

Source:

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## 1 | Proteins

### 1.1 | Structures

- Proteins account for 50% of the dry mass of most cells
- Enzymes are mostly proteins
- Very structurally complex
  - They are constructed from the same 20 sets of amino acids
- A polypeptide is a polymer of amino acids
  - A protein is made up of one or more polypeptides
- A protein must serve a biological function to be a protein
  - It also must be folded and coiled into a specific 3 dimensional structure
- There are many types of proteins
  - Enzymatic proteins
    - Selective acceleration of chemical reactions
    - Digestive enzymes are an example that catalyze the hydrolysis of bonds in food
  - Defensive proteins
    - Protect against disease
    - Antibodies are an example and inactivate as well as help destroy viruses and bacteria
  - Storage proteins
    - Storage of amino acids
    - Casein is an example which is in milk and is the major source of amino acids for baby mammals
  - Transport proteins
    - Transport of substances
    - Hemoglobin is an example that transports oxygen from the lungs to other parts of the body.
  - Hormonal proteins
    - COordination of an organism's activities
    - Insulin is an example as it causes other tissues to take up glucose thus regulating the blood sugar concentration
  - Receptor proteins
    - Response of cell to chemical stimuli
    - Responsible for stuff like detecting signaling molecules released by other nerve cells
  - Contractile and motor proteins
    - Meant for movement
    - Responsible for stuff like flagella
  - Structural proteins
    - They are used as support
    - Keratin is an example

### Amino Acids

- All amino acids share a common structure
  - It is an organic molecule with both an amino group and a carboxyl group
    - An amino group is two Hydrogens bonded with a nitrogen and a carboxyl group is an oxygen double bonded with a carbon and an OH bonded with the same carbon
  - The side chain determines the unique characteristics of the particular amino acid

### 1.1.1 | **Protein Structure**