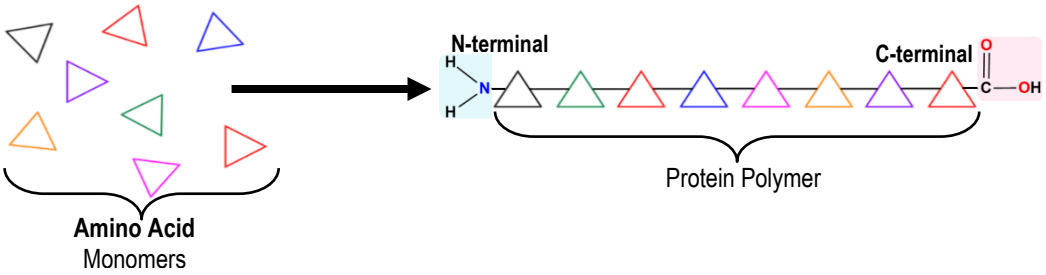
CONCEPT: PROTEINS

- *Proteins*: one of the four major biological macromolecules that have vast _____ & _____ roles.
- Proteins are polymers of _____ _____ monomers, which have _____ (*N-terminal* & *C-terminal* ends).
  - □ N-terminal has a free *amino group* and the C-terminal has a free *carboxyl group*.

EXAMPLE:



Amino Acids

- Each amino acid monomer contains *common components* & a *unique* _____.
- Living organisms use _____ different amino acids grouped based on their *R-groups*.

EXAMPLE:

Common to **all** Amino Acids

Amino Acid Components:
- -Central carbon atom (α-carbon)
- -Central Hydrogen atom
- -Amino group on N-terminal
- -Carboxyl group on C-terminal
- -**Unique** R-group

Amino Acid Structure

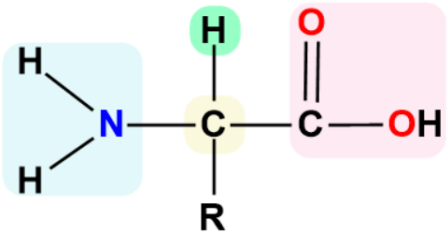
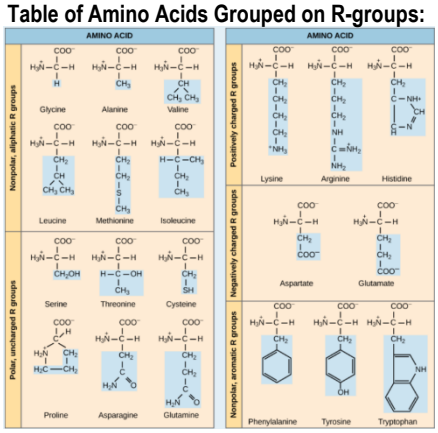


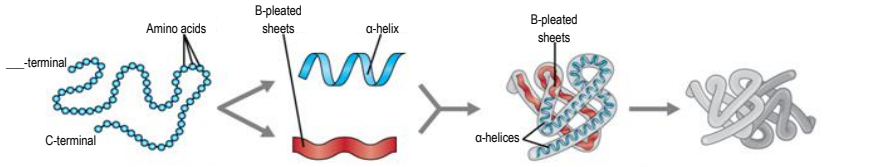
Table of Amino Acids Grouped on R-groups:



Protein Structure

- Proteins can have up to _____ levels of structure: *Primary*, *Secondary*, *Tertiary* & *Quaternary* levels of structure.
- Several terms refer to amino acid chains that _____ in length: *Oligopeptide*, *Peptide*, *Polypeptide* & *Protein*.

EXAMPLE: Consider the protein levels of structure below & complete the chart.



_____ **Protein Structure:** Types, quantity & order of amino acids.

Secondary Protein Structure: ___-helices or ___-sheets.

_____ **Protein Structure:** Overall 3D shape.

Quaternary Protein Structure: _____ amino acid chains.

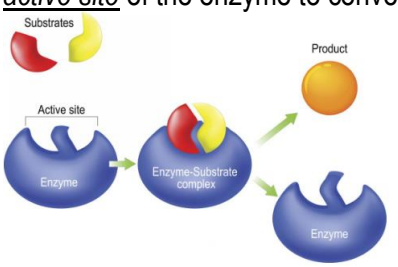
Term	Length of Amino Acid Chain
Oligopeptide	____ - ____ amino acids
Peptide	<____ amino acids
Polypeptide	>____ amino acids
Protein	100's to 1000's of amino acids (Includes _____ form)

Enzymes

- Recall: *enzymes* are proteins that _____ (or speed up) other reactions *without being consumed* by the reaction.
- The reactants (or _____) fit into the *active site* of the enzyme to convert them to products.

"-ase" = enzyme
(ex. Peptidase)

EXAMPLE:



CONCEPT: PROTEINS

PRACTICE: Which of the following is not a component of an amino acid?

a) Peptide
b) α-carbon
c) Amino group
d) Carboxyl group

PRACTICE: Which level of protein structure corresponds to the formation of α-helices and β-pleated sheets?

a) Primary
b) Secondary
c) Tertiary
d) Quaternary

PRACTICE: Fill in the blanks: Enzymes _____ chemical reactions _____ being consumed by the reaction.

a) Speed-up ; while
b) Slow-down ; without
c) Catalyze ; without
d) Inhibit ; while