

CONCEPT: AMINO ACIDS CLASSIFICATIONS

- Amino acids are classified by the _____ of the **R** groups attached to the α -carbon.
 - Classified as (1) _____ polar, (2) _____, or (3) _____ amino acids.

(1) Nonpolar Amino Acids

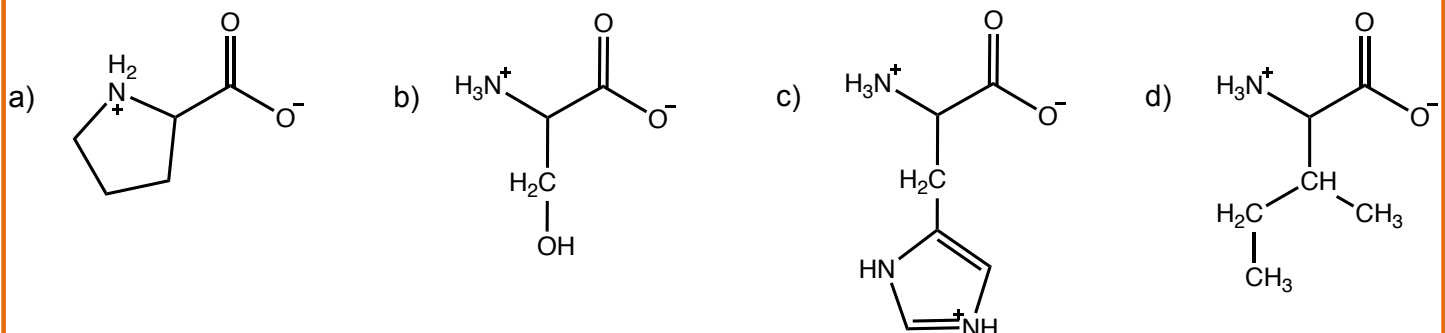
- Contain **R** groups that are nonpolar and _____.
 - Hydrophobic:** water _____ and do _____ interact with water.

MEMORY TOOL: GAV Trp Fell LIMPing



Nonpolar Amino Acids				
Glycine, _____, _____ 	Alanine, _____, _____ 	Valine, _____, _____ 	Tryptophan, _____, _____ 	Phenylalanine, _____, _____
Leucine, _____, _____ 	Isoleucine, _____, _____ 	Methionine, _____, _____ 	Proline, _____, _____ 	

EXAMPLE: Identify all hydrophobic amino acids.



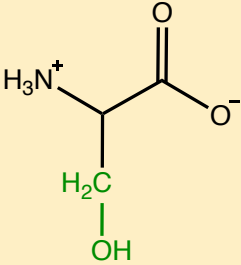
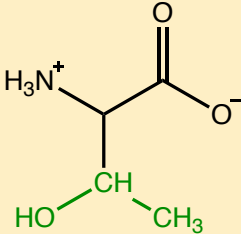
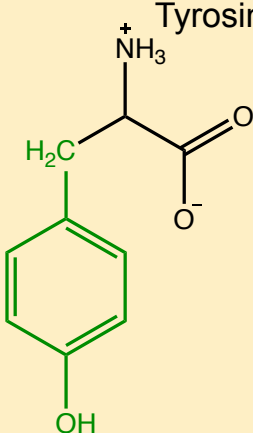
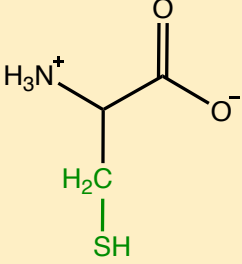
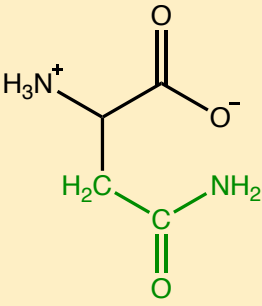
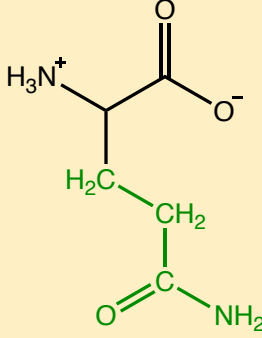
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2) Polar Amino Acids

- Contain **R** groups that are polar and _____.
- **Hydrophilic:** water _____ and interact with water.
 - All except for cysteine form _____ with water.

MEMORY TOOL: Santa's Team Tyrelessly Crafts New Quilts



Polar Amino Acids		
Serine, _____, _____ 	Threonine, _____, _____ 	Tyrosine, _____, _____ 
Cysteine, _____, _____ 	Asparagine, _____, _____ 	Glutamine, _____, _____ 

EXAMPLE: Which of the following amino acids will have R groups mostly on the outside of the proteins?

- a) Met
- b) Gln
- c) Thr
- d) Trp

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3) Charged Amino Acids

- Polar amino acids contain **R** groups that are electrically _____ at physiological pH.

□ **Acidic:** R group contains a _____ **carboxylate** group.

□ **Basic:** R group contains a _____ **amino** group.

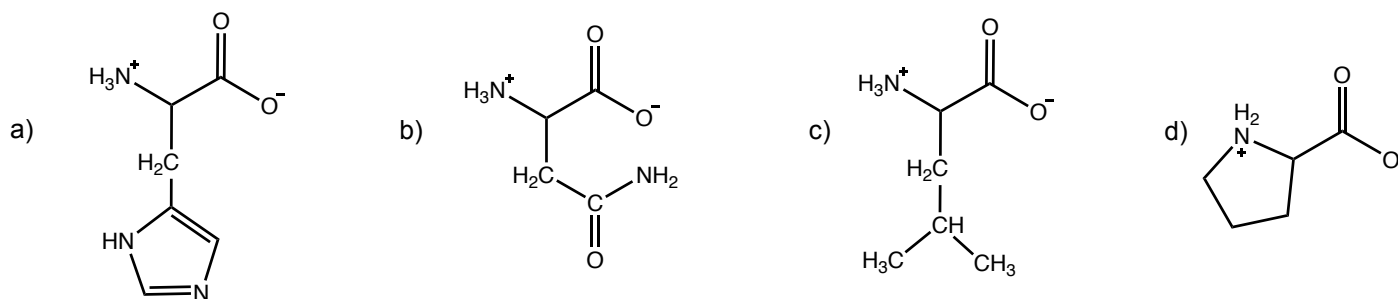
MEMORY TOOL: Dragons Eat Knights Riding Horses



Charged Polar Amino Acids				
Acidic		Basic		
Aspartic acid Aspartate, _____, _____	Glutamic acid Glutamate, _____, _____	Lysine, _____, _____ _____	Arginine, _____, _____ _____	Histidine, _____, _____ _____

- Exist as _____ forms of their acidic and basic forms.

EXAMPLE: Which amino acid would have a net charge of +1 at physiological pH?



CONCEPT: AMINO ACIDS CLASSIFICATIONS

PRACTICE: Classify each amino acid as polar, nonpolar, acidic, or basic.

- | | |
|--------|--------|
| a) Glu | d) Lys |
| b) Val | e) Gln |
| c) Pro | f) Arg |

PRACTICE: Provide one letter codes for amino acids with neutral hydrophilic R groups that participate in H bonding.