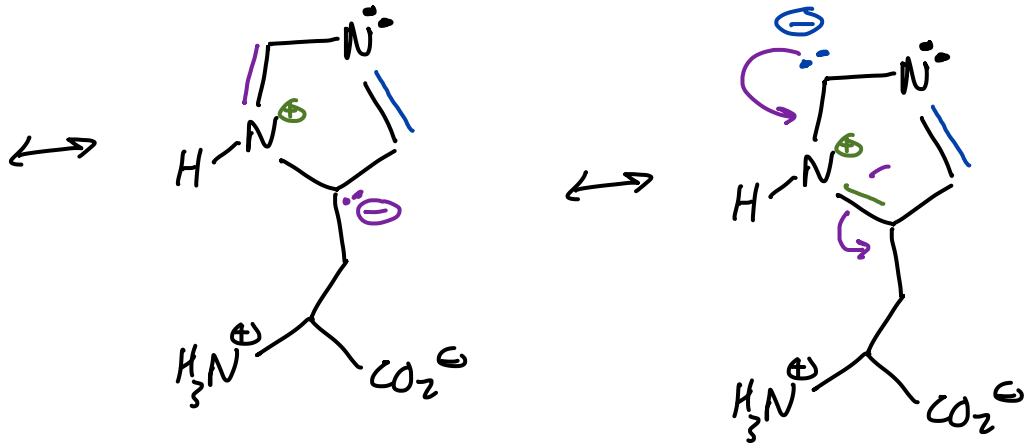
33% s means e⁻'s closer to Nucleus and less attractive to H⁺

can be found in protonated & deprotonated state

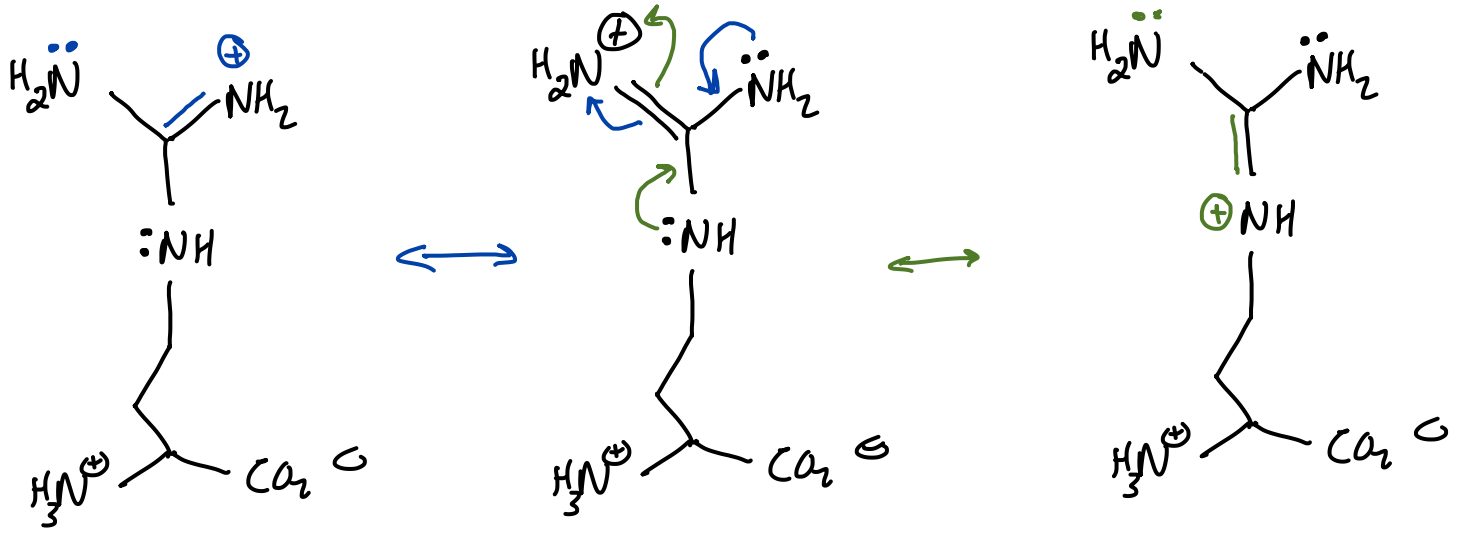
these e⁻ are not part of the π system they are basic



these e⁻'s are stuck in an aromatic π system they are not basic

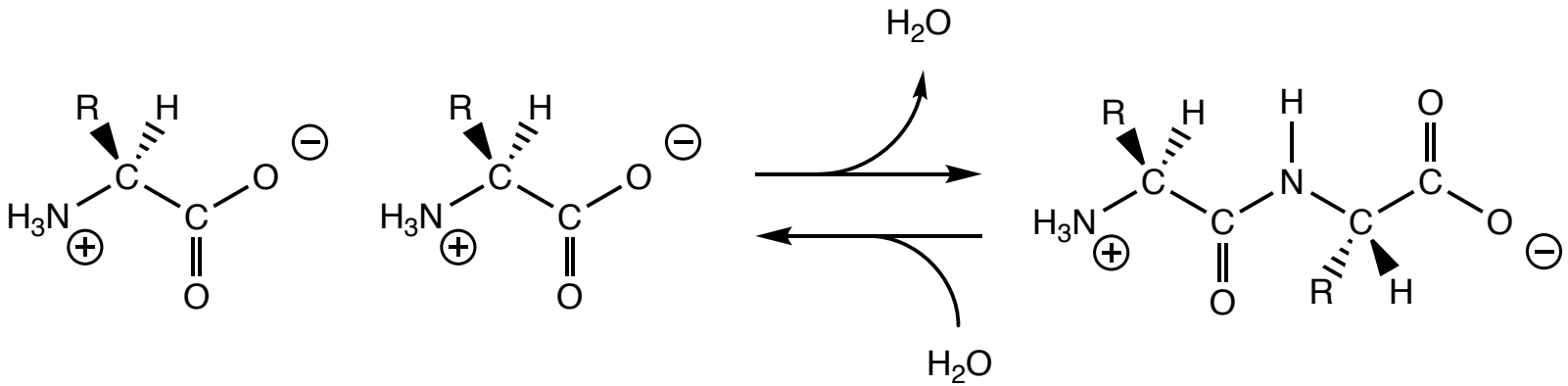


Explaining base strength by looking at resonance stabilization of the protonated base



Resonance spreads the ⊕ charge out over 3 N atoms whereas with lysine one N atom has to bear the ⊕ charge

DNA -> mRNA on Ribosome mRNA and tRNA build proteins



DNA sequence determines RNA sequence which determines the 1° structure