

Proteins

Food sources for proteins include nuts, meat, fish, milk, beans.

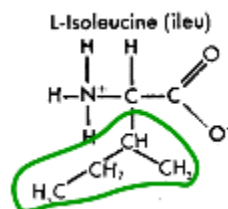
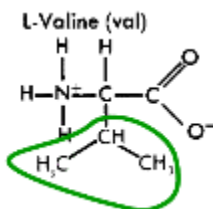
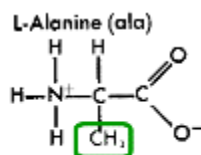
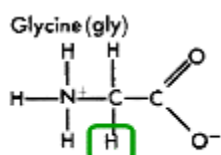
Proteins have three main **functions** in our bodies:

1. Form **structural** parts of all cells, organs and tissues
2. **Enzymes** that speed up all chemical reactions are all proteins
3. **Transport** substances within and between cells

Amino Acid Monomers

- The monomer to make proteins are **amino acids**
- All proteins are made of the same 20 amino acids connected in different combinations.
- All amino acids have an amino functional group, and an acid functional group
- Each amino acid has a unique side functional group

Here are a few amino acids. Circle the amino group.
Draw a square around the acid or carboxyl group.



Forming Protein Polypeptides

- Amino acids form a covalent bond between the amino and acid functional groups of two amino acids.
- This is a **peptide bond**.
- This is a dehydration synthesis reaction because water is produced and a polypeptide is synthesized.
- **Polypeptide chains** can be 40 to 1000 amino acids long

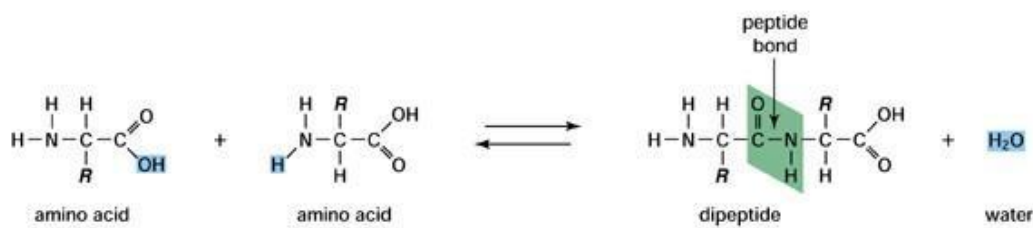


Figure 1.17. In the first stage of the formation of a polypeptide, two amino acids are linked together. The R groups appear only as "R" because they do not take part in the reaction that produces or breaks a peptide bond.

Protein Folding and 3D Structures

- Proteins are only functional when the polypeptide folds into the correct 3D shape.
- A polypeptide is a **primary** protein structure.
- Each polypeptide folds into a unique three dimensional structure
- When protein foods are cooked the protein shape is damaged

