Biochemistry:

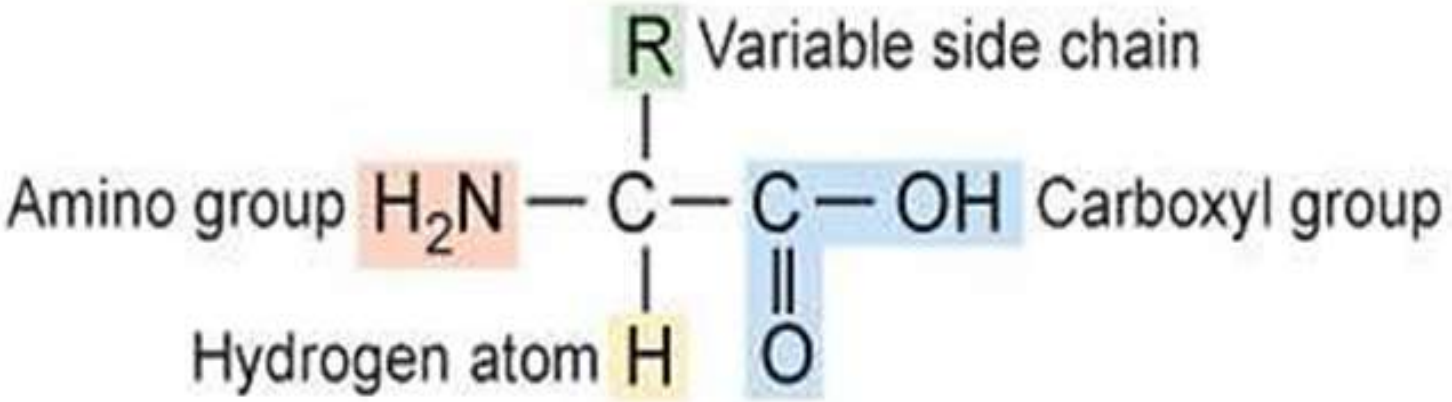
Proteins

Proteins

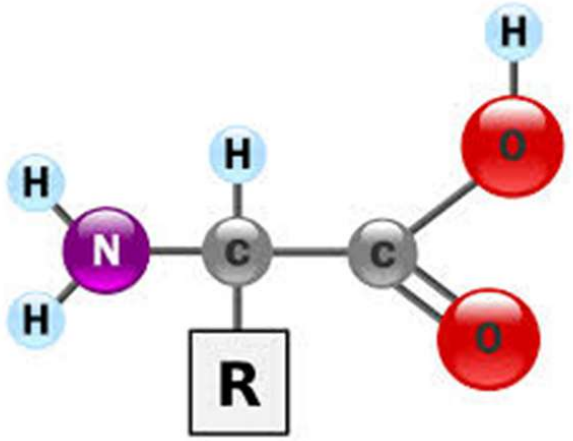
- **Foods**: meats, soy, cheese
- Large complex polymer composed of C, H, O, N & sometimes S
- Monomers (basic building blocks): **Amino acids**
  - **20** different amino acids

Proteins

- Example: amino acids:



Proteins

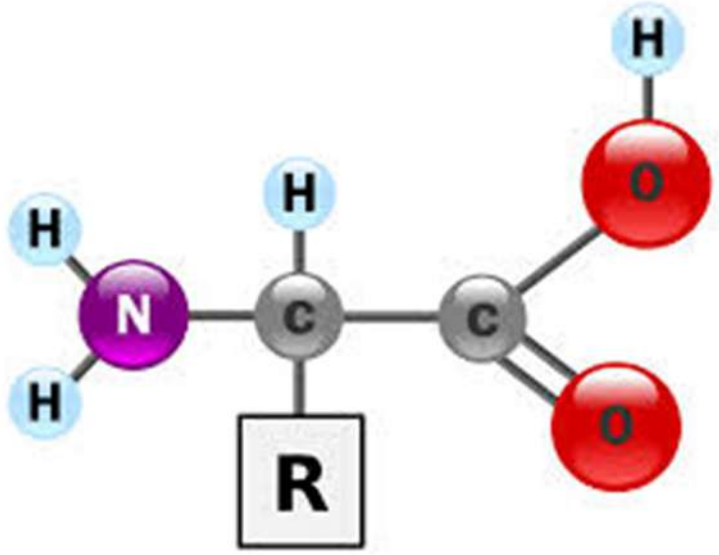


Structure of an amino acid

- Central carbon atom bonded with **hydrogen**. The other 3 bonds are with an **amino** group (-NH2), a **carboxyl** group (-COOH), and a **variable** group (-R).
- The variable makes each amino acid **different**!

