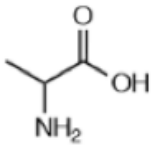
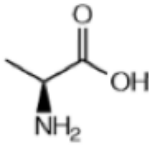
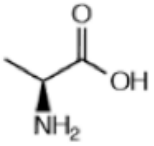
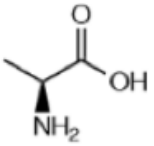
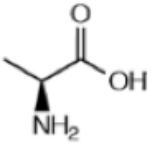
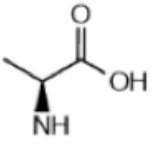
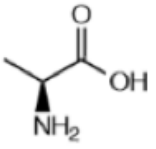
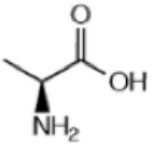
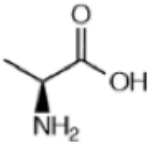
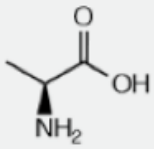
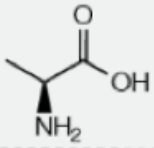
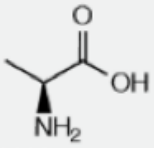
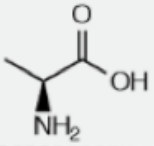
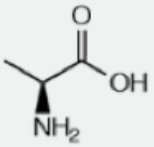
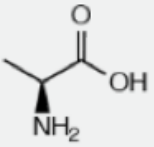
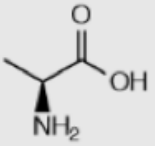
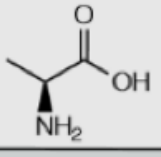
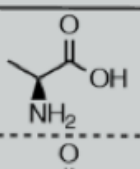
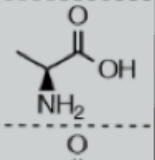
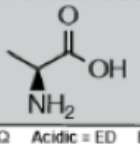
CONCEPT: THE CLUTCH PREP AMINO ACID BREAKDOWN

Nonpolar Side Chains:	Notes:
	Glycine **Gly (G)** COOH = 2.34 NH_3^+ = 9.60
	Alanine **Ala (A)** COOH = 2.34 NH_3^+ = 9.69
	Valine **Val (V)** COOH = 2.32 NH_3^+ = 9.62
	Leucine **Leu (L)** COOH = 2.36 NH_3^+ = 9.60
	Isoleucine **Ile (I)** COOH = 2.36 NH_3^+ = 9.60
	Proline **Pro (P)** COOH = 1.99 NH_3^+ = 10.60
	Methionine **Met (M)** COOH = 2.28 NH_3^+ = 9.21
	Phenylalanine **Phe (F)** COOH = 1.83 NH_3^+ = 9.13
	Tryptophan **Trp (W)** COOH = 2.83 NH_3^+ = 9.39

Polar Side Chains:	Notes:
	Cysteine **Cys (C)** COOH = 1.96 NH_3^+ =10.28
	Serine **Ser (S)** COOH = 2.21 NH_3^+ = 9.15
	Threonine **Thr (T)** COOH = 2.09 NH_3^+ = 9.10
	Tyrosine **Tyr (Y)** COOH = 2.20 NH_3^+ = 9.11
	Asparagine **Asn (N)** COOH = 2.02 NH_3^+ = 8.80
	Glutamine **Gln (Q)** COOH = 2.17 NH_3^+ = 9.13

Acidic Side Chains:	Notes:
	Aspartic Acid **Asp (D)** COOH = 1.88 NH_3^+ = 9.60
	Glutamic Acid **Glu (E)** COOH = 2.19 NH_3^+ = 9.67

Basic Side Chains:	Notes:
	Lysine **Lys (K)** COOH = 2.18 NH_3^+ = 8.95
	Histadine **His (H)** COOH = 1.82 NH_3^+ = 9.17
	Arginine **Arg (R)** COOH = 2.17 NH_3^+ = 9.04

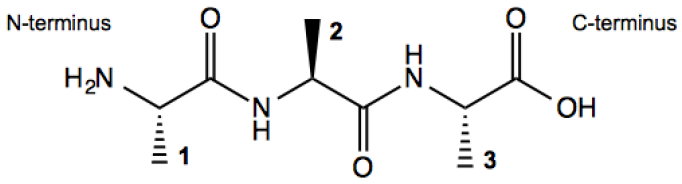
= ***universally*** accepted as essential amino acids (FVT HI_KLMW) **Aliphatic** = GAVLIP **Other Nonpolars** = MWF **Polars** = C-STY-NQ **Acidic** = ED **Basic** = KHR

