**PROTEINS**

What are they?

* Carry out numerous functions everyday; Proteins are essential for the structure, function, and regulation of tissue and organs in the body.
* Made up of thousands of smaller units called **amino acids**, which are all linked by long chains.
* **Species-specific**; Proteins of one species differ from those of another species.
* Are also **organ-specific**; for instance, within a single organism, muscle proteins differ from those of the brain and liver.

Amino Acids

* 20 different types that may be combined to make a protein; Humans can produce 10 of the 20
* These are: **alanine, asparagine, aspartic acid, cysteine, glutamic acid, glutamine, glycine, proline, serine and tyrosine**
* The sequence of amino acids determine the unique 3D structure and its function
* Building blocks of proteins and as intermediates in metabolism

Importance and Uses in the body

* **Enzyme** is a class of proteins, act as catalysts in chemical reactions in cells
* Structural proteins provide support in our bodies such as collagen in our connective tissues
* Transport proteins move molecules around such as hemoglobin that transports oxygen through our body

Denaturation

* **Altering of protein structure causing temporary change** in structure. Protein may uncoil or assume a new shape.
* Caused by heating, alkaline/acids, detergents, shaking, organic solvents, etc.
* Allows for more reactions with other group
* **Ex)** The unraveling of proteins allows trypsin (an enzyme responsible for breaking down proteins) to bind onto it and break it down through hydrolysis.

Coagulation

* Like Denaturing, coagulation involves the disruption of bonds holding the protein molecule together
* Results in **permanent change**

  **Ex)** Boiling an egg - causes bonds to break apart resulting in permanent change