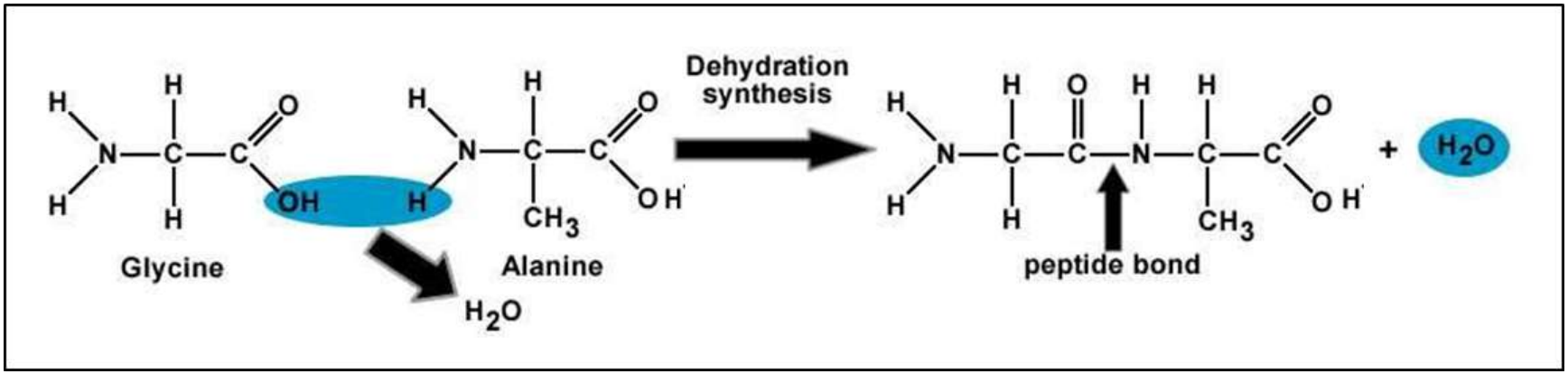
Proteins

- Amino acids are linked together by **dehydration synthesis** to form a protein.