CONCEPT: THE 20 AMINO ACIDS: BLANK WORKSHEET

Nonpolar Side Chains:	Notes:	**Polar Side Chains:**	Notes:
	COOH = 2.34 NH_3^+ = 9.60		COOH = 1.96 NH_3^+ =10.28
	COOH = 2.34 NH_3^+ = 9.69		COOH = 2.21 NH_3^+ = 9.15
	COOH = 2.32 NH_3^+ = 9.62		COOH = 2.09 NH_3^+ = 9.10
	COOH = 2.36 NH_3^+ = 9.60		COOH = 2.20 NH_3^+ = 9.11
	COOH = 2.36 NH_3^+ = 9.60		COOH = 2.02 NH_3^+ = 8.80
	COOH = 1.99 NH_3^+ = 10.60		COOH = 2.17 NH_3^+ = 9.13
	COOH = 2.28 NH_3^+ = 9.21	**Acidic Side Chains:**	Notes:
	COOH = 1.83 NH_3^+ = 9.13		COOH = 1.88 NH_3^+ = 9.60
	COOH = 2.83 NH_3^+ = 9.39		COOH = 2.19 NH_3^+ = 9.67
		Basic Side Chains:	Notes:
			COOH = 2.18 NH_3^+ = 8.95
			COOH = 1.82 NH_3^+ = 9.17
			COOH = 2.17 NH_3^+ = 9.04

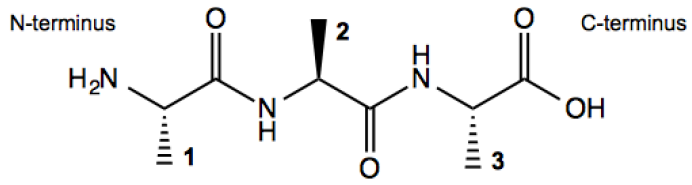
CONCEPT: THE 20 AMINO ACIDS: NON-POLAR SIDECHAINS

PRACTICE 1: Non-Polar Sidechains - Fill in the missing sidechains on the following target tripeptide.



Target Peptide: **L-A-M**

PRACTICE 2: Non-Polar Sidechains - Fill in the missing sidechains on the following target tripeptide.



Target Peptide: **W-I-G**

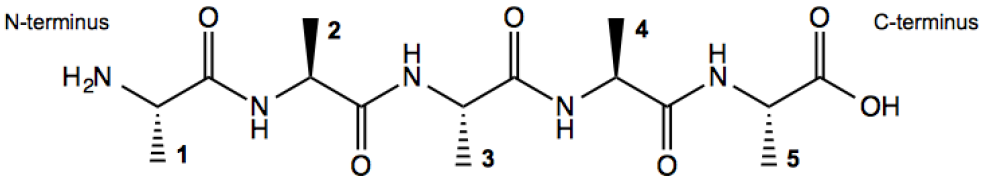
PRACTICE 3: Non-Polar Sidechains - Provide the complete structure of the tripeptide P-F-W

CONCEPT: THE 20 AMINO ACIDS: POLAR SIDECHAINS

PRACTICE 1: Polar Sidechains - Provide the Fischer Projection of Glutamine (Q)

PRACTICE 2: Polar Sidechains - Provide the complete structure of the dipeptide Asn-Cys

PRACTICE 3: Polar Sidechains - Fill in the missing sidechains on the following target oligopeptide.

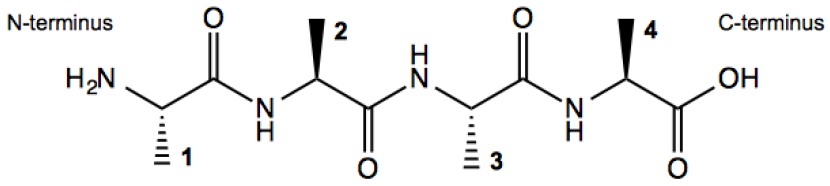


Target Peptide: **F-A-S-T-N**

CONCEPT: THE 20 AMINO ACIDS: ACIDIC/BASIC SIDECHAINS

PRACTICE 1: Acidic/Basic Sidechains - Provide the Fischer Projection of Amino Acid (H)

PRACTICE 2: Acidic/Basic Sidechains - Fill in the missing sidechains on the following target oligopeptide.



Target Peptide: **R-E-C-K**

PRACTICE 3: Acidic/Basic Sidechains - Provide the complete structure of the oligopeptide V-I-D-Y. Based on your knowledge of hydrophobicity, which side of the peptide is more likely bury itself within the protein?