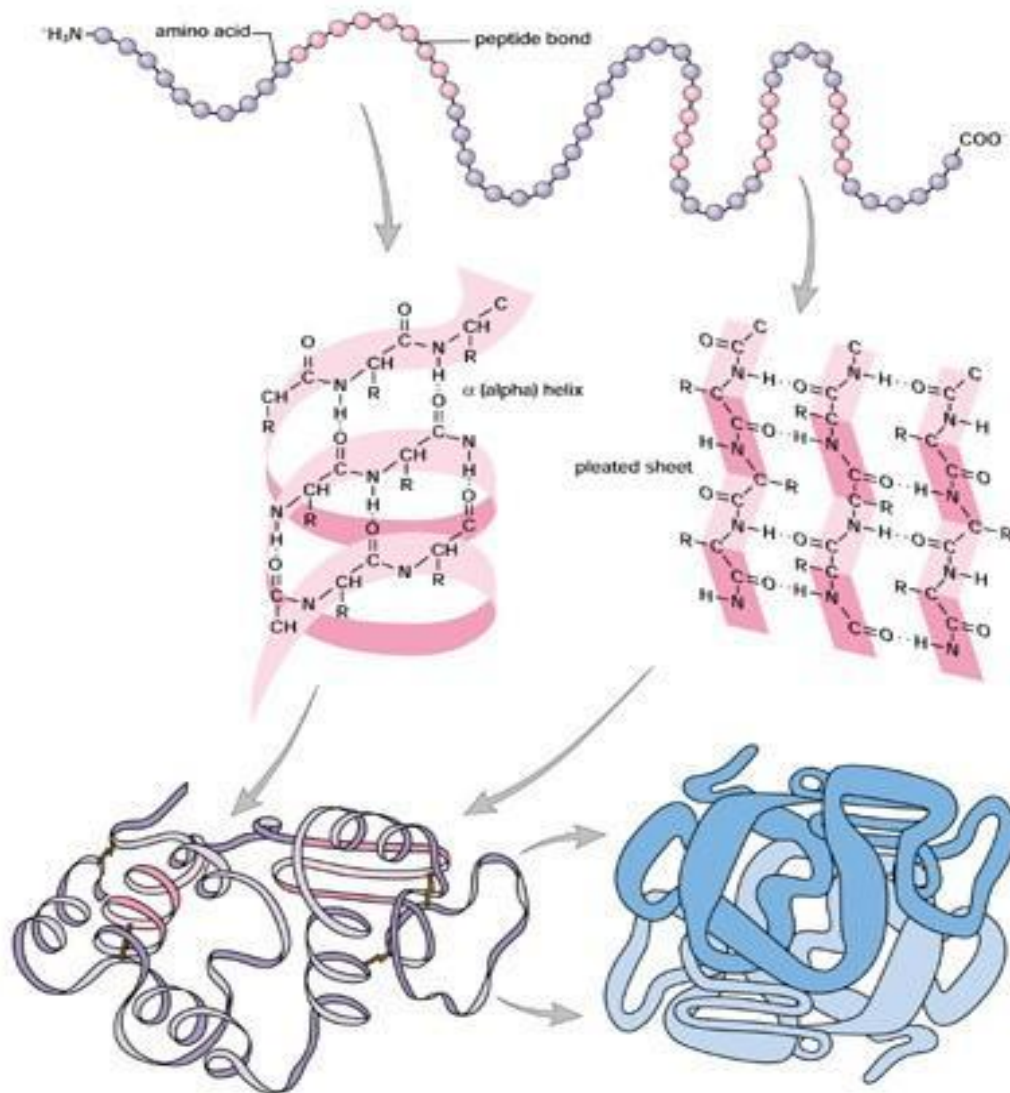


Figure 1.19. The formation of a protein macromolecule from a polypeptide.

Proteins

Food sources for proteins include

Proteins have three main **functions** in our bodies:

1. Form _____ parts of all cells, organs and tissues
2. _____ that speed up all chemical reactions are all proteins
3. _____ substances within and between cells

Amino Acid Monomers

- The _____ to make proteins are

- All proteins are
-

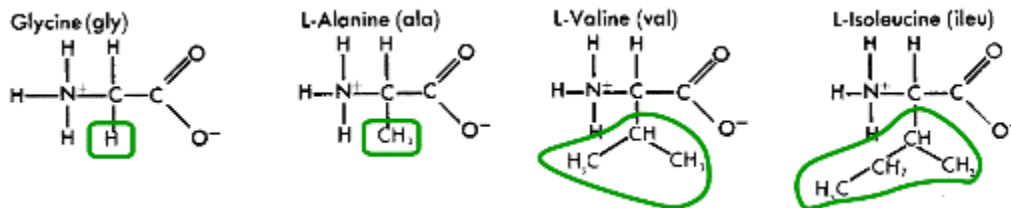
connected in different combinations.

- All amino acids have an _____ functional group, and an _____ functional group

- Each amino acid has

_____ group

Here are a few amino acids. Circle the amino group. Draw a square around the acid or carboxyl group.



Forming Protein Polypeptides

- Amino acids form _____
between the amino and acid functional groups of two amino acids.
- This is a _____ **bond**.
- This is a _____ reaction
because water is produced and a polypeptide is synthesized.
- Polypeptide chains** can be 40 to 1000 amino acids long