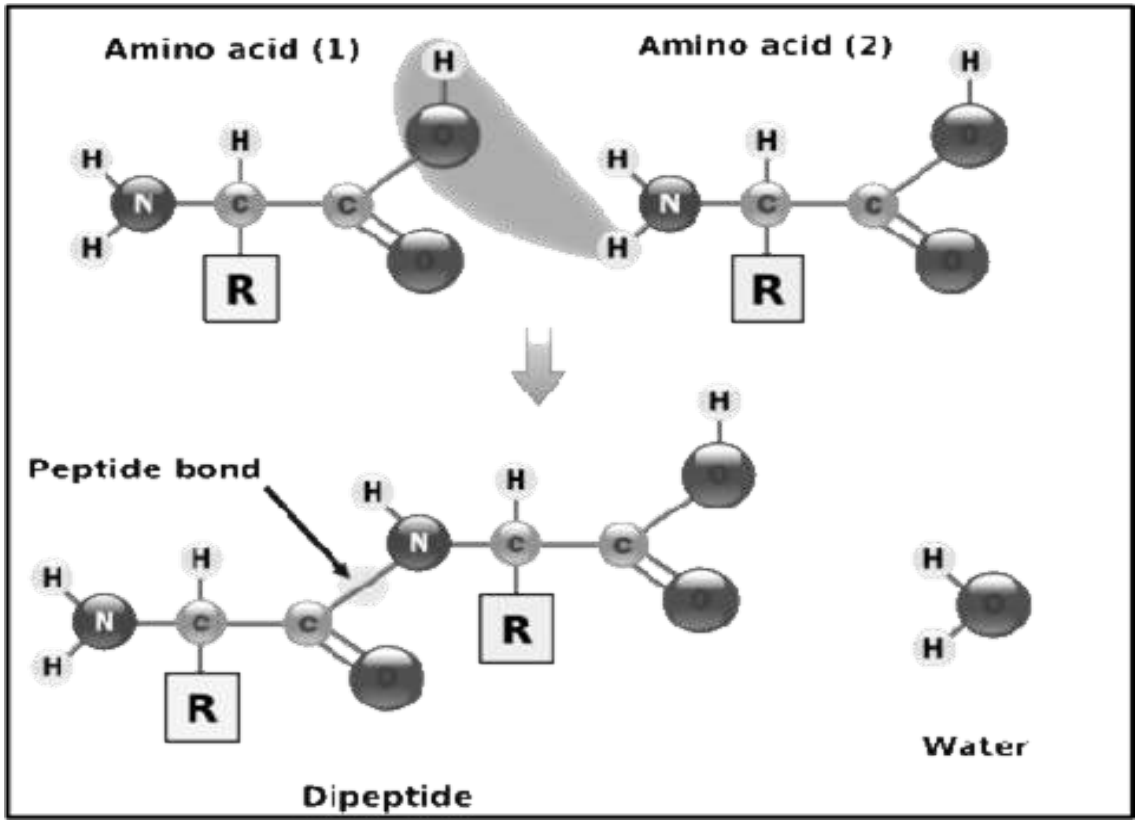


Proteins

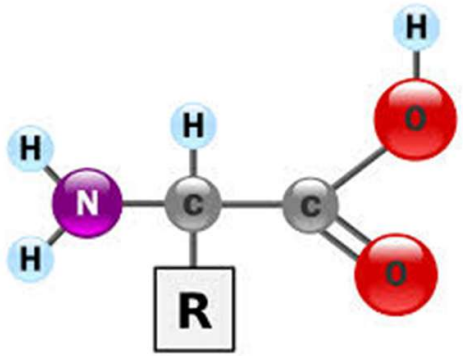
- Ex: 2 amino acids joined by **dehydration synthesis**.



- **Peptide bond** = a covalent bond that joins amino acids to each other.
  - Forms between the **amino** group of one amino acid and the **carboxyl** group of the other amino acid.

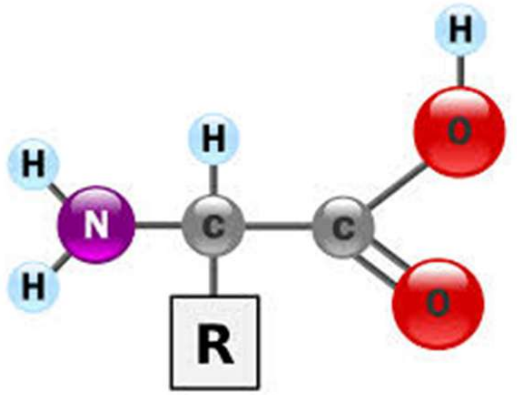


Proteins



- Proteins – named for the **number** of amino acids that make them.
- Ex:
  - Two amino acids = **dipeptide**
  - Three amino acids = **tripeptide**
  - Many amino acid = **polypeptide**

