


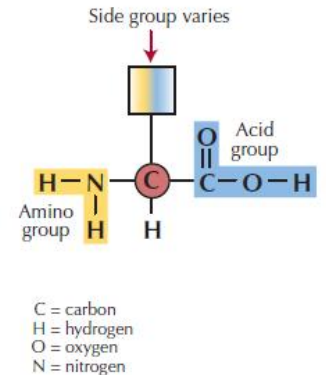
Protein

- Composition
- Function
- Metabolism



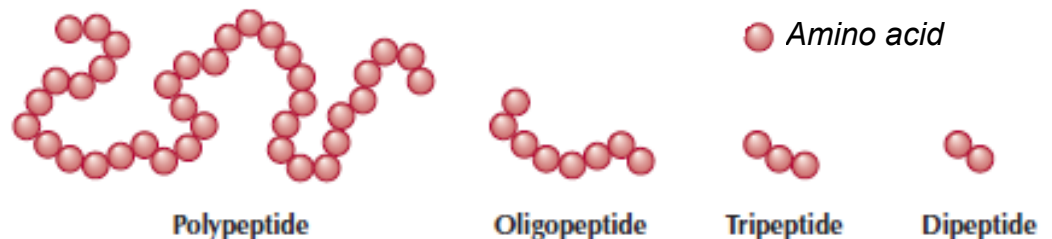
Protein – Composition

- There are **21 different amino acids (aa)**  used to make proteins
 - These different amino acid are defined by their side group (see diagram)
- Some amino acids cannot be synthesized by the body and must be supplied through the diet:
 - 9 **Essential** amino acids (supplied through the diet)
 - 12 **Non-essential** amino acids (synthesized by the body)
 - Some of the non-essential may become **conditionally essential** due to medical condition or disease. During periods of high stress, the body's protein needs are higher.
- Proteins are made up of different combinations & length of **amino acids** linked end to end by **peptide bonds**.



Generic structure of an amino acid

- Combining amino acids creates:
 - Peptides (2-99 amino acids)
 - Proteins (>100 amino acids)



- Proteins are the body's only source of nitrogen, which is important for growth and protein synthesis.

Protein – Functions

- Main functions:
 - Build and repair **muscles & other tissues** and form integral parts of most body structures, such as **skin, muscle & bones (collagen)**.
 - Act as enzymes and hormones to **regulate metabolic reaction**.
 - Act as antibodies & key components of the immune system defending the body against disease by aiding in the **immune response**.
 - Can be broken down for **energy**
 - Proteins are preferably used to **support essential body functions** rather than being used as an energy source.
 - However, if the diet contains insufficient carbohydrate & fat, protein is broken down and provides energy.
- A diet low in protein can lead to decreased immune function, poor wound management & potentially reduced muscle strength.

Protein – Digestion, Absorption & Metabolism