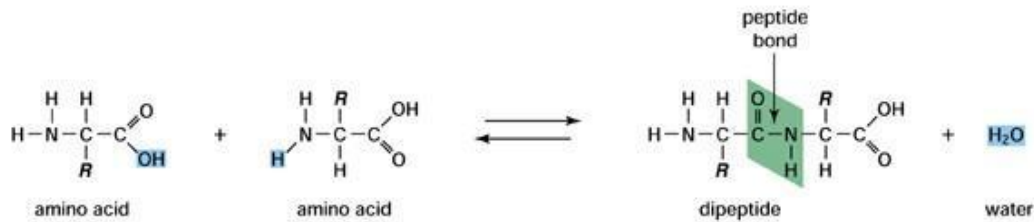
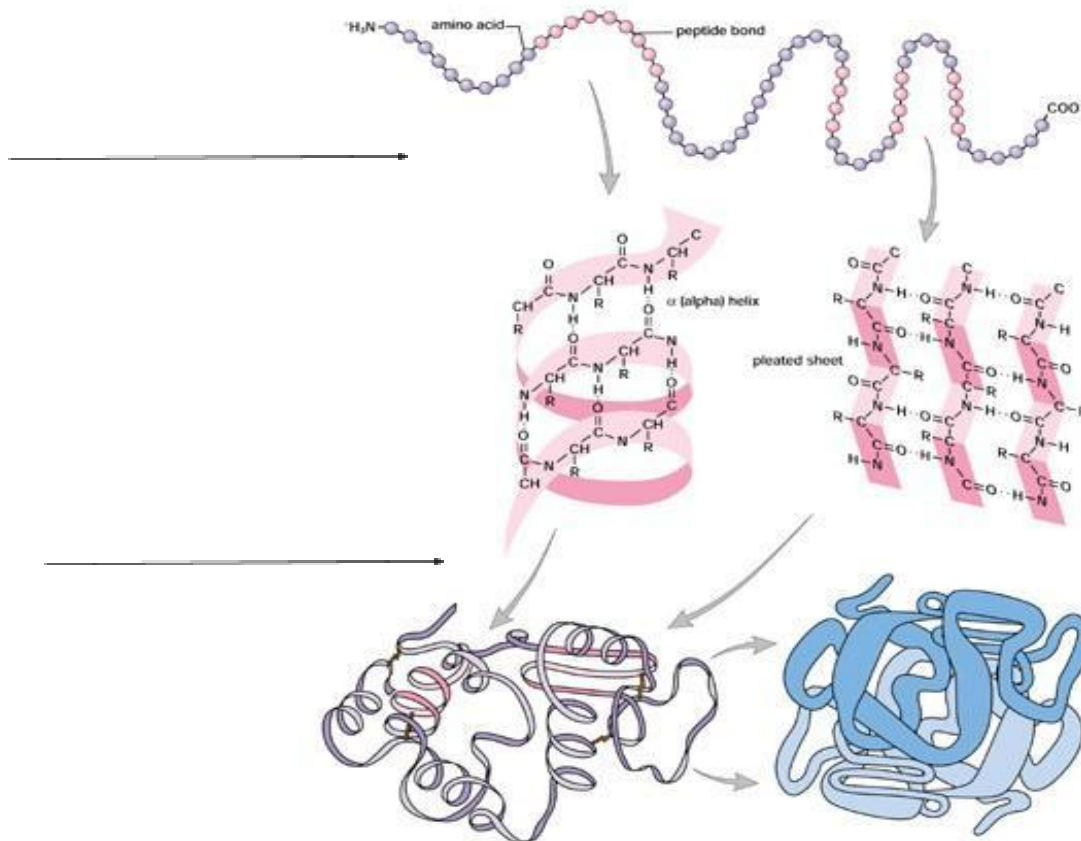


Figure 1.17. In the first stage of the formation of a polypeptide, two amino acids are linked together. The R groups appear only as "R" because they do not take part in the reaction that produces or breaks a peptide bond.

Protein Folding and 3D Structures

- Proteins are only _____ when _____ into the correct _____.
- A polypeptide is a **primary** protein structure.
- When protein foods are _____ the protein _____



Proteins

Read pages 30-34 of the Biology 11 textbook to answer the following questions.

1. Define the following terms
 - (a) Protein
 - (b) Amino acid
 - (c) Polypeptide
2. List 6 functions of proteins.
3. Draw a diagram of the **general structure** for an amino acid. Label the amino group, carboxyl (acid) group and the unique side chain. See Fig 16.

Use Fig 17 for # 4-6

4. Name three amino acids that have a **ring** in their side chain.
5. Name two amino acids that have **sulfur (S)** in their side chain.
6. Name two amino acids that have **nitrogen (N)** in their side chain.
7. How many amino acids are there?
8. One very special type of protein is an enzyme. Define enzymes.