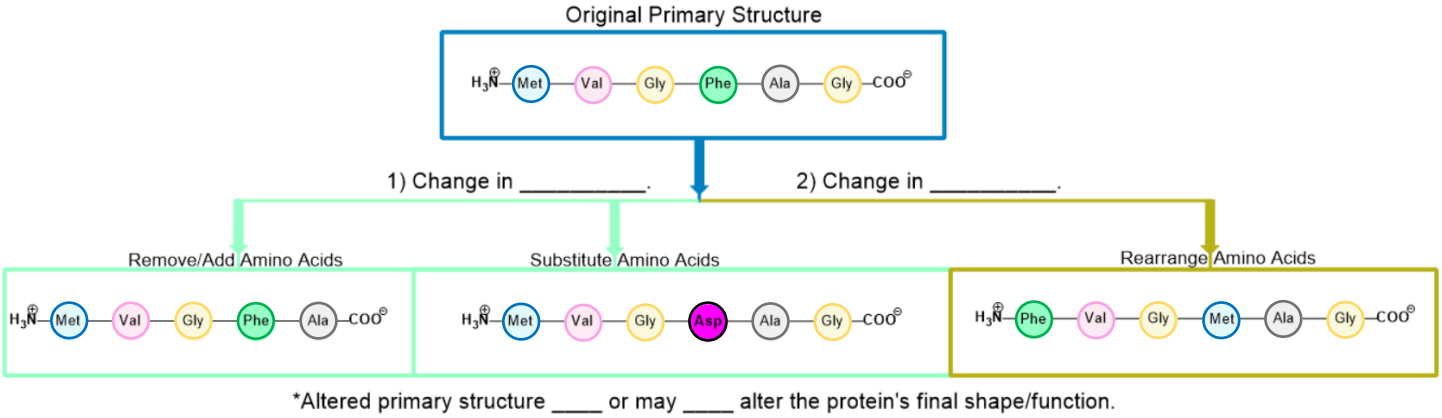
CONCEPT: ALTERING PRIMARY PROTEIN STRUCTURE

●Recall: Primary protein structure can be _____ by changing either amino acid: 1) *composition* or 2) *sequence*.

□ Just a _____ amino acid change *could* cause a protein to lose its shape & function.



PRACTICE: True or false: The following proteins with identical composition are certain to have the same shape/function.

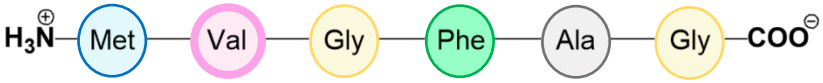
Protein #1: L-G-T-V-R-D Protein # 2: D-R-V-T-G-L

a) True. b) False.

Substituting Amino Acids

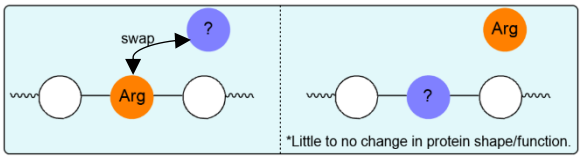
●If the substitute amino acid has similar properties to the original, it is _____ likely to cause a drastic change.

EXAMPLE: Which amino acid substitute is least likely to impact the protein's shape/function if substituted with Val?



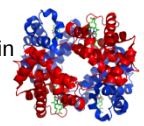
a) Asp b) Glu c) Ile d) His

PRACTICE: Which amino acid is *least* likely to alter protein shape/function if substituted with an Arg residue?



a) Lys b) Tyr c) Asn d) Ala

PRACTICE: Patients with sickle-cell anemia disease have a point mutation leading to a single amino acid substitution in the hemoglobin protein, causing it to alter its shape/function. Which amino acid substitution *most* likely causes the disease?

Hemoglobin 

a) Ser to Thr b) Arg to Lys c) Val to Leu d) Glu to Val