Proteins

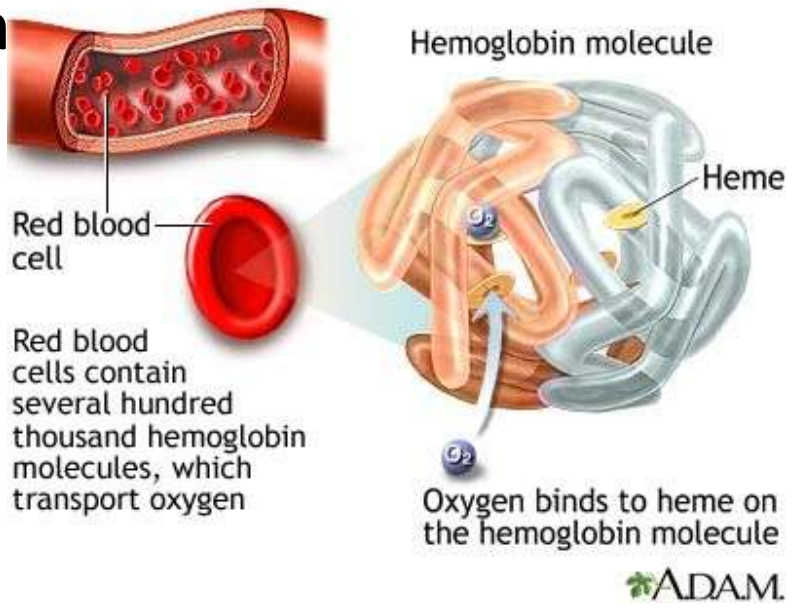


- **Essential Amino Acids:**
  - **8** of the **20** amino acids are "essential" because they are required by the body but **NOT** created by it.
    - As a result, it must be provided by our **diet**. If one is missing, then proper growth and repair cannot be **maintained**.

Types & Functions of proteins in our body:

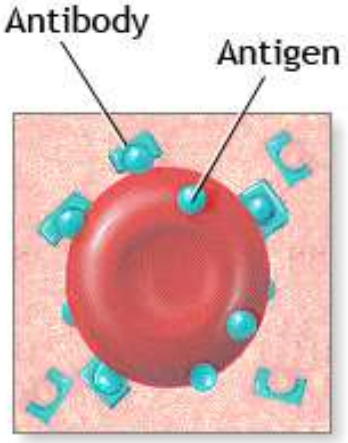
1. **Muscle** contraction (actin and myosin)

2. Transport **oxygen** in the bloodstream (hemoglobin)



Types & Functions of proteins in our body:

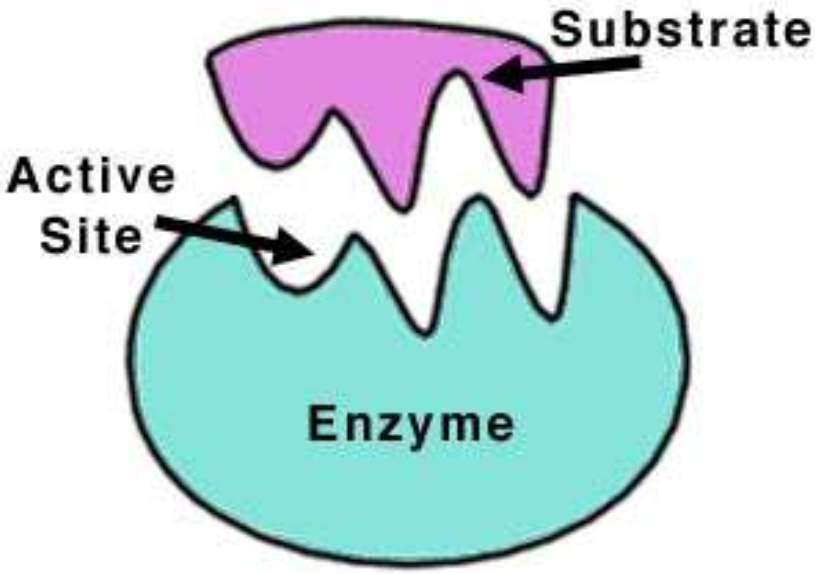
3. Provides **immunity** (antibodies)



Red blood cell

An antibody is a protein produced by the immune system in response to the presence of an antigen

4. Carry out **chemical** reactions (enzymes and hormones)



A.D.A.M.

Types & Functions of proteins in our body:

5. Collagen
   - **Structural** protein in animals
   - Gives connective tissue **elasticity**
     - **Skin**
       - Anti wrinkle creams?

6. Keratin
   - **Structural** protein in humans
   - Found in **hair**, nails, **skin**
   - Adds **strength**

Types & Functions of proteins in our body:

- All proteins help with **growth** and **repair** of cells in our diet
  - Increase protein intake during rapid **growth** years or **injury** repair.

What happens to PROTEINS in the body?

- Broken down by the digestive system via HYDROYSIS into **amino acids** which are then absorbed into the body through the bloodstream, where the body cells take the amino acids and make protein for muscles.

- Crash Course: You are What You Eat.